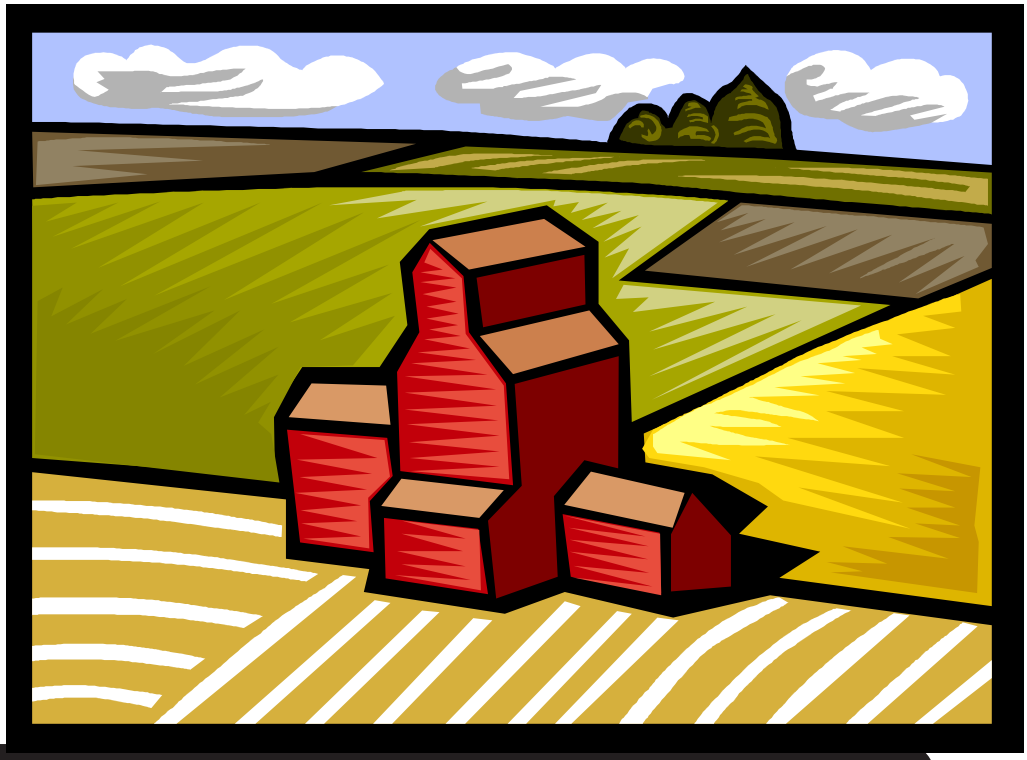


Farm Safety Project

Practice Farm Safety
It Won't Kill You!

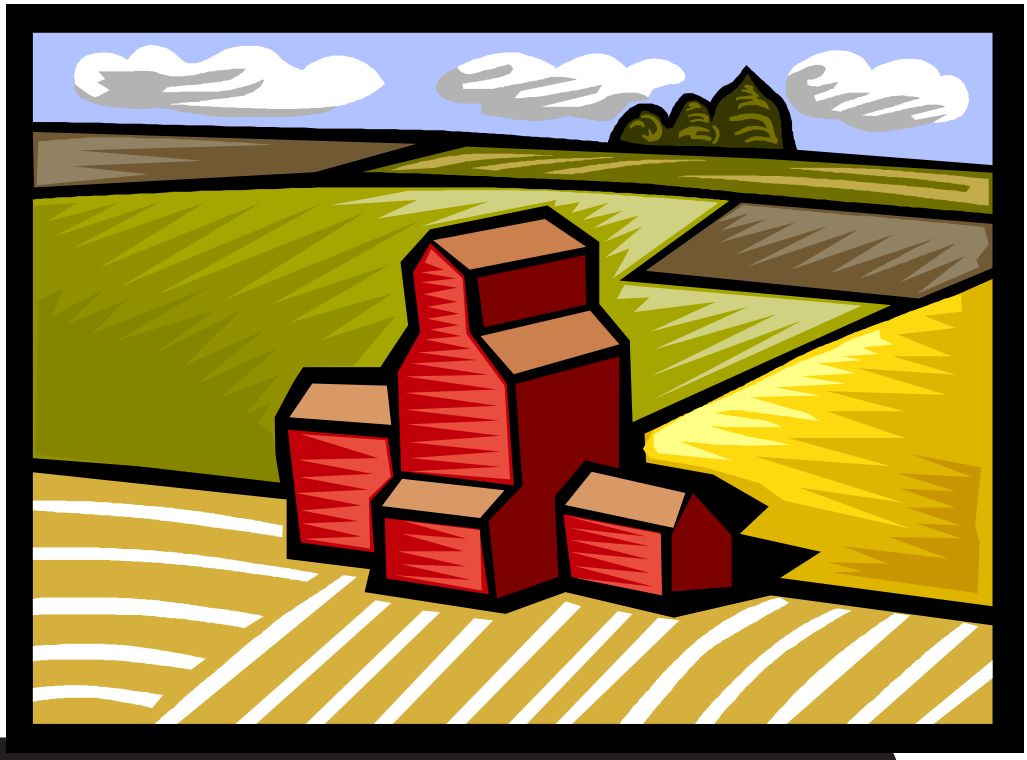
4-H Ontario

CANADA

Guide for Volunteers and Members
4-H Ontario
April 2007

ONTARIO'S MUTUAL INSURANCE COMPANIES

Protecting Rural Communities For Over 150 Years!



Farm Safety Project

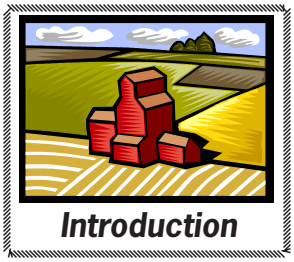
Introduction

4-H Ontario

4-H Canada

Ontario's Mutual Insurance Companies

Protecting Rural Communities For Over 150 Years!



The 4-H Motto

"Learn to Do by Doing"

The 4-H Pledge

"I pledge
My HEAD to clearer thinking,
My HEART to greater loyalty,
My HANDS to larger service,
My HEALTH to better living,
For my club, my community, and my country."

The 4-H Grace

(Tune of Auld Lang Syne)
We thank thee Lord, for blessings great
on this our own fair land.
Teach us to serve thee joyfully,
With head, heart, health and hands.

4-H Ontario Vision

We will be recognized for delivering quality, innovative, and sustainable, leadership and life skill programs for youth and volunteers; which will benefit the citizens and communities in which they live.

The Farm Safety Manual was created by Karen Plume, whose life was changed in an instant by a family member's farm related accident.

For more information contact 4-H Ontario

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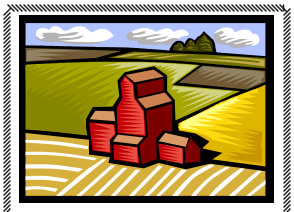
RR 5, Guelph, ON N1H 6J2

Phone 1-877-410-6748 or
519-824-0101 Fax: 519-824-8759
Email: inquiries@4-hontario.ca
www.4-hontario.ca



Introduction

PRACTICE FARM SAFETY – IT WON'T KILL YOU

The purpose of this 4-H manual on farm safety is to teach our future farm workers about the many hazards related to farming. Some may think because they have grown up on a farm, they know everything they need to about farming. Unfortunately, that serene beautiful homestead, the place many of us call home, with the fresh air, rolling green hills, surrounded by nature can very quickly become a death trap! How is that for reality!

There is no denying it. Farming is a hazardous occupation. There are many contributing factors that make it hazardous. Every year in Canada approximately 100 people die in farm accidents. Another 25,000 are injured: many lose fingers, hands, arms, legs and eyes. Others are left partially or fully paralyzed. The financial cost of these accidents is staggering. The bigger, greater losses cannot be measured. They are the loss of a parent, child, brother, sister, aunt, uncle, cousin, neighbour or friend. Another loss is the loss of dreams. Perhaps a generational farm without an owner or operator; a family without a main wage earner; a family member permanently disabled. These are ongoing human costs… costs that the survivors, or their families live with everyday.

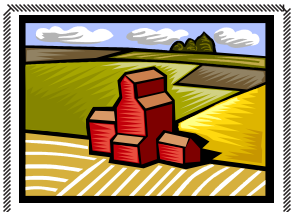
But you can make a difference simply by taking the time to continue to learn and work safely. Hopefully this 4-H manual will help. If the information in this manual helps prevent even just one accident, it too is invaluable to the person who has learned and practiced farm safety as a part of their everyday lives. So you see, the Farm Safety 4-H Project just may be an invaluable experience for us all!

Project Objectives:

- to educate youth about the many hazards related to agriculture and farming.
- to encourage the promotion of farm safety practices amongst 4-H members, peers, families, communities and farm related businesses.
- to encourage more in-depth learning in addition to the information presented in this manual.

Format:

This 4-H project is divided into twelve parts, including this section. Each addresses a certain topic, has within it supplemental information for senior 4-H members and lists possible activities that will reinforce what is learned within the meetings.



Introduction

General Requirements:

In order to receive 4-H Ontario recognition for completing the Farm Safety project, a member must be “a member in good standing” and must:

- participate in at least 2/3 of his/her club time.
- adhere to the signed code of conduct agreement.
- take part in the achievement program.
- have paid the annual 4-H membership fee.

How to Use this Manual

Welcome to the Farm Safety Project!

This manual is divided into 11 sections (not including the introduction), each focusing on different farm safety related categories - **Animal Handling, Chemicals and Gases, Environmental Safety, Farm Accident Preparedness and Action, Safety and Farm Machinery, Health, Fitness & Farming, Personal Protective Equipment, Road Safety, Tractor Safety, Other Farm Safety Topics, and Additional Resources.**

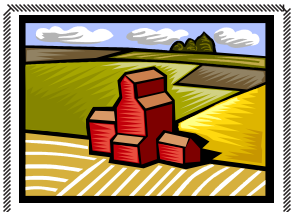
The categories have been formatted and printed to act as information sheets. These sheets can be used for meetings and focus on different topics within the categories. At the end of each category is a list of suggested activities that reinforce what has been learned during the meeting.

It is suggested that as leaders you read over the manual, and choose two or three information sheets to review with members at the meeting. Depending upon available time, more than one activity can also be included. Some activities are outdoor activities and some are indoor to try to accommodate for poor weather conditions.

Throughout the manual and at the end you will find references where members can obtain additional information on the topic if desired. Youth leaders and senior members are encouraged to “dig deeper” whenever possible to enhance their knowledge, and take a leadership role whenever possible in bringing the additional information back to the club.

To prepare manuals for the members:

- Read over the manual and decide which categories and topics you would like to use to make the Farm Safety project that is a good fit for your members at this time. We have marked pages that we think would be of particular benefit to members with the icon.
- Print or photocopy the information sheets and activity sheets that you require.
- Distribute the information sheets either as a complete manual at



Introduction

the beginning of the club or as smaller units before each meeting.

- Have fun, enjoy the project and remember each time you lead this project it can be different by choosing to focus on different roll calls, information sheets and activities within the manual. Not all of the content of this manual needs to be covered in one project.
- When facilitating this project for the first time, keep track of what went well, and what you would change for the next time because each time the Farm Safety project is taught, the content of the meetings can be different!

Achievement Ideas

These are just some suggestions and ideas. Children and youth like to be included in decisions that effect them, and will be more committed if they have participated in the decision making process.

1. Create a presentation on one of these topics covered in this project. Arrange to present at a local school, a local fair, or take part in a local Farm Safety Day Camp.

2. Create a large display on one of the topics covered and enter it in as many local fall fairs as possible. Have a member contact the fair board afterwards to find out approximately how many people attended the fair and potentially saw the display and were educated.

3. Create a press release on a topic related to farm safety and send it to a local newspaper.

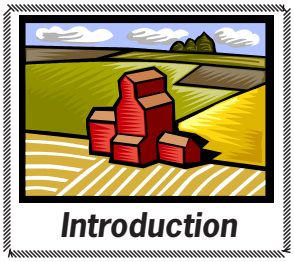
4. Create a video on a farm safety topic. Show the video at a local fair, school or other 4-H clubs. Send it to another 4-H club in a different region or province and have them show it at their achievement day or awards banquet.

5. Create a power point presentation on a farm safety topic. Show it at a local fair, school or other 4-H clubs. E-mail it to another 4-H club in a different region or province and have them show it at their achievement day or awards banquet.

6. Approach a reporter, newspaper or local magazine and set up an interview about a farm safety topic. Be sure to research the topic and make an outline of what should be included in the interview to prepare for the interview.

7. Arrange a tour of a large farm or farm related business. Ask them to emphasize as part of their tour what they do to address farm safety and keep everyone safe.

8. Organize a farm or animal safety event to promote safety awareness. This could involve 4-H members, families, a local school or fair.

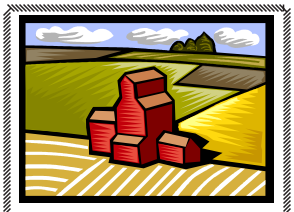


Introduction

9. Use the Internet to promote farm safety. Set up a web page, group or chat room to discuss farm safety topics.

10. Ask for permission and set up a display in a public area to educate people about a topic covered in this project. This could be done at other farm organizations' events such as Farmers Week, conferences etc.

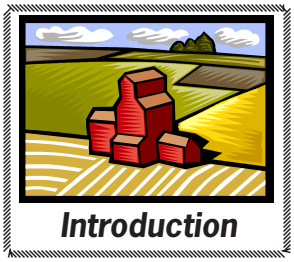
11. Think of any other ideas and discuss them with the club leader. There are many things we have not thought of that would make great achievement ideas.



Project Planning Chart

For Volunteers and Youth Leaders of the 4-H Agriculture Awareness Project

Meeting	Date	Time	Place	Equipment and Materials Required	Ideas
1					
2					
3					
4					
5					
6					
Achievement Program					



Introduction

PROJECT EVALUATION
FARM SAFETY

(To be completed at the end of the project)

1. Member Comments:

I joined this club because

I really enjoyed

I didn't enjoy

If I were to take this project again, I would change

I learned

I'm glad

2. Parent/Guardian Comments:

3. Leader Comments:

Meeting Schedule

	DATE	TIME	PLACE
Meeting ONE			
Meeting TWO			
Meeting THREE			
Meeting FOUR			
Meeting FIVE			
Meeting SIX			
Achievement Program			

Club Membership

Get involved! Be willing to let your name stand for an executive position. It is a rewarding and fun experience. Following your club's elections, complete this membership and executive chart.

Club Executive:

	NAME	PHONE
PRESIDENT		
VICE – PRESIDENT		
SECRETARY		
TREASURER		
PRESS REPORTER		
OTHER		

Club Membership:

MEMBER'S NAME AND PHONE #	MEMBER'S NAME AND PHONE #
LEADER'S NAME AND PHONE #	

Farm Safety Project

Congratulations on successfully completing this 4-H Project.

_____

Name

_____

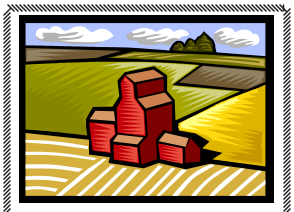
_____

_____

_____

_____ _____

Date ***Club Leader's Signature***



Introduction

Roll Call For Meeting #1

Roll Call #1: Why do you think people don't practice farm safety?

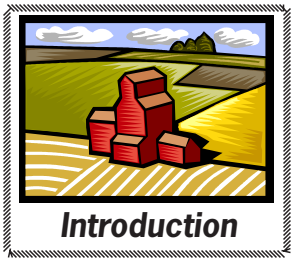
According to Farm Safe Australia the reasons why people don't practice farm safety are many and varied. Here is what they found:

- Farmers values and attitudes.
- Economic and cost related issues e.g. it is too costly.
- Shortcomings in education and training.
- Age and poor design of farm machinery and safety equipment.
- Characteristics of the work force, work practices and farm environment.
- Deficiencies in government departments and other responsible authorities (not enough rules and regulations).
- Inconsistent support from farmer organizations and rural industry groups.
- Other priorities.

How many of these did you mention as part of your roll call?

Getting Started

Farm Safety is a journey. Although this 4-H club will have a beginning and an end, that doesn't mean farm safety has a beginning and end. Farm safety should become one of your basic values. It should be kept in mind and practiced each and every day of our lives. This manual is divided into 10 different sections and covers a lot of different farm related information. You might not be interested in it all, but I guarantee if you live, work or visit a farm it will be information you need to know!



Introduction

Farm Safety First Thoughts

Write down why you chose to take this 4-H club.

1. _____
2. _____
3. _____

Take a moment and write down 5 things you hope to learn as part of this club.

1. _____
2. _____
3. _____
4. _____
5. _____

Now write down the names of special people in your life. (Because farm safety is not just about keeping ourselves safe, but other people in our lives safe too.

1. _____ 4. _____
2. _____ 5. _____
3. _____ 6. _____

What jobs scare you the most on a farm?

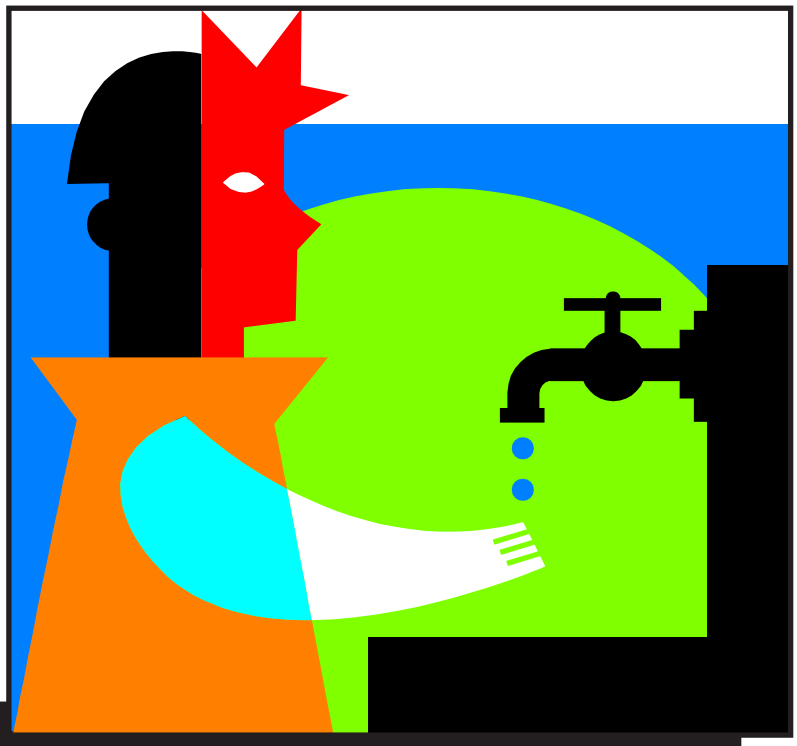
1. _____
2. _____
3. _____

What would help you feel more comfortable with these jobs?

1. _____
2. _____
3. _____

Who can help you with this?

1. _____ 3._____
2. _____ 4. _____



Farm Safety Project

Health, Fitness and Farming

Farm for Life - Have a Health and Fitness Plan!

4-H Ontario

4-H Canada

Ontario's Mutual Insurance Companies

Protecting Rural Communities For Over 150 Years!

Health, Fitness and Farming

Roll Call #1: Name a common injury a person may get while farming?
Roll Call #2: Name some exercises that may be beneficial to a person who works on a farm
Roll Call #3: Name some common illnesses that people can get while farming
Roll Call #4: Name some places on the farm that would be good breeding spots for mosquitoes.

HEALTH AND FITNESS OVERVIEW

Why worry about health and fitness? Years ago, people didn't pay much attention to the need for proper diet and exercise. How many older farmers do you see around, who have visible problems walking, sitting, bending, having a full range of motion with their arms, breathing, hearing or seeing? While some disabilities may come naturally with age, others are hastened or caused by working without taking precautions to be good to our bodies!

In our late teen years, many of us feel like we are going to live forever! At times, this belief causes some teenagers to take risks they normally wouldn't. This sense of immortality (thinking they will live forever) along with a lack of experience can be a deadly combination, especially while working on the farm. Ever wonder why most professional athletes retire in their late twenties or by their mid thirties? That is because our physical abilities peak in our late twenties. From there it is all downhill. Between 55 and 70 years of age, our eyesight, hearing and strength typically deteriorate. We find that jobs that once were a breeze are now harder to do. Some will realize and admit that they are not as able to do farm jobs as well as in their earlier days. Others have a hard time admitting this, and continue to work as hard as they always did. Those people are more likely to experience a farm related accident.

Whether young or old it is important to be good to our bodies. We only have one! Get regular physical check ups, and keep monitoring any changes you may find. Get problems looked at as soon as possible. It is always easier to fix things before the problem gets too big, and causes other problems.

ACCEPT YOUR LIMITATIONS

No one can do all jobs. Each one of us is unique. We each have our strengths, but they may be in different areas. Some people are stronger than others. Some may shine in figuring out problems. Some may be better at handling livestock than others. It is okay!

Here is a list of some things that could affect us:

- **Get your eyes checked regularly.** Vision deteriorates gradually, and so it can sneak up on us. Some people need a lot of light to see well, or are more sensitive to glare. Try to avoid moving farm equipment at dawn or dusk. Even if your eyesight is good, the person coming towards you might have problems seeing.
- **Get your hearing checked regularly.** For some people it is hard to admit they cannot hear everything as well as they used to. When a person is experiencing hearing loss, their alertness is decreased. They may not be aware of all the possible hazards around them, and it can also lead to communication problems… which could result in an accident. What if a person didn't hear someone call to "stand clear" or they were restarting some machinery?
- **Fatigue.** We all do it at times - we try to get too much done in one day even though we are tired. Although it is a temptation to "push it" to get the crop in or to get it harvested while the weather is good, too many farmers have lost their lives or been injured as a result. It is very important to get enough rest during busy periods on the farm. We are less alert when we are tired, and can make poor decisions. Make sure you take breaks during the workday to protect yourself from fatigue.
- **Chronic Illness.** During the teen years, not too many youth have to worry about chronic illness, but some do. Some will have asthma. They have to protect themselves by making adjustments to what they do, and for how long. Not everyone can keep the same work pace. Be prepared if working around older co-workers or family members that they may not be able to "keep up" and by trying, they may put themselves and possibly yourself at risk of an accident.
- **Medications.** Medications, when required and taken as prescribed are good. Some will cause drowsiness, and should not be taken when working around machinery. Check with the pharmacist or the package for possible side effects. Allergy and cold medicines that are bought over the counter can slow down reflexes and decrease alertness. This is not a good mix with operating farm machinery!
- **Problems keeping up with Modern Technology.** Don't laugh! Many of the youth today are able to figure out modern technology very quickly. But trying to figure out a remote control, a DVD player, or a cell phone poses less risk than trying to figure out a bunch of electronic and hydraulic controls that require a quick response, or on huge equipment at times 10 to 15+ metres wide, and enough horsepower to crush anything in its path! Some people may find this modern technology very intimidating. Not everyone can operate it well. Get training, and be supervised until you know how to operate it correctly.

Fast Farm Safety Tip:

Short-cuts while farming can cut-short your farming career and your life. Don't take short-cuts!

- **Stress Levels**
  Today, farmers have higher stress levels than previous generations. For many, farming is not their only occupation. Many farms are being operated in addition to other full and part time jobs off the farm. Farming today is an occupation that requires a high dollar investment, and at times, very low returns for that investment. This can cause stress! Stress can have a negative effect on people. They can become less alert, more tired, can become confused and at times angry. Stress can cause poor judgment which can lead to dangerous short cuts that normally would not be taken such as stepping over a PTO shaft or leaving a tractor running while refueling. Stress affects each person differently, but be sure that high stress levels do affect people physically. It is important that you recognize when stress levels are high and protect yourself by focusing on things that will bring your stress level down.

Older farmers at greatest risk of injury, death. (March 1998) Farm Safety Association, Fact Sheet F-15.

COPING WITH STRESS

Farming today is stressful. Can you think of reasons why? Sowing crops and harvesting are dependent on the weather, over which we have no control. That causes stress. The majority of the farm operators today, also have other jobs either full time or part time in addition to farming. That causes stress.

To farm today, it takes a lot of financial investment By the time you buy the farm, the livestock, the equipment, the feed, the seeds, the fertilizer, and have enough money set aside to do unexpected repairs, pay insurance… the list goes on. Financial pressure causes stress. Right now in your lives, I bet each one of you can identify something that is stressful for you.

Stress in moderate amounts can be positive. It keeps us alert, interested and challenged. It can motivate us to do more, or things better. Moderate stress helps us achieve things we might not be able to do otherwise. But too much stress is not healthy. It can have many negative effects. It can cause fatigue, memory difficulties, effect energy levels, lower tolerance levels, and many physical difficulties. Whether we work on a farm, or elsewhere, there will always be stress in our lives. Therefore it is important to learn how to deal with it in positive ways. We may not be able to control all the things that contribute to our stress levels, but we can control how we react and respond to stress. Everyone is different, so how we manage our stress levels will also be different. What is important is to find the stress management techniques that work for you.

Here are some ways to cope with stress. Keep an open mind and try them out. Then when you get really stressed you will have an advantage. You will already have an idea of what types of things work for you, and bring your stress level down to a manageable level.

1. **Regular Exercise.** You have heard it before, and it is simple to do. Block time each day to stretch, and exercise. Farming is very demanding. Each day we may need to use different muscles to complete the job being done that particular day. It makes sense to keep our muscles in shape, so when we call upon them, they are ready to go!

2. **Relaxation.** Everyone needs down time. We need time away from the job (and school) to focus on other things. If we don't take time to relax, we are at high risk for burn out. Relaxation can be different for different people. It may be reading a book, taking a bubble bath, watching TV, taking a walk, or having a massage… the list is endless and quite simple. The hard part is giving ourselves permission to do it.

3. **Proper Sleep and Diet.** These are two really important things to help manage stress. They also are components that should become ordinary life habits. We need to eat healthy to provide the necessary fuel for our bodies to operate at their best. We need to get enough sleep to allow our bodies to rejuvenate for the next day. Without proper sleep and diet, we don't think clearly, we can't problem solve as well, we forget things, we lack energy and strength, and our tolerance levels are lower. We put ourselves at higher risk for injuries and illness.

4. **Introvert vs. Extrovert.** People "recharge" themselves differently. For some, having fun is going out to dances, surrounding themselves with people, being part of a crowd, partying! After participating in these types of activities and having fun, they feel energized, relaxed, ready to go back to work or school. If this describes you, then you are an extrovert. For others, "recharging" may be reading a book, spending time alone, or with a good friend, walking or hiking, or going for a drive. If this describes you, then you are an introvert. One type is not better than the other. Understanding yourself is important, because trying to be what you are not is stressful! An extrovert does not recharge by spending time alone, and an introvert does not recharge by going to a crowded dance. Find out which you are, and then adjust your lifestyle to make sure you get what you need to recharge! That doesn't mean that an introvert should never go to a crowded football game, or an extrovert should never go on a quiet nature walk.

5. **Create A Good Support Network.** Everyone needs friends. It is a fact that people cannot live totally alone. Surround yourself with people you get along with, who share similar values, and have common interests. When your stress levels get high, call them, and share what's bothering you. That doesn't mean you dump on them, or take your frustrations out on them. If you have friends that do that to you, it may be time to re-evaluate how positive and supportive the relationship is. Sometimes just talking through the problem helps. It doesn't get solved or fixed, but sharing the burden helps. Sometimes, when you feel less stressed, then you are better able to come up with ways to solve what is stressing you!

6. **Don't Be A Perfectionist And Don't Be a Procrastinator.** A perfectionist is never satisfied with a job or task unless it is absolutely perfect. A perfectionist puts a lot of pressure on himself or herself and even when a job is completed well beyond expectations they will not be happy with it, or themselves. Perfectionists are very hard on themselves and often are very critical of their abilities and sometimes others. This is not healthy. A procrastinator is someone who keeps putting off jobs that need to be done, until there is no time left to do it. When working on a farm operation, you can't be either. You must learn when to let things go, and you must learn that ignoring things does not get it done. Jobs usually don't go well, when you have not given yourself enough time to do the job properly. Stress levels rise really quickly when you are supposed to be somewhere else or doing something else, but are now forced to do the job that should have been done before. Be nice to yourself. Plan. Organize. Do the job when there is enough time to do it well. Once it is done, let it go!

7. **Learn To Laugh.** There will always be days that don't go as planned or well. When faced with a choice of laughing or crying or getting angry, try to find some humour wherever possible and use it to your advantage. Laughing releases chemicals to your brain that help bring stress levels down. The people you are around will appreciate some appropriate humour in stressful situations.

8. **Learn and Use Effective Communication Skills.** How many of you have problems saying "no" to other people? At times, not being able to say no to other people will increase your stress levels. Why? Because you usually then end up getting involved in or doing things you don't want to be doing (For the record – I am not telling you to say no to your parents). Learning effective communication skills now are a tool you will use your whole life through. There will be fewer misunderstandings. People will

Health, Fitness and Farming

Fast Farm Safety Facts & Tips:
"Plan Your Work, Work Your Plan, Then Call It a Day! Fatigue Leads To Accidents."

(Farm Safe)

respect you more if you are able to talk to them openly, honestly and respectfully.

(Just for fun, go around the room and have members give examples of nice ways to say "no").

Ten ways to Cope With Stress. (n.d.) Retrieved December 28th, 2006 from http://panicdisorder.about.com/od/selfhelp/ss/copewithstress_9.htm

FITNESS FOR LIFE ON THE FARM

Who can think of reasons why it is important to stay physically fit if you are working or living on a farm? There are not too many occupations in existence where every day can be absolutely different. Everyday there may be different demands placed on your body when working on a farm operation. Some demands change with the seasons, some with other outside demands. Each day is different. Farming is active. Although it is not as physically demanding as our ancestors who cleared the land and planted crops by hand, today there are other demands placed on us.

We need to have good physical fitness in order to farm for years to come. In a typical week, we may need to work in the freezing cold, we may need to use brute strength to repair some machinery, we may need to twist and turn in different positions while operating machinery, or stacking feed. We also may need to stay seated for long periods of time, climb on and off equipment multiple times a day, or sit and do the dreaded paperwork that also comes with farming. We may need to lift heavy loads. We may even need to be able to move quickly to get out of the way, and keep ourselves safe! Convinced yet?

When we are in our teen years and early twenties, we usually are in good health and have a reasonable fitness level. We usually reach our peak of strength and fitness by the late twenties. We need to consciously make a commitment to stay fit, in order to stay healthy, and protect ourselves from injuries and disabilities.

How To Measure A Heart Rate

Everyone should know how to measure a heart rate. If there is ever an accident, you will want to check for a heart rate on the victim to determine if CPR is needed. Your heart rate can be taken at several spots in the body where an artery is close to the surface. This allows a pulse to be felt. The most common places to measure a heart rate using this method (called the palpitation method) is at the wrist (the radial artery) and the neck (the carotid artery).

To take your resting heart rate, place your index and middle fingers together on the opposite wrist about 1.25 cm. on the inside of the joint, in line with the index finger. Concentrate and feel for the pulse. When you have found it, count the number of beats there are over a one-minute period. This is your heart rate “at rest” or without exercising.

Never take someone else’s pulse using your thumb. Sometimes you can feel your own pulse through your thumb. That would be a big mistake at an accident scene!

What Your Heart Rate Should Be

A normal heart rate at rest should range anywhere from 40 beats to 100 beats a minute. Ideally the rate should be between 60-90 beats per minute. The average resting heart rate for a man is 70 beats a minute and for a woman, 75 beats a minute.

*Measuring Heart Rate. (*n.d.) Retrieved December 28, 2006 from http://www.topendsports.com/testing/heart-rate.htm

INJURIES

SPRAINS, STRAINS AND TEARS

Many types of injuries can happen in the agricultural injury. Some can be very serious and life changing. Some are fatal. But the most common injuries in agriculture are no different than in other types of industries. They are: damage to muscles, ligament, tendons or nerves. Many of these injuries are caused by repetitive, forceful or awkward movements that can cause strains, sprains, and musculoskeletal injury (damage to the muscles and bones). The injuries can be mild to severe in nature and the actual damage to the body may consist of back pain, shoulder pain, muscle strain, tendonitis, carpal tunnel syndrome in the wrists and hands, and tennis elbow to name a few.

In 2004, 15% of the injuries in agriculture that caused workers to lose time at work were from sprains, strains and tears. Another 5% were due to fractures, 4% from bruises and contusions and 3% were due to cuts and lacerations.

In 2005, sprains, strains and tears accounted for 25% of injuries that resulted in lost time at work, followed by 11% due to bruises and contusions, 10% due to bone fractures and 7% due to cuts and lacerations.

On the farm, there are often times when machinery needs to be adjusted or worked on from awkward body positions. This accounts for the high occurrence of sprains, strains and tears. When working pay attention in general to your body position, and the motions needed to complete the job at hand. Try to make changes, or use tools and equipment so you are in the best position possible while working.

Remember, just like athletes, good physical fitness is a must for farmers and will help protect you from sprains, strains and tears. Exercise regularly and stay in shape. Be good to your body and it will be good back!

Farmsafe, Vol 31, No. 2

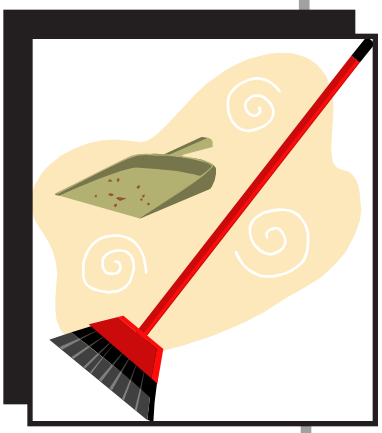
Fast Farm Safety Facts & Tips:
The average cost per year of farm related injuries to the Canadian economy is between $200 & $300 million dollars.

CAISP

Good Housekeeping

Good housekeeping is a sign of good farm management. Here are some things to check around the farm to prevent slips, falls, sprains, strains and tears:

1. Are buildings clear of trash and other things that could start a fire, cause a fall, or get in your way?
2. Are the ladders in good condition?
3. Are stairways in good condition with secure handrails?
4. Are there damaged floor boards or concrete problems that need repairs?
5. Are ladder openings, hay chutes and poultry clean-out openings surrounded by cages or railings?
6. Are nails taken out of boards before lumber is stacked?
7. Are passageways clear of objects that could cause falls?
8. Are building lights and yard lights adequate?
9. Are light fixtures in areas containing combustible materials protected so they will not break and cause a possible explosion?
10. Is electrical wiring in good condition and free from cobwebs?
11. Can electrical equipment be locked in the “off” position?
12. Are portable electrical power cords and extension cords checked before being used?
13. Are lightning protection systems checked yearly for proper grounding?
14. Are materials and supplies stored so they will not fall or collapse and do not block passageways?
15. Are aisle ways wide enough, do they need warning signs or mirrors to improve being able to see around blind corners?
16. Is there equipment that needs regular maintenance to avoid spills or leaks?
17. If a leak occurs is there material available to help with clean up? Are there (MSDS) Material Safety Data Sheets around to refer to?
18. Are power tools where they are supposed to be, and in good condition?
19. Are there waste containers close by to make organizing wastes easy?

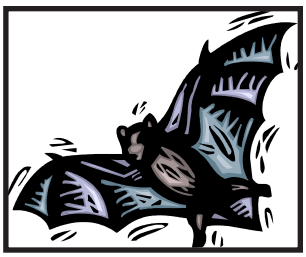


“Good housekeeping” a sign of good farm management. (n.d.) Farm Safety Association Factsheet.

General Houskeeping in the Workplace. Farm Safety Association Fact Sheet, December 2002.

Diseases

Zoonosis – What is "Zoo" – "Nose" – "Is"?
Zoonosis is a disease that can be passed from animals, both wild and domestic to humans, or from humans to animals. The word zoonosis comes from the Greek words, "zoon" (animal) and "nosos" (disease). The following is a partial list of animals that can carry zoonotic infectious organisms:



- Bats
- Cats
- Cattle
- Chimpanzees
- Dogs
- Geese
- Goats
- Horses
- Humans
- Monkeys
- Opossums
- Pigs
- Rabbits
- Raccoons
- Rodents
- Snails
- Sloths
- Fish

As you can see people who work on farms may be exposed to zoonotic diseases as part of their everyday work. There are several infectious agents or organisms. They are parasites, bacteria, viruses and fungi.

Zoonosis. (n.d.) Medline Plus. Merriam-Webster Medical Dictionary. Retrieved February 28, 2007. www.nlm.nih.gov/medlineplus/mplusdictionary.html

Parasites are organisms that live in, with or on another organism and at times can only be seen by a microscope. There can be over 100 different types of parasites that can live in the human body. It obtains its' food and nutrients from the organism (person or animal) where it is living and causes harm. The name parasite comes from the Greek word para that means beside and sitos which means food. Parasites secrete toxins and steal nutrients.

Human Intestinal Parasites Worms. (n.d.). Retrieved December 28, 2006 from http://www.appliedozone.com/parasites.html

Fast Farm Safety Tip:
"Keep hot foods hot and cold foods cold. Don't keep potentially unsafe foods at room temperature for more than 2 hours."

(Canadian Institute of Public Health Inspectors)

Bacteria are also known as germs or microbes. Bacteria are very tiny and can only move in watery fluids. Bacteria can be carried by dust, droplets of moisture e.g. a sneeze or cough, hands, insects, pieces of clothing and rodents. The majority of bacteria are harmless, and some are even good to have around. Bacteria can be found in many places such as in soil, inside animals, in manure and raw vegetables. Bacteria is a living organism, it takes in food, gets rid of wastes, grows and multiplies.

Food Fitness. (n.d.). Canadian Institute of Public Health Inspectors brochure.

A virus is an infectious disease. It is a particle that can only be seen with a microscope. Viruses infect the cells of a biological organism. They are not living organisms and cannot reproduce on their own. They multiply and replicate by infecting other cells. The word virus comes from Latin and means poison.

Virus. (n.d.). Retrieved February 28th, 2007 from Medline Plus. Medical Dictionary www.nlm.nih.gov/gov/medlineplus/mplusdictionary.html

An interesting example of a zoonotic disease is the Influenza Virus. It is very common. We all will have had the flu at one point in time, or we will know someone who has. The influenza virus continually recombines genes between strains found in humans, swine and ducks. These new strains continue to have changed characteristics. That is why the flu vaccines are changed each year. The last large flu epidemic was in 1918 and killed millions of people across the world.

Another example is the West Nile virus that appeared in the United States in 1999 in the New York City area. By the summer of 2002, it had spread across the United States and parts of Canada.

Fungi break down dead organic material. They are very important organisms and are helpful and needed for many forms of plant life. Fungi also cause a number of plant, animal and human diseases. Some examples for humans would be ringworm and athletes foot. Fungi cause several more serious diseases. Fungal diseases are hard to treat because they are genetically and chemically similar to animals than other organisms.

Introduction to the Fungi. (n.d.). Retrieved December 28, 2006 from http://www.ucmp.berkeley.edu/fungi/fungi.html

Some zoonotic diseases that are more common in Ontario are reviewed below:

Campylobacter

- This is a bacterium that commonly causes diarrhea.

Symptoms: Diarrhea, abdominal pain, malaise, fever, nausea, vomiting. The illness will appear 3-5 days after exposure to the bacteria and will last 2-5 days typically.

Source:

- Found in fowl, cattle, swine, sheep, dogs and cats.
- Direct contact with infected animals or manure in the barn.
- The bacteria must be swallowed, so contaminated hands that are put in the mouth, or used to eat with are sources.
- Contaminated food or drink e.g. contaminated water and unpasteurized milk.

Prevention:

1. Thorough hand washing after using toilet, handling pets, animals, handling manure and before preparing food.
2. Clean and sanitize counter surfaces.
3. Do not drink unpasteurized milk.
4. Refrigerate dairy products, meats and poultry.
5. Store and serve foods at safe temperatures –below 5°C or above 60°C.
6. Cook meat and poultry to an internal temperature of 74°C.
7. Drink water from a safe water supply.
8. Don't handle puppies or kittens with diarrhea.

Campylobacter (August 2005) Fact Sheet, Grey Bruce Public Health Unit.

Cryptosporidiosis

- This is an infection of the intestines caused by very small parasites.

Symptoms: Although not everyone will feel sick, symptoms can start 2-10 days after becoming infected. They include watery diarrhea, stomach cramps, nausea, vomiting and mild fever. Symptoms usually clear within 30 days but can last longer and be more serious in people with poor immune systems.

Source:

- Manure of infected animals such as rodents, pets, cattle, sheep, fowl, poultry, reptiles, fish and wild animals, and human stool.
- Uncooked food e.g. vegetables and fruits.

- The parasite must be swallowed, so wash hands before eating.
- The parasite can live outside the body for several months and can be transferred from contaminated items or surfaces.

Prevention:

1. Wash your hands after using the toilet, touching farm or wild animals and pets.
2. Wash your hands before eating and preparing food.
3. Do not drink water from rivers, creeks or lakes or wells that have not been tested.
4. Avoid unpasteurized milk or milk products.

Cryptosporidiosis (August 2005) Grey Bruce Public Health Unit www.publichealthgreybruce.on.ca

E. coli Bacteria

E. coli are bacteria that are usually found in human and animal intestines. There are different types of E.coli. Not all of them are harmful to people. Some however, can cause serious illness or death.

Symptoms: Stomach cramps, diarrhea (possibly bloody), fever, nausea and vomiting. This illness must run its course. In severe cases Hemolytic Uremic Syndrome, may develop and can lead to kidney failure.

Source:

- Can be spread from contaminated food such as undercooked ground beef, unpasteurized apple cider and milk, ham, turkey, roast beef, luncheon meats, raw vegetables and cheese.
- Can be spread by drinking contaminated water.
- Can be passed from person to person by hand to mouth contact.

Prevention:

1. Cook ground beef to an internal temperature of 70°C.
2. Drink only pasteurized apple cider and milk.
3. Wash all fruits and vegetables before eating.
4. Wash your hands after using toilet, handling livestock or pets and before preparing food.
5. Drink safe water intended for human consumption.
6. Do not drink water from streams or lakes.
7. Keep cold foods at 4°C or lower and hot foods above 60°C.
8. Use separate work surfaces and utensils for preparing raw and uncooked foods.

E. Coli Bacteria (n.d.) Grey-Bruce Public Health Unit www.healthunitgreybruce.on.ca

True Story:
Ontario, May 2000 seven people died and hundreds of people became ill from drinking unsafe water contaminated with E.coli bacteria. It became known as the Walkerton water crisis.

Gardiasis

This is a disease within the intestine caused by the parasite, Giardia lamblia.

Symptoms: Symptoms can appear between 5-25 days after contact. Diarrhea, stomach cramps, bloating, weight loss, fatigue. Not all people will show symptoms.

Source:

- Giardiasis is found in the gut of infected humans and animals such as beavers, muskrats and pets.
- It is usually spread through water supplies contaminated with manure.

Prevention:

1. Wash your hands after using the toilet, handling livestock or pets, and before preparing food or eating.
2. Do not drink from untreated surface water e.g. lakes, rivers & streams.
3. Avoid unpasteurized milk and milk products.
4. Wash all fruits and vegetables before eating.

Giardiasis (n.d.) Canadian Institute of Public Health Inspectors

Lyme Disease

This is an infection caused by bacteria named Borrelia burgdorferi.

Symptoms: At first there may be a skin rash at the location of the tick bite 2-30 days after contact. The rash often looks like a bull's eye. The rash disappears if untreated within 3 weeks. Flu like symptoms can also occur that include headache, chills, pain in the joints, loss of appetite, nausea, fatigue, fever, aching muscles, stiff neck, sore throat and vomiting.

Source:

- This bacteria is spread by the bite of deer ticks and western blacklegged ticks that can be found on sheep, songbirds and on tall grass and brush in wooded areas.

Prevention:

1. Wear light coloured long pants and long sleeved shirts outdoors.
2. Wear close-toed shoes when walking through fields.
3. Use a tick repellent such as DEET.
4. Put a tick and flea collar on your pets and check them regularly.

What to do if bitten:

1. Remove the tick as soon as possible to avoid infection.
2. Use fine-tipped tweezers to firmly grasp the tick close to the skin.
3. Do not squeeze it; pull the tick's body away from the skin.
4. It is not uncommon for the mouthparts to detach from the tick.
5. If possible save the tick and take it to the local health unit office for analysis.
6. Clean your skin with soap and warm water or alcohol.

Lyme Disease. (August 2005) Grey Bruce Public Health Unit www.publichealthgreybruce.on.ca

Q-Fever

This is a disease caused by organisms called Coxiella burnetii. It is usually spread from animals to humans.

Symptoms: Symptoms usually occur 2-3 weeks after exposure and include chills, headache, weakness, malaise, and severe sweats. Pneumonia, cough and chest pains may also be present, but some people may not have symptoms.

Source:

- Cattle, sheep, goats, cats, rodents, ticks and some wild animals.
- The organisms are found in the urine, manure, milk and placental tissues and birth fluids from infected animals.
- It is commonly spread to humans through airborne dust.
- It can also be spread by direct contact with infected animals and contaminated materials such as wool, straw and the laundry of an exposed person.
- Drinking unpasteurized milk from an infected cow, goat or sheep.

Prevention:

1. Adequate disinfection and disposal of animal products of conception and birth.
2. Wash your hands.
3. Strict personal hygiene practices of those who work in cow and sheep barns.
4. Disinfect clothing with 0.05% bleach product or 5% peroxide.
5. Do not drink unpasteurized milk.

Yersiniosis

This is a bacterium that must be swallowed. It can be passed on by unwashed hands that have been in contact with manure. The bacteria can also be spread to foods or objects and then to other people.

Symptoms: Usually appear 24-36 hours after contact with the bacteria and can last 1-3 days. They include watery diarrhea, fever, vomiting, headache, and abdominal pain that feels like the pain you would have if you had appendicitis.

Source:

- Raw meat, poultry, milk, fish and shellfish may carry the bacteria.
- Undercooked food will not kill the bacteria.
- Swine are the most common source. They carry the organism in the back of their throats, and usually do not have any symptoms so there is no way to tell which pigs have it. Therefore cook pork thoroughly.

Prevention:

1. Thoroughly wash hands after using the toilet, handling livestock, pets and before preparing food.
2. Clean and sanitize counter tops and utensils after contact with raw meats and poultry.
3. Use separate surfaces to prepare raw and cooked foods.
4. Cook meat, especially pork, thoroughly.
5. Do not drink unpasteurized milk.
6. Keep cold foods at 4°C or lower and hot foods at 60°C or higher.
7. Only drink from safe, tested water sources.

Yersiniosis. (n.d.) Canadian Institute of Public Health Inspectors

Shigellosis

This is a disease caused by bacteria that can be more severe in children. It can be associated with Hemolytic Uremic Syndrome and can lead to kidney failure. It is found in the intestines of infected people, so must be swallowed.

Symptoms: They include diarrhea (at times bloody), fever, nausea, vomiting and cramps. It can last several days to several weeks.

Source:

- Water contaminated by sewage.
- Touching by people who do not wash their hands thoroughly after using the toilet can spread it.
- Flies that land on manure can spread it, then land on uncovered, un-refrigerated food.

- Raw shellfish such as clams, crabs, oysters or mussels that have been exposed to sewage.

Prevention:

1. Wash your hands thoroughly after using the toilet.
2. People who have Shigellosis should not prepare food.
3. Do not eat raw shellfish.
4. Drink water only from safe, tested water sources.
5. Do not swim in water that may be contaminated.

Shigellosis. (n.d.) Canadian Institute of Public Health Inspectors

Salmonellosis

This is an infection caused by bacteria. There are over 2000 different kinds of salmonella bacteria across the world. It lives in the intestines of people and animals.

Symptoms: Sudden stomach cramps, diarrhea, nausea, fever, headache and sometimes vomiting. Sever dehydration is possible. Symptoms usually appear 12-36 hours after exposure and can last several days to several weeks.

Source:

- It can be spread by improper handwashing after using the toilet or coming into contact with manure from fowl, swine, cattle, turtles, reptiles, dogs, cats and rodents.
- It can be passed by infected people by touch or through food.
- Contaminated food, drinks or ice cubes.

Prevention:

1. Wash your hands thoroughly after using the toilet, handling pets, livestock or poultry and preparing foods.
2. Clean and sanitize counter tops and utensils after preparing meats and poultry.
3. Avoid unpasteurized milk.
4. Drink water only from a safe water supply.
5. Store and serve cold foods at 4°C or below and hot foods above 60°C.
6. Cook red meats to 70°C and poultry to 74°C.

Salmonellosis. (July 2005) Grey Bruce Public Health Unit Fact Sheet
www.publichealthgreybruce.on.ca

Fast Farm Safety Facts:
Over 500,000 Canadians every year are victims of food poisoning. Most cases could have been prevented.

(Canadian Institute of Public Health Inspectors)

The Best Prevention of Zoonosis – Proper Handwashing!

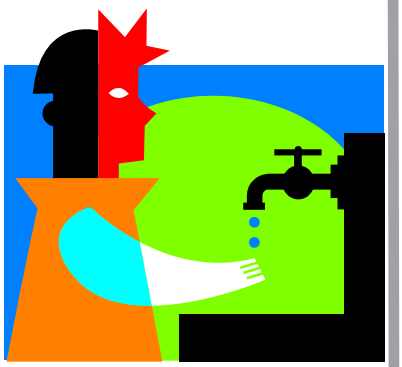
Are you convinced yet? Proper handwashing is really important to protect ourselves from parasite, bacteria, fungi and virus infections. Think about it. How many times a day on the farm do we touch a livestock animal, pet the dog or cat? When at an agricultural fair, how many times a day do we touch animals? Handwashing gets rid of visible dirt and helps loosen and reduce the number of harmful germs that can be carried by people, animals and equipment. It also prevents germs from being transferred to food. There is actually a proper way to wash our hands. Here it is:

1. Wet both hands with warm water. The warm water helps melt the soap.
2. Apply enough soap to produce lather.
3. Rub your hands together for 10 – 20 seconds (to time yourself if you don't have a watch sing "Twinkle Twinkle Little Start" or the "Happy Birthday Song") to remove 80% of the germs. Scrub vigorously, create friction and make sure all areas of the hands and wrists get covered.
4. Rinse away the germs.
5. Dry your hands with a clean towel (or paper towel when out in public). Remember some of these disease-causing agents can remain on material so make sure the towel is clean!
6. Turn off the tap with the paper towel (lots of germs can remain on the faucet from the previous people who didn't do a good job washing).

Germs can linger on your fingers... (n.d.) Grey Bruce Public Health Unit Brochure www.publichealthgreybruce.on.ca

Antibacterial Soap

Most of the time people only need to use plain soap and water to wash their hands. If they use the correct procedure, they will protect themselves from germs. By using antibacterial soap too often it can lead to bacterial resistance, which is not a good thing. Antibacterial soaps are not recommended for use at home. They do not kill viruses and only kill some bacteria.



Alcohol Hand Rubs, Gels and Sanitizers

Alcohol hand rubs or rinse sanitizers are disinfectants that contain at least 60% alcohol. They can be used after washing hands with soap and water as an extra precaution to kill germs. They can also be used when soap and water is not available for handwashing. To use these products properly, place a portion about the size of your thumbnail on the palm of your hand and rub it thoroughly on your hands, making sure you get under the fingernails too. Hands should be clean and dry from washing with soap before using alcohol hand sanitizer. Be prompt

though, as the alcohol will completely evaporate in 15 seconds. Alcohol sanitizers will not lead to bacteria resistance because there is no alcohol left behind.

What is the importance of hand washing?. (February 2003) Food Safety Network, Safe Food From Farm to Fork, University of Guelph. www.foodsafetynetwork.ca

Other Precautions To Prevent Disease

1. **Cover Cuts** – If you have open sores or wounds, cover them with a plastic bandage.
2. **Wear Gloves** – If there is risk of coming into contact with substances that can carry disease, wear latex gloves. Some people however are allergic to latex. Those allergic to latex should use synthetic vinyl or nitrile gloves. Gloves should only be worn once and then disposed of in a plastic garbage bag.
3. **Wash Hands** – After using the toilet, handling pets, livestock or before preparing or eating food, wash your hands. It is a good idea to wash after taking off the latex gloves as well. If you need to use hand lotion to prevent chapped or irritated skin.
4. **Discard Garbage** – Be careful when disposing of garbage that could have things in it that would carry disease. When possible, use sealed plastic bags.
5. **Wash Clothes** – Until contaminated clothes can be washed, they should be kept in sealed plastic bags. Be sure to wash them separately in hot soapy water, and dry them in a hot dryer. Dry cleaning may be another option for some clothing.
6. **Clean Up** – Disinfect surfaces and areas with a mixture of 1 part household bleach and 9 parts of water mixed together. Wear latex gloves, and use paper towels. Dispose of everything in plastic garbage bags.

Universal Precautions. (n.d.) Canadian HIV/AIDS Clearinghouse, a program of Canadian Public Health Association, Health Canada. www.clearinghouse.cpha.ca

West Nile Virus - Viral Zoonotic Disease

West Nile Virus (WNV) is a zoonotic disease that is spread by mosquitoes and is relatively new to Ontario so we are going to review this one in more detail. The virus is spread by mosquitoes that have become infected as a result of biting birds with West Nile Virus. There is also a very low risk of getting the virus by handling an infected dead bird, so be sure to wear gloves and a thick plastic bag.

West Nile Virus can cause flu like symptoms such as fever, headache, body aches, and occasionally there will be a skin rash on the trunk of the body and swollen lymph glands. If the infection becomes severe

there is also severe headache, high fever, neck stiffness, confusion, disorientation, coma, tremors, convulsions, muscle weakness and paralysis. WNV has caused deaths in some elderly people, who had other health difficulties before contacting WNV.

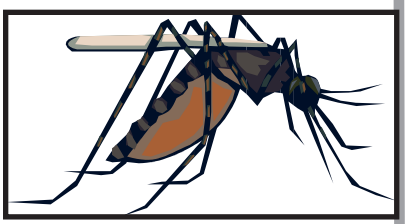
The best personal protection to guard against WNV is to cover us. Avoid being outside if possible in the early evening hours. If this is not possible, where light coloured, long sleeved shirts and pants out of material that is thick enough so mosquitoes can't bite through it. Shoes and socks are also a good idea.

Some people may choose to wear insect repellent that contains DEET. It is important to use the correct DEET repellent for the age of the person and the amount of time spent outdoors.

- Insect repellents with 30% DEET will be effective for approximately **5 hours**.
- Insect repellents that have 10% DEET will provide protection for approximately **3 hours**.
- Insect repellents that have 5% DEET will be effective for approximately **2 hours**.

Health Precautions

- Children under 6 months of age should not use insect repellent containing DEET.
- Children between 6 months and 2 years: 10% DEET repellent should be used sparingly, to a maximum of once a day. It should not be applied to the face or hands.
- Children between 2 and 12 years old: 10% DEET repellent should be used in high risk situations for a maximum of 3 times a day. It should not be applied to the face or hands.
- Youth & Adults 12 years old and older: a repellent with a maximum amount of 30% DEET.



Check with your pharmacist or local Public Health Unit for recommendations on insect repellent use that contains DEET.

It is important to read the manufacturers instructions before using an insect repellent. Other health precautions include:

- Do not allow young children to apply insect repellent themselves.
- Do not spray insect repellent with DEET directly on the child.
- Apply the repellent on your hands, and then put it on the skin being careful to avoid the eyes, mouth and palms of the hands.
- When possible use liquid or cream repellents that are applied by hand.
- Learn how to use the product correctly by yourself in case you are away from home.
- Be sure to wash all treated skin and clothing once coming indoors.

- Do not use insect repellent on open wounds or irritated or sunburned skin.
- If repellent gets in your eyes, rinse them right away.
- Avoid breathing the repellent mist – only apply in well-ventilated areas.
- Do not spray repellent near food.
- If using for the first time, apply repellent to a small area of skin and monitor it for 24 hours for sensitivity e.g. rash.
- Only use personal insect repellents that are registered in Canada by the Pest Control Products Act.
- Never use a product that is labeled “insecticide” on your body.

Sunscreen and Insect Repellents

Some personal insect repellents also advertise that they are OK to be used as a sunscreen as well. But remember, insect repellents should be applied sparingly, and sunscreens should be applied liberally and frequently (this means use lots). If using a product that advertises both, only use it as an insect repellent and use sparingly. Health Canada recommends using separate products.

Safety Tips on Using Personal Insect Repellents. (May 2003) Health Canada. www.hc-sc.gc.ca/pmra-arla

Mosquito Myths!

Did you know that citronella oil registered in Canada to protect people against mosquito bites can last for less than one hour?
Did you know the registered lavender oil in Canada provides protection against mosquito bites for a half an hour or less?
Citronella-based products can cause allergic reactions for some people!
Outdoor repellents such as citronella candles and mosquito coils are not entirely effective at protecting against mosquitoes and should be used under proper conditions such as in protected areas with little breeze.
Did you know that ultrasonic devices, incense and bug zappers actually attract mosquitoes, and therefore are not totally effective? If used, they should be located away from the home, porch or deck where you are sitting.

West Nile Virus. (December, 2002) Grey Bruce Public Health Unit Fact Sheet

PUBLIC HEALTH
GREY BRUCE HEALTH UNIT

www.publichealthgreybruce.on.ca

There are other things that can be done on the farm to help protect against mosquito bites. One method is to control the areas where mosquitoes breed.

- Get rid of areas of standing water on the farm. For example store items upside down that could hold water. Some of these might be, wheelbarrows, water troughs, puddles, flowerpots, unused barrels or containers, and garbage containers to name a few.
- Remember that tire swing everyone loves? Oops, it also is a great breeding ground for mosquitoes! Change it or drill drainage holes in it.
- Dispose of old tires.
- Replace the water in water troughs, rain barrels, birdbaths and outdoor pet dishes at least once a week.
- Repair any leaks from outdoor water pipes, joints or hoses. Repair outdoor taps that drip.
- Keep eavestrough and gutters clean of standing water.
- Make sure drainage ditches are not clogged.

Effective Control of Mosquitos Around Your Home. (May, 2003) Health Canada Brochure. HealthyOntario.com
What you need to know and what you can do about West Nile virus. Fight the Bite! (May 2004) Government of Ontario, Queens Printer for Ontario.

Rabies – Avoid Those Bites and Scratches!

Fast Farm Safety Facts:
Each year in North America 40,000 people are given life saving treatment after being scratched or bitten by rabid animals.

(Min. of Natural Resources)

Rabies is a virus that attacks the brain and spinal cord and can cause death. The rabies virus lives in the saliva and nervous tissues of infected animals. When they bite or scratch the virus is spread by saliva touching the broken skin, open wound or the lining of the mouth, nose or eyes. In caves it is even possible to inhale the virus from bat saliva floating in the air!

Rabies can infect any mammal with fur or hair. It is found most often among bats, skunks, foxes and raccoons. Cats, dogs and livestock can also get rabies, and then can spread it to their owners. That is why they need yearly shots. Rabies is very rare among small rodents such as squirrels, rats, mice and chipmunks. Fish, snakes, turtles, lizards, frogs, salamanders, insects and bugs cannot get or spread rabies.

Rabid animals often behave strangely after being bitten or scratched because the virus affects their brain. They may attack people or other animals for no reason. They may lose their fear of people, and at times wild animals seem to become unnaturally friendly. Not all rabid animals act this way though, so it is a good idea to stay away from all wild animals, and do not feed or touch stray cats and dogs.

If Exposed To Rabies

If you think you may have been exposed to rabies because you have been scratched or bitten by a farm animal, pet, wild animal or stray that is behaving strangely, follow these steps:

1. Wash the scratch or bite with soap and warm water immediately for at least ten minutes.
2. Call your doctor or the local hospital as soon as you finish washing. They will help you determine if you need to be treated for rabies.
3. Follow their instructions exactly.
4. Contact the local animal control officer to find or catch the animal that scratched or bit you.
5. The local Public Health Unit will know how to have it tested for rabies, if need be.
6. If your pet has been scratched or bitten by a possible rabid animal, put on gloves before touching your pet.
7. Follow all the steps above, but instead of calling your doctor, call your local veterinarian.

The Treatment For Rabies

The treatment for people who have been exposed to rabies includes two medications. One is called Rabies Immune Globin (RIG). It contains antibodies to fight off the virus. It is given once. The other medication is the Rabies Vaccine. It gives long-lasting protection and is given as five shots over a one-month period. It is nice to know that rabies shots are no longer given in the stomach! If a person is unlucky enough to have received the full series of five rabies shots in the past, and is bitten or scratched again, they only need two rabies vaccine shots instead of the five. To work best, the shots should be given as soon as possible after the person is bitten or scratched. If the animal has been caught however, and will be tested for rabies, the person can wait for the test results to see if the shots are necessary.

Prevention

- Avoid wild animals especially bats, skunks, foxes and raccoons.
- Do not feed or pet stray animals.
- Avoid any wild or farm animal or pet that you don't know.
- Report any animal behaving oddly to the local animal control officer.
- Do not handle sick, injured or dead wild animals – if you have to handle it wear heavy gloves, and use sticks and other tools to avoid direct contact.
- Make sure all your pets on the farm are vaccinated against rabies regularly.
- Do not keep wild animals as pets.
- Cap your chimney with screen and block attic, cellar and porch openings to keep bats, and raccoons out of the house.
- If you have bats in your house get a professional to get rid of them, and bat-proof your home.

Rabies. (March 2004)–, Massachusetts Dept. of Public Health Fact Sheet http://www.gov/dph)

Hanta Virus Pulmonary Syndrome

This is a viral infection that is associated with deermice and other rodents.

Symptoms: The average time between contact and symptoms appearing is 2-3 weeks. The symptoms may include fever, muscle ache, cough, headache, nausea and vomiting. If you develop a fever or respiratory illness that worsens quickly, get immediate medical attention. Tell the doctor you have been in contact with rodents.

Source:

- Although the chance of infection is low, half of all people who have been infected have died.
- The greatest risk of infection is when you are around rodent nests, burrows, droppings and the surrounding environment.
- Be very cautious in granaries, feed rooms and other storage areas.
- Remember rodents live over the winter in farm equipment such as balers and combines.
- The infection is usually transferred when rodent droppings are disturbed and the dust is inhaled.
- (There has been at least one death in Ontario so far. The victim got the virus after cleaning out a cottage that had been infested by mice.)

Prevention:

1. Good housekeeping and cleanliness is important.
2. Get rid of trash, abandoned machinery, tires etc. that can be nesting sites for rodents.
3. Use commercial traps, rodenticides or ultra-sonic devices.
4. Seal all openings where mice could get in.
5. Placing gravel underneath structures and buildings helps prevent burrowing.
6. Keep food and garbage in rodent proof containers.
7. Keep grass and brush cut within 30 metres of buildings.

On The Farm Precautions

1. Air out any enclosed space for 30 minutes before beginning clean up.
2. Wear rubber gloves when handling dead rodents, droppings or traps.
3. Wear a respirator that as a HEPA 100 rating – ordinary dust masks will not filter out the virus.
4. Wear disposable coveralls if possible.

5. Any exposed clothing should be washed separately, in hot water and detergent and dried in a hot dryer – handle the clothing with gloves.
6. Before starting clean up wet down the area with a 10% bleach solution – 3 tablespoons of bleach to one quart of water.
7. Do not sweep, vacuum or use other dry clean up techniques – use only wet cleaning techniques e.g. damp mopping.
8. Double bag dead rodents and other solid materials in a 10% bleach solution – then burn or bury to dispose of them.
9. After clean up disinfect the whole area with 10% bleach solution and allow it to completely dry before entering.
10. All traps should be disinfected with a bleach solution.
11. Before removing the rubber gloves, wash them in a bleach solution, and then with soap and water.
12. Wash your hands once you remove your gloves.

Rodents carry potentially lethal Hanta Virus. (n.d.) Farm Safety Association

Bronchitis

This is the most common respiratory difficulty experienced by farm workers. Cell linings in the air passages of the body produce too much mucus to get rid of the dust.

Symptoms: Increase in coughing and phlegm (mucus) and shortness of breath. Reactions can be immediate after 2 or more hours a day in a dusty barn. This is called acute bronchitis. When symptoms last 3 months per year for at least 3 years, then it is chronic bronchitis.

Source:

- Dusty conditions in poor ventilated areas

Prevention:

1. Where proper PPE – respiratory equipment.
2. Make sure buildings have proper ventilation.
3. Don't smoke!

Farm Workers Health Problems Related to Air Quality Inside Livestock Barns. (September 1997). Ministry of Agriculture, Food and Rural Affairs Fact Sheet Retrieved September 13, 2006, from www.omafra.gov.on.ca/english/livestock/swine/facts/93-003.htm

Occupational Asthma

This disease is caused by an increase in the reactivity of the air passages in the body. Muscle cells in the airways become irritated, inflamed and enlarged, then constrict (become smaller). It is a specific type of allergic response that farmers develop even though they never had allergy related asthma before.

Symptoms: An asthma attack with tightness of chest, shortness of breath, a wheezing sound when breathing.

Source:

- Can happen after one occasion of being exposed to dust particles.
- For others it may not happen for months or years of being exposed.

Prevention:

1. Use proper respiratory equipment.

Farm Workers Health Problems Related to Air Quality Inside Livestock Barns. (September 1997). Ministry of Agriculture, Food and Rural Affairs Fact Sheet Retrieved September 13, 2006, from www.omafra.gov.on.ca/english/livestock/swine/facts/93-003.htm

Organic Dust Toxic Syndrome (ODTS)

This syndrome is fairly common but is often misdiagnosed as the flu. Prolonged and repeated exposure to low levels of dust from many different sources on the farm result in chronic ODTS.

Symptoms: Symptoms include fever, muscle aches, chest tightness, headache, coughing, fatigue, and loss of energy. Usually symptoms occur 4-6 days after being exposed and last for approximately 1-3 days.

Source: High dust and endotoxin levels caused by sorting or moving pigs, cleaning a confined space or grain bin, taking silage from a vertical silo.

Prevention:

1. Use of proper respiratory equipment.

Farm Workers Health Problems Related to Air Quality Inside Livestock Barns. (September 1997). Ministry of Agriculture, Food and Rural Affairs Fact Sheet Retrieved September 13, 2006, from www.omafra.gov.on.ca/english/livestock/swine/facts/93-003.htm

Farmer's Lung

Although when you think of farming, you generally think of wide-open spaces with lots of clean air, it is not always the case for those who work in farming environments. For them the air may be contaminated with particles or toxic gases that can cause severe sickness or even death. Repeated and continual contact can lead to a condition called Farmer's Lung.

It is an allergy related disease usually caused by breathing in the dust from any mouldy crop e.g. hay, straw, corn, silage and grain to name a few. Mould spores look like dry, white or gray powder in grain or forage. When the feed is moved, billions of microscopic particles go into the air, attached to the dust. When inhaled, they enter the lungs.

Symptoms: The disease can cause shortness of breath and a general ill feeling, coughing, mild fever, chills, muscle and joint pain, loss of appetite and weight. Symptoms can occur very suddenly, or it can be a slow progressive disease. It causes a kind of allergic type of pneumonia. Repeated exposure and attacks can scar the lung tissue and can cause permanent lung damage, physical disability and can even cause death. It is not uncommon for victims with Farmer's Lung to be misdiagnosed with asthma, pneumonia or flu.

Source:

- Main causes are from mould spores that are microorganisms that grow in baled hay, stored grain, and silage with 30% moisture content.
- The mould spores become active in poorly ventilated areas with warm temperatures.

Prevention:

1. Avoid crop spoilage and the production of the bacteria or mould spores.
2. Make sure buildings that store dusty material are properly ventilated.
3. Change to mechanical or automated feeding or feed handling systems.
4. Keep facilities clean using wet clean-up techniques.
5. Wet down the top of a silo before uncapping.
6. Use feed additives such as tallow or soybean oil for swine feeds to reduce the amounts of dust.
7. Work outdoors whenever possible.
8. Design new farm buildings so they are as open as possible.
9. When you have to break open a mouldy bale, use a fork instead of bending over and using your hands.
10. Use the proper type of respirator e.g. approved dust respirators with HEPA (High-Efficiency Particulate Air Filters) whenever there are dusty conditions.

Farmer's Lung. (2002) Farm Safety Association Fact Sheet. www.farmsafety.ca

Mould

Moulds are fungi. They are usually found in nature and carried indoors from outside. There can be more than 270 different kinds of mould in Canadian homes. Farm buildings are also places where moulds can grow. Moulds grow in wet or damp places, including wallpaper, ceiling tiles, carpets, insulation, wood and drywall.

Most moulds are not harmful to a healthy person. Exposure to mould however can cause negative reactions for some people depending upon their age, the amount of time spent around the mould, and overall health. People who are elderly, who have weakened immune systems, allergies, chronic respiratory difficulties and chemical sensitivities are more likely to be effected by mould.

The most common symptoms are:

- Irritation of the eyes, nose and throat.
- Runny nose, sinus congestion, and frequent cold like symptoms.
- More frequent asthma attacks.
- Allergic reactions.

Prevention depends upon controlling the amount of humidity and moisture in the air. Proper ventilation is really important.

1. Avoid places with high humidity over long periods of time.
2. Limit the use of humidifiers in the home.
3. Indoor plants and fish tanks also increase the humidity in the home.
4. Use exhaust fans in the home and in farm buildings to draw humidity outside.
5. Open windows when possible.
6. Repair any leaks or problems with plumbing.
7. Make sure carpets and water damaged building materials are clean and dry.
8. Dispose of any materials that cannot be cleaned or dried properly.

Clean up of mouldy surfaces should be done with household bleach and water solution (250 ml. to 4 litres of water). The solution should be left on the surface being cleaned for 15 minutes, then wiped up and thoroughly dried. Mould will grow again unless the reason for its growth is fixed. Be sure to regularly inspect the farm buildings for moisture problems and water damage.

Safety precautions should be used while cleaning mouldy areas. They include:

- Wear a mask rated N95.
- Wear glasses or safety goggles.
- Wear household rubber gloves.
- Infants and others who have asthma, allergies or other health problems should not be present during clean up.

Mould. (n.d.) Grey Bruce Public Health Unit Fact Sheet. Retrieved November 6, 2006 From http://www.publichealthgreybruce.on.ca/Healthy_Housing/MouldFS.html

Skin Disease

Farming can increase the risk of developing some types of cancer. Farm work involves working outside when the sun's radiation is the most intense. Over the years, repeated exposure to the sun's rays increases the chances of developing skin cancer and lip cancer. People with fair hair and skin are the most vulnerable, but people with dark hair and complexions can still be harmed.

Recognize Skin Problems

We should all inspect our skin on a regular basis for signs of damage that may indicate other serious health problems. Use a full-length mirror and be sure to check on the top of your head, your face, lips and the tips of your ears (places most prone to sunburn). Look for the following:

- Changes in the size, shape or colour of any moles.
- Moles with irregular, ragged, notched or blurred borders around them.
- Moles that are not symmetrical – that means one half of the mole doesn't match or look the same as the other half.
- Colours that aren't the same throughout the mole.
- Moles that are bigger than a pencil eraser.

Other things to watch for are:

- Sores that continue to bleed and will not heal.
- Moles that become itchy or painful.
- Red patches or lumps – especially on the top of the head.
- Any new moles that weren't there before.

Any of these signs may indicate skin cancer. Skin cancer, if diagnosed early can be treated very effectively. If you suspect any problems, call your doctor, or be seen at the closest hospital or clinic.

Protecting your skin from the sun may be one of the best and easiest things you can do to protect your health and future.

Protect yourself against the sun. (March 2000) Farm Safety Association Fact Sheet

Poison Ivy, Poison Oak and Poison Sumac

The roots, stems, leaves and fruits from poison ivy, poison oak and poison sumac have a poisonous sap called urushiol. This sap can cause painful, itchy rashes if it has direct contact with the skin. This can happen by touching the plant, or by touching clothing, shoes, tools or pets that have the sap on them. Approximately 85% of the all people who have contact with it will develop an allergic reaction.

Prevention

- Wear long sleeved shirts and long pants, tucked inside boots around these plants.
- Wear cloth or leather gloves.
- Apply barrier creams to any skin that is exposed.
- Learn to identify the poison ivy, poison oak and poison sumac plants.
- Learn about the signs and symptoms of the allergy.
- Apply rubbing alcohol to remove the poisonous oil within 30 minutes of exposure.

Working Outdoors in Warm Climates. (September 2005). Occupational Safety and Health Administration Fact Sheet. U.S. Department of Labor. www.osha.gov

Farm Safety Facts:
Over 50% of all farm accidents happen while the person is working alone.

(Farm Safe)

Working Alone

While many jobs on the farm are designed to be done alone such as tractor work, other jobs should be done with more than one person present. Unfortunately when the season is short, days are long and available helpers are few and not around, many farmers are forced to work alone for long periods of time.

There are things that can be done to minimize the risks of working alone.

- Make sure there are clear rules around working alone.
- Every worker should be checked up on every two hours.
- Recognize that some jobs are not safe to be completed alone.
- Use cell phones, or two way radios to make sure there can be ongoing communication or a way to call for emergency help.
- Examine the job and determine if one person can manage the risks – if not wait until more help is available – live to farm another day!
- Determine if the person being asked to work alone is capable to

Farm Safety Facts & Tips:
"Make sure every worker
is checked-up on at least every two hours."

Farm Safe

do the job, and is in good health.
- Be sure the person has training on how best to do the job when they are alone.

There are jobs on the farm that should never be attempted alone. Some would be jobs involving electrical, mechanical, pneumatic systems. Jobs involving toxic, reactive or flammable materials should be shared jobs. Confined space work should never be attempted alone. Even administration or clerical jobs should have time limitations put on, so employees can be accounted for without gaps of hours in between.

Check-ups and check-ins are important. Although supervisors have the responsibility of checking up on workers, workers assigned jobs where they are working alone have the responsibility of "checking in" at times that are agreed upon by both people. Check ins can be done by someone seeing the person, or by phone or two-way radio. Build in automatic check ups and check-ins. They would be lunchtime, coffee breaks and the end of the workday. By taking breaks with others, you are not just being healthy, but you are also being safe!

The Lone Worker. (April 2001). Farm Safety Association Inc. Fact Sheet

Heat Stress

Our temperatures in Ontario appear to be getting hotter. Farm work in hot temperatures can put stress on our bodies and our body temperature controls may not work that well. When heat is combined with hard physical labour, not enough fluid intake (drinks) or fatigue, it can be a deadly combination.

Heat leaves your body in a number of ways:

- It transfers from your skin to the air.
- It can evaporate by perspiration (sweating).
- We exhale hot air when we breathe out.
- If we touch a cool object.

As we get older our ability to sweat decreases. Therefore people over 40 are at higher risk of experiencing heat related illness, disability or death. The amount of water that we take into our bodies must equal the amount that is leaving our bodies to prevent dehydration. Therefore, when it is hot drink lots of water!

When it is humid and hot outside, our body has to work even harder to get rid of heat. The risk of illness and accidents increase when temperatures rise above 30°C. It is best not to push ourselves physically when it is this hot.

There are three conditions that can happen from our bodies overheating. They are **heat cramps, heat exhaustion and heat stroke**. It is important that we know what each of these conditions are, what the signs and symptoms are, and what to do about them.

Heat Cramps

When we sweat our body loses salt. This salt can't be replaced by drinking water.

Symptoms:

- Heat cramps can cause cramps in our legs, arms or stomach.
- They can occur immediately while you are working or later.

Treatment:

- Move to a cool place.
- Loosen clothing.
- Drink cool, lightly salted water or a commercial fluid replacement
- Get medical help if the cramps are severe and don't go away.

Heat Exhaustion

When our body loses too much water and salt that is not replaced our body's cooling system, the system breaks down.

Symptoms:

- Heavy sweating.
- Cool, moist skin.
- Body temperature of over 38°C.
- Weak pulse.
- Normal or low blood pressure.
- The victim may be tired, weak, clumsy, upset or confused.
- They will be very thirsty, and may breathe or pant rapidly.
- They may have blurred vision.

Treatment:

- Get medical help immediately.
- Heat exhaustion is one step away from heat stroke that can cause death.
- Move the person to a cool, shaded location.
- Loosen or remove excess clothing.
- Give cool, lightly salted water.
- Fan the person or spray them with cool water.

Heat Stroke

When a person no longer has any more water or salt to use up, they quit perspiring (sweating). If their body temperature is above 41°C there is a good chance they have heat stroke. Look for the following symptoms:

Symptoms:

- Weakness, confusion, distress, strange behaviour.
- Hot, red, dry skin.
- Rapid pulse.
- Headache or dizziness.
- In later stages the person may loose consciousness and have convulsions.

Treatment:

- Call an ambulance – NOW!
- Even if you suspect heat stroke – call an ambulance – NOW!
- Move the person to a cool location and remove extra clothing.
- Fan them or spray them with cool water.
- Offer them sips of water if conscious.

Prevention of Heat Related Illnesses

1. Slow down! Don't do physically hard work.
2. Stop as soon as you feel any symptoms of heat stress e.g. headache, heavy perspiration, high pulse rate or shallow breathing. Take a break!
3. Watch for signs of heat stress in others.
4. Wear lightweight, light-coloured clothing. It reflects heat.
5. Drink plenty of water.
6. Increase your salt intake – add salt to your food.
7. Get used to warm weather gradually, your body will have a better chance adjusting to the heat if you take it slow for the first 2-3 hot days.
8. Take breaks where you get out of the heat. Find cool shady places.
9. Don't try to get a sun tan while working. Your body's cooling system has a harder time working through sun burnt skin.
10. Wear a hat, and long sleeved shirt to prevent sunburn.

Dangers of heat stress. (March 2000). Farm Safety Association Fact Sheet.

Pasteurization

Pasteurized and Unpasteurized Drinks

In the past, people used to drink juices, ciders and milk straight off the farm. It was not pasteurized. Over the years we have learned that some unpasteurized drinks can be contaminated with E.coli 0157:H7 and Salmonella which can make some people very sick. This is why today we pasteurize our milk, juices and cider. The majority of these drinks when sold in Canada are pasteurized and therefore safe to drink. However, there can be a small percentage of apple and orange juice and apple cider that are sold unpasteurized which can contain bacteria that can be harmful to your health. They are often sold at the roadside, country fairs, juice bars, and sometimes are displayed on ice in grocery stores.

Pasteurizing is the process when a liquid is heated at a high temperature to kill harmful bacteria that may be in the product. Most commonly the process is used for milk, but it can also be used for juices and ciders sold in bottles, cans and juice boxes. Most farmers that produce unpasteurized juices and ciders are very careful and use very clean methods to prepare and package their products. They follow what is called a code of practice to avoid contamination by harmful bacteria.

The Code of Practice is:

- Avoid using fruit that has dropped to the ground.
- Wash, brush and rinse the fruit thoroughly.
- Clean and sanitize the equipment often.
- Label products properly.
- Keep unpasteurized products refrigerated.

However, this Code of Practice is voluntary. Producers do not have to label their products as unpasteurized, but they are encouraged to do so through a policy that was introduced in the year 2000. If there is no label, ask the people selling the product if it is pasteurized or not. If you are not satisfied with the information given, you need to boil the product before drinking it or weigh the risks of consuming that product as it is being sold. People at the most risk of being harmed by contaminated drinks include young children, seniors and those whose immune systems are weak.

Unpasteurized Fruit Juices and Cider – Know What You Are Drinking. Government of Canada, CAT. NO. H49-143/2001)

ONTARIO'S OCCUPATIONAL HEALTH & SAFETY ACT (OHSA)

Although Ontario's Occupational Health and Safety Act (OHSA) came into effect in October 1979, until recently, farming operations have been exempt. With OHSA it is an expectation that workers, supervisors and employers share the responsibility for health and safety concerns in the work setting. OHSA stipulates rights and duties of all people in the workplace and gives Ministry of Labour inspectors the authority to inspect the workplace to make sure OHSA rules are being followed, and to investigate complaints, critical injuries and fatalities. As of June 30th, 2006 paid workers on farming operations will also be covered and protected by OHSA.

These changes mean that under OHSA, employers must provide information, instruction and supervision to workers. Workers must be advised about hazards in the workplace. If a critical injury or fatality occurs the Ministry of Labour must be notified and investigate the accident. Farm operations that have more than six regularly employed workers must have an occupational health and safety policy and program.

Farm workers now protected by OHSA will now have the same kinds of basic rights that other Ontario workers already have.

They include the right to:

1) Participate in decisions about workplace health and safety.
2) Know about workplace hazards.
3) Refuse unsafe work.

Safety Resources:
For more information on the Occupational Health and Safety Act, and safety programs there are a number of excellent resources on the web. Some of the current sites are listed below. Check them out!

Farm Safety Association www.farmsafety.ca
Canadian Centre for Occupational Health and Safety www.ccohs.ca
Workplace Safety and Insurance Board www.wsib.on.ca
Ontario Ministry of Labour www.labour.gov.on.ca
Institute of Agricultural Rural and Environmental Health
www.iareh.usask.ca
Farm and Ranch Safety and Health Association www.farsha.bc.ca
National Ag Safety Database www.cdc.gov/nasd/
Prevention Dynamics www.preventiondynamics.ca

Farmsafe Services for Agricultural, Horticultural &Landscape Industries. (February 2006). Vol. 31, No. 1.

The OHSA brings a new set of rules for reporting injuries. Farmers will still have to report injuries to WSIB (Workplace Safety and Insurance Board) but now they also have to notify the Ontario Ministry of Labour (MOL).

WHAT IS A CRITICAL INJURY?

According to OHSA a critical injury is defined as an injury of a serious nature that:

a) Places life in jeopardy.
b) Produces unconsciousness.
c) Results in substantial blood loss.
d) Involves a leg or arm fracture (but not a finger or toe).
e) Involves the amputation of a limb (but not a finger or toe).
f) Consists of burns to a major portion of the body or;
g) Results in the loss of vision in an eye.

Once the Ministry of Labour is contacted, in most cases a Labour Inspector will attend the place of the accident and do an investigation. You should leave the accident scene as it is until the investigation is completed.

Farmsafe Services for Agricultural, Horticultural &Landscape Industries. (February 2006). Vol. 31, No. 1.

It is important that young people know their rights at the workplace. Too many young people have lost their lives, trying to complete jobs without proper training, supervision or appropriate safety precautions. The OHSA is designed to protect farm workers. Because of the OHSA farm workers now have the same rights as other Ontario workers. These are important rights and include:

- The right to refuse to complete unsafe work.
- The right to know about workplace hazards.
- The right to participate in decisions about health and safety on the job.

The OHSA has outlined a process that must be followed by an employer and worker when there is a work refusal. If the situation cannot be resolved internally by those at the work site, a Ministry of Labour inspector must be called. They will respond as quickly as possible because responding to work refusals is considered a priority of their job.

While waiting for an inspector to arrive, the employer can assign the work to another worker. The second worker however, must be told that another co-worker has already refused to do the work, and why they have refused. This information must be given with one of the following people present:

- A worker member of the joint health and safety committee (if there is one).
- A worker health and safety representative in work settings where there is no committee.
- Another worker, chosen by the workers to represent them, because of their knowledge, experience and training.

The second worker also has the right to refuse the job. To protect yourself, if you feel your safety is being put at risk by doing a job, ask if someone else has refused the job, and if so why. Don't be a dead hero!

In most cases, health and safety concerns can be resolved before it becomes grounds for a work refusal usually by involving the joint health and safety committee or the worker health and safety representative.

Occupational Health and Safety Act Application to Farming Operations Frequently Asked Questions. (January 2006) Ministry of Agriculture, Food and Rural Affairs.

Activities

Activity #1- Farm Inspection

As part of a meeting, or as homework, have the members do a site inspection. They are to identify any places that may be a breeding site for mosquitoes. If you wish, this can be done in groups, and then see who finds the most sites!

Activity #2 – Handwashing Song or Rap

Divide into groups. Your task is to create a song, or a rap about washing your hands. It should be at least 20 seconds long (as long as you should rub the soap on your hands before rinsing). Perform the song or rap back to the group. Now that you have your song, try it out! Get each member to dip their fingers into some type of cooking oil and wipe it all over their hands. Next give each member a little amount of cinnamon. Have them wipe this into the oil mixture on their hands. Now half the group is to wash their hands with warm water and soap, while the other half washes their hands with cold water and no soap. What is the outcome? Which worked better?

Activity #3 – Good Farm Housekeeping

Refer to the list about good housekeeping practices on the farm. Have the members either check some farm buildings as part of a meeting, or at home and report any hazards they may have found. Senior members will be expected to report what they were able to do to help fix any hazards they found.

Activity #4 – Senior Activity – Ontario Health and Safety Act

Have senior members research certain parts of the new Ontario Health and Safety Act that came into force in June 2006. Have them present what they found to the group. Information sites are listed on page 36.

Activity #5 – Stress Management Techniques

Have members research stress management techniques to try to learn what appeals to them. They can research this on the Internet and bring their information back to the next meeting. Some ideas may be: guided imagery, journaling, meditation, music therapy, breathing exercises etc.

For additional home fitness tests check out the following website: www.topendsports.com/testing/tests/home

Activity #6 – Cardio-vascular Endurance Test.

Here is a simple test that can be done at home to measure your cardio-vascular endurance. Do the exercise as detailed and then at the end, remain standing and take your pulse for one minute. Then compare your results with the table supplied to determine your level of fitness.

The Step Test

The step test is designed to measure your cardio-vascular endurance. This means it is measuring your "heart" fitness. Work on a farming operation, our cardio-vascular system is always being tested by numerous jobs. Good cardio-vascular fitness and health guards against heart attacks and strokes.

Find a step in the house that is as close to 29 cm. (12 inches) high as possible. The exercise is to step on and off, alternating feet for 3 minutes. Step up with one foot, then the other. Step down with one foot, then the other. It might help to say, "up, up, down, down." Do this at a steady, consistent speed that is easy to maintain. It will not give an accurate result if you go as fast as you can, or change speeds. At the end of 3 minutes, remain standing and take your pulse for one minute. Record your heart rate and then compare it to the chart below.

Three Minute Step Test For Men

Age	**18-25**	**26-35**	**36-45**	**46-55**
Excellent	<79	<81	<83	<87
Good	79-89	81-89	83-96	87-97
Above Average	90-99	90-99	97-103	98-105
Average	100-105	100-107	104-112	106-116
Below Average	106-116	108-117	113-119	117-122
Poor	117-128	118-128	120-130	123-132

Three Minute Step Test For Women

Age	18-25	26-35	36-45	46-55
Excellent	<85	<88	<90	<94
Good	85-98	88-99	90-102	94-104
Above Average	99-108	100-111	103-110	105-115
Average	109-117	112-119	111-118	116-120
Below Average	118-126	120-126	119-128	121-129
Poor	127-140	127-138	129-140	130-135

Source: Canadian Public Health Association Project.

References

Campylobacter (August 2005) Fact Sheet, Grey Bruce Public Health Unit Fact Sheet www.publichealthgreybruce.on.ca

Cryptosporidiosis (August 2005) Grey Bruce Public Health Unit Fact Sheet www.publichealthgreybruce.on.ca

Dangers of heat stress. (March 2000). Farm Safety Association. Fact Sheet. www.farmsafety.ca

Effective Control of Mosquitos Around Your Home. (May, 2003) Health Canada Brochure. HealthyOntario.com

Farm Workers Health Problems Related to Air Quality Inside Livestock Barns. (September 1997). Ministry of Agriculture, Food and Rural Affairs Fact Sheet Retrieved September 13, 2006, from www.omafra.gov.on.ca/english/livestock/swine/facts/93-003.htm

Farmer's Lung. (2002) Farm Safety Association Fact Sheet. www.farmsafety.ca

Farmsafe Services for Agricultural, Horticultural and Landscape Industries. (February 2006) Newsletter *Vol 31, No. 2*.

Germs can linger on your fingers... (n.d.) Grey Bruce Public Health Unit Brochure www.publichealthgreybruce.on.ca

Food Fitness. (n.d.). Canadian Institute of Public Health Inspectors Brochure.

Giardiasis (n.d.) Canadian Institute of Public Health Inspectors

General Housekeeping in the Workplace. (December 2002). Farm Safety Association Fact Sheet. Guelph, Ontario. www.farmsafety.ca

"Good housekeeping" a sign of good farm management. (n.d.) Farm Safety Association Factsheet. Guelph, Ontario. www.farmsafety.ca

Human Intestinal Parasites Worms. (n.d.). Retrieved December 28, 2006 from http://www.appliedozone.com/parasites.html

Introduction to the Fungi. (n.d.). Retrieved December 28, 2006 from http://www.ucmp.berkeley.edu/fungi/fungi.html

Lyme Disease. (August 2005) Grey Bruce Public Health Unit Fact Sheet www.publichealthgreybruce.on.ca

*Measuring Heart Rate. (*n.d.) Retrieved December 28, 2006 from http://www.topendsports.com/testing/heart-rate.htm

Mould. (n.d.) Grey Bruce Public Health Unit Fact Sheet. Retrieved November 6, 2006 from http://www.publichealthgreybruce.on.ca/Healthy_Housing/MouldFS.html

Older farmers at greatest risk of injury, death. (March 1998) Farm Safety Association,Fact Sheet F-15. Guelph,Ontario. www.farmsafety.ca

Protect yourself against the sun. (March 2000) Farm Safety Association. Fact Sheet Guelph, Ontario. www.farmsafety.ca

Q-Fever. (February 2004) Grey Bruce Public Health Unit Fact Sheet www.publichealthgreybruce.on.ca

Rabies. (March 2004)–, Massachusetts Dept. of Public Health Fact Sheet http://www.gov/dph

Rodents carry potentially lethal Hanta Virus. (n.d.) Farm Safety Association. Guelph, Ontario. www.farmsafety.ca

Safety Tips on Using Personal Insect Repellents. (May 2003) Health Canada. www.hc-sc.gc.ca/pmra-arla

Salmonellosis. (July 2005) Grey Bruce Public Health Unit Fact Sheet www.publichealthgreybruce.on.ca

Shigellosis. (n.d.) Canadian Institute of Public Health Inspectors

Ten ways to Cope With Stress. (n.d.) Retrieved December 28th, 2006 from http://panicdisorder.about.com/od/selfhelp/ss/copewithstress_9.htm

The Lone Worker. (April 2001). Farm Safety Association Inc. Fact Sheet. Guelph, Ontario. www.farmsafety.ca

Universal Precautions. (n.d.) Canadian HIV/AIDS Clearinghouse, a program of Canadian Public Health Association, Health Canada. www.clearinghouse.cpha.ca

Virus. (n.d.). Retrieved February 28, 2007 from www.nlm.nih.gov/medlineplus/mplusdictionary.html

West Nile Virus. (December 2002) Grey Bruce Public Health Unit Fact Sheet www.publichealthgreybruce.on.ca

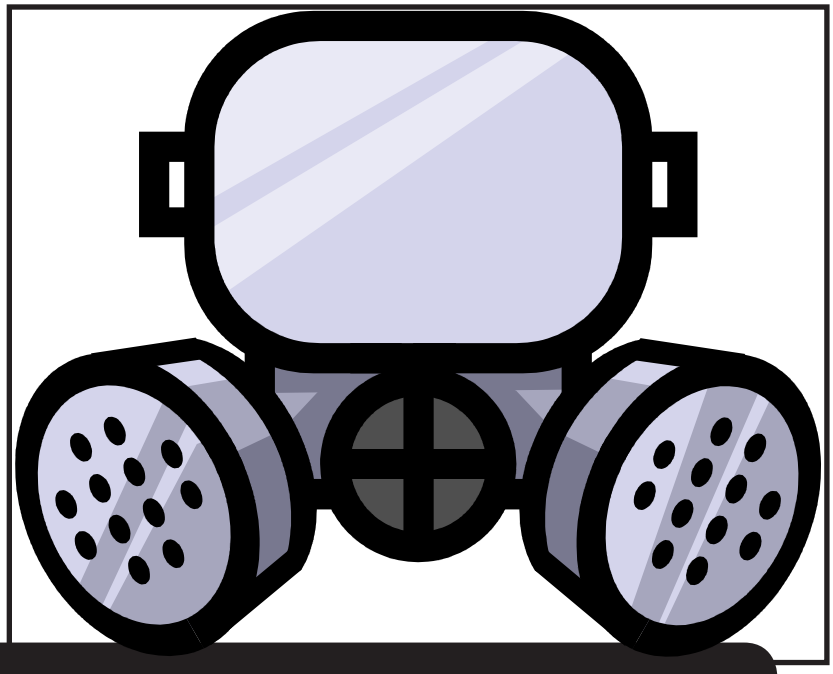
What is the importance of hand washing?. (February 2003) Food Safety Network, Safe Food From Farm to Fork, University of Guelph. www.foodsafetynetwork.ca

What you need to know and what you can do about West Nile virus. *Fight the Bite!* (May 2004) Government of Ontario, Queens Printer for Ontario.

Working Outdoors in Warm Climates. (September 2005). Occupational Safety and Health Administration Fact Sheet. U.S. Department of Labor. www.osha.gov

Yersiniosis. (n.d.) Canadian Institute of Public Health Inspectors

Zoonosis. (n.d.) Retrieved February 28th, 2007 from www.nlm.nih.gov/medlineplus/mplusdictionary.html



Farm Safety Project

Farm Accident Preparedness and Action

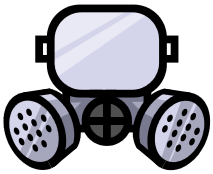
Prevention is the Best Intervention

4-H Ontario

CANADA

ONTARIO'S MUTUAL INSURANCE COMPANIES

Protecting Rural Communities For Over 150 Years!



FARM ACCIDENT PREPAREDNESS AND ACTION

Roll Call #1: What is your Emergency Response Address or Civic Address (for those without 911 Emergency Calling Service).
Roll Call #2: Why are safety procedures not always followed.
Roll Call #3: Give the group directions from the closest ambulance base or hospital to your home.
Roll Call #4: Name one thing you can do to stay safe at home or on the farm.

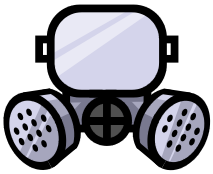
Basic first aid knowledge and **basic rescue procedures** are two things everyone on a farm or working in a rural area should know. Why do you think it is particularly important for people who live and/or work in rural areas to know this?

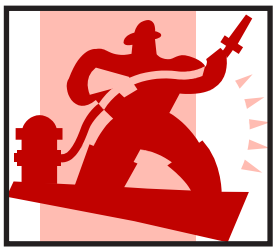
If you said because it can take longer for emergency rescue personnel to reach the accident scene you are right! Think about it. In many rural places, fire and ambulance services have to travel greater distances to get to the accident. Of course it is going to take longer than if they were responding to an accident in a city. What is scary is that someone's life can depend on what happens in those few extra minutes that it takes for the experts to arrive. Your ability to know what to do with an emergency could mean the difference between life, death, or the amount of permanent damage for the victim.

Have you ever heard someone say "it won't happen to me - accidents happen to the 'other guys'?" Our basic human nature makes us think that way at times, kind of like a survival or coping strategy. But reality is that **accidents can happen to EACH OF US**, at any time. No one gets up in the morning and says, "Yep! Today is the day, I am going to have an accident." Good thing! Because if we knew, I think we all would stay in bed!

According to the Funk and Wagnall Dictionary, the word accident means, "anything that happens by chance; anything occurring unexpectedly; or without known or assignable cause; especially, any unpleasant or unfortunate occurrence involving injury, loss, suffering or death."

We cannot stop all accidents from happening. We can, however, stop some by practicing prevention. But also we need to make a purposeful effort to be as prepared as possible, just in case an accident happens and you are there.





Prepare A Fire Escape Plan

Every family should have and practice a fire escape plan. Here is how you make up a plan that could save your life and others! Fire escape plans should be posted not only for the house but other farm buildings too.

- **Get everyone together**, family and those that work on the farm.
- Draw a **floor plan** that shows all the rooms with doors, windows and hallways. There should be a drawing for each floor of the building.
- **Plan your escape!** Draw arrows showing two ways if possible to get out of each room.
- Plan a **meeting place** where everyone will gather after leaving the building.
- Once outside, assign someone to go and **call the fire department.**
- **NEVER RE-ENTER A BURNING BUILDING FOR ANY REASON!**

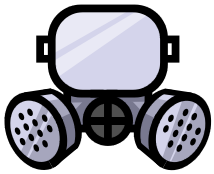
Know First Aid!
In an ideal situation, there should be at least two people on each farm who have taken professional first aid training and CPR (cardio-pulmonary resuscitation). Why two? If you said to increase the odds that one of them will be available when an accident happens you are right. Also, what happens if the only person who knows first aid is the one who gets hurt? Who helps them? What would be best is if everyone who lives or works on the farm, as soon as they are old enough, got trained in basic first aid and CPR.

Be Prepared – Have a Plan
One of the best things to do in order to be prepared for an accident is to prepare a plan. Knowing what to do in certain emergency situations is really important. It can help save the accident victim from further injury, and at times protect others from becoming injured if they try to help out without knowing the hazards.

Each workplace or home should have a file or booklet that is kept in a place that everyone knows. Inside should be information on what to do when dealing with accidents, health problems and natural disasters.

When developing this file, also develop “what if” plans with everyone who lives or works on the farm. Each person should have basic information on what to do in an emergency.

Feeling helpless can lead to panic and fear. These are two feelings that we don’t want to overwhelm us during an accident. Knowledge and preparedness can help us remain calm, and think things through. Accident victims need others to remain calm around them.

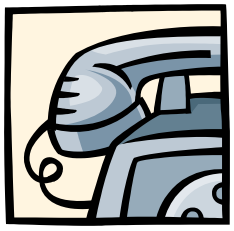


Assess The Scene

When directly involved in an emergency, assess the situation carefully. Stay calm and decide what steps need to be taken and in what order. Remember, it will take a while for emergency services to get to you, so in many cases, acting quickly is important. Do the best you can do, as quickly as you can with available resources. **AS SOON AS POSSIBLE CALL FOR HELP!!!**

Get Help!

Use a telephone or radio. Flag down a passing automobile, or go find help! Be sure to give clear directions to the scene and whenever possible, have someone wait by the roadway to show the way to the accident.



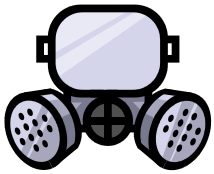
Know Who To Call And Your Location

In most areas of Ontario we are fortunate to have the "911" Emergency Response System. To access emergency services such as police, ambulance and fire, you call "911." If the 911 system is not available in your area, find out what each of the numbers are for police, ambulance and fire and post them where others can see them, ideally by each telephone.

So you make the call, and you get the dispatcher on the phone. This dispatcher is not a person down the road, or in the next town. They will not know where the "Smiths live next door, or the white house with the red barn on the Blind Line is." Although we might know this from living in our own little area, the person on the telephone line needs more, accurate, formal information. They need to know either our 911 address or our civic address.

Many of us now have fire numbers posted at the end of our laneways. Know this number! You should also know what road you are on, and what township you are in. It would help to know your civic address as well. For those of you outside the 911 calling area, this would mean you have to know the lot and concession number of the farm. Complicated isn't it? The best way to know the information you need is to have it written down beside each phone, **where everyone can see it each and every day.** Then you will learn it, and if you forget it because you are nervous, it will be written there as a reminder.

Remember, be accurate. Say the numbers slowly; speak in a very controlled, purposeful manner. If you are giving directions, stay calm, and think about what you are saying. When anxieties are high, or you are excited, things may not be clear. Be careful with mileage estimations, landmarks, road and bridge conditions, and turning directions. Do not assume that all emergency personnel will be coming from the same direction. Only use landmarks that are well known, highly visible in daylight and darkness and are permanent.



Provide the dispatcher with as much information about the accident or emergency as possible. This will help the rescue teams and medical personnel make plans and call in other experts as needed while they are on the way to the emergency. For example, if the victim is trapped or entangled in farm equipment, special procedures may have to be taken to free them, or specialized equipment may have to be called to the scene. If the accident is in a muddy field, or in a forest, four-wheel-drive vehicles may be needed to get help to the victim. This type of simple information can make sure that help gets to the emergency scene as quickly as possible. Remember seconds count!

Return To The Scene

If you had to leave the scene of the accident to go get help, try to pick up some things that could be useful to you while you wait for emergency medical services (EMS). Depending upon the situation, these things might include, a first aid kit, a fire extinguisher, blanket, tractor, chains, boards, and a cell phone.

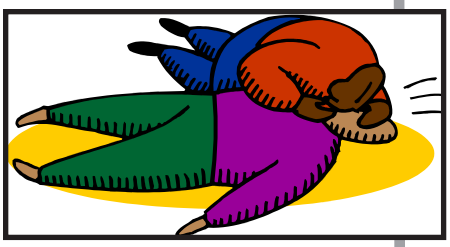
The Victim Comes First

The first priority in any emergency is the physical care of the victim. But don't approach unless it is safe. The last thing you need is to become a victim yourself! Is there something you can do to make the scene safe, such as turn off the equipment, turn off the electrical source, or shut a gate to keep livestock out? If you can safely control the scene, do it. Remember seconds count!

The accident victim should not be moved unless in imminent (immediate) danger of further injury!

Top Priority: Establish Breathing and Heart Function

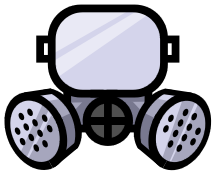
In order to survive one needs to breathe and have their heart pumping blood to the rest of their body. If they can't do it on their own, we need to help with artificial resuscitation to establish breathing and CPR (cardio pulmonary resuscitation) to establish heart function. Remember seconds count!



When a person quits breathing or their heart stops they are just minutes away from permanent brain damage or death. Cardiopulmonary resuscitation (CPR) combines mouth to mouth breathing with external cardiac compression to maintain blood circulation. In a rural area, CPR may be the only way to keep a victim's heart pumping and the victim alive until help arrives. Experts state however that CPR should not be attempted unless the rescuer has had formal training in the technique.

Second Priority: Bleeding and Shock Symptoms

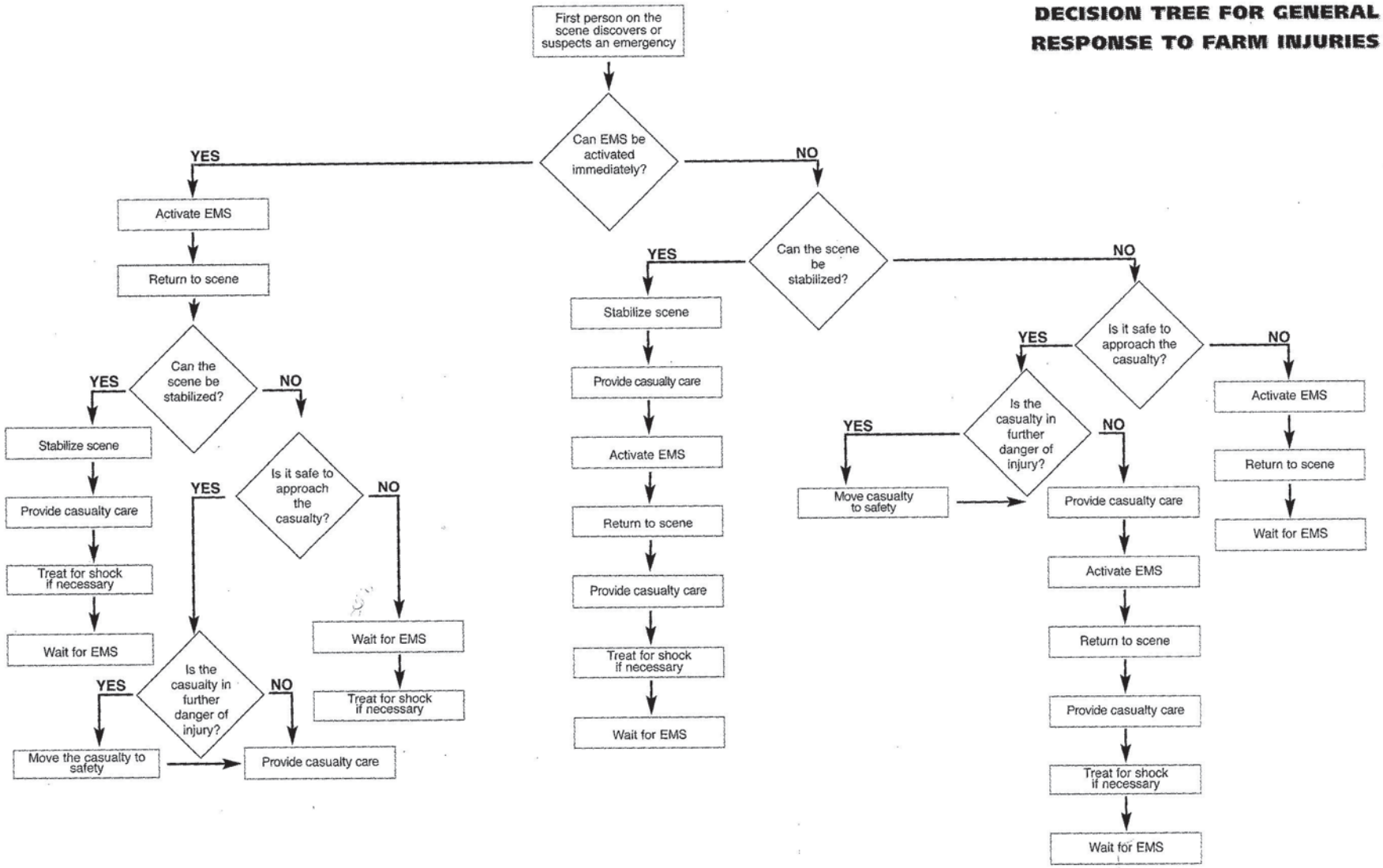
Next, control any bleeding. Place a dressing over the wound and apply pressure. If nothing else is available, the dressing may need



to be a clean piece of your clothing. Administer other first aid. Talk to the person, and if possible keep them talking to you. Give lots of reassurance, and keep the victim warm. Do not give them anything to eat or drink. These simple steps can improve a victim's chances of survival. **Remember, seconds count!**

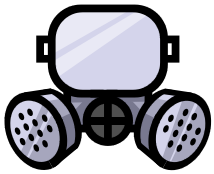
Rescue Situations

It is impossible to go into detail about every possible rescue situation or rescue procedure. The best preparation is to have current first aid and CPR qualifications. Be trained by the professionals who offer courses in your area. Create a plan. Post the plan. Talk about the plan with others. Refer to the plan, in the case of an accident or emergency. **Remember, seconds count!**



Decision Tree For General Response To Farm Injuries

The Decision Tree For General Response To Farm Injuries is adapted with permission from *First on the Scene,* Natural Resource, Agriculture and Engineering Service (NRAES) P.O. Box 4557 Ithaca, New York, USA 14852-4557.



Rescue Situations

It isn't possible to provide details on every type of emergency. The following information highlights steps for dealing with some of the most common farm accident situations. Further information of on-farm emergencies may be obtained from health facilities, insurance companies, fire departments, St. John Ambulance, agricultural services offices, and the Farm Safety Association.

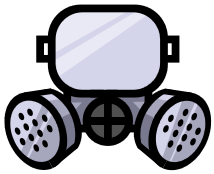
Remember, **never put yourself in danger.** For some of these scenarios it is best to call EMS and wait for the experts to arrive. They have been extensively trained in best responses to farm accidents.

At The Scene

- If the victim is trapped, while waiting for EMS further assess the situation. If you are familiar with the piece of machinery, your ideas for freeing the trapped victim could be extremely helpful to emergency workers.
- As soon as possible make sure the victim can breathe and control blood loss. **This may be all you should do if you are not familiar with rescue procedures. Trained personnel should conduct removal and rescue under controlled conditions.**
- The most likely reason for attempting to move a trapped victim is to avoid further injury from an immediate hazard. Examples would be if there was a possibility for fire or explosion. If there is no immediate hazard **do not move the victim.**
- Turn off the ignition and other electrical accessories such as lights. Keep cigarettes and flares away from the immediate area. If possible disconnect the battery ground. Have a fire extinguisher ready if needed.
- Watch for battery acid, gasoline, diesel fuel, transmission, engine, or hydraulic oil that could leak onto the victim. Leaking fuel should be channeled away from the victim or dammed up if possible.
- If there is pressure on the victim's chest that could cause suffocation, try to dig underneath the chest area to relieve the pressure, or cut away any tight clothing.

Moving The Victim

- **Only if there is threat of further injury, move the victim.** It is best to suspect there has been a spinal or back injury. Keep the midline of the body in a straight line with the victim's spine. Pull the body from either both feet or both shoulders. If it is possible to pull by the victims clothing, grab the collar of the shirt and support the victim's head with your forearms. The "clothes drag" method is preferred because the head is supported while being moved. **Do not pull the body sideways.**



- It may be necessary to roll the victim over onto their back to evaluate breathing, clear an airway or administer artificial respiration. When the victim if rolled, the head, neck and torso should be moved together to prevent twisting. This can be difficult to accomplish with just one person.

Realize and Accept Your Limits

- If you ever find someone or witness someone trapped in or under a piece of farm machinery, realize that each situation is unique, and has its own risks. Do not expect miracles from yourself or others. Keep yourself safe. It is important that rescuers do not become additional victims, adding to the complications and complexities of an already bad situation.

The Farm Safety Association has published Fact Sheets to inform and educate others about many hazards related to farming. The following information is taken from a Fact Sheet published in 2002 on "Farm Accident Rescue." Remember though, this is for education purposes only. In knowing what a rescue consists of, you may be able to help with the preparation. In the vast majority of cases it is best to wait for the emergency personnel services who have been trained to perform safe rescues.

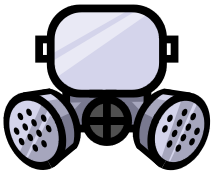
Rescue Procedures

Grain Bins

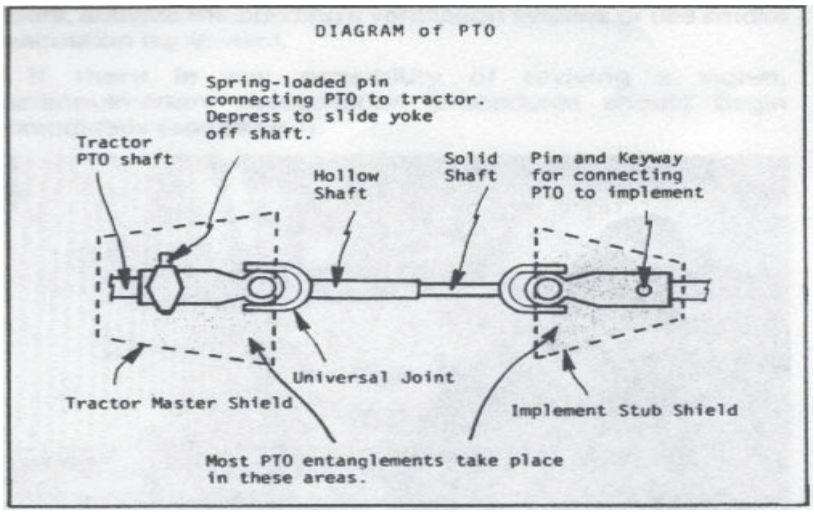
- If a person becomes submerged in grain, begin rescue operations as quickly as possible. If the person is totally covered, turn on the dryer blower and move some air into the bin. Make sure there is no way the grain auger can be started.
- Always assume that the person trapped in the grain, even if completely submerged, is alive. The most successful way to quickly remove a victim is to cut large holes around the base of the bin, approximately 5 feet up from the base. Note that if you cut too many holes, the bin may collapse on you!) Cutting holes reduces the volume of grain in the bin in the shortest period of time. Access into the grain bin sidewalls will be done using the front end loader of the tractor, an abrasive saw or an air chisel. Cutting torches should be a last resort! Why? Because of the risk of fire and explosion from dust and fumigant residue.
- Another rescue technique is to place a drum with both ends cut out of it around the victim to reduce the force of the grain on the person. When you must enter the grain bin, have a safety harness on, and rope. There should be several people available to lift you out in case of an accident or to assist you.
- **Do not attempt a rescue in an oxygen-deficient atmosphere.** Always use a SCBA to enter these settings.

True Story:
The victim was found in a grain bin filled with barley. His body had been covered with several feet of grain. He and another person were trying to level out the grain in the bin, because it was not evenly distributed, when it shifted and buried him alive.

(Farm Fatality Analysis)



Power Take Off (PTO)



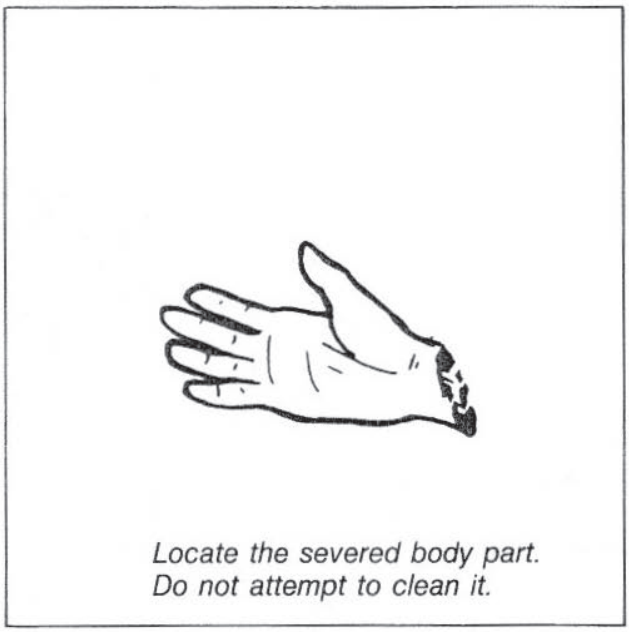
Reprinted with permission from: Farm Safety Association, Fact Sheet No.F-002, Nov. 1998.

- Rescue procedures to remove a victim from a power take off shaft should start by shutting off the tractor and making sure it will not re-start. Next, block the tractor wheels so the tractor cannot move.

There are several methods that can be used to remove a victim from a PTO shaft:

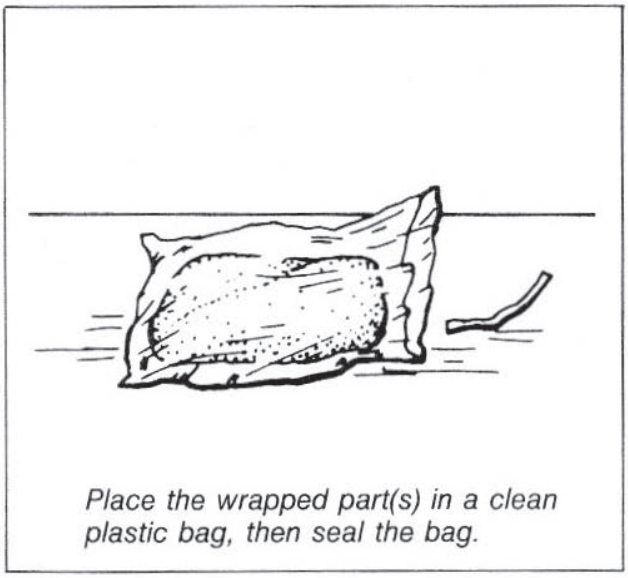
- **Disconnect** the PTO shaft from the rest of the tractor, and turn the shaft counterclockwise to unwrap the tightly wrapped cloth and tissue that may be around the shaft.
- Place the PTO drive unit in **neutral** and turn the PTO shaft counterclockwise to unwrap the person from the shaft. This may require a large pipe wrench or putting a bar into the yoke of the PTO unit and turning.
- You may **disconnect the hitch pin** that attaches the trailing equipment to the tractor and move the tractor forward to pull the PTO shaft apart. After the PTO shaft separates into two parts, you will have to turn the shaft counterclockwise to remove the victim. If the shaft is solid, the rescuers may have to cut it with a portable power grinder, hacksaw or oxyacetylene torch.
- If there are combustible materials in the area, **extreme caution** should be used when operating any type of flame-producing equipment or equipment that produces sparks. Don't use this equipment if there is a fuel or gasoline spill. Have a fire extinguisher available. Do not smoke in the area.
- While the victim is being removed from the equipment life supports need to be provided by other rescuers and vital signs monitored.
- If an arm, foot, leg or other body part is amputated, it should be **handled properly** and transported for possible reattachment.

Caring For Amputated Tissue

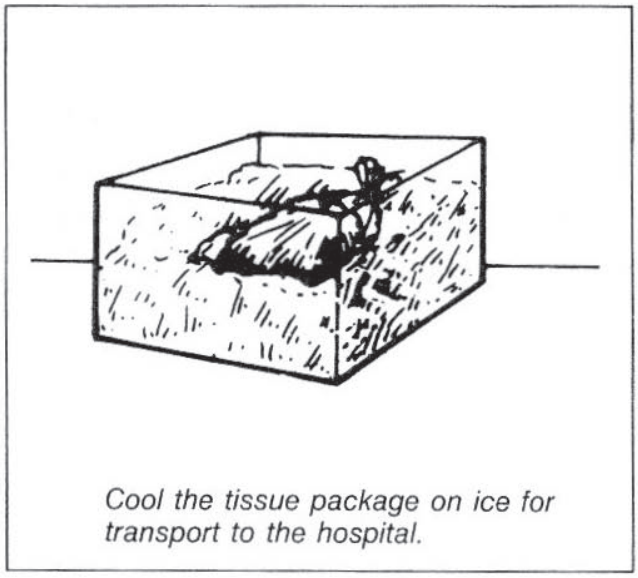


Locate the severed body part. Do not attempt to clean it.

Wrap the body part(s) in sterile or clean dry gauze.

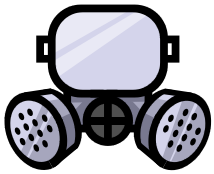


Place the wrapped part(s) in a clean plastic bag, then seal the bag.



Cool the tissue package on ice for transport to the hospital.

Preserve tissues for reattachment. Although it would be a gruesome job searching for a severed hand or amputated limb at an accident scene, this job is extremely important! If amputated tissue is handled properly and transported with the victim, modern surgical techniques have made it possible in some cases to restore badly mangled tissue and reattach limbs. (FSA Fact Sheet F-002, Nov. 1998)

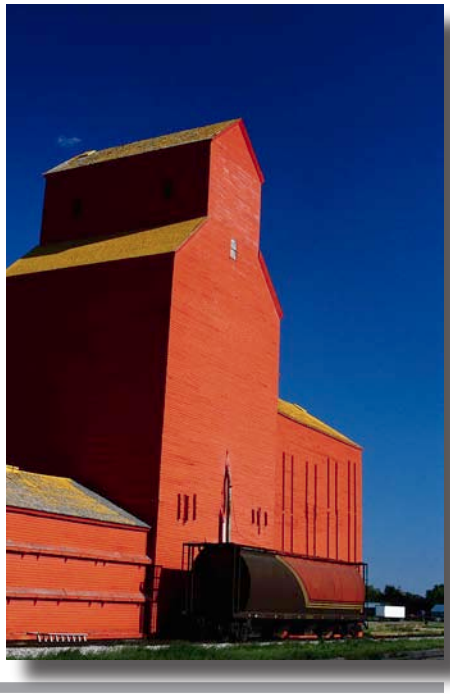


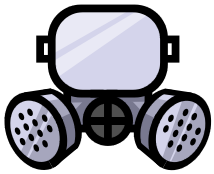
Tractor Rollover

- If there is spilled fuel, fire is a threat. Have an ABC type extinguisher available.
- Oxyacetylene cutting equipment should be used as a last resort.
- Shut off the tractor engine.
- If the ground is soft, assess if it is possible to dig the victim out from under the tractor.
- Always block or crib the machine to prevent it from tipping or causing more injuries.
- A large tow truck or second tractor is the best equipment to lift the overturned tractor.
- If the tractor must be rolled away from the victim, careful blocking is required to minimize settling of the lower side
- Place cribbing under the tractor as it is raised. Non-essential rescuers need to stand well back in case a cable or chain breaks.
- Hydraulic jacks can be used to lift smaller tractors. Block the axle on both sides to prevent the tractor from rocking onto the victim.
- Air bags can also be used by emergency personnel if they are available.

Manure Gas Poisoning / Silo Gases

- Self-contained breathing apparatus must be used to safely enter a manure storage pit or tower silo. Confined space entry procedures must be followed.
- Rescue personnel need to use a lifeline with the assistance from a back up crew.
- Restore ventilation to facilities with beneath the floor manure storage as quickly as possible. Run the blower on the silo if it is still operable.
- Open windows and doors, activate the buildings ventilation system, or use smoke evacuation equipment.
- If there is a possibility of reviving a victim CPR should be administered immediately.

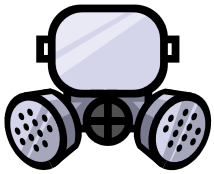




Electrocution

- Always assume that any downed power line or any piece of equipment that is in contact with a power line is energized. If you have not been trained to handle high voltage lines, call 911 or EMS.
- Wear rubber soled boots and non-conductive gloves. Use material that is non-conductive to remove the power line. If the victim is in contact with the energized equipment, it will be necessary to push or pull them away from it.
- Check for breathing as soon as the victim is free from the electrical contact and it is safe. If needed give artificial resuscitation. A doctor should examine anyone who has received a high voltage shock as soon as possible.

Farm Accident Rescue (2002) Farm Safety Association Fact Sheet.



ACTIVITIES

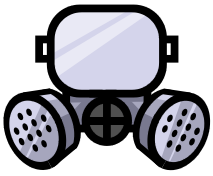
Activity #1- Mad Minute Exercise:
Break up into pairs of small groups and brainstorm for one minute. List the types of information that each person should know or have access to. After one minute, each group comes back and shares with the large group all the things on their list.

Senior Member Activity #2:
Have Senior Members develop a file or booklet (duo tang) of information on measures to be taken when dealing with emergencies, accidents, health problems and natural disasters. Have them talk to local emergency services personnel to make sure the information is the most up to date. Once the booklet is complete, have it photocopied and give it to each member of the club.

Junior and Senior Activity #3:
At the back of this section there is a copy of a blank emergency form. Have the members find out the information they need and complete this form on both sides. Encourage them to post this completed form at a location at home where it can be accessed in case of an emergency.

Activity #4 – Fill In The Blanks
Now that we have reviewed the Decision Tree For General Response To Farm Injuries, divide up into two groups. Each group should have senior members if possible. As a small group, complete the decision tree on the next page as best as you can. After you are done, rejoin the large group and together review all the steps on the tree. Keep track of which group had the most correct answers in the correct order. Congratulations! You guys really listened and learned. In the end, the winners will be the people you are able to help, should you discover or witness an accident

Accident Preparedness and Action



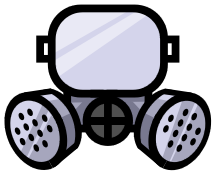
Activity #5

EMERGENCY PREPAREDNESS WORD FIND

F A D D X N C A L L F O R H E L P M N L A
I K H P L E Q F E A F A I E B O L E O C I
R W A R T I K F C I A L R A S U Z C L I S
O S S E L D T I H F W O I R S K H O E P A
B E S A F E B I H D I O K T E L P M E Q R
T Y E R O N V M C X O R P L A D U L K J T
J V S I G Y E I Y J X R S P O W P Q A Y I
M E S O N O D D C S Y H E T L N O B C N F
D I R E C T P R E S S U R E A O U D W Q I
B I D Q P G I L R U O W D V M I C N S O C
U S T D R F L B E P R E P A R E D B A V I
F U S P E O D Q Z C T Y H I C L V R L L A
F R S K D Q P F K L E I P W F P R Q I D L
A V G H E Y F H K I R E W O L M J T E W R
R I E E R A T H E E S I L Y O O P P E A E
M V T A E T W B A R M P R E C S S U R E S
A E H Z A D S Y R A C C I D A W A S O P U
C B E Y W O Q Z V E K L E D T L V D W P S
C A L M A D D R V I A V E N I L I K O A C
I K P O S U A Q X O P T F K O Y C T N S I
D K N O W L E D G E I V H D N H T C K O T
E H N Y H L P H D R E S C I S H I M H D A
N L O C A A I O N R T E W R N C M P R C T
T N A C C C Z F I R E R E E S G T I K O I
R E S C U E R A W H E S T C R E S S E A O
E D I R E A R T R K E E S T P B E P E U N
S I G T E U S O E D C L H I P I W Q P D P
C R H E L B D U C D S L W O T H I C W A L
U S E S H O C K R L A C I N T Y R A A C L
E X P L O K B L L O D T R S I C P R R C K
A I O L E E K N O L L E G T I M S E M Y V
V C B A D Q W H V I T A L S I G N S F U N

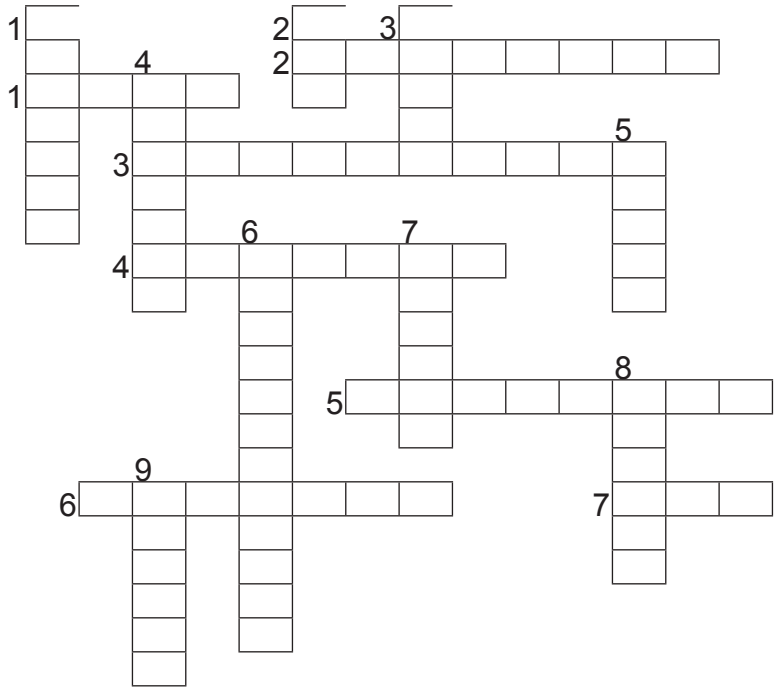
Find the following words:

Breathing	Shock	Direct Pressure
Blood	Plan	Vital Signs
Assess	Location	Calm
CPR	Hazards	Be Prepared
Farm Accident Rescue	Keep Warm	Survive
First Aid	Be Safe	Victim
Directions	Rescuer	Heart
Artificial Resuscitation	Knowledge	Address
Call For Help	Get Help	



Activity #6

Emergency Preparedness Crossword Puzzle



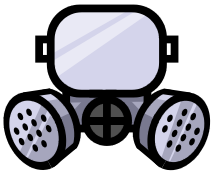
Down

1) People trained for rescues
2) When a heart stops you do ____.
3) Necessary for life
4) Know this to call for help
5) Prevent a victim from _____.
6) If a person is not breathing you perform _____.
7) A person hurt in an accident
8) Before acting you must _____ the situation.
9) In order to breathe this must be clear.

Across

1) Have this for emergencies.
2) For a deep wound apply _____.
3) Make sure you remain calm so these are clear.
4) The goal of any accident is to _____.
5) It is best to take this to be prepared.
6) Check the accident scene for these.
7) Short form for the medical professionals who come to the scene.

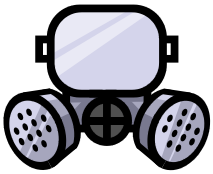
Accident Preparedness and Action



Activity #5

Emergency Preparedness Word Find Answers

F A D D X N **C** **A** **L** **L** **F** **O** **R** **H** **E** **L** **P** M N L A
I K H P L E Q F E A F A I **E** B O L E O C I
R W **A** R T I K F C I A L R **A** S U Z C L I S
O S **S** E L D T I H F W O I **R** S K H O E P **A**
B **E** **S** **A** **F** **E** B I H D I O K **T** E L **P** M E Q **R**
T Y **E** R O N V M C X O R P L A D U **L** K J **T**
J V **S** I G Y E I Y J X R S P O W P Q **A** Y **I**
M E **S** O N O D D C S Y H E T L N O B C **N** **F**
D **I** **R** **E** **C** **T** **P** **R** **E** **S** **S** **U** **R** **E** A O U D W Q **I**
B I D Q P G I L R U O W D V M I C N S O **C**
U **S** T D R F L **B** **E** **P** **R** **E** **P** **A** **R** **E** **D** B A V **I**
F **U** S P E O D Q Z C T Y H I C L V R L L **A**
F **R** S K D Q P F K L E I P W F P R Q I D **L**
A **V** **G** H E Y F H K I R E W O **L** M J T E W **R**
R **I** **E** E R A T H E E S I L Y **O** O P P E A **E**
M **V** **T** A E T W **B** A R M P R E **C** S S U R E **S**
A **E** **H** Z A D S Y **R** A C C I D **A** W A S O P **U**
C B **E** Y W O Q Z V **E** K L E D **T** L **V** D W P **S**
C **A** **L** **M** A D D R V I **A** V E N **I** L **I** K O A **C**
I K **P** O S U A Q X O P **T** F K **O** Y **C** T N S **I**
D **K** **N** **O** **W** **L** **E** **D** **G** **E** I V **H** **D** **N** H **T** C K O **T**
E H N Y **H** L P H **D** R E S C **I** S H **I** M H D **A**
N L O C A **A** I O N **R** T E W **R** **N** C **M** P R C **T**
T N A C C C **Z** **F** **I** **R** **E** R E **E** S **G** T I **K** O **I**
R **E** **S** **C** **U** **E** **R** **A** W H E **S** T **C** R E S S **E** A **O**
E D I R E A R T **R** K E E **S** **T** P B E P **E** U **N**
S I G T E U S O E **D** C L H **I** P I W Q **P** D P
C R H E L B **D** U C D **S** L W **O** T H I C **W** A L
U S E **S** **H** **O** **C** **K** R L A C I **N** T Y R A **A** C L
E X P L **O** K B L L O D T R **S** I **C** **P** **R** **R** C K
A I O **L** E E K N O L L E G T I M S E **M** Y V
V C **B** A D Q W H **V** **I** **T** **A** **L** **S** **I** **G** **N** **S** F U N



Activity #6 - The Great M&M Rescue

"THE GO WITH THE FLOW" EXPERIMENT

Materials (Each Group Will Need):

2 - 500 ml. Margarine/cottage cheese or sour cream plastic containers.
5 – M&M's (each group can choose what colours they want)
Enough salt or sugar to fill one 500 ml container
Tape
Strip of Bristol board 2.5 cm wide and 10 cm long.
Strip of Bristol board 2.5 cm wide and 5 cm long
Tray

EXPERIMENT #1

1) Break the group into groups of three of four members.

2) Each group needs to cut three "U sections out of one margarine container (this simulates the supporting structure of a grain bin and allows the members to see the grain as it flows out of the top margarine container and collects under the bottom container, which simulates the grain bin)

3) Each group will cut a hole in the center of the bottom of both containers approximately .5 cm round or the size of an M&M. Place tape on both sides of the hole on the very bottom of the containers, and stick them together.

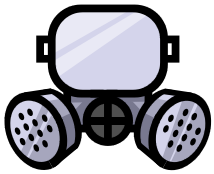
4) Slide the piece of paper between the two container bottoms, to act as a "stopper" so the grain does not flow through until ready to perform the actual experiment.

5) Place the silo structure in a tray to collect the grain (and not make a mess!)

6) Fill the top 500 ml container with the sugar or salt.

7) Place one M&M in the center of the top margarine container and the other four equal distances around the edge. (Leave them on top of the sugar)

8) Remove the cardboard strip (this is the same as starting the auger in the grain bin). Observe how the grain drains from the top container.



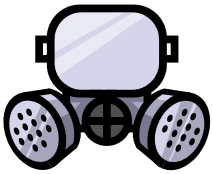
THE LAW OF GRAVITY
Experiment #2

1) Refill the container with salt/sugar.

2) Take a pencil or pen and see how much pressure it takes to “sink” the pen/pencil to the bottom of the container (not much!)

3) Now break a popsicle stick in two. Place it on the top of the salt/sugar. Now place the pen/pencil on the stick and apply pressure. It takes a lot more pressure to “sink”.

4) Learning Moment! – If you must enter a grain bin / silo, place a board on the top you can walk on. There is less chance of being sucked into the bin as the weight is distributed over a greater area!



THE GREAT M&M RESCUE

Experiment #3 (The groups need to identify themselves as group #1 or group #2)

1) Once empty, place the cardboard strip back between the containers to stop further flow.

2) Take the sugar/salt and pour it back into the top container.

3) Now place just one M&M on the top of the sugar/salt in the center. The M&M represents the person in the silo who is about to get buried.

4) Pull the cardboard out (but not all the way) to start the container draining. Once the M&M disappears slide the cardboard strip back into place to stop the flow IMMEDIATELY. (If the M&M gets buried too deep it will be impossible to rescue it).

5) **Group #1-** Cut a hole the size of a pea just below the top grain line, in one side of the container only. Observe what happens. How does the grain flow out of the container? Is it safe? How does it change the weight distribution?

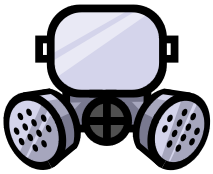
6) **Group #1-** Cut a second hole in the side of the container. If you wish to change the height of the holes, plug the first hole by placing masking tape over it. Also keep in mind the height placement of the holes so the grain will flow out without plugging, and will be low enough to empty enough that the victim can partially be seen. Once the victim can be partially seen, attempt to dig the salt/sugar away from the victim. How does it work? Report back to the large group.

7) **Group #2 -** Cut two holes the size of a pea in the top container, one on each side. Estimate where the holes should be. Keep in mind, if the holes are too high, enough grain will not flow out to expose the M&M victim. If the holes are too low, the holes may plug as it cannot clear fast enough. Allow the salt/sugar to drain so the M&M victim can partially be seen.

8) **Group #2:** Make a circle out of the second piece of Bristol board 2.5 cm wide and 5 cm long and tape it. This simulates a drum. Place the "drum" around the M&M victim in the sugar and push down on it. Now start digging out the M&M. How does this work? Report back to the large group.

9) Which way is the best? What safety equipment would be needed to remove the victim from the grain bin. What safety precautions should be in place before entering the bin?

(Adapted from "The Great Raisin Rescue" in SAFETY Agricultural Hazards, pg. 26)



Experiment Answers:

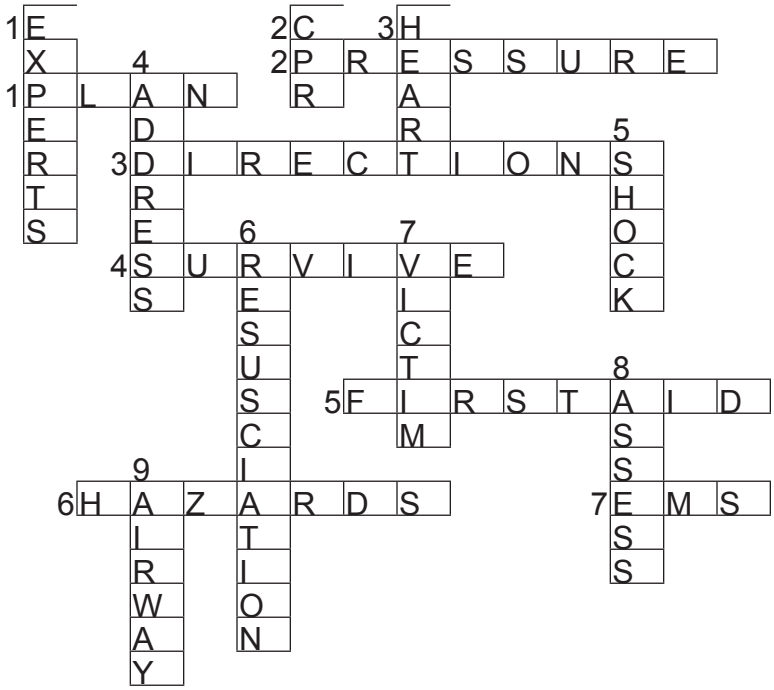
A victim cannot be dug out without some sort of separation around them, as the grain will flow back in where you have dug. Safety Equipment: No one should enter the grain bin without a safety harness or life line and a buddy system in place. Always make sure the auger is inoperable before entering a bin.

THIS EXPERIMENT HAS BEEN FOR LEARNING PURPOSES AND FUN ONLY! DO NOT EVER ATTEMPT TO RESCUE A VICTIM FROM A SILO OR GRAIN BIN YOURSELF: CALL FOR EMERGENCY SERVICES AND PROFESSIONALS TRAINED IN THESE TYPES OF RESCUES!

Now, although you all did a good job and rescued your M&M victims, they are having a bad day… they are about to meet an untimely end… because… now you can **EAT THEM!**

Activity #5

Emergency Preparedness Crossword Puzzle Answers



IN CASE OF EMERGENCY

YOU ARE AT ... ***(Additional Properties On Reverse)***

Farm Name / #: ..... **Phone #:** .....

Lot: ..... **Concession:** ..... **Township:** .....

County: ..... **911 Code (If Available):** .....

Directions To This Location: .....

.....

.....

Alternative Contact: ..... **Phone #:** .....

EMERGENCY TELEPHONE NUMBERS

POISON INFORMATION CENTRE

TORONTO
1-800-268-9017
OR
1-416-813-5900

OTTAWA (Bilingual)
1-800-267-1373
OR
1-613-737-1100

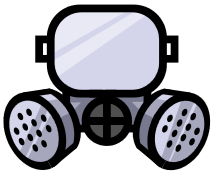
Ministry Of Environment (MOE)
SPILLS ACTION CENTRE
1-800-268-6060

	**FIRE / EMERGENCY**
	**HOSPITAL**
	**POLICE**
	LOCAL MUNICIPAL OFFICE

	**AMBULANCE**
	**FAMILY DOCTOR**
	**LOCAL MOE OFFICE**
	ONTARIO HYDRO

ADDITIONAL PROPERTIES

FARM NAME / #	LOT	CONC.	TOWNSHIP	COUNTY / REGION	911 #



References

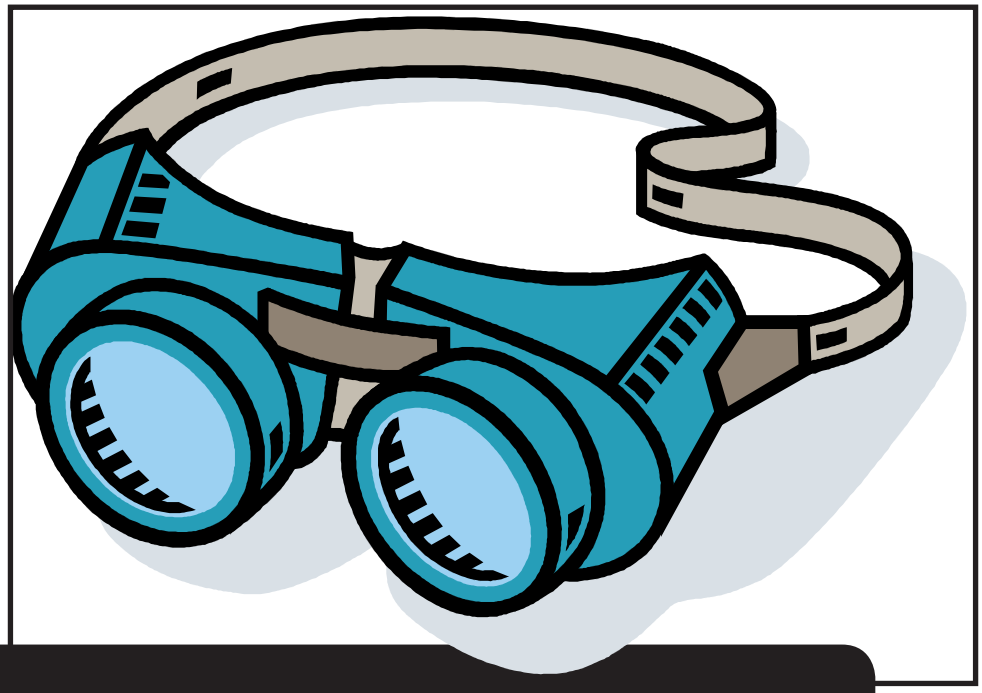
Farm Accident Rescue (November 1998) Fact Sheet No. F-002, Farm Safety Association. www.farmsafety.ca

Farm Accident Rescue (2002) Fact Sheet. Farm Safety Association. www.farmsafety.ca

First Aid – The Vital Link (Revised Edition, 2001) The Canadian Red Cross Society.

First on the Scene – Farm Emergency Information (n.d.) Natural Resource, Agriculture, And Engineering Service Cooperative Extension. Brochure. Ithaca, New York. U.S.A.

SAFETY Agricultural Hazards (1996) Ontario 4-H Council. Ontario Ministry of Agriculture, Food and Rural Affairs. 4-H 2065 97 LE



Farm Safety Project

Personal Protective Equipment

Farm to Live, Live to Farm - Farm Safety is a Journey With No End

4-H Ontario

4-H Canada

Ontario's Mutual Insurance Companies

Protecting Rural Communities For Over 150 Years!

Personal Protective Equipment

Personal Protective Equipment

Roll Call #1: The five senses are hearing, seeing, tasting, smelling and feeling. Which would be the hardest for you to lose and why?
Roll Call #2: Name one piece of personal protection equipment.
Roll Call #3: Name a job on the farm and how you would protect yourself while doing that job.

Protect Your Hearing… What did you say?

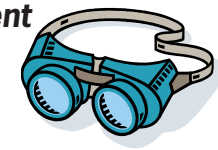
The Canadian Hearing Society warns that the noise that we are exposed to every day in our lives can cause hearing loss. The majority of people are not around noisy farm machinery all day so can you imagine how farming is a high-risk occupation that can lead to hearing loss? We need to protect our hearing, for quality of life and for safety.

Even when noises don't seem that loud, they can be intense enough to damage our hearing. The intensity of noise, or sound pressure is measured in units called decibels. The very softest sound that a human can hear is zero decibels and the loudest is 140 decibels. Listening to sounds that are over 90 decibels for more than eight hours a day can cause hearing loss. Listening to sounds of higher volumes for shorter periods of time can have negative effects as well… so turn down that music!

Normal conversation	50-60 decibels
Personal CD Player or MP3 Player	85+ decibels
Insulated Tractor Cab	Approximately 85 decibels
Tractor /Machinery Noise	Over 100+ decibels
Weed eaters/Lawn mowers	100 decibels
Shot Gun Blast	140 decibels
Car Stereos	Up to 150 decibels
Many Industrial Workplaces	85+ decibels
Vacuum Cleaner or Hair Dryer	70 decibels
Livestock Barn – Feeding Time	More than 100 decibels

Our judgement on how loud a sound is can be affected by background noise that we have "tuned out." An example of this would be when we are driving in our cars or trucks to town to get gas. The stereo is adjusted to a comfortable level of loudness (if the parents have the volume controls!). When we stop to get some gas, the stereo all of a sudden sounds louder, and at times is uncomfortable so we have to turn the volume down. It was the background noise that we hadn't noticed, such as the engine, the heater fan or the wind that had affected our ability to judge the intensity (loudness) of the music. Here are some noise levels of sounds that we hear every day, or take for granted.

Personal Protective Equipment

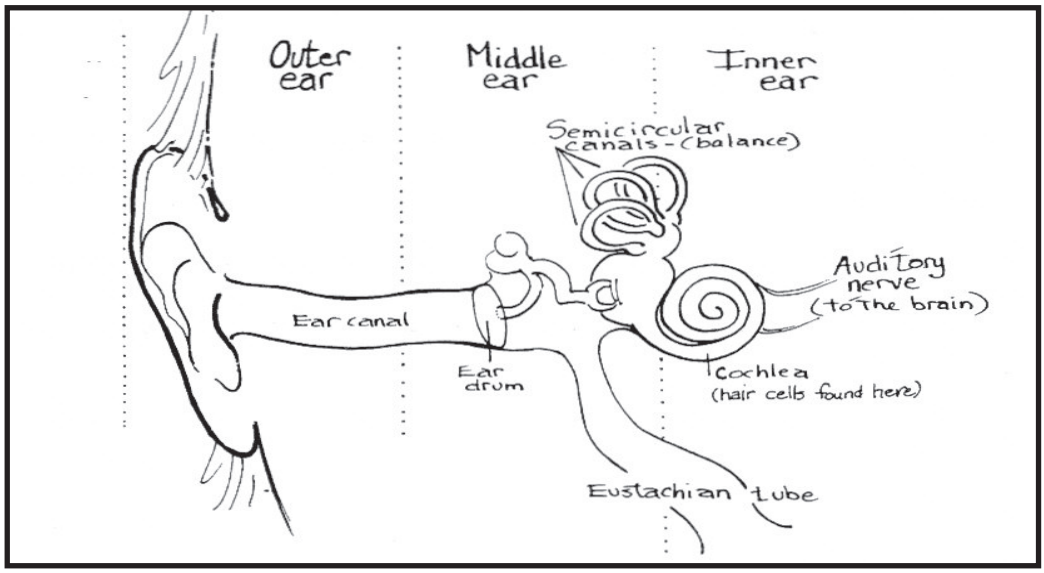


How Noise Damages Our Hearing

Our ears are divided into three sections: the outer ear, middle ear and inner ear. There are tiny hair cells deep inside the ear in a part called the cochlea. These tiny hairs forward sound to the brain for processing. Noise damages the tiny hair cells in the inner ear, and fewer sounds make it to the brain. An analogy would be if you walked over the same patch of grass repeatedly, it would eventually become worn. The first few times the grass would bounce back. Over time, the grass would turn yellow and die. This is like what happens inside the ear. Frequent, loud noise will eventually damage our hearing. The tiny hairs will no longer "bounce back." A one time very loud noise, such as a firecracker exploding close by, or a machine backfiring in close range, can also damage hearing. Sometimes the damage causes our ears to have a constant, annoying ringing sound. This is called tinnitus.

Have you noticed that your hearing is not the same for a while after you were, for example, on the tractor or running the lawn mower without hearing protection? Well you just took a "walk" on the tiny hairs in your ears and you may have already done some minor damage!

Parts of the Ear

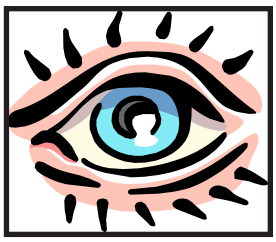


(Diagram reprinted from *Safety – Looking Out for #1* (1999) 4-H Manual, Ontario 4-H Council)

There are many types of hearing protection available including earplugs or muffs. Hearing protection that is suited for the farm environment should be worn whenever working under noisy conditions.

Personal Protective Equipment

Eye Protection



Can you imagine your life without being able to see? Close your eyes and try to walk fifty feet down the lane. Think of all the ways your life would change if one day you became blind. The eyes are very sensitive. They need to be protected from many hazards on the farm, things such as chemicals, dust, chaff, and injuries from being hit by foreign objects. The best way to protect them is to wear eye protection when working at things such as spray painting, grinding, drilling, welding, sawing, where there are dusty conditions or when working with chemicals.

There are many different types of eye protection equipment available. You need to choose which is best for you and the job you are doing.

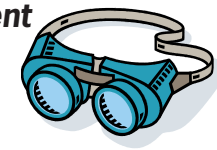
Safety Glasses
Regular eye glasses and sun glasses only provide protection for the front of your eyes, and only if they have special impact resistant lenses. Otherwise, they could shatter on impact and cause further damage. Safety glasses have side shields to protect the eyes from debris coming from the periphery (the sides). They also are made heavier so they can take more impact or shock than ordinary glasses.

Goggles
Plastic goggles protect the eyes from side or frontal injuries. Goggles that are un-vented or special chemical splash goggles also will protect the eyes from harmful chemical vapours and liquids.

Face Shields
Face shields protect the whole face, including the eyes against splashing, dust, chaff and other hazards. Some designs provide little protection against things that may hit the shield. Many face shields come attached to helmets that are designed for specific purposes such as for ATV operation, snowmobiling, welding etc.. Make sure you have the proper face shield for the job. If unsure wear safety glasses or goggles under the shield.

Welding Protection
The eyes, along with the face and neck need to be protected against the burning rays of the arc and from the potential splatter of molten metal and slag when welding. A special welding helmet needs to be worn that has a coloured lens with at least a No.10 shade when welding with 200 ampere or less. Be sure to read the welder's instruction manual before using to make sure you have the proper recommended protection. Also never strike a welding arc before your helmet is in place. On the farm, if you ever approach a place where welding is occurring, make sure you never look directly at the thing being welded with your naked eye. It will cause damage.

Personal Protective Equipment



Never chip slag from a weld when your eyes are not protected or when others nearby are not wearing goggles, an eye shield or welding helmet. Fragments imbedded in the eye have caused blindness. If you get any in your eye get medical attention immediately.

When using oxyacetylene welders you must wear goggles for welding and cutting. The lenses should be a Number 5 or 6 grade when welding and cutting, and a Number 3 or 4 grade when brazing.

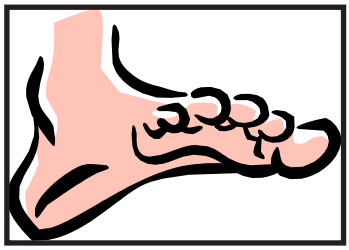
Ultraviolet Rays Are Harmful

The sun gives off certain rays called ultraviolet radiation (UV), which can be harmful. They not only can cause skin cancer, but they can also damage the eyes. The damage will not be immediate. It is not painful like sunburn. After many years of exposure it can cause serious vision problems and in some cases blindness. Not all sunglasses protect you from UV rays. Before you buy a pair make sure there is a label that tells you they will block UV rays. Some will say "100% UV protection." They are the best to choose in order to be safe. Sunglasses should be large and curved to fit your face. This keeps the sun from shining around the frames and into your eyes. The best sunglasses will have side shields. It makes sense that if you will be working outside a lot that you get a good pair of sunglasses, and get in the habit of wearing them even if you only expect to be outdoors for a short time. Make sure the lenses are shatterproof in case of an accident.

Protect Your Eyes For Life

You can't work on a farm if you can't see. Blindness will seriously effect your quality of life. Always put on proper eye protection, even if only doing a job for "just a minute." Blindness can happen in a second. Don't take chances!

Foot Protection



We rely on our feet a lot. It only makes sense that we take care of them. On the farm, foot protection in the form of steel-toed boots with steel shanks and non-slip soles are usually recommended. Steel shanks are plates on the bottom of the boot above the sole that prevents puncture wounds. Ever stepped on a nail? Ouch, it hurts! If working in wet areas or under wet conditions, it is best to wear steel-toed boots that are waterproof and that have slip-resistant soles. Slips, trips and falls are the most common farm related injuries.

Proper footwear for the job will go a long way to preventing a slip, trip or fall. How many times have you seen farm workers wearing steel-toed safety boots with the laces undone? The next time you see someone wearing his or her boots this way do them a favour and remind them that they are hazardous. Loose boot laces have caused many injuries, some fatal by getting caught in machinery and PTO shafts, or causing

people to trip and fall onto moving machinery. Also when replacing shoelaces, make sure you use the correct length of lace for the boot or shoe so there is not a lot of lace hanging out from the knot – this also can get caught in rotating machinery. It doesn't matter if you are mowing the lawn, handling livestock or taking the crops off, wear proper footwear and keep those laces tied!

Hand Protection

Gloves protect hands. They can be made of many different materials such as cotton, leather, rubber, and plastic. Make sure the gloves you choose are the right ones recommended for the job. They will help protect against cuts, scrapes, blisters, chemical burns and skin irritations when doing many farm related jobs. Also wear gloves in cold temperatures. Ever try to complete a job with frozen fingers? It usually doesn't go too well. Keep those hands covered and safe.

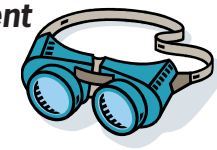
Head Protection – Don't Sprain Your Brain!

We now wear head protection for many of our recreational activities. Can you name some of them? I bet you said bicycling, motorcross, rock climbing, skateboarding, hockey, ATV and horseback riding to name a few. If we protect our heads when we are playing and having fun why would we not protect them when we are working? Anywhere there is a potential hazard for a head injury, we should be wearing head protection.

When you think of it, is there a place or job on the farm that is not potentially hazardous? Head injuries happen in a second. They can happen as a result of a slip, trip or fall, when working with unpredictable livestock (even the most calm, familiar animal can startle), working in confined spaces or where there are low ceilings or beams. Even out in the field there are tree branches, and possible flying debris. Construction workers would never work on the construction site without a hard hat, so why would a farmer work on a farm without proper head protection?

Find out if hard hats, bump caps or helmets are recommended, and wear them! Even if working, playing or relaxing outside for any length of time, because of the intensity of the suns ultraviolet rays, your head should be covered by a wide brimmed hat to protect from sunstroke. Also remember to keep long hair under your hat so it also cannot get caught in machinery. This will prevent having patches of hair and skin on your scalp ripped out. Always protect your brain - you only have one!

Personal Protective Equipment



Body Protection

For certain jobs it may be necessary to use body protection. Examples would be when working in dusty conditions, when spraying liquid pesticides or handling chemicals. The type of hazard will determine the type of body protection that is the best to wear. It could be an **apron, coveralls or a full rain suit**. It is never a good idea to operate chain saws in shorts. Wear chaps or other leg protection. Cover up for safety!

Fall and Rescue Protection

When working in confined spaces, unstable environments or high places you should always be wearing some form of protection. This protective equipment is to be used to prevent falls, and to make sure if you need to be pulled out of an unsafe place in a hurry, it can be done. Examples of this type of equipment would be **safety belts, harnesses and lifelines.**

Sun Protection

As mentioned before, being outdoors a lot over the years can increase a person's risk of experiencing health problems later on. Some of these problems include:

- Aging, wrinkling, and drying out the skin.
- Skin cancer.
- Lip cancer.
- Damage to the eyes.

Did you know it is even possible to get sunburned on a cloudy day?

Take Necessary Precautions

- The sun's rays are strongest between 10 a.m. and 3 p.m., protect your skin and eyes during these times.
- Try to limit the time spent in the sun. This could be hard on a farm, but try to spend your breaks indoors or in the shade. If possible try to get out of the sun for a few minutes every hour.
- Use sunscreen, put it on before going out, and use more as required during the day. Put it on your face, neck, hands, forearms, ears, and any other place that is not covered. The sunscreen should be at the very least 15 SPF, but the higher the number, the better the protection.
- Always wear sunglasses that filter out at least 90% of the sun's ultraviolet rays.

Cover Up For Protection

Cover up as much as possible. This means leave that shirt on! The tan or sunburn you get today can become a serious health risk later on.

Personal Protective Equipment

Therefore:

- Wear lightweight, tightly-woven shirts and long pants.
- Cottons that are light coloured are best in hot summer sun and heat.
- Clothing should be comfortable, not tight, but make sure it is not loose when working around machinery.
- Wear a hat that shades the ears, face, temples and back of the neck. (Sorry but the usual baseball hat won't provide the protection needed). Hats with wide brims are the best choice.

Respiratory Protection

Ever run a very long distance and felt like your lungs were going to burst? Or have you ever had the wind knocked out of you? It is not a nice feeling. It can frighten you when you can't get enough air. Can you imagine living each day of your life feeling that way? That is what COPD feels like. COPD stands for **Chronic Obstructive Pulmonary Disorder** and this is just one of the lung diseases that can occur if correct respiratory protection is not used. The type of protective equipment, or respirator needed depends on the potential hazard and the amount of filtering that it will take to be safe.

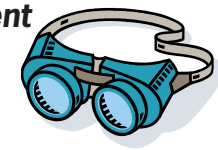
There are many kinds of respirators that are used to protect people against hazards in the air. It is important that the respirator being used is the proper one for the job, because wearing the wrong one can be just as bad as not wearing one at all. All respirators must fit well and provide a seal between the mask and the person's face to be the most effective. Did you know that the growth of one day's facial hair could prevent the mask from being able to seal properly?

1. **Disposable respirators** are used where there is dust, mist and fumes present. They are not to be used in areas where there might be a lack of oxygen.

2. **Chemical cartridge respirators** are used to filter out gases and organic vapours. These respirators are very "hazard-specific." That means that the cartridge is designed to filter out one specific gas and will not protect a worker from being exposed if the cartridge respirator is used for a different gas. An example of where they would be used is when working with pesticides or spray painting. They also should not be used where there might be a lack of oxygen.

3. **Powered air purifying respirators** should be used when there may be excessive dust levels or pesticides present. They have replaceable cartridges that are hazard-specific, and are operated by a battery. They have a constant airflow to help breathing but also should not be used in places where they may be a lack of oxygen.

Personal Protective Equipment



4. **Gas masks** are used for places where there are high levels of specific gases. They usually have a full face piece and a canister attached. They must not be used in places that may lack oxygen.

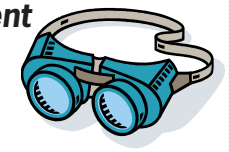
5. **Supplied air respirators** should be used in **highly toxic and oxygen deficient places.** Examples of places where these types of respirators would be used are manure pits, silos containing silo gas, airtight silos or bins containing high moisture grain. Those using this type of equipment should be well trained to know how to properly use it. There are two main types of supplied-air respirators. They are the hose mask with blower and emergency air supply, and the self-contained breathing apparatus (SCBA). This equipment:
    - Comes with an air supply in a tank.
    - Comes with a small emergency bottle.
    - Has positive pressure for use in toxic environments.
    - Should never be used alone.
    - Should be used according to confined space entry procedures.
    - Should always be used with a lifeline attached.

Dress For The Job

You wouldn't wear a three-piece suit to the barn, and you wouldn't wear coveralls to the office. Although not considered personal protective equipment, what you wear is very important. Here are some general guidelines when it comes to choosing what to wear when doing farm work.

- Don't wear clothing that is baggy, torn or too long.
- Button up and Zip up! (your clothing).
- Take out all drawstrings from clothing or other dangling items.
- Wear slip resistant safety footwear.
- Keep long hair tied back or under your hat.
- Use the personal protective equipment recommended for the job.

Personal Protective Equipment



Senior Supplement

The Ministry of Labour gives Occupational Health and Safety Guidelines for farming operations in Ontario. One of the guidelines pertains to proper personal protective equipment (PPE). As senior members, some of you may find jobs working for others in the agricultural field. It is important to know what is expected of you and what is expected of the employer. Here are the general responsibilities for employers as outlined by the Ministry of Labour around personal protection equipment.

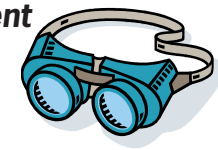
General Responsibilities

- The employer must ensure the personal protective equipment is used when appropriate
- The employer needs to provide information, instruction and supervision to workers on the proper use and maintenance of **personal protective equipment** (PPE). Instruction should include but not be limited to the following:
    1. How to properly fit and wear the PPE.
    2. When the PPE should be worn.
    3. How to care for the PPE and identify when it needs repair, cleaning or replacement.
    4. How the PPE provides protection and potential consequences for not wearing it.

- The employer should check and assess each job task and process on the farm and determine where PPE may be required to protect workers. PPE should be a last resort if the hazard cannot be controlled using other methods such as engineering controls like ventilation, redesign of the work processes or using less toxic substances.
- The worker must use PPE provided by, and as required by the employer.
- Where a chemical or other hazardous product may endanger the health or safety of the worker, PPE should be worn according to the manufacturer's instructions on the warning label or MSDS (Material Safety Data Sheet – part of WHMIS system).
- The employer should monitor the use of PPE to make sure that it provides adequate protection for the worker and does not cause undue discomfort or create new hazards while being used.
- The worker will inform the employer of any defects with the PPE which the worker is aware of and may endanger the worker.

Staying safe is a two way street. Make sure you do your part to keep yourself and others safe on the job.

Personal Protective Equipment



Activities

Activity #1
You Be The Judge: Set out different types of Personal Protective Equipment. Get the members to judge the different equipment according to safety. They rank equipment and give reasons for their ranking.
Examples: Running shoe, Safety boot (good condition), Safety boot (laces too long, ripped (poor condition). Sunglasses or Safety glasses: No UV protection, no side panels, a good pair. Hearing protectors: Winter earmuffs, proper hearing protector muffs, cotton balls. (You get the idea).

Activity #2
Speaker or Field Trip: Either have someone come with the equipment and talk about respirators, or see if the club can visit the local fire department where the fire personnel can educate them on the use of respirators, lifelines etc..

Activity #3
Brainstorm: Assign different groups, different types of jobs on the farm and ask them to brainstorm, what kind of personal protective equipment they will need to use to complete the job safely. Have each group report back to the larger group.

Activity #4
Protect Your Brain Demonstration: In small groups have one person break an egg into a small clear plastic container with a lid. The yoke is the brain, the egg white is the cerebral fluid. Have them shake the container to simulate a fall or something hitting a person on the head. What happens? The yoke breaks! Ask the group what just happened to the person's brain? Now place another egg is a clear plastic container. Pour in some water, to simulate the "cushion" that a helmet would provide. Seal the container and shake it. The egg yoke should remain unbroken. You have just proved that helmets and hard hats work!

Senior Member Activity #5
Have senior members "dress up" for the next meeting. Have the other member identify any types of hazards their clothing may pose while working on the farm. Make sure some members dress properly, and some others purposely make poor choices to give the members visual aids to help them remember what not to wear such as hoodie sweaters with cords, loose laces, long hair unrestrained etc.

Personal Protective Equipment

Senior Member Activity #6

Have senior members research the new Ontario Health and Safety Act for agricultural workers for any information that is related to the use of PPE. Have them report their findings back to the group.

References

Confined Space Entry in Agriculture (n.d.). Farm Safety Association Inc. Guelph, Ontario www.farmsafety.ca

Dress Up For Safety (March, 2001) Fact Sheet. Farm Safety Association Inc. Guelph, Ontario. www.farmsafety.ca

Eye Protection (March 2000). Fact Sheet. Farm Safety Association Inc., Guelph, Ontario. www.farmsafety.ca

Personal Protective Equipment (Sept. 15, 2006). Ontario Ministry of Labour, Occupational Health and Safety, Guidelines for Farming Operations in Ontario. Section 4. www.labour.gov.on.ca/english/hs/farming/ohsg_4.html Retrieved Dec.7, 2006.

Personal Protective Equipment (Reprinted Sept. 2003). Fact Sheet No. 13 Institute of Agricultural Rural and Environmental Health, University of Saskatchewan. http://iareh.usask.ca Retrieved Dec. 7th, 2006.

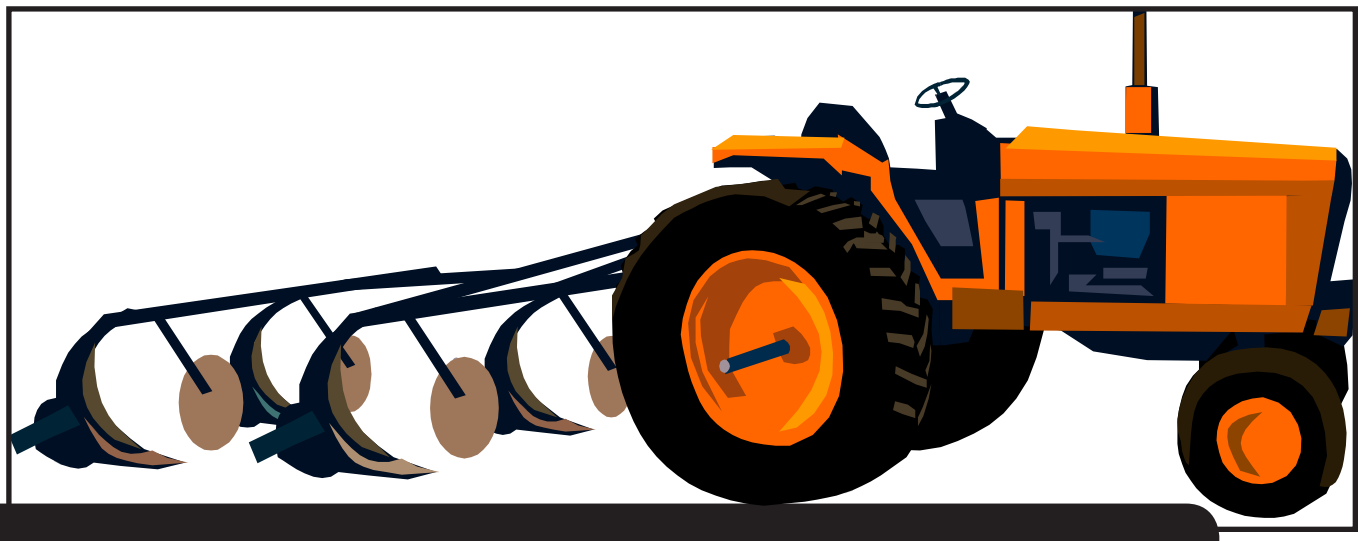
Protect your hearing. (March 2000). Farm Safety Association Inc., Guelph, Ontario. www.farmsafety.ca

Required Respiratory Protection (2002) Fact Sheet. Farm Safety Association Inc., Guelph, Ontario. www.farmsafety.ca

Respiratory Hazards in Agriculture. (December, 2002). Fact Sheet. Farm Safety Association Inc. Guelph, Ontario. www.farmsafety.ca

Safety: Looking Out For #1 (1999). 4-H Project, Ontario 4-H Council.

Silo Gas Dangers (n.d.) Fact Sheet. Farm Safety Association Inc., Guelph, Ontario. www.farmsafety.ca



Farm Safety Project

Safety and Farm Machinery

Stay Alert - Don't Get Hurt!

4-H Ontario

CANADA

ONTARIO'S MUTUAL INSURANCE COMPANIES

Protecting Rural Communities For Over 150 Years!

Machinery Safety

Roll Call#1: Name some different kinds of injuries that can occur with different kinds of tillage equipment.
Roll Call#2: Name a piece of equipment that is often pulled behind a tractor on the highway or in the field.
Roll Call#3: Name one thing that should be checked as part of the pre-operational checklist.

Over the past century there have been many changes to the agriculture industry. Mechanization is one of them. What used to be done by hand is now done with the aid of machinery. In the past twenty years this farm machinery has drastically increased in size. One only needs to meet some of this machinery on the roadway to realize their great size! Along with size comes power. Farm machinery uses tremendous power to do the work, and along with this are risks and hazards to the operators. Farm machinery manufacturers do their best to make their products safe to use, but not all the risk can be removed.

Farm machinery has helped farmers produce more crops and feed more people. It also has added many hazards to the working environment of the farm. Each year farm machinery accidents in Canada are responsible for many deaths, permanent injuries and disabilities. In many cases the operator took a short cut or took a risk, ignored a warning, wasn't paying attention or didn't follow the safety rules.

There are many different kinds of agricultural machinery. There are mowers, tractors, shredders, harvesters, grinders, blowers, augers, balers etc., but they all work because of similar equipment designs and therefore, similar hazards. In a second, you can be cut, crushed, pulled in, or struck by an object thrown by these machines. They can have cutting edges, gears, chains, revolving shafts, rotating blades, levers and similar hazards. You can also be hurt if you fall while working on or near farm machinery.

When properly maintained, and used properly, farm machinery is safe, useful and profitable for the farmer. There are many ways we can protect ourselves from farm machinery accidents. Each piece of equipment is different and requires different safety precautions. There are some basic things we can do to **keep ourselves and others safe**. They are:

1. **KNOWLEDGE –** Know the piece of equipment, how it works, how to start it or shut it off, what it is designed to do. A hay baler can't tell the difference between a clump of hay and somebody's arm!
2. **BE RESPONSIBLE –** You need to take responsibility for your own and at times others safety. If the working conditions are not good, don't do the job. Wait – live to farm another day! Be aware of where other people are when using equipment. Never back up machinery without a spotter. Don't be responsible for an accident.
3. **READ THE OPERATORS MANUAL / WARNING SIGNS-** The operator's manual can be your best friend! Read it to not only learn how to use the machinery, but to learn what parts move; what parts could be dangerous or cause an accident; how to stop it in an emergency etc.
4. **SHOW RESPECT –** Machinery demands and deserves respect. A small power drill or saw can seriously injure people. Imagine what a 60+ horsepower tractor with an implement on it can do!
5. **DRESS FOR THE JOB –** Wear protective clothing and equipment that suits the job. Don't wear fitting sweaters or hoodie sweaters with cords hanging down, tuck in those shirttails and tie those boots.
6. **PROPER MAINTENANCE –** Machinery breakdowns are dangerous. A belt or chain breaking can cause parts to fly, sudden acceleration or deceleration and loss of control of the situation.

Safety and Tillage Equipment (1998) 4-H Manual, Ontario 4-H Council & Ontario Ministry of Agriculture, Food and Rural Affairs.

Hand Signals For Safe Equipment Operation

You Want Me To Do What?

Have you ever misunderstood directions or instructions? Have you ever had trouble understanding someone talking to you, maybe because they have an accent, or may not even to talking in English? Have you ever had trouble hearing what your friends are saying in a noisy hallway or classroom?

Well, farms can be pretty noisy at times too. It can be hard to hear another person and understand what they want you to do. For

example, if you are the person driving the tractor, you be wearing hearing protection, right? Between the noise, and the hearing protection, sometimes we have to rely on other ways to communicate. On a farm understanding hand signals can at times mean the difference between life and death. It is important that everyone understands the same hand signals to prevent an accident.

UNIVERSAL HAND SIGNALS

COME TO ME

Can also be come to me because I need assistance. Lift your arm vertically over your head with the back of your hand to the rear and turn your arm in large, horizontal circles.

RAISE EQUIPMENT

Point up with one finger and at the same time, move your hand in a circle at head level.

LOWER EQUIPMENT

Point to the ground with one finger and at the same time move your hand in a circle.

DECREASE SPEED

Put your arm out horizontally with the back of your hand up and then move your arm down about 45 degrees many times. Keep your arm straight and do not move your arm above your shoulder.

INCREASE SPEED

Lift your hand to shoulder level with your fingers closed. Move your closed hand fully up and then return to shoulder level. Do this fast many times.

STOP

Raise your arm fully up with the back of your hand to the rear. Keep this position until the signal is understood.

For fun, play “Simon Says” to try these signals out. No words! Just actions!

START THE ENGINE

Move arm in a circle at arm level.

STOP THE ENGINE

Move your right arm across your neck from left to right.

MOVE TOWARD ME - FOLLOW ME

Look toward person or vehicle you need to move. Hold one hand in front of you with the back of the hand toward the vehicle and move your arm from the elbow to the fingers backward and forward.

THIS FAR TO GO

Put your hands in the front of your face with the backs of your hands outward. Move your hands in or out as an indication of how far to go.

MOVE OUT

Face in the needed direction of movement. Put your arm straight out behind you. Then, swing your arm over your head and forward until your arm is straight out in front of you with the back of your hand up.

Safety and Tillage Equipment (1998) 4-H Manual, Ontario 4-H Council & Ontario Ministry of Agriculture, Food and Rural Affairs.
www.4-hontario.ca

Many farm machinery accidents happen when a person stands between the tractor and the piece of equipment that needs to be hitched.

- **Never** stand directly in between the tractor and the equipment while the engines are running. If the operator pops the clutch, or the tractor rolls, the person on the ground can be crushed between the two pieces of machinery. Once the tractor is stopped you can go in and hitch.
- **Always** make sure you can be seen by the driver at all times when giving hand signals.
- **Always** stand in a safe place, making sure you have an escape route if you need one in a hurry!
- Keep all other bystanders away from the machinery.

Tillage Equipment

The word "till" means to work the soil by breaking in up, turning it over or moving it in some way. What are some examples of tillage equipment?

Tilling is important because:

- It prepares the soil for seeding by covering up previous crops
- It removes or destroys unwanted weeds and
- It allows air and nutrients to enter the soil to help plants grow

Tillage equipment is divided into two categories.

1. **Primary Tillage Equipment**
   This is heavy-duty equipment used to do the heavy work of turning the soil or sod to prepare for the next crop. Examples would be the plow or disk cultivator.

2. **Secondary Tillage Equipment**
   This is usually lighter equipment than primary tillage equipment. It is used to continue to work the soil to prepare for seeding by loosening the soil or removing unwanted weeds.
   Examples would be the harrows or cultivator.

True Story:
A farmer had been cultivating summer fallow. It is unclear whether he jumped or fell from the tractor cab. They found footprints for about 100 feet that indicated he walked alongside the tractor for a distance. Then they found drag marks. It appeared that his clothes had become caught in the cultivator.

Farm Fatality Analysis

When working with any equipment, there are safety measures that need to be taken at all times. On the next page is a chart that identifies the different types of tillage equipment, what it is used for, and what the hazards may be.

Equipment	Use and Description	Special Safety Notes
MOLDBOARD PLOW	USE: • Primary tillage • Turns previous crop under soil to prepare for further cultivation DESCRIPTION: • 3 types • 3 point hitch mount • semi-mount (part 3 point hitch, part trail) • trail – total weight of plow is carried on wheels	SAFETY NOTES: • may be sharp around plow bottom and coulters • semi-mount type or trail type can upset or overturn on steep hills, ditches or embankments • can snag on large obstructions e.g. roots • may drop suddenly if hydraulics fail. • Always put supports underneath when working on a plow
DISCS	USE: • Primary tillage on fields that may be easily cultivated • Secondary tillage after plowing to cut up crop residue and pulverize soil DESCRIPTION: • Offset type, mainly primary tillage • Tandem opposed, mainly secondary tillage	SAFETY NOTES: • Discs may be sharp • Hydraulics may allow discs to drop while operator attempts to remove stones or other debris from discs • Snagging on large obstacles.
DEEP TILL – SUB-SOIL PLOW	USE: • Primary tillage • Shatters hardened soil below the depth of normal cultivation DESCRIPTION: • 3 types of shanks • Rigid • Shear-bolt • Spring loaded	SAFETY NOTES: • Rigid shank style could be dangerous if it strikes a very large buried obstruction e.g. stone • May drop suddenly if hydraulics fail

DISC CHISEL PLOW	USE: • Primary tillage • Works up fields, leaves some residue DESCRIPTION: • A chisel plow with various kinds of tools i.e. sweeps, twisted shovel, disc gangs across front	SAFETY NOTES: • Sharp edges • May drop suddenly if hydraulics fail
CHISEL PLOW	USE: • Primary or Secondary tillage • For weed control or to incorporate fertilizer • Most crop residue remains on soil surface • Roughens field surface to help water enter and reduce erosion	SAFETY NOTES: • Sharp tines • Possible entanglement in obstructions • May drop suddenly if hydraulics fail
ROTARY HOE	USE: • Secondary tillage • Helps air and water enter soil • Removes small weeds DESCRIPTION: • Hoe wheels cultivate areas between crop rows to break crusted soil	SAFETY NOTES: • Very sharp tined wheels • Stones and debris can fly from the ground
RIDGE CULTIVATOR	USE: • Specialized equipment for row crops • Turns soil to build supportive ridge where crop plants grow • Reduces soil erosion	SAFETY NOTES: • May drop suddenly if hydraulics fail • Sharp tines • Possible entanglement in obstructions

FIELD CULTIVATOR	USE: • Secondary and primary tillage • Levels field • Controls weed growth • Incorporates fertilizer DESCRIPTION: • Similar to conservation tillage plow, but weighs less • Shanks dig into soil • Tines may be “S” or “C” shaped • Various teeth to attach to shank ends	SAFETY NOTES: • Very sharp points on shanks • May drop suddenly if hydraulics fail • Always have supports underneath when changing teeth • Possible entanglement in obstructions
CULTIVATING HARROWS	USE: • Secondary tillage • Smoothing seedbed • Covering seed, works in manure or fertilizer • Use alone or pull behind other equipment to finish seeding DESCRIPTION: • Chain type have tines joined together in chain link formation • Tines are on both sides, one side digs in deeper than the other	SAFETY NOTES: • Sharp, pointed tines that point upwards because equipment is reversible (can be turned over to be used) • Store in a visible or well marked location • Dangerous if stored where people or animals walk • Debris can become entangled between tines • Extreme risk of falls onto equipment when trying to disentangle.

Safety and Tillage Equipment (1998) 4-H Manual, Ontario 4-H Council & Ontario Ministry of Agriculture, Food and Rural Affairs. www.4-hontario.ca

Farm Machinery Hazards

SHEAR: PINCH: WRAP: CRUSH: CUT AND PULL-IN POINTS - OUCH!

Most machines used for farming work on similar principles with similar machinery components. To stay safe we need to understand these components and the hazards that are present when working with them. This will increase your awareness when around farm machinery.

Component / Point	Use:	Hazard / Safety Notes
Shear Points /Cutting Points • Created when edges of 2 objects removed close together • Cutting points created when a single object moves forcefully, or quickly enough to cut.	• Shears or Augers have shear points • Sickle Blades have cutting points • Designed to cut soft material	Hazard: • They are hazards because of their cutting force • Often move so fast that they may not be visible • Some cutting/shear points can't have guards • Danger of thrown debris and objects from cutting equipment Safety Note: • Be alert when operating • Warn others and look out for their safety
Pinch Points • Created when two rotating objects move together, one in a circle • Belt drives, chain drives and gear drives are places of pinch points	Use: • Wherever a belt or chain moves on a pulley e.g. baler, motor • Feed rolls, gathering chains and similar equipment to draw crops into a machine	Hazard: • Fingers, hands & feet can be caught • Loose clothing that becomes entangled can draw body parts into pinch points • Contact can be from brushing against, leaning over/falling. Safety Notes: • Machines move too fast to get out of a pinch point once you become caught • Avoid areas of machinery where there are pinch points • No loose clothing/cords or shoelaces • Turn off machinery when working on it • Make sure all safety guards stay on the machinery

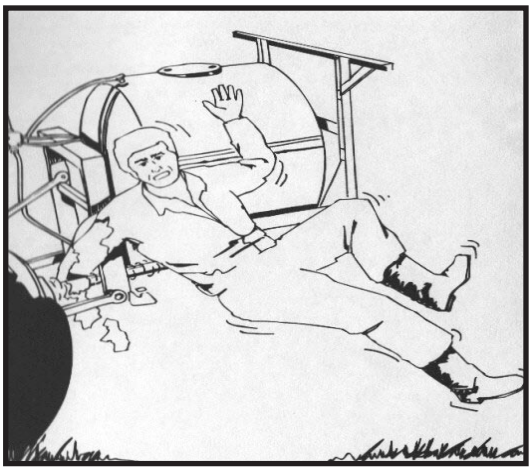
Component / Point	Use:	Hazard / Safety Notes
Wrap Points: • Rotating shafts are most common cause of injury • Any exposed machine part that rotates can be a wrap point	Use: • Power Take Off Shafts • Multiple uses – multiple machines for farming have rotating shafts	Hazard: • A sleeve, cuff, cord, shoelace or even a **thread** can catch on a shaft • Entanglement can pull you into the machine and wrap so tightly that you can be crushed or suffocated • Entanglement can throw you off balance so you fall into other machine parts • Even perfectly round shafts are dangerous Safety Notes: • Increased risk when shafts are not round, or there is mud, manure, dirt or a nick on the shaft –keep shafts as clean as possible. • Mark ends of shafts that protrude beyond bearings – paint them bright colours for visibility • Place shields on any wrap points when possible.
Springs: • Coil springs	Use: • Commonly used to lift equipment • May be used to keep belts tight	Hazard: • Under compression/or stretched will expand or contract with great force Safety Notes: • Know what direction the spring will move & stay out of its path
Pull-In Points: • Areas where machinery moves in a motion to take things into the machine	Use: • Combines, balers etc. • Machines with feed rolls.	Hazard: • Plant material or objects get caught in these areas • Clothing or body parts can be dragged in by the pull in points Safety Notes: • Always totally shut the machinery off before working to clear plugged equipment

Component / Point	Use:	Hazard / Safety Notes
Free-Wheeling Parts: • Machine parts that continue to spin even after the power is shut off	Use: • Cutter heads for forage harvesters • Hammer mills of feed grinders • Rotary mower blades • Fans, flywheels etc.	Hazard: • Can catch clothing & cause injury or death • Can knock off balance and cause a fall onto other machinery parts Safety Notes: • Never touch parts until completely stopped • Never be in such a hurry that you compromise safety
Crush Points: • Created when 2 objects move towards one another • Created when one object moves towards a stationary one	Use: • Multiple opportunities on farms for crush points on multiple machines Examples: • Combine headers • Loaders • Hitching points • Between machine & buildings	Hazard: • Failure to block up or support machinery during repairs • Not enough clearance for operators of machinery Safety Notes: • Always have a spotter when backing up • Hitch equipment on level ground • Be aware of who is where!
Hydraulic Systems: • Store energy	Use: • Lift implements such as plows, loaders, combine headers, bulldozer blades • Operate hydraulic motors • Assist in steering and braking.	Hazard: • High pressure blasts can injure eyes or other body parts • Hot liquid can burn or penetrate human tissue and flesh Safety Notes: • Never inspect a hose with your hand as a fine jet of fluid can pierce the skin • If skin is pierced seek medical attention immediately • Use a piece of cardboard to test a hose of a leak • Before repairs shut off the engine that powers hydraulic pump • Lower implement to the ground • Follow operators manual for proper serving procedures

(Information adapted from: Farm Safety Association Agricultural Machinery Hazards, 2002)

Power Take Off Equipment

Power take off driven machinery is very common on farms. Equipment is powered by a **power take off shaft** (or PTO shaft) that carries power from the tractor to the implement. It is just like a driveshaft that connects the engine to the transmission of a car or truck. The difference is it is usually exposed, or out in the open. PTO shafts should have shields around them to reduce the risk of accident. All too often shields don't get replaced once removed which makes it a potential hazard. Even if a PTO shaft has a shield around it, it is still better to avoid any contact with it. A PTO shaft that has dirt or manure on it can easily snag clothing and a person can very quickly become entangled. What is really frightening is PTO's have been known to engage by themselves due to vibration or mechanical problems. Yikes!



True Story:
The farmer had been working alone. When he didn't return home, they went searching. His body was found in a potato field. He had been repeatedly run over by an out of control tractor and disc that was running in circles.
It appeared he had fallen from the tractor as it was running.

Farm Fatality Analysis

Here is an example of how fast a PTO shaft will turn. Think about it. At 540 RPM in just over 1/3 or a second the distance traveled will equal .73 metres. That doesn't mean much right now, but add this to the problem. How long is your shoelace? How long is your scarf? How long is the cord on your hoodie? How long is the tail of your shirt or coat? In just over 31/3 or a second, these clothing items would be tightly wrapped the PTO shaft. Where would you be?

Lapsed Time Vs.Distance Travelled

And how it relates to a tractor PTO turning at 540 and 1000 rpm-shaft/shield diameter of 3 inches

Lapsed Time In Seconds Time(sec)	540 RPM		1000 RPM	
	Revolutions Turned	Distance Travelled(m)	Revolutions Turned	Distance Travelled(m)
0.33	3.0	.73	5.5	1.34
0.50	4.5	1.06	8.3	1.98
1.00	9.0	2.17	16.7	4.00
3.00	27.0	6.47	50.0	11.99
5.00	45.0	10.80	83.3	19.98

(Chart and Sketch (above) reprinted with permission from The Farm Safety Association Inc. Power Takeoff Safety Poster)

True Story:
A farmer had been loading bales into a chopper that was driven by the PTO of the tractor. It is unknown how it happened but he became entangled in the PTO, and died of multiple injuries.

Farm Fatality Analysis

PTO SAFETY CHECKLIST

1. **Always** disengage the PTO, shut off the tractor and remove the keys before leaving the tractor seat. It can't hurt you if it is not spinning. If you have the keys someone else can't start up while you are making repairs.
2. **Always** replace the master shield. (If it needs to come off for repairs, take the time to reinstall it. You and your family are worth the extra few minutes.) An exposed rotating tractor stub shaft would grab and wrap around anything it contacts if the PTO were ever engaged with no driveline attached.
3. Keep the shield in good condition. Damaged shields need to be repaired or replaced before operating the machinery again.
4. **Never** step across a PTO shaft that is rotating. **Always** walk around the machinery. Take extra care if the ground is slippery from mud or ice.
5. **Dress for safety!** No loose clothing. Tie those shoelaces. Take out the cords on sweatshirts, coveralls and coats. No scarves etc.If your favourite work coat is ragged or ripped, get rid of it!
6. **Never** extend a PTO shaft beyond a safe length. Get the proper shaft. A shaft that becomes loose while turning can be flung with tremendous force and is very dangerous.

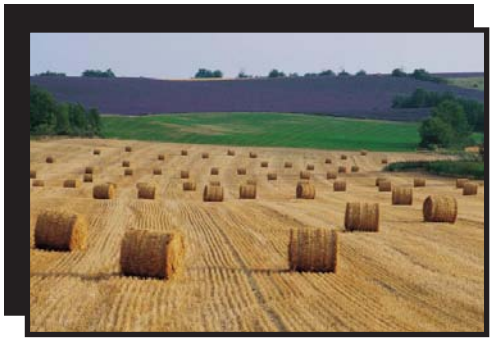
Big Bale Safety

True Story:
A person had gone for a leisurely walk on the side of the road. Round bales that were being moved on a flat wagon rack and towed by a tractor, shifted and fell onto the roadway, at the top of the hill. The bales gained speed as they rolled down the steep hill. The person never had a chance to get out of the way. Think about safety before you walk on the roadway listening to your walkman or MP3 player!

Farm Safety Association

So you may ask, what is the big deal? Much of Ontario's hay crop is now harvested as large round or square bales. It saves time and labour. How can big bales be a problem? Those big bales that you see around weigh between 450 – 900 kg or 1,000 and 2,000 pounds. That is a lot of weight to be working with and can increase risks when haying. The tractors needed to operate the round balers have a lot more horsepower than was required when the small square bales were harvested. However, the biggest risk and the one thing responsible for the most injuries to deaths to date are the big bales themselves. We need to be responsible and also think about others.

For everyone to stay safe we need to take additional precautions.



Senior Supplement

Baler Safety Maintenance – Don't Get Wrapped Up In Your Work!

Pre-season Checklist

Before operating a large baler you should:

- Read the operator's manual (at the beginning of each season!)
- Provide or receive hands-on training on how to operate it.
- Check and make sure all guards and shields are in place, especially the PTO shaft shield.
- Check maintenance records and inspect for excessive grease of grass build up – this can cause a fire.
- Locate the 5 pound A:B:C fire extinguisher which is *part of your tractor equipment.*
- If repairs are needed a) chock or block the baler wheels,
  b) lock the tractor brakes,
  c) remove the ignition key.
- Clean the baler of field residue or other debris. Lubricate all parts according to manufacturers recommendations to prevent overheating and fire.
- Replace any bent or damaged pick up teeth.
- Inspect all belts/chains for wear and tear and adjust to proper tensions.
- If belts need to be replaced read the instructions on securing the upper chain and moving load from the belt tension springs.
- Check all hydraulic hoses.
- Check twine feeding and cutting mechanisms for proper working order.
- Check the slip clutch, roll scraper and rear gate latch for proper adjustment and operation.
- Check all lights, warning reflectors and slow moving vehicle sign.

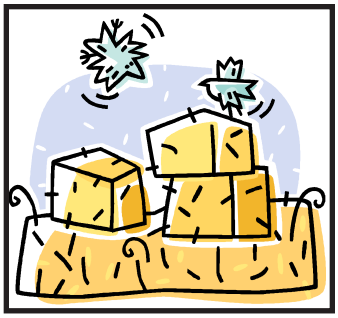
Ready, Set, Bale!

There are a number of things to pay attention to when baling. When driving over rough ground or on hillsides try not to hit any holes or obstacles. This could cause the windrower to tip, or could throw the operator off the machine. Adjust your speed according to conditions (holes, obstacles, hillsides) and the thickness of the crop. Each time you have to get off to unplug the machine the more risk there is of an accident.

Remember **always** turn the machine off. We know that if there are frequent clogs, the operator is more apt to get frustrated and try to remove the clog with the machine running. **Remember: don't hurry! Go slowly and carefully and live to farm another day!** Never attempt to unplug the baler without the PTO disengaged, the tractor shut off and the keys in your pocket! Also never try to remove twine or feed the hay by hand into the baler. This is really dangerous. One slip and you could have a deadly fall into the baler.

True Story:
A farmer had removed the front guard on his round baler for repairs and never put it back on. They think the baler got plugged and he tried to fix it without turning off the machine. When they found him he was inside a bale that ejected from the machine when the baler gate opened.

Farm Fatality Analysis



Baling

After the equipment safety checks have been completed and before the baler is taken to the field do the following:

- Join the two independent brake pedals together.
- Pump the brake pedal to make sure the brakes are working.
- Clean off the Slow Moving Vehicle Sign.
- Check tractor and baler tire pressures.
- No Riders! No Riders! No Riders! - Keep young children away.
- Check for any loose clothing and make adjustments if necessary. Don't eject a bale on a downward slope, as it may continue to roll.
- When ejecting a bale make sure the area behind is clear before raising the tailgate.
- If the tailgate must be opened for repairs, it should have a mechanical hydraulic cylinder lock-out device to stop the gate from closing accidentally.

Round Bale Handling

You may have learned about the center of gravity in school. Now you will learn why you needed to know that. You have to keep in mind the center of gravity when handling and transporting round bales. Why? **So you don't overturn!**

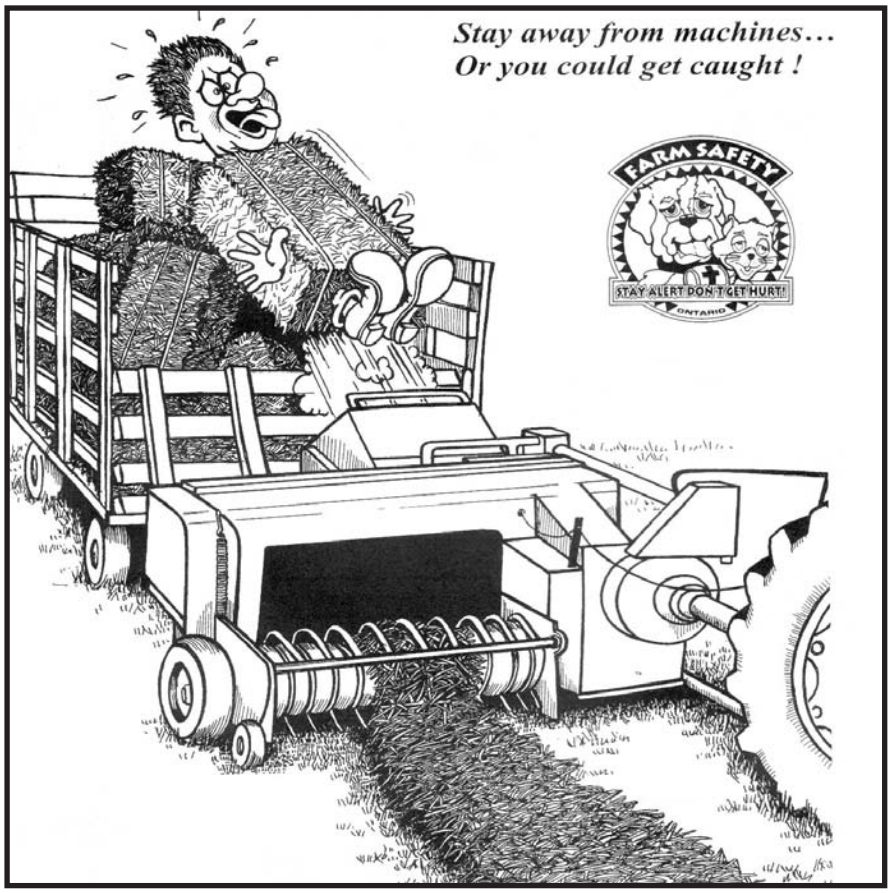
- Keep the load as low as possible to prevent the tractor from overturning.
- When crossing over even slight embankments with a heavy load, tractors can overturn. Remember if you have to brake do it lightly.
- **Never** push in the tractor clutch pedal when transporting bales down a steep hill. Often the tractor will gain speed. If you brake too hard, the load can shift, and you can overturn.
- When picking up a bale on a steep hillside, work on the downhill side.
- Remember most tractors only have two wheel brakes, so it is best to use the same gear going down a hill as going up it.
- Do not use the front-end loader to pick up bales unless proper bale restraining devices are used.

Conventional Baling

Some of us still use the traditional square balers to do the job. On the baler there is a large part that looks like a wheel. This is called a flywheel. Its job is to keep the momentum of the baler at a constant speed. When the baler is shut off, even without power it keeps spinning for a long time, so it is a good thing to stay away from it. Sometimes the flywheel will be turned by hand in order to watch if the knotter mechanism (the parts that tie the knots) is working correctly. It should never be turned when someone is actually working on the knotter, the knives inside the machine or other moving parts.

Use extra caution when bale throwers are used because of the extra force involved. Be careful when building a load on a hay wagon. The load needs to be tight for transporting. Take into consideration the experience of the person driving the tractor and the person stacking.

Look at the picture below. Try to identify all the potential areas that could be hazards. Remember the shear; cut; pinch; wrap; pull-in; free-wheeling and crush points. Go back and review the chart if it helps to identify the hazards. This picture is poking fun at the farmer who went through the baler. Unfortunately in real life, this person would be dead!



(Reprinted with permission from the Farm Safety Association, Guelph, Ontario www.farmsafety.ca)

Round Bale Hazards

Here are some key safety points when working with round bales.

- Equipment used to handle big bales should have **rollover protection.**
- **Never** carry a round bale in a loader bucket – it can become dislodged and fall onto the tractor operator, or someone else close by.
- **All** loaders should be equipped with a spear or grapple that is designed for the size of bales being handled.
- Loaders should have **bale restraining safety devices** to prevent a loose bale from sliding backwards.

- Loaders must be large enough to handle the 450 – 900 kg bales safely or be fitted with **counterweights**.
- Set wheel span to the maximum width to increase tractor stability.
- Travel at a slow speed when carrying a bale.
- Keep bales as low as possible as this increases stability.
- Wagons should be wide enough for the bales and have end racks to stop bales from falling off the ends while transporting.
- When storing bales use good judgment. Removing bales from high stacks can be dangerous.

True Story:
The large round bale had been loaded on a front-end loader of a tractor. The loader raised, and the bale fell backwards onto the tractor. The tractor was open, it did not have a cab. The bale crushed the operator.

Farm Fatality Analysis

Mower Safety

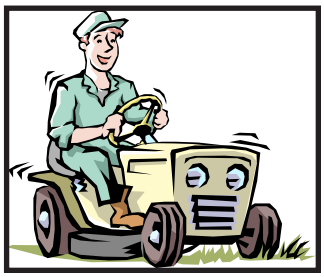
An accident with a small push mower can be dangerous. An accident with a rotary mower can cost you your life. Proper maintenance, knowledge on how to use it, and wearing protective equipment correctly can make the difference between a safe job completed and a severe or fatal accident.

Mower Hazards
The most dangerous part of a mower is the blade as it is designed to do the actual cutting. To work efficiently the blade needs to be sharp and turning at a very high speed. This blade can do serious damage to a hand or foot that finds its way under the mower deck when it is running.

Watch For Slippery Slopes
Push mowers should always be operated across the slope so your feet cannot get under it if you slip and fall. Going across the slope will also stop the risk of the mower rolling down the slope and running over you! You also should never pull a push type mower as again you can slip and your foot could land under the mower as the momentum is coming towards you.

Riding mowers however are safer and more stable when operated up and down slopes. How many of us have seen people cutting the ditches in front of their properties, leaning excessively to try and prevent the mower from rolling? This is an accident waiting for a place to happen. But riding mowers can present other hazards:

Who said cutting the lawn is boring?!



1) The tip of the mower blade can be turning as fast as 320 miles per hour. Think about what would happen if a heavy, running lawn mower, rolled over on top of you. There would be hands, feet, legs flailing along with gasoline leaking, a hot engine, and very sharp mower blades still turning… Ouch!
2) Bystanders have been killed by a rock or piece of wire that has been thrown by the mower.
3) Don't run the mower inside a closed garage or it can cause carbon monoxide poisoning.
4) Make sure no one is smoking, and make sure the engine is turned off when filling the mower with fuel or the risk of fire is quite high.

True Story:
A son last saw his mother alive in the morning. When he returned he found her lying under the riding lawn tractor. The mower was still in gear and had run out of gas. It appeared the mower rolled over while turning. The weight of the mower on top of her had crushed her chest.

Farm Fatality Analysis

General Safety Precautions

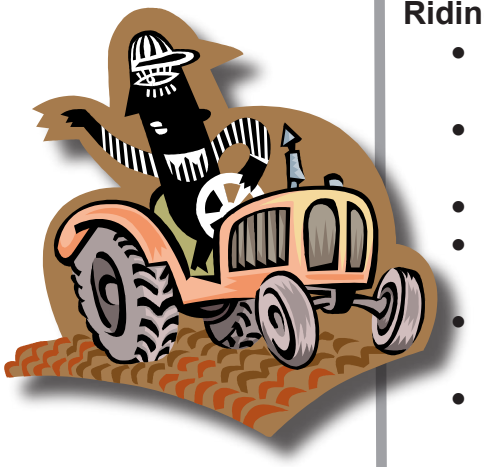
- Prepare the lawn or field for mowing. Check for sticks, rocks, toys, sports equipment, dog bones, wire, and equipment parts to name a few.
- Watch for any pipes, tree roots or partially buried rocks. Running over these can shatter the blade, causing jagged chunks of sharp metal to be thrown out the chute of under the mower deck. Any of these things and ditches can throw you off the mower, or upset it.
- A hot muffler can ignite vapours from gasoline. **Always** allow the mower to cool down before refueling (time to go get that drink or snack you wanted). Wipe up any gasoline immediately that may be spilled to lessen the risk of fire, and help keep the environment clean.
- **Always** fill the mower with gasoline outside. Because of gas vapours move the mower at least 10 metres away from the fueling location before restarting.
- **Don't** wear running shoes or sandals. Wear steel-toed safety footwear for the most protection.
- Wear long pants and close-fitting clothes. The pants will protect your legs from small debris. The close fitting clothes are less likely to get caught on controls or moving parts.
- Use hearing protection (not your MP3 player) gloves and safety glasses.
- Keep others away. No Riders! No Riders! No Riders! It is hard to survive being run over by a mower.
- **Never** try to unclog a mower while it is running. Shut it off.
- If you have to reach under the mower for any reason… Shut it off and disconnect the sparkplug wire. It will take a little longer, but recovering from an accident will take more time – guaranteed.
- Only use the mower in the daylight.
- Do not use the mower on wet grass. It is slippery, and the mower is more likely to clog.

Rotary Mower Safety List

- Read the **operator's manual -** learn how to start, stop, disengage the mower, the location and purpose of controls, gauges and dials on the tractor.
- Walk over the property on which you are going to be working. Take note of any ditches, hills, rocks, obstacles etc.
- Use the **rollover protective structure** – it is there for a reason. If there is a ROPS then use the seatbelt – it too is there for a reason!
- Check belts, chains, shields and guards.
- Make sure the discharge chute is pointed downward.
- Always disengage the PTO, and shut off the tractor before dismounting.
- Many rotary mower blades continue to turn for a while even when power it cut off – be sure they are before approaching.

Tractor Mower Safety List

- To avoid a fall be sure hands and feet are clean and dry before mounting the tractor.
- Make sure the wheels are positioned wide apart for stability
- Disengage the PTO before cranking the engine
- Raise the mower high and use low rpms before engaging the unit
- Use a ground driving speed of 2 – 4 km/hr based on the height of the plants being cut and the density (thickness of the growth).
- With rear-mount, pull-type and wing-type mowers – cut up and down slopes
- With side-mount, offset and sicklebar mowers cut across the slopes
- **Always** look before backing up
- When finished or stopping: disengage the PTO, shift into neutral or park, set the parking brake, turn the engine off, remove the key, and wait for all parts to stop moving before getting off the tractor.
- **Always** block the mower tires or frame with supports when working underneath it



Riding Mower Safety List

- Before starting make sure all safety devices are working (know how to use all the controls as well)
- Make sure the “deadman” control is working (the control that shuts off the mower when the weight is off the seat)
- Wear heavy leather gloves when working with the blade
- **Never** wear gloves when sharpening the blade as they could get caught in the power grinder wheel.
- Before starting make sure the transmission and mower are disengaged
- On gentle slopes, drive up and down. Back up moderate slopes. Don’t go on steep slopes.
- Slow down when turning sharply and on slopes to keep from tipping.
- **Always** look behind you before backing up.
- **Always** be aware of where small children, pets and obstructions are.
- Make sure the discharge chute is pointed away from buildings, people and animals.
- **Never** unclog the chute when the engine is running.
- Keep hands and feet away from moving parts.
- Turn off the engine, take the key and wait for all moving parts to stop before getting off.

Agricultural Mower Safety (2002) Farm Safety Association. Fact Sheet. Guelph, Ontario www.farmsafety.ca

Grain Auger Safety

Grain augers are usually used for a very short period of time each year. Because of this maintenance may be neglected or overlooked. Maintenance is important for many reasons. It reduces the hazards, reduces the amount of down time when it is needed the most, and keeps the operator familiar with the operation of the equipment.

Machine Inspection

- Check all guards for proper installation and proper functioning.
- Replace any missing safety decals.
- Check the winch and cable for condition and operation. When fully down the cable should have at least three wraps of cable around the winch drum.
- Check the anchor on the winch drum for tightness.
- Check all fasteners for tightness and belts and chains for condition and proper adjustment.
- Check oil levels in the gear box and drive box and lubricate according to manufacturer recommendations

Safe Auger Transport

- Grain augers should be empty and in full down position.
- The hitch pin should be attached and a safety chain connected to the auger and tow vehicle.
- A slow moving sign should be on the output end of the auger and speeds should be less than 40 km/hr.
- Watch out for overhead obstructions and electrical wires.
- No Riders! No Riders! No Riders! on the auger (believe me, it has been done!)

Proper Auger Set Up and Operation

- When unhitching, lift slowly and do not raise the intake end higher than the tractor bar.
- Set up the auger on level ground attached to a vehicle.
- Check for overhead obstructions and electrical wires.
- Slowly move the auger into working position with the vehicle, not by hand.
- Anchor the auger at the intake end. Supports should be in place at the discharge end.
- Check all guards and safety shields
- **Never** attempt to increase the height of the auger by raising it with blocks or lumber.
- Make sure the work area is free of debris, has good footing to prevent trips and falls.
- Keep hands, feet, hair and clothing away from moving parts
- Keep children and bystanders away. Have a marked “hazard area” and shut down equipment immediately if someone enters.

True Story:
A farmer had been working alone. He fell into the mix mill he was operating and was trapped by the auger for four hours. It took longer than that to free him from the auger and get him to the hospital where he had a heart attack and *died.*

Farm Fatality Analysis

- Shut off equipment for servicing, adjustments and cleaning.
- Normal shut down should occur when the hopper and auger are empty.
- The power source should be removed before leaving the machinery alone.

Emergency Shut Down

- If an auger has to be shut down in an emergency, disconnect and lock out the power source. Clean as much grain from the hopper and auger as possible before restarting.

Grain Auger Safety Reminders (2002) Farm Safety Association. Fact Sheet. Guelph, Ontario www.farmsafety.ca

Snowblower Safety

Some say it is the "most wonderful time of the year." We are not referring to going back to school; we are talking about winter, and … snow! Sometimes it falls in places where it has to be moved. That's where the snowblower does its job. Maintenance before the snow flies is important, and should involve checking all guards and shields, bearings, chains, u-joints etc. We should also make sure the laneways and yards are clear of debris and objects; we don't want to blow metal, stones or wood, just the snow! If there are steep dropoffs beside laneways it is a good idea to mark them. When blowing the snow… **No Riders! No Riders! No Riders! or bystanders.**

For the first pass down the laneway the snowblower's cutting edge should be tilted up slightly, and a thin layer of snow should be left. Try to blow the snow away from buildings and vehicles. When possible take advantage of the wind direction. Blowing snow with the wind increases visibility and is more efficient. Always cut the power to the snowblower before you get off the tractor. Never try to unclog the chute with the auger running. Never stand behind the unit with the auger running, one slip or fall, could cost you your life!

Snowblower Safety Pointers (n.d.). Farm Safety Association. Fact Sheet. Guelph, Ontario www.farmsafety.ca

Senior Supplement – A True Survival Story

Read the following article about Billy Woods. Afterwards have a discussion about the accident. Answer the following questions:

1. Billy writes, " I didn't really do anything wrong – but there was more that could have been done to prevent this." What does he mean by this statement?

2. Glen Blahey, chair of the Canadian Agricultural Safety Association states, " Farm-related incidents are almost always the results of a series of little things that are not much on their own, but when put altogether create a significant safety hazard." What point is Blahey trying to make? Can you think of any possible examples of little things building up and becoming something big in your own life?

3. How has the accident changed Billy's life?

I remember thinking, 'Am I dead?'

THE BILLY WOODS STORY

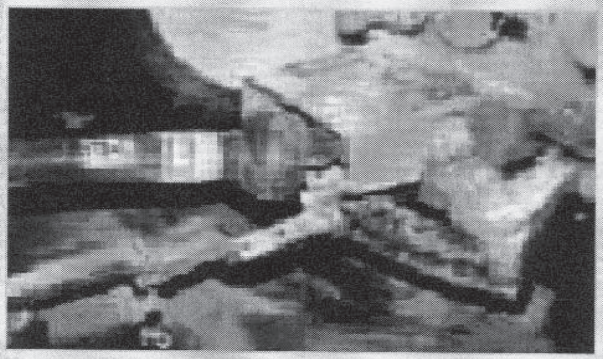
It was one of those miserable spring days when the icy rain stings against your cheeks. The kind that makes you turn your collar up against the wind and hunch your shoulders, so the chill doesn't go down your neck and back. Evening was setting in and there was still much work to do. It would be a while yet before Billy could enjoy the warmth of the house and the hot dinner he knew was waiting.

Billy Woods (28) was working on the 180-cow dairy farm that belonged to his grandfather and uncle near Torbay, Newfoundland. They were busy putting the manure out in preparation for spring planting. Billy had already hooked up the manure pit agitator to the power take-off (PTO) of the 90-horsepower tractor and started it up. This would allow the solids and liquids to mix while dissipating any gases that may have collected.

A PTO is a device that transfers mechanical power from a tractor to a piece of towed or stationary equipment through a rod or drive shaft. The tractor makes the driveshaft turn and this drives the piece of equipment. A PTO is directly geared to the tractor and is designed to spin at either 540 or 1000 rotations per minute (rpm) depending on the machine that is being powered. It doesn't stop until the tractor is shut down. Furthermore, because of the massive workload they must endure, PTOs are made of superior steel and do not break. When operating, a PTO is extremely dangerous – that's why it should have a sleeve guard around the shaft and a plate shield over the connecting joint to protect things from getting caught in it.

Billy heard a noise out by the manure pit and went to investigate. The manure pit agitator had been working, but ice had jammed against the pump. As he reached over to turn the handle on the pump Billy felt himself being pulled by the leg.

"I was conscious for the first few goes around and I knew I was in the PTO. There was this thump, thump, thump feel and everything was a blur – I knew I was in there," recalls Billy. "It just happened so fast."



This tragic story is all too common in Canadian agriculture. On average, 115 people are killed and another 1,500 are seriously injured by farm-related incidents in Canada each year – and many more minor injuries are never even reported. Of these incidents, machinery entanglements account for 9 per cent of fatal injuries and 15 per cent of hospitalizations says a study by the Canadian Agricultural Injury Surveillance Program.

"Machines – especially tractors – are by far the leading killers in agriculture, accounting for two-thirds of farm-related fatalities," explains Glen Blahey, chair of the Canadian Agricultural Safety Association (CASA). "Survivors of farm machinery incidents often sustain injuries that result in amputations and long-term disabilities."

Looking back, Billy figures the wind must have blown his bootlace into the spinning connecting joint of the PTO causing him to fall backwards onto the racing PTO shaft. The PTO had the sleeve and plate guards properly installed and he believes that made the difference between injury and death.

Billy doesn't know how long he was entangled, but it wasn't until his arm detached from his body that he was freed from the machine's grasp and thrown to the ground – along with his severed arm nearby.

"When I first came-to I remember thinking, 'Am I dead?' because everything was all black. But then as my senses came back I could hear the tractor revving and my clothes making a whipping sound as they spun around the PTO," tells Billy, taking a moment to reflect. "I just lay still for a bit and then slowly things came into focus and I was looking at the sky."

"I guess once shock sets in you don't really feel much anymore – that's the only thing that can explain it," said Billy. "As I was lying there I realized my left arm was gone and that I'd better get help in a hurry."

So that is just what he did. Billy got up, held onto what was left of his arm, idled-down the tractor, walked about 35 metres to the barn entrance and yelled for his uncle to come and help him.

"I guess he knew by the tone of my voice that something was wrong," recalls Billy. "And then my instincts and training kind of took over."

Billy was a Level II certified volunteer fire fighter with First Aid and Trauma Training for First Responders. He told his uncle to call 911 and bring blankets to keep him warm. By the time his uncle got back, Billy had put a tourniquet on his own arm complete with a half knot.

The Fire Chief was the first on the scene with the rest of the unit close on his heels. It was quickly determined that no ambulance was avail-

able for dispatch, so the Fire Dept Rescue Unit transported Billy on the 20 minute drive to the St. John's Hospital.

"At first the doctors thought it was only my arm that got caught in some machine," said Billy. "Once I explained it to them and told them I had gone around, then they got more worried about internal injuries. They had no idea what a PTO was or what the dangers could be."

Billy survived two surgeries that night and woke up in the intensive care unit. "When I came-to and saw the bandages I knew they couldn't save my arm and that it was gone – but I also knew I was lucky to be alive."

In addition to the loss of his left arm, Billy suffered a dislocated SI joint, whiplash to the neck, severe batters and bruises, and nearly died of blood loss. Amazingly, Billy had no internal injuries and was discharged from the hospital after three weeks to return home and take physiotherapy as an out-patient from his local hospital.

"I was left-handed and that's the arm I lost, so there was lots to get used to," says Billy reflecting on his April 1996 incident. "Now I have to watch my right arm because it gets tired and weak from excessive use. So I've had to learn my limitations and leave more time to do things."

Billy has shared his story as part of this year's Canadian Agricultural Safety Week (CASW) campaign, March 8-14, 2006. The theme, ***"Farm safety is MY business."*** emphasizes the importance of applying risk management processes to all farm work.

"Farm-related incidents are almost always the results of a series of little things that are not much on their own, but when put altogether create a significant safety hazard," explains Blahey. "Some of these things we have control over and others we don't. With some of these factors we can predict what might happen, and with others we can't. That's why it is so important to think things through and control all the risks that you can – because that still leaves all kinds of risks out there that you'll have no control over. This thought process is called risk management."

"When I think about what happened – I didn't really do anything wrong – but there was more that could have been done to prevent this," explains Billy. After the incident, bigger shields and guards were installed around the PTO and a rail guard around the pump area to keep a minimum area clear.

Billy also feels very strongly that First Aid training is a must for everyone on the farm. "Even little things can make big injuries. The machines are so powerful that when a farmer gets hurt, it's usually a significant injury – knowing First Aid can make all the difference."

Billy is still farming with his uncle, raising replacement dairy heifers and cropping about 500 acres of hay and pasture. He also leads the Newfoundland chapter of an organization called Canadian Farmers With Disabilities.

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"I was left-handed and that's the arm I lost, so there was lots to get used to," says Billy Woods reflecting on his April 1996 incident. Woods is a spokesperson for the recently launched Canadian Agricultural Safety Week, March 8-14, 2006.

(the above article appeared in Farmsafe Services for Agricultural, Horticultural & Landscape Industries, Vol. 31, No.1. February 2006)

Activities

Activity #1
In pairs make a poster about the safe operation of farm machinery. It can be of a general nature or focus on one piece of farm machinery. On achievement day, hang these posters for everyone to see.

Activity #2
Have the members practice their hand signals. Have one of them be the "driver" and the other person giving the signals. See if they can guide the person to where they want to be by just using hand signals. For the raising and lowering of equipment the participant can stand tall or crouch.

If you are outside for this activity, get one person to take their manual and move some distance away from the group. Have them make signals to the group while everyone guesses what message is being given.

Another variation - have some members put on hearing protection. Tell them the message first verbally without yelling and see if they were able to comprehend the message given. Now repeat the message using hand signals. eg. start the engine; go this far; stop the engine; move out; move towards me; follow me; decrease speed; raise equipment; increase speed; lower equipment; stop.

Activity #3
Have some operating manuals available for machinery with PTO shafts. Have the members look up at how fast the PTO turns. Now have the members break up into groups and measure the following:

- How long is their shoelace?
- How long is their shirt if not tucked in?
- How long is their scarf?
- If wearing a hoodie, measure around the edge of the hood, and the cord to get the length.
- Anyone with long hair – how long is it?
- Have members look at each other and identify anything they feel might be a hazard if they were around machinery.
- If you have any bring a shoelace, or a spool of strong thread have the members try to break it.

Senior members can do the math using the PTO Shaft Chart in this section as a guide. Junior members can do approximations using the chart.
The distance traveled column equals the length of the items measured. For example **if a scarf was 1 metre long it would be wrapped tightly around the PTO shaft in just a half a second. A cord on a hoodie would be wrapped around the shaft in approximately a half a second.**
To end the activity, stress that no person would have a chance at these speeds to even try to get loose.

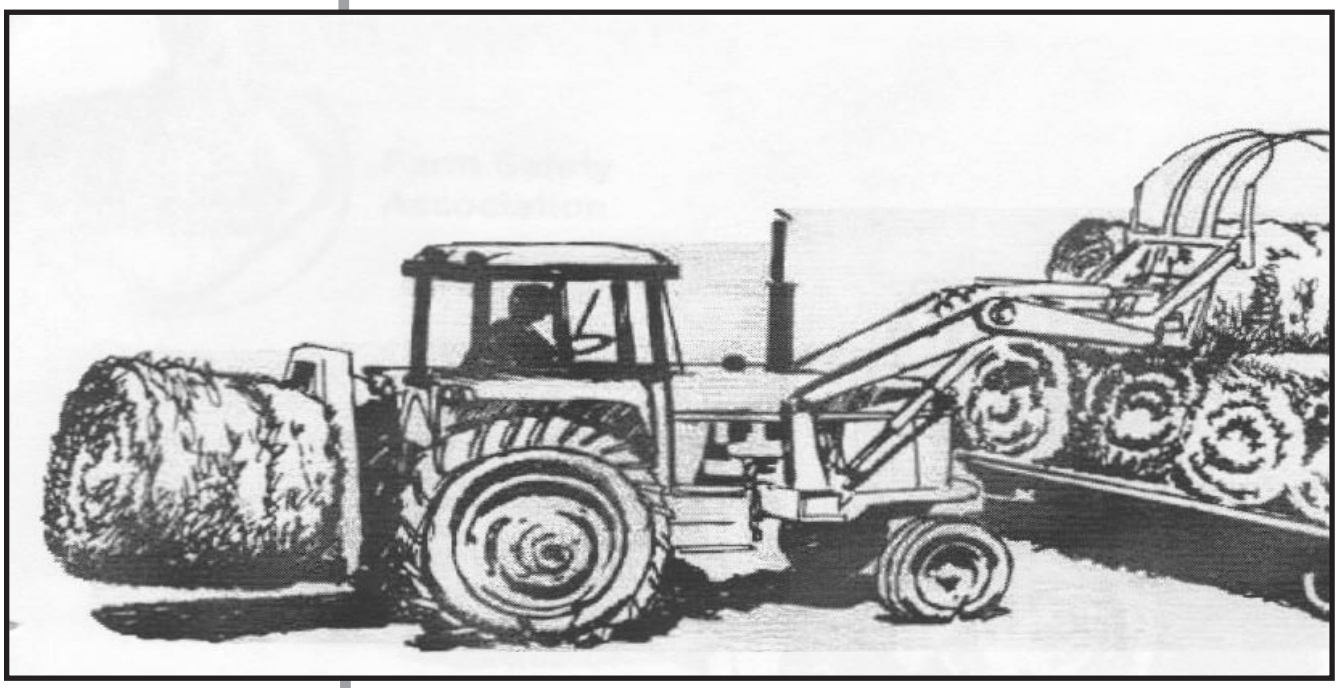
Activity #4

In small groups come up with a Farm Machinery Safety Rap and present them back to the group.

Activity #5

What are the safety precautions for handling large bales that are being taken in the picture below?

(reprinted with permission from Farm Safety Association. "Big Bale Safety" Fact Sheet, Sept. 1997)



Senior Activity #6

Senior members can arrange a visit to a farm machinery dealership. Once there, they can take the lead and show the members the safety equipment on the various types of farm machinery. They can also ask members to identify where there are potential crush, pull-in, wrap, pinch, cut and shear points on each piece of equipment.

Senior Activity #7

Have senior members invite and arrange for a representative from the Farm Safety Association to come and talk to the club members about safe farm machinery operation.

Activity #9 – Mower Safety Quiz

1. When reading pre-operation procedures the focus is on:
   a) safety checklist precautions
   b) personal protective equipment required
   c) guidelines for the safe operation of the equipment
   d) All of the above

2. When operating a mower what protective gear is recommended:
   a) only hearing protection
   b) dust masks
   c) long pants, long sleeve shirts
   d) hearing protection, safety gloves, long pants and dust masks

3. To avoid objects and debris being thrown from the mower, the operator should:
   a) walk the area to remove objects
   b) use optional catchers that is available for debris
   c) remove shields to reduce the distance debris is thrown
   d) aim the discharge chute upwards into the air

4. Dust masks should NOT be worn when:
   a) working with chemicals
   b) working with toxic gases
   c) where there is an oxygen deficiency
   d) all of the above

5. When getting off the seat of the mower, be sure to:
   a) stop the engine
   b) disengage the PTO
   c) engage the brake
   d) all of the above

6. The steps and platforms on mowers should be cleaned to prevent:
   a) rusting
   b) falls
   c) dirt and dust build up
   d) roll overs

7. The term ROPS stands for:
   a) Reverse Only Power Safety
   b) Review Operating Procedures Seriously
   c) Roll Over Protection System
   d) Rear Only Power Service

8. Never refuel the mower when:
    a) the gas tank is empty
    b) the gas tank is half full
    c) when the engine is running
    d) when the engine is hot
    e) both c) & d)

9. A deadman switch is a device that:
    a) should never be touched by the operator
    b) automatically turns the mower off when the driver leaves the seat
    c) will cause electrocution when touched
    d) turns the mower off when you have run out of time for the job

10. Guards on mowers should be removed:
    a) when mowing heavy grass
    b) on uneven ground
    c) never
    d) when there is debris that can't be seen

Answers for Activity #5:

1) Front end loaders must be equipped with proper restraining devices for handling large bales such as a spear
2) Counterweights on tractors help prevent tipping
3) The tractor has an ROP roll over protection structure
4) It has been fitted with a proper three point hitch spear mechanism to carry bales.
5) They are not stacking the bales more than two high.
6) The size of the tractor and loader is such that it does not have to reach really high which will destabilize the unit
7) If you look closely you can see the back of the wagon has a lip on it to stop bales from rolling off.
8) The wagon is wide enough for the bales.
9) They are loading on level ground.

Activity #9 Answers:

1-d; 2-d; 3-a; 4-d; 5-d; 6-b; 7-c; 8-e; 9-b;10-c.

References

Agricultural / Industrial mower safety (March 2000) Farm Safety Association.Guelph, Ontario. www.farmsafety.ca

Agricultural Machinery Hazards (2002) Farm Safety Association. Fact Sheet. Guelph, Ontario. www.farmsafety.ca

Agricultural Mower Safety (2002) Farm Safety Association. Fact Sheet. Guelph, Ontario. www.farmsafety.ca

Big Bale Safety (Sept. 1997) Farm Safety Association. Fact Sheet No. F-019. Guelph, Ontario. www.farmsafety.ca

Farmsafe Services for Agricultural, Horticultural & Landscape Industries, (February 2006) Vol. 31, No.1. Reprinted by Farm Safety Association.

Grain auger safety reminders (n.d.) Farm Safety Association. Guelph, Ontario. www.farmsafety.ca

Handling Big Bales Safely (2002) Farm Safety Association. Fact Sheet. Guelph, Ontario. www.farmsafety.ca

Power Takeoff Safety (n.d.) Farm Safety Association. Flyer. Guelph, Ontario. www.farmsafety.ca

Safety – Agricultural Hazards (1997) 4-H Manual, Ontario 4-H Council & Ontario Ministry of Agriculture, Food and Rural Affairs. www.4-hontario.ca

Safety and Tillage Equipment (1998) 4-H Manual, Ontario 4-H Council & Ontario Ministry of Agriculture, Food and Rural Affairs. www.4-hontario.ca

Snowblower safety pointers (n.d.). Farm Safety Association. Guelph, Ontario. www.farmsafety.ca

Farm Safety Project

Tractor Safety

Drive to Stay Alive!

4-H Ontario

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Tractor Safety and Vehicle Safety

Roll Call #1: Name one safety feature on a tractor.
Roll Call #2: What do you need to know to drive a tractor?
Roll Call #3: Name one hazard to look out for while driving a tractor.

What About The Operator?

Did you know that the main cause of farm accidents is human error? The tractor doesn't make mistakes, the person in control of the tractor does. Tractor related accidents are the number one killer on the farm. Approximately 40% of all farm related deaths in Ontario are related directly or indirectly to the use of the tractor. Tractors are designed to carry one person. Each year, small children are killed due to falls from and being run over by a tractor. The chances of children being killed when riding on the towed equipment are just as great. Remember **No Riders! No Riders! No Riders!** Saying "no" and not allowing a child to ride with you can be hard, but it can be the kindest thing to say and do in the long run.

Think about the many jobs on the farm that are done by people operating tractors. Can one person do all the jobs really well, all of the time? I hope you answered "no" to this question. Inexperienced operators should not drive tractors in poor weather conditions or during risky situations. We all know there are lots of other jobs on the farm that need to be done, and maybe that is where you can do your best work. There are things to consider before jumping into the seat of the tractor and taking off.

Ask yourself, "Am I the right person to do this job, today?" Do you have the knowledge, the experience, what are the weather and working conditions, do you know the equipment well enough, do you understand all the steps and aspects of the job to be done? Physically, am I fit, do I feel well today? How old am I, can I reach all the pedals and controls? Do I have a safe attitude, or do I just need to get the job done quickly so I can go have some fun? Ask yourself, "Would I be able to make safe split second decisions today if I needed to while operating this tractor?"

Special Training Is Vital For Safety

Before being allowed to drive and operate a tractor on their own, young people should receive special training. You need to know how to use all the controls and be able to recognize and avoid potential hazards. All people, regardless of age, who are operating tractors should read the owners manual. Teach young people how to complete pre-operational safety checks and how to prepare the tractor for the job to be done. Any special hazards on the farm should be pointed out to the new drivers. Do not let young people drive on the road under the age of 16. It is

recommended that an operator should have a drivers license before taking equipment out onto the roadway. Have new tractor operators practice without equipment attached, in a level field or yard. Only after new drivers can operate the tractor alone, should equipment be introduced. New drivers should be supervised until they are competent, or capable and know the safety precautions to be taken. Then they can gradually work on more complex jobs involving tractor operation.

Tractor Overturns Are The Most Common Accident

About half of all tractor related accidents resulting in death are due to rollovers. Survivors usually live with permanent disabilities. The main causes of tractor rollovers are:

- Driving too fast for the conditions.
- A change in the driving surface, such as hitting rocks, stumps and holes.
- Driving into ditches.
- Hitching too high for extra traction.
- Driving on steep slopes.
- Improper operation of front-end loaders.
- Overweight loads i.e. large round bales.

Other types of tractor related accidents include:

- Passengers falling from a moving tractor.
- Collisions with vehicles or objects on the roadside.
- Falls when mounting or dismounting the tractor.
- Running over bystanders.
- Running into overhead hazards e.g. electrical wires, tree branches, building beams etc.
- Being hit by flying objects, debris, broken machinery parts or hydraulic fluid.
- Tractors falling off of inadequate supports during repairs, crushing those below.
- Cuts, bruises, burns related to maintenance and every day operation.
- Carbon monoxide poisoning from tractors running inside closed buildings.
- Being crushed between the tractor and equipment while hitching and unhitching.
- Experiencing burns from fires caused by improper re-fuelling methods, collisions or rollovers.
- Power Take Off (PTO) entanglement, usually due to missing or damaged guards and shields.

True Story:
The farmer was on his flat bed truck loaded with round bales. As he was releasing the tension on the front tension strap that was holding the bales in place, some of the bales fell off the truck sideways. The farmer died from his crash injuries.

(Farm Fatality Analysis)

Tractor Safety

True Story:
He had arrived for a visit on his son's farm. His son was loading grain from a grain bin onto a semi-trailer. He went out to say hello. His son didn't see him, got onto his tractor and started it. As it started, it lurched backwards, and pinned his father between the dual wheels of the tractor and the grain bin.

(Farm Fatality Analysis)

True Story:
The victim was a 46 year old man. He had tried to start his tractor by short-circuiting the starter while standing in front of the dual wheel. The tractor was in gear when it started, and ran him over. The man tried to make it back to the farmhouse for help but never made it.

(Farm Fatality Analysis)

Accident Prevention

Accident prevention is the key to stopping unnecessary deaths and injuries. Accident prevention starts with knowledge. In order to be able to identify potential hazards they must understand how the tractor operates, and what its capabilities are. Tractors are the safest when they are properly maintained and are in top running condition. It is true that a person's skill can only come from hours and hours of operating the tractor, but even the most experienced operators can have serious accidents. Carelessness is a primary factor in accidents. Sometimes even the most experienced operators will ignore safety precautions to beat the weather or the clock to finish a job.

This is a prime time for an accident to happen. Tractor drivers must **always** be alert and pay attention to the job they are doing.

Accidents happen when something happens that is unexpected. Three separate risk factors that could contribute to a tractor related accident are:

- Machinery malfunction or part failure.
- Poor weather and/or field conditions.
- Driver fatigue or being distracted.

Most accidents happen when there are two of the three risk factors listed above present. We will have a greater understanding of accident prevention if we learn about these three potential factors.

Machinery Malfunction

Breakdowns always increase the risk of accidents. The tractor should be properly maintained. The tires should be in good condition and properly ballasted. A deflated tire can tilt the axle six inches to that side. Implements should be properly hitched, and all safety and protective equipment should be present and in good working order. Tractor owner's manuals are the best place to learn what the tractor needs to stay in top working condition. The manufacturer knows their type of tractor best. The manual will also outline procedures for safe operation of the machine. This owner's manual should be kept in a place where it can be referred to easily, when needed. Leaks, breakdowns and flying machinery parts are more apt to happen with poorly maintained equipment.

ROPS – Rollover Protective Structures

All late model farm equipment comes with standard safety equipment. It is not there for decoration or to make the unit look better. ROPS (Rollover protective structures) and seat belts are there to keep people safe. It is estimated there would be a significant drop in deaths and injuries from tractor rollovers if each machine had an ROPS and each operator wore their seat belt when equipped with a ROPS. ROPS can't do their job if they are propped against the driving shed wall. Without

seat belts fastened, a ROPS cannot protect the driver by keeping them within the structure during a rollover. They both have to be used at the same time for the best protection.

Don't add a ROPS to an older tractor without checking for approval first from the manufacturer. Once you know what you are looking for, there are many types of good structures available. Check that the ROPS has passed performance and testing criteria. It is not recommended to use homemade ROPS. ROPS can be simple steel frames, or quiet, dust proof cabs that provide additional comfort and health benefits to the operator.

Shields

Shields can't act as guards if they aren't attached to the machinery. If they are damaged, dirty or loose, they may also be more hazardous. Keep all shields well maintained.

Environmental Factors

Environmental factors have to do with the weather, and the changing soil and road conditions. When the weather is bad, and visibility is poor, we all need to slow down! Proper lighting may help you avoid an accident. Tractor operators need to be aware of rough or slippery ground surfaces, obstacles, slopes and ditches. A young person who is a competent tractor operator under ideal outside conditions may not be the best operator when the weather changes and ground conditions and visibility deteriorate. Dry slopes and slippery, wet slopes are two different things! Farmers are subjected to temperature extremes, intense sun, dust, excessive noise, boredom, fatigue and stress. Some jobs require multiple decisions and control movements in short time spans. The driver needs to be alert so they can avoid or control factors that can lead to accidents.

The Human Factor

We are all human, therefore none of us are perfect and we will make mistakes. These errors, oversights or failures may be due to the work situation, but also a product of the operator's actions. Human error is a contributing factor in almost every accident. Farmers at times operate their tractors for many hours straight without breaks. Fatigue, illness, poor vision, slowed reflexes, alcohol consumption, drug/ medication usage, age, recklessness, distraction, anger, inexperience, psychological distress, lack of understanding, ignoring safety guidelines and an unwillingness to follow recommended procedures are all human factors that have played a part in accidents. Self-awareness is crucial. All possible safety features on tractors cannot replace a well-trained operator, who is aware of the hazards. The bottom line is that you need to be alert to hazards at all times and know how to respond. Sometimes it is best to delay the job, or get someone better qualified to do the job and live to farm another day.

True Story:
He was just 21 years old. He was using the tractor to install fence posts on a very steep hill when it rolled over. The impact crushed the cab of the tractor. He never had a chance.

Farm Fatality Analysis

Safe Tractor Operation

Avoid Sideways Rollovers

- Set wheels at the widest spacing possible for the job.
- Don't attempt to cross extremely steep slopes.
- Be alert for obstructions, holes and depressions.
- Turn **downhill** not uphill on steep slopes if stability is threatened.
- Match tractor speed to conditions and loads.
- Don't let the tractor bounce – slow down.
- Before traveling at fast speeds lock brake pedals together.
- Slow down before turning.
- Use engine braking when going downhill.
- Stay at least as far away from ditches and streams as the banks are deep – if the load topples into the ditch it can pull the tractor with it.
- Keep the front-end loader bucket as low as possible when traveling.

Avoid Rear Overturns

Although rear overturns happen less frequently than sideways overturns, they are almost always fatal. In a backwards flip, the tractor can hit the ground in as little as 1.5 seconds after the front wheels leave the ground!
Here are some tips to avoid rear overturns.

- Never hitch a load higher than the tractor drawbar.
- Use front end counterweights to increase tractor stability.
- Start moving forward slowly and increase speed gradually.
- Whenever possible do not back downhill.
- Drive around ditches, not across them.
- Back the tractor out when stuck in mud; if this doesn't work, tow it out with another tractor.

Front End Loaders

When a front-end loader is attached to a tractor it moves the center of balance closer to the front of the vehicle. This center of balance shifts forward when the bucket is loaded. To compensate for the front-end heaviness, weight or ballast needs to be added to the rear of the tractor. This can be done by calcium filling the rear tires or adding weights that fit to the rear wheels. A front-end loader may partially block vision. Before raising or lowering the bucket make sure you know what is above and in front of you. Workers and children have been injured or killed by:

- buckets lowering or dropping on them.
- being hidden from view by the bucket and run over.
- electrocution when loaders touch power lines.
- using the wrong bucket for the wrong job.
- quick attach buckets that are not locked onto the mounting plates.

True Story:
The farmer was crushed. He had been using his tractor with a front-end loader to stack round bales. The tractor with the loader raised high was top heavy. The ground was also sloped. The tractor rolled. There was no roll over bars or seatbelts.

Farm Fatality Analysis

True Story:
The man had been trying to start his combine by pouring gasoline down the carburetor. The gasoline exploded, and a combine fire resulted. The 52 year old farmer died in the hospital from severe burns to his body.

Farm Fatality Analysis

Refueling

When refueling tractors there is always risk of fire and explosion. Keep in mind the following safety tips:

- Never refuel with the tractor running or when it is hot
- Always refuel outside.
- Static electricity, a hot exhaust, or an activated cell-phone can cause fuel to ignite.
- Ground out the tractor with a good ground wire or drop mounted equipment onto the ground to reduce static electricity.
- Store fuel outside at least 10 meters away from buildings.
- Keep fuel storage areas free from weeds or other combustible materials.

Tractor Safety Precautions For Roadway Travel

- Check all lights, tires, brakes and steering before starting out.
- Lock brake pedals together before entering the roadway.
- When towing equipment use proper safety hitch pins with cotter keys plus attach safety chains between the tractor and towed equipment.
- Always drive defensively and try to anticipate other people's actions.
- Stop before entering or crossing a roadway.
- Always signal your intent to slow, stop or turn.
- Use proper lighting reflectors and a Slow Moving Vehicle Sign.
- It's a good idea and a courtesy to use headlights and flashers on the roadway during day or night.
- Shift to a lower gear *before* going up or down hills.
- Never engage the clutch on hills, don't coast and avoid "free-wheeling" gears.
- If the tractor and equipment are oversized make sure lighting meets Highway Traffic Act requirements.

General Safety Precautions

- Tractors should be equipped with at least a five pound A-B-C fire extinguisher.
- Make a pre-operation inspection, which includes circling the tractor.
- Adjust all mirrors for maximum visibility.
- Keep all shields in place, in good repair and clean.
- Check hitch connections, including locking devices (especially if someone else hitched for you).
- Check all hydraulic lines for good condition and to make sure connections are secure.
- No Riders! No Riders! No Riders!
- Never use a tractor for joy riding or to herd cattle.
- Always know where bystanders are before moving.
- Never jump from a moving tractor or turn your back on a tractor

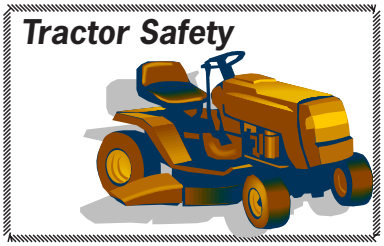
with its engine running.
- Engage the clutch slowly to avoid “jack rabbit” starts.
- Always disengage the Power Take Off (PTO) when not being used.
- Lock the transmission and/or set the brakes and remove the key before leaving the tractor.
- Refuel only when the tractor is turned off.
- No smoking in the area when refueling.
- Operators should wear close fitting clothes, safety shoes or boots with slip-resistant soles to avoid slips and falls.
- Use hearing protection.
- Know the tractor’s limitations and use it only for jobs it was designed to do.

Big Tractor Facts

Big giant tractors are now used on many farms in Ontario. Operators of these super-sized machines need to be aware of additional safety factors. Their sheer size can cause difficulties at gates, field corners and on narrow roadways. It is important that the operator know the machine’s size and dimensions, including overhead clearance where there can be obstructions or power lines.

The unique steering designs of these 4-wheel drive tractors can present new driving and handling challenges especially for beginner drivers. The all-wheel steering can quickly shift a towed piece of equipment into an unexpected path. This type of steering also alters the tractors center of gravity that can increase the chances of overturn. Travelling at high speeds with all-wheel drive steering requires total attention and concentration. Even when the unit is immobile, a bystander can become trapped in the “hinge” area. Operators should know where all bystanders are before operating this equipment because the sheer size obstructs visibility.

The key safety points for operating super-sized tractors are:
- Make sure shoes/boots are clean and are non-slip safety approved.
- Climb onto the machine carefully and use available hand holds.
- Drive slowly – gates, buildings, overhead obstructions that don’t pose a hazard on smaller tractors may be a hazard for larger tractors.
- A super-sized tractor with heavily ballasted tires needs more space to stop.
- Adding a load on behind such as a wagon without brakes will increase the stopping distance considerably, particularly on hills.
- Keep brakes properly maintained, adjusted and equalized. Equip large wagons with brakes.
- Use great care when driving articulated 4-wheel drives at road speeds to ensure the tractor travels in a straight line.



- Slow down if the back of the unit starts to fishtail.
- Keep the right side wheels out of the roadway ditches, as the rear section can jackknife.
- Be sure small bridges, floors and flatbeds can support the tractors weight before driving onto them.

Safety Precautions and Hitches

- Never hitch to the axle of the tractor or another high point.
- Hitch towed loads only to the drawbar and at the manufacturer's recommended height.
- When using the three-point hitch add front counterweights to keep the tractor stable and to help steering.
- Use proper safety clips and pins.
- Slowly take up the slack between the tractor and the towed equipment.
- Never jerk on chains or cables.
- Never let loose chains dangle from the drawbar, three point hitch arms or implement – they can catch on a rock or stump and pull the tractor over backwards.
- Make sure chains, cables and nylon ropes are in good condition Broken chain parts can be like bomb shrapnel: a snapped cable can cut a bystander's legs off and broken nylon ropes have also killed bystanders.
- Never hitch a chain or cable to the front end and have it pass under the back axle; this can upset the tractor.

Tractor Cabs Should be Chemical-Free

- Never transport chemicals in the cab of the tractor.
- Remove contaminated soil, manure and debris from boots before entering the cab.
- Keep the tractor floor clean.
- Wipe down the interior of the cab regularly.
- Wash the tractor exterior to reduce exposure to chemicals.
- Remove gloves worn during handling or mixing chemicals before entering cab.
- Clean all control knobs and steering wheel with grease cutting solutions regularly.

True Story:
The farmer was working on a pit silage with the skid steer. He backed over a bank that caused the skid steer to roll. The roll bars had been removed. He died of asphyxiation from his chest injuries.

Farm Fatality Analysis

Skid Steer Loader Safety

Skid steer loaders are becoming more popular. They have many advantages over using larger tractors. They look like a lot of fun to operate. They are so tiny, and respond so quickly, but remember they are not toys. Like any piece of machinery care and caution needs to be practiced when operating these useful machines.

What You Should Know About The Machine And Its Capabilities

- Balance is very important to the stability and turning potential of a skid steer. When the bucket is not loaded approximately two thirds of the weight is on the rear axles. When loaded the weight then shifts to the front wheels. It is important to not overload the skid steer to prevent overturns, and steering problems.
- Do not operate steering levers or other hydraulic controls while standing outside the cab. Skid steers have what is called "hydrostatic drive" which means it will respond instantly when the levers are moved.
- Do not remove the ROPS rollover protective structure. The screens should be kept in place to prevent being crushed between the loader arms and the skid steer frame.
- Always use the seat belt and seat bar when operating a skid steer.
- Make sure attachment locking devices are in place, even when switching attachments for only a few minutes. Lives have been lost when the attachment has broken free, rolled back the arms and hit a bystander.

Safe Skid Steer Traveling

- Always travel and turn with the buck as low as possible to increase stability. Stability is reduced when the loader arms are raised.
- Always travel up and down slopes, never across and avoid rough ground or steep slopes.
- Move up and down slopes with the heavy end of the loader pointed uphill. Remember: **No Load** - most weight on the rear
  Loaded - most weight on the front.
- Go around obstacles instead of over them.
- Stay as far away from streams, gullies and ravines as the banks are deep.
- Don't travel on the road with the skid steer.

Do The Job Efficiently

1. Drive slowly into the manure or material pile.
2. Then raise the front of the attachment.
3. Back away with the tilted-up bucket or fork loaded.
4. Drive to the unloading area with the loader arms down.
5. Stop, raise the arms, drive forward slowly until the bucket is just over the spreader or pile.

Use the hydraulics to raise the lift arms at a slow, even rate. Be sure to lower the arms quickly if the skid steer becomes unstable.

New Operators

Operating a skid steer requires having to complete a number of functions at the same time. Over time, with practice and experience the operation of the controls becomes almost automatic, but for beginners it can be confusing. If the beginner becomes confused it is usually best to remove all hands and feet from the controls. The machine functions will stop immediately. The operator then can "regroup" and start over again. Remember, beginners need supervision. Start slow, and increase speed once experience has made the operator more capable. Stay safe!

Safety Pointers

Work smart and stay safe by using these guidelines:

- Like any other piece of machinery, you need to understand the warning devices, gauges and controls.
- Read the operator's manual.
- Before starting check the ground condition of the work area. If the ground is soft or slippery, delay the job until better conditions are present.
- Remove any obstacles in the work area. Ensure there are no overhead power lines.
- Never use a skid steer as a work platform or to carry others. Hydraulic failure could happen at any time causing the arms to fall.
- Adjust speed to suit working conditions and operator experience.
- Avoid sudden stops, starts or turns.
- Don't allow bystanders in the work area.
- When lifting loose materials such as rocks, keep the bucket level while the arms are being raised. Lifting the arms too high may cause the material to fall into the cab of skid steer.
- When dumping material, avoid reaching over obstacles such as fence posts that could come into the cab if the loader ever tipped forward.
- Do not undercut steep embankments as the earth could bury the loader
- Do not place any body part under raised loader arms – crush point!
- Lock arms in place before doing any repairs with loader arms raised.

Forklift Safety

Forklift trucks should only be operated by well-trained, experienced operators. Before using, it is necessary to know the load limit of the machine. The size and center of gravity of a load can change and make lifting unsafe. To give a comparison, a forklift truck is like an out of balance teeter-totter!

Safety Basics

- Use the safety equipment supplied. Fasten that seat belt or restraining equipment!
- Do the basics – look forward before driving forward – look behind you before reversing – face the direction in which you are traveling!
- Only carry loads within specified weight ranges.
- Only use the forklift truck for jobs it was designed to do.
- Make sure the brakes work.
- Don't start, stop or turn suddenly – the forklift could lose its load or overturn.
- Be extra careful when working on loading docks.
- Go slow on wet, slippery or rough ground.
- Drive with the forks low, just clear of the ground and tilted slightly back.
- Avoid tilting an elevated load forward until over the location it is to be unloaded.
- Make sure you can see at all times.
- No Riders! No Riders! No Riders!
- Don't work with suspended loads due to potential hydraulic failure.
- When going up or down slopes the load should always be pointed uphill.
- Don't drive a forklift across an incline.
- Don't park on a slope.
- Lower the forks, set the brake, neutralize the controls, shut off the power and take out the key before leaving.

ATV Safety

ATV Safety For Farm Work

These days just about everyone wants an ATV (All Terrain Vehicle). Canada is the biggest per capita market for all-terrain vehicles in the world. As of 2004 it was estimated that 850,000 Canadians own ATV's and 2.5 million people in Canada ride them for work and recreation. Many farm operators purchase ATV's to help them with day-to-day tasks on the farm, such as hauling livestock feed, checking herds or getting to and from the fields. All-terrain vehicles can be both practical and fun on the farm but they also come with risks. By following good safety practices the risks and the severity of injuries with ATV's can be reduced.

Youth are frequently the ones involved in ATV accidents. Adults need to determine if a young person is ready to operate an ATV. What do you think should determine if a person is ready?

Each person is unique. Some will be ready sooner than others. Things that need to be considered before a young person drives any piece of machinery, ATV's included would be: physical size, strength, coordination, balance, ability to judge distances, maturity, willingness to follow rules, and skills. Other things to consider would be the size of the ATV. The age of the child may determine the size of the engine. It is not a good thing to put a child or youth on an ATV that is too powerful.

What To Wear, What To Wear?
The answer is simple. Wear the right gear. But what is the "right" gear?

A **helmet** is the most important piece of safety gear for an ATV operator. That is because your brain is one of the most important parts of your body!

Seriously, a helmet can prevent major head injuries. Helmets for bicycling, skateboarding and rollerblading should not be used for ATV operating. They do not have the needed face protection and lack the ability to absorb energy on impact. Get the proper headgear, designed specifically for ATV use. Make sure it is CSA approved. The helmet should also be able to provide protection from a blow from a sharp object, stay in place, and allow a certain amount of side or peripheral vision. The ATV operator needs to have a helmet correctly sized for them for maximum safety protection.

Eye protection is also important. Think about it, on the farm there are numerous hazards that can injure eyes such as rocks, twigs, branches, flying dirt, insects and water to name a few. Any of these objects can cause you to lose control of the machine or may damage your eyes from direct contact.

Convinced yet? Wear eye protection! It may be a face shield that is part of your helmet. If not wear safety goggles or glasses with hard-coated polycarbonate lenses.

Now that your head and eyes are protected, what's left? Your body! **Gloves** are great. They protect your hands from scrapes and scratches, improve your grip on the controls and can even reduce soreness from the pressure of holding the handlebars for longer periods of time. **Boots** protect your feet from debris flying up on the trail, and help keep your feet on the footrest, which is really important to help keep your balance and control of the ATV.

Long sleeve shirts or jackets and long pants are also recommended to protect arms and legs from cuts and scrapes. These can also protect the operator from weather extremes such as sunburn and frostbite.

The Pre-ride Check Over

An ATV is a machine. It has an engine and a lot of power. It should be checked, just like any other piece of machinery before taking it for a ride. Believe me, it takes less time than having to walk home from the back 40.

- **Tires and Wheels** – make sure the tires have proper air pressure, and are free from cuts and gouges. Axle nuts also should be tight and secured with cotter keys.
- **Controls and Cables** – make sure you know their location and make sure everything works. The throttle should move smoothly when the handlebar is in different positions. Brakes should also be checked for proper adjustment.
- **Lights and Electrical System** – the ignition should stop the engine when it is in the "off" position. Check headlights and taillights. Make sure the battery has enough charge, that the ATV can be restarted if stopped or stalled.
- **Oil and Fuel Levels** – it is no fun to run out of gas. It is no fun to have the engine run out of oil! Ouch, repairs would be costly.
- **Chain and/or Driveshaft Chassis** – inspect, adjust and lubricate chains and/or driveshaft chassis. Check for any nuts and bolts loosened by the vibration of the ATV. (Teenagers have had legs severed when chains have broken at high speeds).

Ready, Set, Start

There are five steps in starting the ATV. They should be followed in the same order each time. An acronym is a "made up" word that helps you to remember things. Before starting the ATV remember the acronym BONEC.

- **Brakes**: always have the parking brake on.
- **On Position**: Check fuel cap vent or valve, and then turn the ignition key to "on" if equipped.
- **Neutral:** The transmission must always be in neutral or "park."
- **Engine**: The engine stop switch should be in the "run" or "start" position.
- **Choke**: If the engine is cold put the choke in the "on" position and start the engine according to the manual.

Know How To Operate

ATV's are different from motorcycles, cars and tractors. Operators need to start slow and practice how to adjust speed, stop, and adjust weight to turn, or go up and down hills. They also need to have good judgment in order to stay safe distances behind other motorized vehicles, to decide when to head for home due to poor weather conditions, low fuel levels or darkness. Awareness is crucial. Always scan ahead to identify

potential hazards, such as rocks, stumps, debris, tree branches, fences, ditches, guy wires, rough or unstable ground, railway tracks, driveways or water sources such as rivers, streams, ponds and swamps. Be ready for the unexpected such as other people or wildlife that could present themselves at any time. Check in your area and sign up for an ATV Rider Safety Course to help you be the best ATV operator possible.

Follow The Rules

Any operator must accept responsibility to follow rules. If your ATV is not designed for passengers, don't let them on. Don't let anyone operate it that has not had training, or who is under the influence of drugs or alcohol. Taking extra riders is dangerous as it can interfere with the operation of the ATV. The extra weight can change the handling of the ATV up and down hills, around curves and will increase stopping distances. Don't take the ATV where it is not supposed to be such as on roadways, or private property without permission. Make sure the ATV is insured and properly licensed.

True Story:

The victim was a 11 year old boy. He had been having fun climbing hills on an ATV when it slid down a steep embankment. He had been driving alone. No one knew the ATV had rolled over on him. When they found him he had not been wearing a helmet. He died of head injuries.

Farm Fatality Analysis

The Final Statistics

The ATV is a wonderful invention. It saves farmers fuel and time. It is compact and goes places larger equipment cannot go. It is fun! The downside of ATV's are that they are now the third most common cause of severe injuries being passed only by bicycles and snowmobiles. Boys between the ages of 15 and 19 make up the highest injury rate. These boys are the same ages as many of you! Almost 15% of ATV-related deaths are children under the age of 15. Remember an ATV is not a toy.

Enjoy them safely!

ATV Safety Watch (n.d.). Canada Safety Council. Retrieved December 6, 2006 from www.safety-council.org/info/sport/ATV-rider.html

ATV safety for farm work, recreation (Sept. 1994). Safe Farm-Promoting Agricultural Health & Safety. Iowa State University, Extension. www.extension.iastate.edu/Publication/PM1563C.pdf

Senior Supplement – Combine Safety

Remember, safety remains with the operator. It is a choice each of us make with every job we do. Harvest time can be very demanding. We may feel pushed to get the job done by a self imposed deadline or a change in weather conditions. There is a higher risk of accident when the operator is tired or stressed. Those are not the conditions under which to be operating a combine.

Safety Procedures for Combines

- Read the Operator's Manual.
- Have the machine properly maintained.
- Remove any trash from around the exhaust system.
- Clean tools and debris from the platform or cab.
- Open the driving shed doors before starting inside.
- Check tire pressure each day before using.
- Do not over inflate tires as this increases potential "bounce" and loss of control.
- Check the brakes once a week during harvest season.
- Check brake fluid levels.
- Always use handrails for mounting and dismounting.

Starting The Combine

- Make sure everyone is clear of the machine.
- Open the cab door and ask "is everyone clear?" Wait until you hear the answer.
- Do not allow others in/on the combine with you.
- Before starting sound the horn.
- Disengage the header drive.
- Disengage the separator drive.
- Place gearshift in neutral and depress clutch.
- Starting fluid e.g. ether is very flammable – use with caution.

Safe Operation

- Be alert! Don't operate the combine if you are in poor health or sleepy.
- Wear appropriate close fitting clothing and safety boots with non-slip soles.
- Check the field before harvesting for ditches, debris, fences, bank overhangs and obstacles
- Be aware of and monitor weather conditions.
- Slow down on hillsides and avoid sharp turns.
- Slow down when you have a full grain tank.
- Full grain tanks make the machine more prone to rollover.
- Always operate the combine from the seat.
- Be careful when activating leveling devices on a hillside combine.
- When turning sharply with the brakes – slow down, and always turn the steering wheel before applying the brakes.

Fast Farm Safety Fact and Tips:
Did you know some corn headers can pull in 12 feet of material in one second! This is faster than a person's brain can tell the body to let go!

Farm Safety Association

Safe Field Repairs and Maintenance

- The combine should be kept clean to prevent fires
- Before proceeding with repairs:
    1. Turn the engine off.
    2. Disengage all drives.
    3. Wait for all moving parts to stop completely.
- Never try to unclog a machine when it is still running.
- Stay clear of all moving parts.
- Corn headers can pull 12 feet of material in one second – that is faster than the brain can tell the body to let go!
- Wear protective clothing: hearing, eye, head protection, proper fitting clothing and footwear.
- Use proper lifting techniques when lifting heavy parts.
- When working on the header, block it up with supports.
- Never rely on the hydraulic system alone to hold the header up.
- Use secure supports when working on any parts that can move or fall.
- Keep all shield and safety devices in place and good working order.
- Install a spark arresting muffler when working in dry fields.
- Avoid sparks or flames when working with the battery or on electrical components.

Refueling and Fluids

- Always try to refuel outside of the field.
- No smoking or open flames when refueling.
- Allow combine to cool before refueling.
- Never leave unattended while refueling in case of overflow.
- Check for hydraulic leaks using stiff paper, cardboard or wood to prevent them from accidentally penetrating the skin – if they do get medical attention immediately.
- Keep at least one dry chemical fire extinguisher on the combine at all times.

Stopping The Combine

- Disengage all headers and drives.
- Put gear shift in neutral.
- Lower the head.
- Put on the parking brake.
- Remove the ignition key.

Transporting The Combine

- Move with a flatbed truck or trailer for long distances.
- Slow down in towns, on narrow roads, and for bridges.
- Watch for low power and telephone lines.
- Adjust driving for weather conditions.
- Use flashing lights, rear taillights, slow moving signs, headlights and pilot vehicles with flashing lights at the front and rear of the

Fast Farm Safety Fact:
Under certain conditions a single gallon of gasoline mixed with air has the explosive power of 14 sticks of dynamite!

Farm Safety Association

combine when on roadways.

- Always lock the brake pedals together for even braking.
- Be careful applying brakes when the header is attached – it makes the vehicle front end heavy.
- Put unloading auger in the transport position, making sure it doesn't interfere with safety lights.
- Raise the header enough for safe ground clearance only.

Activities

Activity #1

In pairs, play “mad-minute.” Brainstorm as many general safety precautions as you can in one minute. Bring the ideas back to the large group, and see who had the most.

Activity #2

There were ten safety precautions to avoid sideways rollovers reviewed in the notes. Name them.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

(See Notes under: Safe Tractor Operation – “Avoid Sideways Rollovers” Section for the Answers)

Activity #3

If possible have the members attend an ATV dealership. Have personnel go over the safety features of the various ATV’s. Have them speak on the importance of matching the size and power to the age and size of the operator. If this is not possible, have someone bring an ATV to the meeting and have the children review the meeting material as they go over the machine.

Activity #4

Name 7 things you should be wearing when operating an ATV.

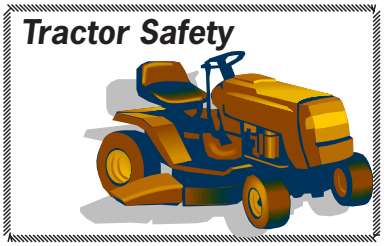
1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____

Activity #4 Answers: helmet, face shield, glass, goggles, gloves, boots, long pants, long sleeve shirt, jacket.

Activity #5
Skid Steer Safety Quiz. (True or False)

1. With no load in the bucket approximately 2/3 of the weight is on the rear axles.
   True False
2. It is OK to operate steering levels from outside of the cab as long as you know what you are doing.
   True False
3. The screens can impair visibility, so for some jobs they should be taken off.
   True False
4. Skid steer stability lessens when the loader arms are raised.
   True False
5. A skid steer is slow, small, and low to the ground. It is designed for sudden stops, starts and turns.
   True False
6. The outer screen provides a safe platform for workers to stand.
   True False
7. Remember: No load = most weight on the rear of the skid steer
   Loaded bucket = more weight on the front.
   True False
8. It is recommended to take the skid steer short distances on the road to save fuel.
   True False
9. Drive to the unloading site with the loader arms up so vision is good.
   True False
10. The skid steer is so compact it is OK to go through obstacles, creeks, gullies and ravines.
    True False

Answers: 1- T; 2- F; 3-F; 4-T; 5-F; 6-F; 7-T; 8-F; 9-F; 10-F.



Activity #6

Have the members complete this quiz. Give them an extra blank copy. Their homework before the next meeting is to have a family member also complete the quiz and report back to the group which questions were difficult to answer correctly.

The Official Farm Safety Association Inc.
Tractor Safety Quiz

1) What questions should an operator ask him or herself before operating a tractor? A) Did I do a pre-operational safety check?
B) Am I aware of the condition I'll be working in?
C) Do I know the hazards and safety solutions of this equipment?
D) All of the above

2) Which of the following might affect a person's ability to operate a tractor safely?
A) Age
B) Size
C) Boredom
D) Attitude
E) All of the above

3) Operators over the age of 65 are more likely to die in a tractor accident than younger operators. Which factors likely add to this greater risk?
A) Slowed reaction time
B) Reduced physical strength
C) Diminished hearing and eyesight
D) Decreased flexibility
E) All of the above

4) Stress might cause an operator to:
A) Take risky shortcuts e.g. not doing a pre-operational check
B) Drive carelessly
C) Leave tractor running while refueling
D) A) and B) and C)
E) A) and B)

5) Which of the following is not recommended as basic personal protection equipment?
A) Baseball cap
B) Sun block
C) Steel toed boots
D) Snug fitting clothes
E) None of the above

6) An operator on a tractor with a ROPS should:

A) Always wear the seat belt if there is one
B) Wear the seat belt if the tractor is in high gear
C) Only wear the seat belt outside of the barnyard
D) B) and C)
E) None of the above

7) When working near a ditch or embankment, the operator should:

A) Adjust mirrors to see properly
B) Drive backwards to avoid a rollover
C) Stay as far from the ditch or embankment as its depth
D) A) and B)
E) B) and C)

8) A tractor with its rear wheels stuck in mud is in danger of:

A) Spinning its wheels until the tractor is really stuck
B) Flipping backwards if the operator tried to drive forward
C) Flipping forward if the operator tries to drive backward
D) All of the above
E) B) and C)

9) You must get to the top of a lengthy 45 degree slope. The safest way to get there is to:

A) Drive in zigzags across the slope until you get to the top
B) Drive up the slope in a reverse gear
C) Drive up the slope in a slow forward gear
D) Drive straight up the slope as fast as possible
E) None of the above

10) To help avoid rollovers, your pre-operational safety check should include:

A) Brakes and lines
B) Steering response
C) Visibility and seat position
D) Operator's platform
E) All of the above

11) High hitching happens when:

A) An operator pulls a load from a point above the rear axle.
B) An operator with a load on the three point hitch lifts it too high.
C) An operator pulls an overloaded wagon.
D) A) and B)
E) B) and C)

12) Which hazards must be considered when towing a load?

A) Side rollovers
B) Rear overturns
C) Runaway loads
D) Jack-knifes
E) All of the above

13) Which of the following are safety solutions to prevent rollovers and overturns when towing a hitched load?

A) Install front end weights
B) Use a tractor big enough for the load
C) Install rear wheel ballasts
D) Use low transmission gear to go down hills
E) All of the above

14) An operator about to tow a heavy load should check that:

A) The hitch pin is big enough to fill the draw bar hole
B) A safety chain is securely attached to the tractor and to the load
C) The hitch pin has an adequate locking pin
D) All of the above
E) A) and C)

15) Hitching a load to a tractor above the drawbar:

A) Makes the tractor easier to steer
B) Shifts the tractor's center of gravity; could cause a backward flip
C) Could cause a sideways rollover.
D) Puts more weight on the front of the tractor.
E) Gives the tractor more stability

16) A front end loader makes a tractor front heavy. How can the operator counter-act this?

A) Lower the bucket and keep it low during travel.
B) Ensure the proper inflation of the tractor tires.
C) Add ballast to the rear wheels.
D) All of the above.
E) A) and C)

17) What additional problem(s) face an operator who is using a loader in rain or heavy dust?

A) Loading the bucket evenly.
B) Hydraulic system leaks.
C) Limited view of obstacles because of the bucket
D) All of the above
E) A) and C)

18) Quick attach buckets:
- A) Should be physically checked to ensure they are locked on the mounting plate.
- B) Should be included in a pre-operational check.
- C) Should be serviced regularly
- D) B) and C)
- E) All of the above

19) An operator checking hydraulic lines for leaks should:
- A) Run his or her hands gently along the hoses to feel any leaks
- B) Place a white card behind the hoses to make any leaks visible.
- C) Check hose connector tightness with a socket wrench.
- D) A) and C)
- E) B) and C)

20) Operators collecting large bales on slopes should:
- A) Approach and pick up the bales from the downhill side.
- B) Reduce their speed to avoid changes in the tractor's center of balance.
- C) Use a "spear" style loader attachment or a bucket with a restraining device.
- D) All of the above.
- E) B) and C).

21) An operator working with PTO powered equipment should:
- A) Avoid loose or torn clothing.
- B) Be sure all PTO shields are in place and working.
- C) Reduce PTO revolutions to reduce the risk.
- D) A) and B)
- E) All of the above.

22) PTO shields and guards can:
- A) Safely be replaced with home-made alternatives.
- B) Be left off for small jobs that won't take much time.
- C) Make it safe to step over a rotating PTO
- D) A) and C)
- F) None of the above.

23) PTO-caused injuries happen when:
- A) Operators step across a moving PTO shaft.
- B) Operators turn on the PTO without checking for bystanders.
- C) Clothing or limbs get caught in the joints of the shaft.
- D) A) and B)
- E) A) and B) and C)

24) Before getting off a tractor running a PTO the operator should:
- A) Shout a warning then disengage the PTO.
- B) Disengage the PTO and shut off the tractor.
- C) Check for bystanders, then shut off the tractor.
- D) Reduce PTO motion to the slowest possible.
- E) None of the above.

25) You should check with your employer if:
- A) You have questions about the safety of any PTO shields and guards.
- B) The PTO shaft doesn't fit correctly.
- C) The integral shield is cracked or missing.
- D) A) and B) and C)
- E) None of the above.

26) A Class B is a fire that is burning:
- A) Combustible metals such as magnesium or potassium.
- B) Flammable materials like wood, paper and textiles.
- C) Live electrical wiring, motors or appliances.
- D) Inflammable liquids such as gasoline, oils and fats.
- E) None of the above.

27) Smothering a fire means that you are:
- A) Cooling it so the fire can't burn.
- B) Removing the fuel so the fire can't burn.
- C) Preventing oxygen from reaching the flames.
- D) A) and B) and C)
- E) A) and B)

28) A fire extinguisher:
- A) Smothers a fire.
- B) Removes fuel from a fire.
- C) Cools a fire.
- D) A) and B)
- E) A) and C)

29) Smoking should not be allowed:
- A) Within 3 meters (15 feet) of a fuel storage tank.
- B) Inside any building or space where fuel is stored.
- C) During any refueling process.
- D) All of the above.
- E) B) and C)

30) Which of the following is a recommended safety solution for refueling?

A) Allow engine to cool if it is hot.
B) Fill tank to the brim to keep out air.
C) Let the hose drain before removing it from the tank.
D) Wipe up any spills immediately.
E) A) and C) and D)

31) To drive a tractor on a public roadway in Ontario, and operator must:

A) Be at least 16 years old.
B) Be at least 16 years old and hold a valid learner's permit.
C) Be at least 17 years old and hold a valid driver's license.
D) Have received special training in tractor operation.
E) A) and D)

32) For safety when traveling on a roadway, an operator should use lights:

A) From 2 hours before sunset to 2 hours after sunrise.
B) Anytime visibility is reduced by rain, fog or smoke to less than 150 metres.
C) At all times.
D) A) and B)
E) B) and C)

33) The SMV or Slow Moving Vehicle sign is a warning to other vehicles that:

A) The tractor or load that it's on turns suddenly without warning.
B) The tractor or load that it's on is slower than normal traffic.
C) The tractor or load that it's on has the right of way.
D) All of the above
E) B) and C)

34) A tractor towing a load on a public roadway in Ontario must be equipped with:

A) A Slow Moving Vehicle sign (SMV)
B) Wheel Weights
C) Two means of attachment between the tractor and load.
D) All of the above.
F) A) and C)

35) An operator driving a tractor in slippery road conditions should:

A) Slow down.
B) Lock the brakes together.
C) Pump the brakes gently to stop.
D) All of the above.
E) B) and C)

36) Which of the following helps to prevent operator falls?

A) Always mount or dismount using three-point contact.
B) Know the right way to fall.
C) Wear good work-boots with non-slip tread.
D) Watch for limbs, low doorways and power lines.
E) A) and C) and D)

37) When a rider dies or is injured in a fall from a tractor, where does the responsibility belong?

A) With the rider who insisted on riding.
B) It's shared between the operator and the rider.
C) With the operator who let the person ride.
D) With the parents who let the child near the tractor
E) All of the above.

38) By-pass starting is acceptable when:

A) The tractor battery is flat.
B) The solenoid will not work.
C) The tractor operator is alone.
D) The operator holds the steering wheel as the solenoid is shorted.
E) Never.

39) Which of the following is a safe place for children or workers to ride?

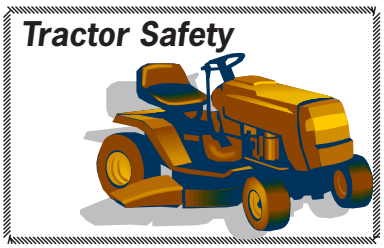
A) The tractor fender.
B) The seat with the operator.
C) The drawbar.
D) In the tractor cab.
E) None of the above.

40) Operators are more likely to fall from their tractors when:

A) They're tired from a long day in the field.
B) They're trying to finish a job before the weather changes.
C) They haven't cleaned their boots after working in the barn.
D) Any of the above.
E) None of the above.

Answers: 1-E; 2-E; 3-E; 4-D; 5-A; 6-A; 7-C; 8-B; 9-B; 10-E.
11-D; 12-E; 13-E; 14-D; 15-B; 16-D; 17-C; 18-E; 19-B; 20-D
21-D; 22-E; 23-E; 24-B; 25-D; 26-D; 27-C; 28-E; 29-D; 30-E
31-A; 32-C; 33-B; 34-E; 35-D; 36-E; 37-C; 38-E; 39-E; 40-D

The above quiz was reprinted with permission from "Tractor Safety, Health and Safety Guidelines for Tractor Operation, Farm Safety Association Inc., 1998.



References

Forklift precautions (n.d.) Farm Safety Association. Fact Sheet. Guelph, Ontario. www.farmsafety.ca

Harvesting Safety (2002) Farm Safety Association. Fact Sheet. Guelph, Ontario. www.farmsafety.ca

Power Take Off Safety (2002) Farm Safety Association. Fact Sheet. Guelph, Ontario www.farmsafety.ca

Prevent tractor overturns (March 2000) Farm Safety Association. Fact Sheet. Guelph, Ontario. www.farmsafety.ca

Safety Resources for the ATV Enthusiast (n.d.) Canada Safety Council – Canada's Voice and Resource for Safety. www.safety-council.org/info/sport/ATV-riders.html

Safety With Agricultural Tractors (2002) Farm Safety Association. Fact Sheet. Guelph, Ontario. www.farmsafety.ca

Skid steer loader safety (March 2000) Farm Safety Association. Fact Sheet. Guelph, Ontario. www.farmsafety.ca

Tractor Safety (May 1999) Farm Safety Association. Fact Sheet No. F-011. Guelph, Ontario. www.farmsafety.ca

Tractor Safety – Health and Safety Guidelines for Tractor Operation (1998) Farm Safety Association. Guelph, Ontario. www.farmsafety.ca

Farm Safety Project

Roadway Safety

It Starts With You!

4-H Ontario

CANADA

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On The Road Again…
Farm Machinery Safety on Roadways

Roll Call #1: Name a piece of equipment that is often pulled behind a tractor on the roadway or in the field.
Roll Call #2: Name one thing that you should check before taking the tractor and equipment out on the road.
Roll Call #3: Name one safety rule when operating a tractor and equipment on the road.

Roadway Travel is Hazardous

Agriculture has changed a great deal in the last few decades. Agricultural equipment is getting larger so farmers can do more in less time. Today's farmers may have several farms that they crop; some of them are kilometres apart from each other, which means more traveling on the road. Agricultural equipment is not designed for traveling on roads; it is designed for fields.

Moving farm equipment on public roadways can be very dangerous. Statistics provided by CAISP (Canadian Agricultural Injury Surveillance Program) 13% of farm-related deaths are from traffic related accidents, and most of them involve tractors. Just the same as driving a car or truck, the operator needs to be alert and drive defensively. You should always be on the look out for potentially dangerous situations and adjust your driving in order to stay safe.

The Safe Movement of Agricultural Equipment On The Roadway (n.d.). Farm Safety Association. Guelph, Ontario. www.farmsafety.ca

Typically roadway accidents involving farm equipment can happen when:

- Operators don't have enough experience to handle heavy, slow moving equipment and machinery.
- Operators drive too fast especially when pulling a heavy load or turning.
- Operators drive partially over the center line.
- Operators drive partially on the shoulder and partially on the main road surface.
- Operators run into obstacles such as trees, guardrails, mailboxes, signs etc.

What was the common word used in each information bullet? You are right. Tractors and equipment don't have accidents by themselves; they don't have the ability to think. They can only do what the **operators** tell them to do. It is up to the operator to stay in control of the machinery and keep everyone safe.

Highway Traffic Act (H.T.A.) Definitions

It is important to know the meaning of some terms you will come across when learning about safe roadway travel practices. Here are some that are taken from Section 1 of the Ontario Highway Traffic Act:
(Senior members pay attention!)

MOTOR VEHICLE: "… does not include… farm tractor, self-propelled implement of husbandry or road building machine within the meaning of the H.T.A."

TRAILER: " means any vehicle that is at any time drawn upon a highway by a motor vehicle, except an implement of husbandry."

FARM TRACTOR: "means a self-propelled vehicle designed and used primarily as a farm implement for drawing ploughs, mowing machines and other implements of husbandry and not designed or used for carrying a load."

SELF-PROPELLED IMPLEMENT OF HUSBANDRY: "means a self –propelled vehicle manufactured, designed, re-designed, converted or reconstructed for a specific use of farming" e.g. the converted school bus/grain bin. Can you name some more?

VEHICLE: "… includes a motor vehicle, trailer, traction engine, farm tractor, road-building machine and ANY vehicle drawn, propelled or driven by any kind of power, including muscular power."

HIGHWAY: "… is defined to include a common and public highway, street, avenue, parkway, driveway, square, place, bridge, viaduct or trestle, any part of which is intended for, or used by the general public for the passage of vehicles and includes the area between the lateral property lines.

REGISTRATION PLATES: " are not required …for farm tractors." "…for farm implements or self-propelled implements of husbandry when traveling from farm to farm for farming purposes, or to places necessary for repair or maintenance" or "for farm wagons." But registration plates are required … "for self-propelled implements of husbandry when traveling on a highway for purposes other than mentioned above."

Take a Friend –That is a SMV (Slow Moving Vehicle) Sign – Always!

One main reason for farm machinery accidents on roadways is the difference in speed. Cars typically travel 80 kph – Tractors travel much slower. Often drivers of cars and trucks approach the slow moving farm equipment so fast they only have a few seconds to react, and avoid an accident. Sometimes a few seconds is not enough! That is why it is really important for tractors and equipment to be easily seen by other drivers. It needs to be identified as moving slower than typical traffic. That identification is provided by the use of a Slow Moving Vehicle Sign (SMV). But even then, at times, it is not used properly.

A SMV sign must be:

- On the center of the rear of the tractor or equipment being moved.
- It must be between .60 metres and 2.0 metres above the road or ground surface.
- It must be clean, and fastened securely so it doesn't turn over, or fall off (that is a whole new hazard – getting hit by an airborne sign!)
- It must be easily seen from a distance of 150 metres.
- Faded or damaged signs should be replaced.
- Mopeds, disabled vehicles being towed or bicycles don't need a SMV.
- Never use a SMV sign on a fixed object such as a mailbox.

Light Up For Safety!

Tractors must be equipped with lights if they are going to be used on roadways at night, or in poor weather conditions that may reduce visibility. The rule is, lights are required to be used on a roadway any time from one-half hour before sunset to one-half hour after sunrise, or when there is insufficient light or poor weather conditions. For the road you need headlights, red taillights and reflectors. Flashing yellow or amber lights should be used day or night. They provide a warning to traffic approaching from either direction.

Tractors equipped with turn signals provide more safety while on the road. If you don't have turn signals, remember to use your hand signals. Most new tractors come with adequate lighting and reflector tape but older tractors may not meet current rules for lighting and visibility. Older equipment requires at least one red light on the rear in addition to headlights. The more the tractor and equipment can be seen, the safer it is!

The Pre-Operational Check
Do It Now And Save Time Later

Before heading out on the roadway you need to complete a check of both the tractor and the equipment. This pre-operational check should be done each time before using the tractor and equipment to prevent potential accidents and breakdowns. If you do it enough times, it will become automatic, kind of like when you automatically fasten your seatbelt before driving the car or truck.

- Use specific safety type hitch pins (not nearby bolts) and make sure they are fastened properly.
- There must be a safety chain that is fastened to the tractor (not higher than the drawbar) and the frame of the towed equipment. **The safety chain's strength must be equal to the gross weight of the vehicles being towed.**
- Check all tires on all pieces of equipment and the tractor for proper air pressure, cuts, bumps, foreign objects such as screws, wires etc.
- Always lock the brake pedals together for highway travel. The tractor could go into a dangerous skid easily if you suddenly braked on one wheel at high speeds.
- Make sure you have flares and a fire extinguisher, which should be standard equipment on tractors. If the tractor is driven on roadways a lot, it should be equipped with rearview mirrors.
- Check all lights.
- Make sure the SMV is clean and mounted properly on the back of the towed equipment.
- Check the towed equipment to make sure the load is balanced and tied down. Make sure it is not too heavy for the tractor as this will effect the steering and braking. Heavy wagons should be equipped with independent brakes.

Drive To Arrive Alive and Safe!

Planning ahead helps farm machinery operators have safe trips. Here are some things the operator should consider:

- Avoid busy roads, take roads less traveled even if it means the trip will take longer.
- Some urban drivers may not know what to do when they see farm equipment on the road - be extra careful to protect yourself and others.
- Travel at a speed that will allow you to be in full control of the equipment at all times.
- Slow down when turning or going around curves.
- Remember your operator's manual? – Don't wait until you are in motion to read that some tractors free wheel in higher gears

True Story:
Victim: 19 year old male. He was driving a tractor on a gravel road that was hitched to a trailer of lumber. The trailer did not have any brakes. He lost control of the tractor going down a hill, being pushed by the heavy load behind him. The tractor rolled. There was no roll bar, or seat belt used.

(Farm Fatality Analysis)

going down hills. Does yours? Find out now!

- Use lower gear ranges when going up or down hills – remember it is best to use the same gear going down as you would climbing the hill.
- If possible, drive on the shoulder of a paved road but don't drive partly on the shoulder and partly on the paved road. If the shoulder is not firm enough to handle the weight of the equipment, drive on the traveled part of the roadway. It is not illegal to drive on the shoulder. But it is illegal to overtake and pass other vehicles when driving on the shoulder.
- Stay alert! Watch for soft shoulders that could cave in, or obstacles such as narrow bridges, loose gravel, signs, guardrails, mailboxes, bumps, potholes and deep ruts. That should keep you busy.
- If cars are lined up behind you, and there is a safe place to pull over and stop, let the traffic pass.
- Move equipment during daylight hours. You will not be seen as well after dark.
- Only travel after dark if absolutely necessary and only if you have proper lighting to be on the road in darkness.
- Don't pull onto the road in front of moving traffic; remember they are moving at higher speeds.
- Enter and exit roadways very carefully, especially if you can't see. If you have a large load and cannot see the traffic behind you, pull over and get into a position where you can check the road before attempting to cross it.
- Obey all traffic laws and signs.
- Be courteous to other drivers.

Farm machinery safety on public roads (March, 2000). Farm Safety Association Inc. Guelph, Ontario. www.farmsafety.ca

Changes to the use of the slow moving vehicle sign (n.d.) Ministry of Transportation.

Over-Dimensional Farm Vehicles

Farm machinery has gotten bigger, wider and longer over the past few years. It is important to know what the requirements are for this type of machinery while on the road. Oversize farm machinery (wider than 2.60 metres) is not allowed on certain highways, may require additional lights and may require escort vehicles on the front and rear when the width of the machinery is more that 4.80 metres. Let's look at these guidelines in some more detail.

Farm Vehicle and Combination Lengths: Farm tractors have no restriction on the length of the combination when one or more vehicles are being towed.

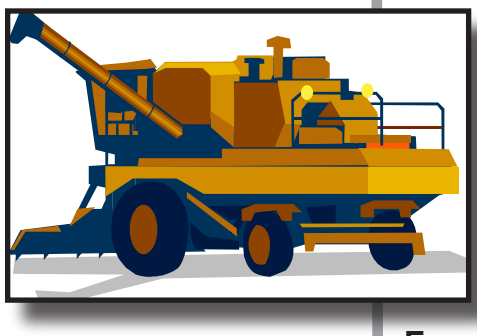
Farm Vehicles over 2.60 metres Wide: Over-dimensional farm vehicles more than 2.60 metres wide cannot operate on express highways such as the 400 series highways in Ontario.

Farm Vehicles Between 2.60 metres Up To and Including 3.80 metres Wide:

These vehicles can operate during daytime with no additional restrictions. During nighttime or when there is poor weather conditions that reduce visibility, there needs to be 2 flashing amber lights on the front and two on the rear.

Farm Vehicles Over 3.80 metres Up To and Including 4.80 metres Wide:

These vehicles can operate during the daytime with 2 flashing amber lights on the front and 2 on the rear or with a rotating amber light on the roof. During nighttime or when there is poor weather conditions that reduce visibility there needs to be the 2 flashing amber lights on the front and 2 on the rear AND EITHER a rotating amber light on the roof OR escort vehicles at the front and rear.



Farm Vehicles Over 4.80 metres Wide:

These vehicles during the daytime need to have 2 flashing amber lights on the front and 2 on the rear OR a rotating amber roof light. During nighttime or when there are poor weather conditions that reduce visibility there needs to be 2 flashing amber lights on the front, and 2 on the rear, AND a single rotating amber roof light AND escort vehicles at the front and rear.

Escort Vehicles: must have their four way flashers on OR have one rotating amber light on the roof.

Farm Vehicle Width Chart

To clear up any confusion from the information just given, here it is in chart form:

WIDTH:

Over 2.6 m (8'6") up to and including 2.8 (12'6") m		• 2 flashing amber lights on the front and • 2 flashing amber lights on the rear
Over 3.8 m (12'6") up to and including 4.8m (15'9")	• 2 flashing amber lights on the front and • 2 flashing amber lights on the rear OR • rotating amber light mounted on the uppermost part of the behicle and visible to the front and rear	• 2 flashing amber lights on the front and • 2 flashing amber lights on the rear AND EITHER • rotating amber light mounted on the uppermost part of the vehicle and visible to the front and rear OR • escort vehicles front and rear
Over 4.8 m (15'9")	• 2 flashing amber lights on the front and • 2 flashing amber lights on the rear OR • rotating amber light mounted on the uppermost part of the vehicle and visible to the front and rear	• 2 flashing amber lights on the front and • 2 flashing amber lights on the rear AND • rotating amber light mounted on the uppermost part of the vehicle and visible to the front and rear AND • escort vehicles front and rear

Reprinted with permission from Farm Safety Association, "The Safe Movement of Agricultural Equipment On The Roadway."

Be Seen, Be Safe
As a result of its size, wide farm equipment sometimes crosses over the center line of the roadway. This has caused accidents where approaching vehicles have clipped the machinery or hit it head on. It is a good idea to mark wide equipment with reflective tape, flags etc. to make the equipment more visible for other drivers.

Driver's Licenses: The driver of a farm tractor or self-propelled farm machinery does not have to hold a valid driver's license when driving

on a highway. They **must** be 16 years of age. Those under 16 years of age can **only** drive a farm tractor or self-propelled farm machinery **directly across** a roadway.

Drinking, Driving and Farming Don't Mix

Did you know that the Criminal Code of Canada applies to drivers of vehicles on and off the roadway? It is breaking the law to operate a farm tractor or self-propelled farm equipment on or off the roadway when impaired by alcohol or drugs. If you are convicted you will not be allowed to drive any vehicle including a farm tractor or self-propelled farm machinery for a period of time. Don't drink and drive!

Farm Vehicles on Ontario Highways (n.d.) Ministry of Transportation. Ministry of Transportation, "Farm Vehicles on Ontario Highways."

Get Hitched – "For Life"

Many kinds of farm machinery must be hitched to the back of the tractor. A lot of time is spent hitching and connecting different types of implements to the tractor and to each other. Farm workers need to know the proper ways to hitch equipment. The best way to hitch is to align the tractor with the hitch, put the tractor in park, put the parking brake on, and shut off the tractor. Then proceed to hitch and connect the equipment. Many times tractors have accidentally gone into gear from the vibration of the running engine. Other times, tractors have rolled, or clutches have been popped (released quickly or by accident) that has caused a person between the equipment and tractor to be crushed.

When it is necessary to have another person help with the hitching of equipment, used the following steps:

- Always hitch equipment on smooth, level ground where equipment cannot roll backwards or forwards.
- Back the tractor into position for hitching.
- Put the tractor in a **forward** gear, (if there is no "park") but keep the tractor in a stopped position by stepping on the clutch and brakes.
- Only then motion that it is safe for the person helping to put the hitch in place (prior to this step the helper should never be standing between the equipment and the tractor).
- Make sure you see the helper leave the area between the equipment and the tractor after hitching is completed before moving the unit.
- Never put your fingers in the holes of the hitch where the pins are meant to go. Remember they are for pins**,** not fingers!

True Story
Victim: 12 year old boy. He had been helping his father, and attempted to pull a truck out that was stuck in the mud. The chain had been hooked onto the top arm of the 3 point hitch. The tractor was driven forward, reared and flipped pinning the boy.

(Farm Fatality Analysis)

Safety Precautions and Hitches

- Never hitch to the axle of the tractor or another high point
- Hitch towed loads only to the drawbar and at the manufacturer's recommended height
- Be sure the wheels are blocked on heavy equipment that can roll e.g. hay wagons
- Be sure heavy equipment is properly jacked on solid ground and supported before hitching – if they were to fall off they could crush the person hitching
- When using the three-point hitch add front counterweights to keep the tractor stable and to help steering
- Use proper safety clips and pins to keep them from bouncing out of the equipment on rough surfaces
- Slowly take up the slack between the tractor and the towed equipment
- Never hitch to a load that is too heavy for the tractor. The torque created can cause a tractor to slip, spin or flip backwards
- Always lock the wheel brakes when hitching so straight stops are possible
- Never jerk on chains or cables
- Never let loose chains dangle from the drawbar, three point hitch arms or implement – they can catch on a rock or stump and pull the tractor over backwards
- Make sure chains, cables and nylon ropes are in good condition Broken chain parts can be like bomb shrapnel: a snapped cable can cut a bystander's legs off and broken nylon ropes have also killed bystanders
- Never hitch a chain or cable to the front end and have it pass under the back axle, this can upset the tractor.

Primary and Secondary Attachments

An attachment is a way of connecting things together. When a farm tractor is towing a motor vehicle, trailer or any type of farm implement e.g. a baler or a wagon, they should be attached together by two separate ways. This is to prevent the object being towed from becoming disconnected if the main attachment fails. For example, hitch a tractor onto a wagon with a proper safety pin and keeper (the primary attachment), then connect a safety chain between the tractor and wagon (secondary attachment).

Types of Attachment

Examples of primary attachment would be a drawbar, tongue, pin, or hitch. Examples of secondary attachments would be chains or cables. They must be fastened with bolts, clevises, open chain hooks or other types of attachment as long as they would stop the towed piece of equipment from disconnecting.

More Than One Vehicle Being Towed

The arrows point to the primary and secondary attachments that are needed between each vehicle or object when being towed on a roadway.

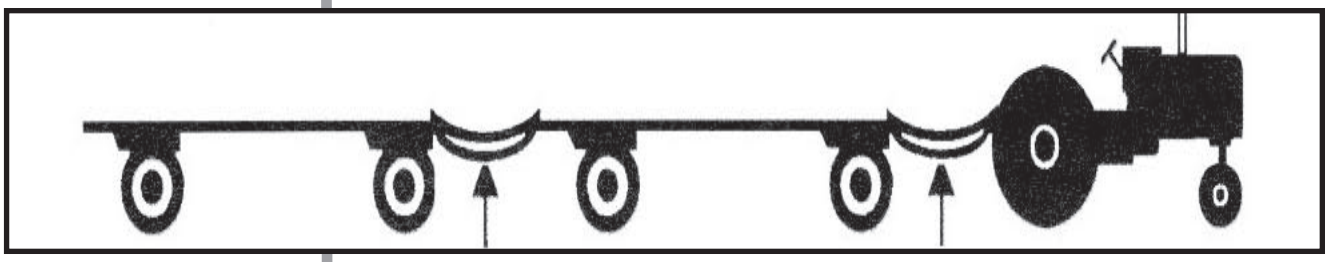


Diagram reprinted with permission from *The Safe Movement of Agricultural Equipment On The Roadway* (Nov. 2000) Farm Safety Association Inc. Guelph, Ontario www.farmsafety.ca

Off-Road Vehicles

In order to drive an off-road vehicle on, along side, or across a highway a farmer needs an ORVA permit, a drivers license, and be using the off-road vehicle for agricultural purposes. The off-road vehicle must have more than two wheels and have a SMV sign posted on the rear. Children age 12 or older or a person who does not have a valid drivers license may drive an off-road vehicle but they cannot drive on or across a highway. The owner of an off-road vehicle cannot allow a child under the age of 12 to drive unless the vehicle is driven on land occupied by the vehicle's owner and is under the close supervision of an adult.

Common Types of Accidents on the Roadway

The type of accident that is the most common is the single-vehicle accident. It usually involves a farm tractor that is driven too close to the shoulder of the road and rolls over into the ditch. The most common type of multi-vehicle accident is farm machinery that is hit as it is turning onto the roadway from a laneway or another roadway. There are also high numbers of rear-end collisions. They usually happen at intersections when drivers approaching the farm tractor or machinery under-estimate their size and speed.

Another common type of accident occurs when farm equipment makes a left turn. Usually it is because the driver did not signal, or other drivers could not see the signal. The peak time of year when most farm related accidents happen is July to September – the peak time for harvesting.

True Story:
The victim died as a result of a collision between a truck and tractor that was pulling a wide cultivator. The person killed was in the truck. The tractor driver was not injured.

(Farm Fatality Analysis)

Don't Let Farm Equipment Sneak Up On You!

Many accidents can be caused by the difference in speed between a car or a truck and farm machinery or tractors. On rural roads, drivers often travel faster than the speed limit, which is a big mistake! Sometimes they will come around a curve, or over a hill and there will be slow moving farm equipment right in front of them. The reaction time to avoid an accident is so small that often they will run into the rear of the machinery. This diagram shows the difference in reaction times.

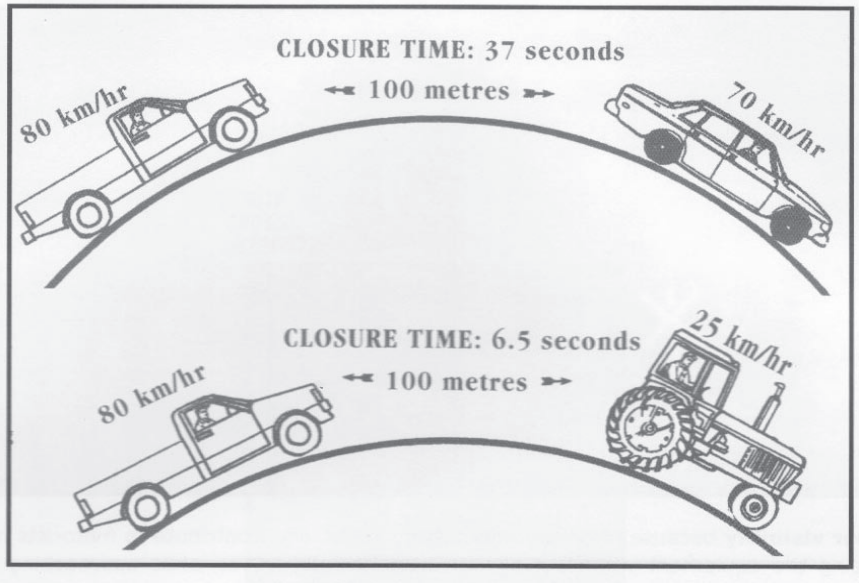
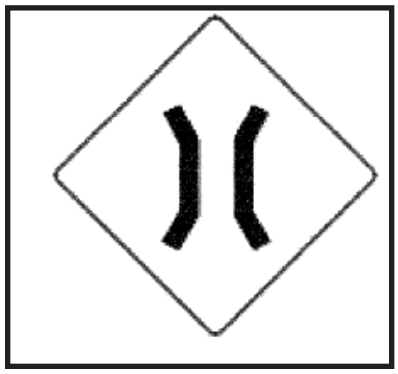


Diagram reprinted with permission from *The Safe Movement of Agricultural Equipment On The Roadway* (Nov. 2000) Farm Safety Association Inc. Guelph, Ontario www.farmsafety.ca

Senior Supplement

Since you have to be 16 years of age before you can drive a tractor or farm implement on the road, but you don't need a driver's license, let's test your knowledge on some signs you may encounter on the road.



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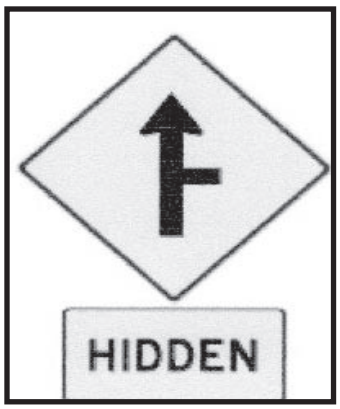

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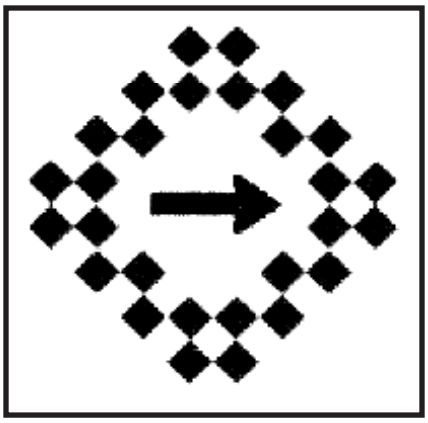

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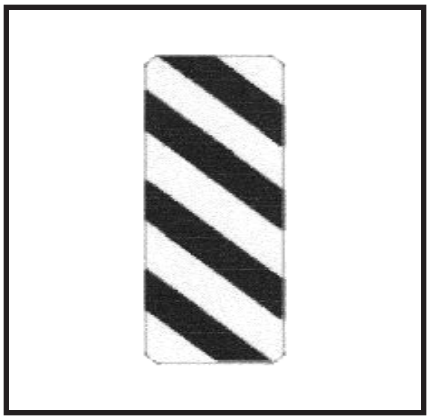

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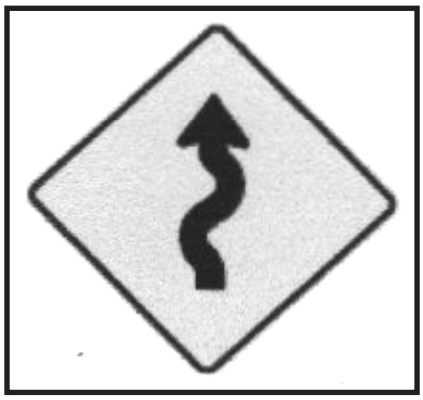

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(The above diagrams and information was taken from the MTO Driver Handbook)

Answers: 1- Narrow Bridge Ahead; 2-Drivers on the sideroad at the intersection ahead don't have a clear view of traffic; 3-Sharp turn or bend in the road in the direction of the arrow – the checkerboard warns of danger, slow down, be careful; 4-Hazard close to the edge of the road. The downward lines show the side on which you may safely pass; 5- Winding road ahead; 6-Steep hill ahead. You may need to use a lower gear; 7- Underpass ahead. Take care if you are driving a tall vehicle. Sign shows how much room you have; 8-Paved surface ends ahead; 9- There may be water flowing over the road; 10- Deer regularly cross this road; be alert for animals.

Road Rage

The term Road Rage was coined in 1988. It was defined in response to a new driving trend on our roads. Road Rage refers to a severe angry response, from one driver for a perceived injustice committed by other drivers. For example it can be tailgating, shaking a fist, cutting someone off, and generally driving unsafe. On rural Ontario roads there can be a conflict between two cultures, the urban dweller and rural resident. Urban dwellers may not be used to sharing the road with large, slower farm equipment and may not know the limits of this machinery. Rural farmers are now transporting larger, longer, wider equipment from farm to farm, and are also having to cope with more traffic than there has been in the past. At times the result is impatience and aggressive driving and the consequences of aggressive driving can be death. Drivers in rural areas have no way of knowing what situation lies over the next hill or around the next bend or corner.

Often the farm vehicles of today will take up most of the road, which demands extra care and consideration. To address the growing problem of road rage and to help educate drivers some communities have placed bright yellow signs showing a farmer sitting on a large tractor with the words “SHARE THE ROAD.” This will indicate that the road the sign is on, has a large number of farm vehicles using it. The best thing is to SLOW DOWN. Although the best solution is to keep one’s anger and frustration level under control there are some practical suggestions on how to manage this.

1) Plan Ahead
2) Give Yourself Lots of Time
3) Get Enough Rest
4) Be Courteous To Other Drivers
5) Don’t Take Aggressive Driving Personally
6) When Driving In Rural Areas – SLOW DOWN!

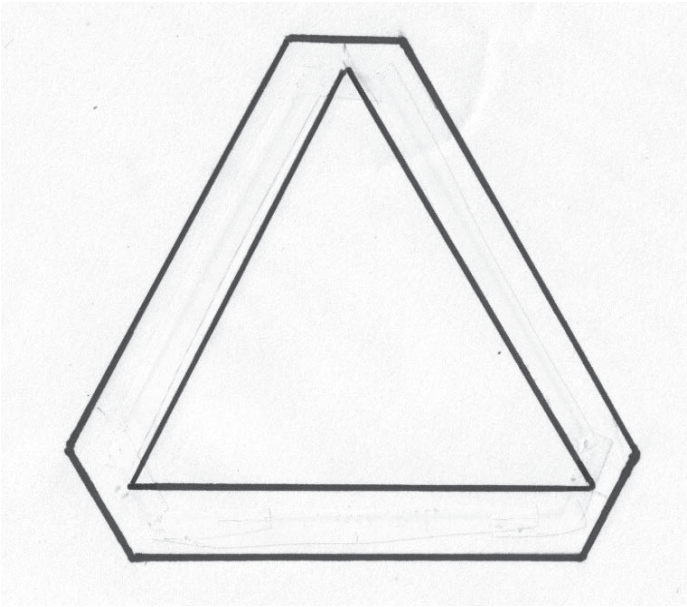
Farmsafe (June 2006). Vol 1 No 2.

Activities

Activity #1

The SMV Test.

1) SMV stands for: _____
2) What colours are on a SMV (colour or write them in).
3) Which way should it be installed on the equipment e.g. pointed end should be facing up or down?
4) It should be placed between these heights from the ground surface: _____ and _____ .
5) It should be clearly visible from a distance of _____ metres.
6) It should be on all vehicles that cannot keep up a speed of more than _____ km/hr.
7) If one slow moving vehicle is pulling another behind it, then the SMV sign must be on the _____ of any combination of vehicles.
8) True or False: A slow moving sign is a perfect way to mark a mailbox or driveway. True _____ or False_____.
9) True or False: You can be fined for not using the sign or misusing the sign. True_____ or False _____.
10) True or False: Mopeds, golf carts and scooters for the disabled need to use SMV signs. _____ or False_____.



Answers: 1- Slow Moving Vehicle; 2- Inside triangle is reflective orange, bordered by reflective red; 3- point facing upwards; 4- between .60 metre and 1.8 metres; 5- 150 metres; 6- 40 km/hr; 7- back of the equipment, most in the rear of any combination; 8- False; 9-True; 10-False.

Senior Supplement: Activity #2: Quick Definition Quiz:
Based on the definitions given in this section, answer the following questions: (use your manuals for reference if you need to).

1. The farm tractor is not a _____ but is a _____.
2. Your implements of husbandry are not _____ or _____, but they are _____.
3. A farm wagon is a _____ no matter what is the towing vehicle.
4. Registration plates are not required for: a) _____ b) _____ c) _____ d)_____.
5. H.T.A. stands for: _____.
6. Is the H.T.A. the same for all of Canada or is it different for each province?
   _____.

Answers: 1- not a motor vehicle but is a vehicle; 2- not motor vehicles or trailers, but they are vehicles; 3- farm wagon; 4-farm tractors, farm implements, self-propelled implements of husbandry or farm wagons. 5- Highway Traffic Act. 6- It is the Ontario Highway Traffic Act, so is provincial, and may differ between provinces.

Activity #3
Ask someone to loan you one of the “traffic mats” young children play with these days. Toy farm machinery and a few toy cars can be used to provide visual aid while discussing dangerous traffic situations that can occur when traveling on public roads with farm equipment. If you can’t access a map, masking tap can make roads on a floor or tabletop to help with the demonstration. Be sure to review:

1) Entering/exiting roadways from laneways
2) Visibility problems, when turning left, over crests of hills etc.
3) What things need to be considered when towing a heavy load.
4) The need to “square” corners when towing equipment.
5) Etc. Anything they may ask!

Activity #4
Have a tractor and implement already hitched for the meeting. Have the members complete a pre-operational inspection on the unit in pairs. After they are done, review what is included in a pre-inspection. Ask senior members to create a standard blank pre-operation inspection check-list on the computer that they can hand out to members at another meeting.

Roadway Safety

Senior Activity #5

Either as part of a meeting or in preparation for a meeting have the senior members look up the drivers handbook at:
www.mto.gov.on.ca/english/dandv/driver/handbook.htm

Have them choose a section to review as part of the meeting. They can test each other on sections of the handbook that can be printed off at the above website.

Roadway Safety

Activity #6

Find The Hidden Driving Safety Message.

(Count the letters in your first name. Subtract four if the number of letters is six or more. Add three if the number of letters is less than six. The result is your key number. Going from left to right, look up the letters appearing under your key number and you'll find an important driving safety message.)

2	6	5	3	7	4	9	8	3	7	6	2
U	O	A	T	A	U	D	D	A	L	B	S
7	4	3	9	2	3	6	5	7	6	5	3
W	S	K	O	E	E	E	L	A	Y	W	A
4	6	2	8	4	7	3	6	5	7	9	3
E	A	S	R	A	Y	S	L	A	S	N	L
5	3	4	9	2	8	7	3	6	5	7	6
Y	O	L	O	E	I	D	W	L	S	O	R
5	3	6	7	8	9	2	4	3	6	5	7
B	M	O	A	V	T	C	L	O	A	E	P
7	3	6	5	4	9	2	8	5	6	3	7
R	V	D	A	P	D	O	E	C	W	I	E
7	2	3	8	6	9	7	4	6	5	3	7
O	N	N	T	A	R	P	R	Y	O	G	E
4	9	2	8	7	4	7	6	5	9	5	3
O	I	D	O	R	P	A	S	U	N	R	V
3	2	6	4	5	9	7	3	6	5	3	7
E	A	A	E	T	K	T	H	F	E	I	I
6	2	7	3	5	2	8	9	4	7	6	5
E	R	O	C	O	Y	S	A	R	N	T	U
4	9	2	4	8	7	3	5	2	6	8	2
L	N	A	I	T	A	L	S	T	Y	A	T
5	6	3	7	8	2	9	4	2	7	8	4
D	R	E	L	Y	A	D	G	C	C	A	H
7	5	6	3	8	2	9	4	2	5	7	6
H	R	U	S	L	H	D	T	M	I	E	L
2	4	8	9	3	7	2	6	4	5	3	2
E	I	I	R	I	C	N	E	N	V	G	T
5	8	9	4	2	9	8	7	3	6	5	9
E	V	I	G	S	V	E	K	N	S	R	E

References

Drivers Handbook (n.d.) Ministry of Transportation, Ontario. www.mto.gov.on.ca/english/dandv/driver/handbook.htm

Farm Fatality Analysis (1997-1999) Government of Saskatchewan. www.labour.gov.sk.ca/farmsafety/fatalities.htm Retrieved: December 7th, 2006.

Farmsafe (June 2006). Vol 1 No 2.

Farm Vehicles on Ontario Highways (n.d.) Ministry of Transportation.

The Safe Movement of Agricultural Equipment On The Roadway (Nov. 2000) Farm Safety Association Inc. Guelph, Ontario. www.farmsafety.ca

Farm Safety Project

Chemicals and Gases

Farm Safety - It's No Accident

4-H Ontario

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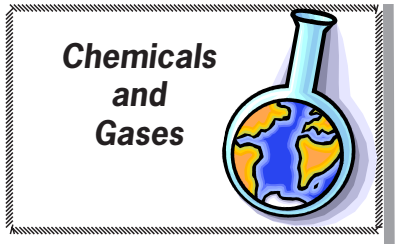
Ontario's Mutual Insurance Companies

Protecting Rural Communities For Over 150 Years!



CHEMICALS AND GASES

Roll Call #1: Name some confined spaces found on farms.
Roll Call #2: Name places on the farm where harmful gases/ chemicals can be found.
Roll Call #3: Name some products at home or on the farm that have warning symbols on them.

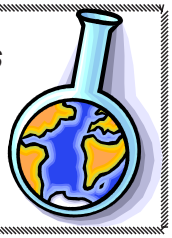
Global Warming and Chemicals

A new term has come into being over the past 20 years. The term is "global warming." It describes the warming trend on earth that is caused by human emissions of greenhouse gases into the atmosphere. Gradually there is an increase in temperature of the land, oceans and atmosphere. The term "greenhouse effect" refers to the result of gases such as water vapour, carbon dioxide and methane gas being released into the atmosphere.

These greenhouse gases stop heat from leaving the earth's atmosphere. A comparison would be what the glass does in a greenhouse. It stops the heat from escaping. The earth is also protected by an ozone layer that lies approximately 15 – 40 km above the earth's surface. This layer helps block out the sun's harmful ultraviolet rays. The ozone layer is deteriorating because of certain damaging chemicals and gases known as **ozone depletion substances** (ODS). Although some substances have been banned, research to replace all harmful substances continues.

Examples of some ODS would be: air conditioning refrigerants; foam blowing agents; cleaning solvents; fire suppressants and pesticides to name a few. The increase of the earth's temperature of course results in warmer climates, but it also contributes to other environmental changes. For example, glaciers that have existed for thousands of years are melting at an alarming rate. This can increase water levels in certain areas. This alone can have negative effects on ecosystems and animals. Why is this important to us? It is not just industrial development that has contributed to the increase in production of greenhouse gases. Agriculture is also a contributing factor to global warming. How many ozone depletion substances do you knowingly have on the farm?

Ozone Depletion. U.S. Environmental Protection Agency, Washington, D.C. U.S.A. www.epa.gov.docs/ozone



Manure Gases

There are also other things to consider though about chemicals. As little as 20 years ago, very little was known about the effects of gases and chemicals used or produced by farming operations. Unfortunately, many farm workers and livestock have developed severe disabilities or experienced early or accidental deaths due to exposure to many of the chemicals and gases found on farms. This is another reason why we must start educating the next generation of farmers now! That means you!

How Are Manure Gases Formed?

The deterioration or "decomposition" of manure begins as soon as it leaves the animal. Things called "microbes" feed on the manure and the result is gaseous by-products or fumes. The types of gases present depend on whether the manure is stored where there is oxygen present (called aerobic state), or where there is a deficiency or not enough oxygen (called an anaerobic state). Liquid manure storage systems that include gutters, sumps or tanks provide a good place for oxygen deficient bacteria to work. They produce the types of gases that are harmful.

There are four main gases found around storage facilities produced by decomposing manure. They are Hydrogen Sulfide (H_2S), Methane (CH_4), Ammonia (NH_3) and Carbon Dioxide (CO_2). Any of these four gases if found in high concentrations (a lot in a small enclosed area) can be life threatening to people and animals.

Methane Gas

Methane gas is the second largest gas that is contributing to the deterioration of the ozone layer and to the greenhouse effect. In 1999 it was determined that agriculture caused 28% of methane gas emissions in the United States.

"**Etheric Fermentation**" is the term that refers to the process where the microbes in an animal's digestive system break down the animal's food. Cattle, buffalo, sheep and goats create high amounts of methane gas because of their rumen.

Methane gas is produced when animal waste is broken down. The amount of methane that is produced depends on the kind of waste material. Liquid manure produces large amounts of methane because it is stored in tanks and not exposed to air. The increase in temperature and moisture increases the methane gas production. Solid manure produces little to no amount of methane.

Rice fields also produce methane gas! Most rice crops are located in flooded fields. The flooding causes organic matter in the soil to rot

and decompose. Methane gas is produced through the rice plants. More rice production means more methane gas being released into the atmosphere.

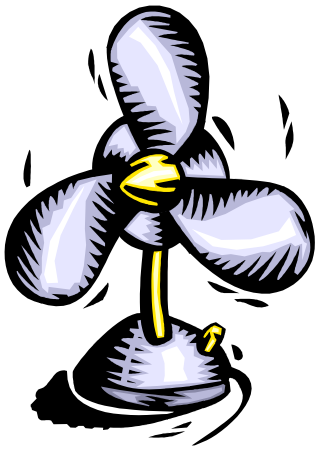
Agricultural residue burning also produces methane gas along with several other gases. Residue burning is a strategy used by some farmers to clean up pastures and crop fields. Unfortunately it also contributes to the ozone layer depletion.

Johansen, B. *The Relationship of Ozone Depletion and the Greenhouse Effect.* The Global Warming Desk Reference., Greenwood Press.
www.ratical.org

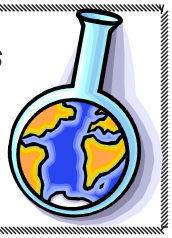
Characteristics of Methane Gas (CH4)
Methane is an odourless gas that is lighter than air so it tends to be present at the top of manure pits. Although it can asphyxiate living things the main hazard is due to its flammable, explosive nature. Because it is odourless, it is extremely difficult to detect without specific gas detection instruments. In order to stay safe, it is best to consider that it is present in all manure storage areas.

Characteristics of Hydrogen Sulfide (H2S)
Hydrogen sulfide is the most dangerous by-product of manure decomposition. It smells just like rotten eggs and is heavier than air. If exposed to high levels of hydrogen sulfide, instantaneously or after a short period of time, you lose your sense of smell, and cannot detect the lethal odours. A low concentration of hydrogen sulfide irritates the eyes and respiratory tract (nose, throat and lungs). Moderate levels cause headaches, nausea and dizziness. Because hydrogen sulfide, like carbon dioxide are heavier than air, these gases tend to be present in lower areas of manure storage areas and are present in high levels even after ventilation.

The gases that are released from manure when it is agitated is like when we shake a carbonated drink (pop) and open the can slowly. The “fizz” gives us the idea of the tremendous release of gases, which occurs when liquid manure is agitated!



Carbon Dioxide (CO2)
Carbon dioxide can occur in high levels in a tightly sealed barn if the ventilation system stops working. Usually most of the carbon dioxide gas would be from the livestock breathing rather than manure gases. Carbon dioxide is heavier than air and hard to detect when present. It replaces oxygen in the air. When carbon dioxide is at lethal levels livestock will suffocate or die from heat stress. At lower levels it can cause shortness of breath and dizziness. You can help prevent carbon dioxide poisoning by installing an alarm system that will send a warning when the ventilation system stops working.



Ammonia (NH3)
Ever entered a livestock building that is poorly vented, or got the job of cleaning out the chicken coop? Then you have smelled ammonia! It is that sharp, pungent odour that can take your breath away. Even at moderate levels it will immediately irritate the eyes and nasal passages. If the levels are really high it can cause damage to the body that cannot be reversed. Flushing irritated skin or eyes with water is the best first aid treatment. Livestock producers take the presence of ammonia very seriously as it has been proven that even at low levels it reduces animal performance and can create health problems for the livestock and those who work in that environment.

Take Out The Manure Safely Before It Takes You Out!
There have been numerous farm related deaths where farmers, family members or employees have died from asphyxiation (lack of oxygen) or from toxic gases that are found in manure storage facilities. There have been cases where good Samaritans have died while trying to save a family member or co-worker from an underground pit or a spreader tank.

Some manure storage systems are more dangerous than others. Storage systems that are below ground or pits are more hazardous than above ground systems. Systems that are covered by lids, caps or slotted floors are more hazardous than uncovered systems. Little gas is present when the manure is still as natural airflow or ventilation from fans prevents gas build up. Pits that require pumping out can be dangerous to living things. Leaking manure systems can also be lethal to fish and other aquatic species if the manure leaks near streams or lakes.

There are three kinds of liquid manure storage systems:
1) **large manure storage** tanks that are built directly below the livestock housing.
2) manure storage in **open lagoons** or ponds
3) **above ground silo-type** manure storage structures.

In all three types manure is flushed from the storage area by adding water and then agitating or mixing to make the manure a liquid. Periodically this liquid manure is pumped from the storage areas into tank wagons or through irrigation systems and used for crop fertilizer and soil conditioner.

In livestock facilities where the manure pit is located below the floor, these manure gases are present in low concentrations. Once the pits are agitated or stirred up for pumping, some or combinations of all these gases can be released from the manure. Toxic levels can be quickly reached, or oxygen can be displaced (removed from the area). This causes extreme risk to all living things in the facility. The risks

are toxic poisoning, asphyxiation from lack of oxygen and sometimes explosions when oxygen mixes with gases such as methane (CH4).

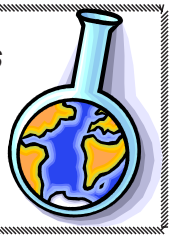
Keep Yourself Safe When Working With Liquid Manure

- Know what the physical effects are of the various gases that are created and released from manure.
- Have an evacuation plan for workers and livestock from areas that could have high concentration of gases.
- Have the ability to provide and maintain ample ventilation where livestock are housed or livestock waste is stored.
- In the event of a power failure open all windows and doors and remove workers and livestock from the area if possible. It is best to have emergency power generators available for continuous ventilation.
- Do not allow smoking or other open flames in or near confined housing or manure storage areas.
- Fence off manure ponds or lagoons and prevent access by children, visitors or livestock. During warm weather the surfaces can look solid.
- Put up warning signs outlining the hazards.
- Do not allow people to enter buildings during manure agitation and pumping manure pits under the building floor.
- Use full respiratory protection, self contained breathing units should be used at all times. No one should enter a manure storage pit without a supply of air and a back up crew with a lifeline attached.
- When someone else collapses in a pit **do not enter without self-contained breathing equipment**. It is **suicidal** to try to save someone in this type of environment. Don't be a dead hero! Call for professional help.

Manure Storage Entry

Many farm workers have died from entering manure storage areas without proper safety precautions and equipment. If someone has to enter a manure storage area keep in mind the following:

- **Never** enter a manure pit during or just after agitation due to the presence of deadly gases.
- Storage areas should be built so plumbing and plumbing equipment is installed so it can be accessed and removed easily for repairs.
- Remove all living things if possible before agitating the manure
- Monitor the condition of animals while agitating manure. Stop the process and ventilate immediately if the livestock become restless, agitated, or present abnormal behaviours.
- Always maintain one foot of space between the manure surface and the slats of the housing floor to protect livestock from breathing in deadly gases that lie down on the floor slats.



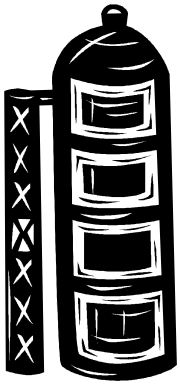
- Increase forced ventilation as this will increase the oxygen and reduce hydrogen sulfide and other toxic gases.
- Test the oxygen level before entering to make sure there is adequate oxygen. Also test that hydrogen sulfide, methane and other toxic gases are at safe levels.
- If another person collapses in a manure pit, **do not enter to save them without self-contained breathing equipment.** Immediately ventilate the area, and call rescue personnel to bring proper equipment.
- **Never** lower barn fans into the pit as this could cause a methane gas explosion.
- **Always** use a safety line and an air respirator when working in tanks.
- Obtain proper training on how to use a respirator and properly fit the mask.
- Keep a clear escape route out of the pit. Make sure exits are not blocked by tools or objects.
- Know first aid and CPR.
- Hire trained professionals to complete maintenance whenever possible.

Manure Gas Dangers (2002) Farm Safety Association. Fact Sheet. Guelph, Ontario www.farmsafety.ca

Agriculture Awareness Manual (2003) 4-H Manual. Ontario 4-H Council. www.4-hontario.ca

Silo Gases

Contact with deadly silo gases can occur wherever there are silos. Safety precautions should always be taken while filling the silo. It is important that every farm worker know the dangers of silo gases and learns how to deal with them.



What are Silo Gases?

Silo gases are formed from the natural fermentation (or the decomposition of organic compounds) of the chopped silage shortly after it is put in the silo. The type of silo will determine the type of gas that will be produced. For example in a sealed silo both nitrogen dioxide and carbon dioxide gases are formed but there will be higher levels of carbon dioxide. High levels of carbon dioxide in the silo are actually desired because it helps the silage stay a high quality. In an open top type of silo nitrogen dioxide will be present at high levels.

Carbon Dioxide (CO_2)

Carbon dioxide is a colourless, odourless gas that is very dangerous. It replaces the oxygen in the silo with high levels of carbon dioxide. Because carbon dioxide is heavier than air it tends to settle right on top of the silage or can flow down the silo chute and build up in the

feed rooms or other low lying areas near the base of the silo. The gas may also flow into the barn itself and collect in corners, under feeders or lie just above the floor. This would cause a serious threat to workers and livestock. A person can be overcome very quickly from the lack of oxygen. Sealed silos however are usually designed so that entering them is unnecessary.

Nitrogen Dioxide (NO2)

Nitrogen dioxide is a very toxic gas. It has a strong odour much like bleach. When it is present, because it is heavier than air, there can be low lying fumes in the air that can be yellow, red or dark brown. Nitrogen dioxide levels will be at their greatest about three days after harvesting. If the silo is vented then the levels will decrease rapidly after that point. After two weeks it is very unlikely that more nitrogen dioxide will be formed unless the gas has not been able to escape from the silo.

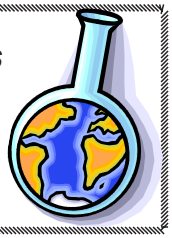
Nitrogen dioxide can cause severe irritation to the nose and throat and can cause inflammation in the lungs. What makes this gas so dangerous is that it causes only a little discomfort or pain when exposed to low levels, however death can occur immediately after contact with high levels. For example, there have been farmers who have breathed in nitrogen dioxide without having any serious symptoms, but have died hours later in their sleep from fluid building up in their lungs. Those who have breathed in this gas in low to moderate levels can have symptoms similar to pneumonia as long as two to six weeks after being exposed**. It is really important that anyone exposed to this gas get immediate medical treatment.**

Minimize Danger – Prevent Excessive Nitrates

Some environmental conditions, especially droughts cause nitrates to build up in plants fertilized with nitrogen, even when the fertilizing has been done according to the usual requirements. Proper fertilization strategies, along with proper weed, insect and disease control reduces the chances of excessive nitrogen dioxide gas being produced when you put the crop in the silo.

The following are suggestions on how to minimize the nitrate hazards:

- Don’t over use nitrogen on the crop.
- Obtain soil analysis and follow the recommendations on the reports.
- Use balanced N-P-K fertilizers, add other minor elements if needed.
- Use disease and insect resistant varieties and/or
- Spray to control insect and disease damage to plant roots and leaves.
- Keep fields free from weeds (they can have excessive nitrates).
- Harvest the crop before rainfall or wait five days after a rain.



- If plants are damaged by frost or hail, harvest immediately.
- Cut the crop higher than normal (10-12 inches); most nitrates are stored in the lower stalk.

Prevention and Safety Steps

- Watch for the odours and yellow-brownish or red fumes in or near the silo.
- The highest danger is between 12 – 60 hours after filling the silo.
- Precautions should be taken however for 10 days after filling when opening for feeding.
- Do not enter the silo for 4 – 6 weeks after filling is completed.
- The silo room should be vented adequately by opening outside doors and windows or using fans for 2 weeks after filling.
- If a silo must be entered do it immediately after blowing the last load into the silo. Run the blower for 15-45 minutes before entering, and leave the blower running while the person is inside. **Never enter without self-contained breathing equipment.**
- Never enter when alone, and always use a lifeline with three people present in case of accident.
- If you experience coughing or throat irritation, get fresh air immediately and present yourself at the closest medical emergency department.
- Keep all doors closed and the roof panel open to help with ventilation.
- Provide good ventilation to the silo room and barn to prevent livestock loss.
- Post warning signs so people know to **Stay Away!**
- Keep children and visitors well away and bar entry to the silo.
- Remove the cover from the filler opening a few days before using the silage by using a rope so the chute doesn't need to be climbed.
- Provide maximum ventilation to the chute for 30 minutes before entering.

Silo Gas Dangers (2002) Farm Safety Association. Fact Sheet. Guelph, Ontario. www.farmsafety.ca

The Deadly Combustion Fumes

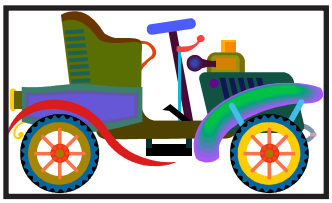
Hopefully we all know this one, right? This gas is odourless and causes the most deaths during the winter months. It has been referred to as the "silent killer." It is estimated by the Canada Safety Council that 200 Canadians a year are killed by it, and more than 1,500 people seek out medical attention because of it. Any ideas? Yes, it is carbon monoxide.

Carbon Monoxide (CO)

Carbon monoxide gas is produced by engines. It is a gas that is formed by incomplete combustion. Every fuel-burning engine produces carbon monoxide, but there are things we can do to keep ourselves safe when we are around it. Carbon monoxide can be a lethal threat in a vehicle or in your home.

Signs and Symptoms

Carbon monoxide poisoning creeps up on you. Present in low levels it can cause a slight headache and shortness of breath. At a higher level, the headache can be severe, the person can experience confusion, and impaired vision and hearing. They may feel drowsy or have slight nausea. At this level a person could collapse or faint with little amounts of exercise. Severe levels lead to unconsciousness and death.

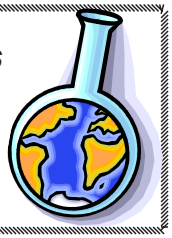


In The Vehicle

It is important to keep vehicles well maintained. That means keeping the engine well tuned, as poor running engines produce more carbon monoxide. Exhaust systems should be checked for holes or loose connections and replaced immediately if leaking. Maybe that "old beater" is not such a good idea, because gas can enter through holes in the body and floor.

Some Helpful Tips For The Vehicle

- Never drink and drive! Even parking with the engine running while "under the influence" increases the risk of dying from CO poisoning greatly.
- **Never** sleep in a parked vehicle with the engine running. If you are stranded and likely to fall asleep, turn the engine off! You will wake up when cold and can turn the engine back on for a few minutes to warm up.
- If you get stuck on a snow bank or ditch and are stranded, check the tailpipe often to make sure it is not plugged, and the exhaust gases can escape easily.
- **Always** leave a window open slightly to let in fresh air (good idea when driving or parked).
- Know the warning signs and symptoms and be alert for them. If you experience any of them get out of the vehicle and get fresh air immediately.
- **Never** leave young children in a vehicle with the engine running



even if you are “just going to be a minute.”
- **Never** run a vehicle in a closed in area such as a garage, workshop or driving shed without proper ventilation.

Some Helpful Tips For The House

- Only allow qualified, licensed people install, inspect or change over fuel burning appliances from one type of fuel to another. For example furnaces, water heaters and fireplaces.
- All fuel burning appliances should have a yearly check up and should include intake lines, flue pipes, chimneys, etc.
- **Never** use barbecues or other charcoal burning appliances inside. They release dangerous levels of carbon monoxide.
- **Never** leave a vehicle running in a garage that is attached to or is beneath the house. Even if there are no adjoining doorways, carbon monoxide gases can enter the home and kill!

First Aid Treatment

- Move outside to get fresh air immediately.
- If an unconscious person needs to be moved outside, open doors and windows first to increase ventilation so the gas doesn’t poison the rescuer as well.
- Keep the patient lying down, and wrapped in blankets to maintain their body heat until emergency help arrives.
- Under no circumstances should the patient be allowed to walk around after regaining consciousness.
- If breathing has stopped artificial respiration needs to be done immediately.

Combustion fumes harbour silent killer (n.d.) Farm Safety Association. Fact Sheet. Guelph, Ontario. www.farmsafety.ca

Chemical Storage

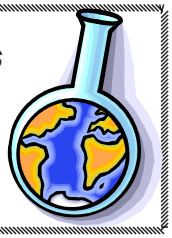
Pesticide/Chemical Handling

Ontario has established the Ontario Pesticide Act, which is administered by the Ministry of Environment. The main purpose of the Act is to protect the environment, and people and other living things through proper handling, transportation, storage, use and disposal of agricultural chemicals. In past years we were not aware of the damage that chemicals had on the environment.

Can you believe in the past, we used to change the oil and antifreeze on vehicles and often let the chemicals seep into the ground? Have you noticed in the past few years, locations that used to be gas station lots are being dug up and the earth removed and replaced. That is because that earth is severely contaminated through improper use and storage of the many chemicals that are associated with gas stations that not only pumped gas, but repaired vehicles. Today, in order to obtain and use many common pest control products a person needs to successfully complete Ontario's Pesticides Safety Course.

Pesticide Transportation

- **Never** leave pesticides unattended in a parked vehicle unless it is locked or parked in a secure place where members of the public are not around.
- Unattended parked vehicles that contain pesticides must display a sign "Chemical Storage Warning – Authorized Persons Only"
- Vehicles that are transporting more than 500 litres of pesticides must have a chemical warning sign displayed at all times.



Pesticide Storage

This is a complicated subject and will be reviewed in more detail in the Environment section of this project. This is a general overview of the Ontario Pesticide Act stipulations.

- Pesticides must be stored in a separate area specific for that purpose.
- Only pesticides, emulsifiers, dilutants, spreaders and dyes can be stored in this building or room.
- Storage areas for other items must be adequate so cross-contamination cannot happen.
- The pesticide storage area must be decontaminated before using it for other purposes
- Insecticides, herbicides and fungicides need to be stored separately from each other.
- The storage area needs to be ventilated to the outside.
- Chemical storage warning signs need to be posted on the door.
- The storage area should be locked, with only one authorized person who has the key.
- The storage area should not have floor drains unless they flow into a holding tank.
- Protective clothing and equipment should be available to protect those handling the pesticides but should be stored in a separate room or in sealed plastic bags.
- Emergency telephone numbers should be posted.
- Materials to absorb spills should be available e.g. sawdust, soil or rags.
- Storage areas should be cool and dry. Check labels for winter storage requirements.
- **Always** store pesticides in their original labeled containers.
- New storage areas should be built away from watercourses.
- Existing buildings should be updated to control and contain any runoff.
- Wash-up areas with soap and water should be available.
- You **must** notify the Ministry of Environment of any fire, spill, or theft of pesticides.
- Only trained people with proper protective equipment should clean up spills.

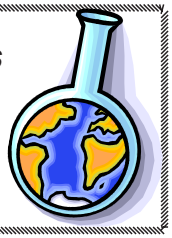
Strict rules apply to pesticide handling and storage (n.d.) Farm Safety Association. Fact Sheet. Guelph, Ontario. www.farmsafety.ca

Handling Pesticides and Sprayers

When working with pesticides, it is not the time or place to be in a rush. You should also be focused on the job you are doing!

- Make sure your movements are **slow, sure and accurate.**
- Don't leave the sprayer **unattended** while filling.
- Have a good **loading platform** on or beside the sprayer.
- Hoses and valves should be checked for **leaks** – proper maintenance is a must.
- Add chemicals to the spray tank **carefully.** Make sure the person loading is upwind of where the chemical is being poured (this means the wind is blowing away from the tank and person, not towards the person)
- Add chemicals **slowly** to prevent splashes
- **Never** lift or pour chemicals above waist height.
- **Always** fill the spray tank half way with water, and start agitation before adding chemicals to the tank.
- Add the rest of the water while continuing to agitate the liquid so it is mixed well.
- Don't overfill!
- **Triple rinse** the empty liquid chemical container and add the rinse water to the spray tank.
- Wear the same **protective clothing** when rinsing as when mixing or loading.
- **Soluble packaging** of pesticides (the package actually dissolves when added to the spray tank) reduces exposure of chemicals to the person. There also is nothing to rinse or dispose of afterwards.
- When using soluble packaging make sure the liquid is **agitated l**ong enough for the package to dissolve.

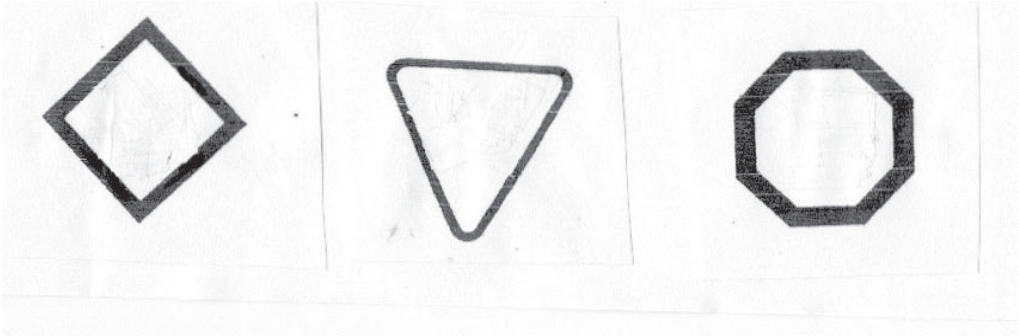
Best Management Practices – Pesticide Storage, Handling and Application (1998), Agriculture and Agri-Food Canada & Ministry of Agriculture, Food and Rural Affairs.



Hazardous Product Symbols

Know Your Symbols!
Hazardous product containers have to be labeled with symbols to warn us about the types of danger or hazard of the product. The symbol has a border, a picture in the center, and is either an octagon shape (has 8 sides), a square that is turned like a diamond, or is a triangle with the point at the bottom. Each shape represents the degree of danger or hazard.

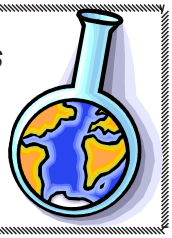
One shape indicates danger, which means it could kill you. Another shape tells you that it is a warning, which means it could make you ill or hurt you. The third shape tells you to use caution; it means it could make you ill. Below you will see the three shapes. Place the correct number inside the shape. Number 1 means **Danger**: Number 2 is the shape used for **Warning**: Number 3 is the shape used for **Caution.**



(Don't read on until you have completed this exercise)

If you said that a caution shape is the triangle you were right. An easy way to remember it is to think of a yield sign on the road, which is a triangular shape and tells the driver to "use caution." The eight-sided octagon indicates danger. Remember it is the same shape as a stop sign on the road. The shape is telling us to stop and be careful as it could kill you. The only one left is the square turned like a diamond. This is the shape of the warning symbol.

Chemicals and Gases



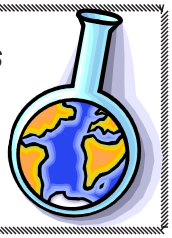
Now let's look at the pictures that can go inside each of these shapes. There are four pictures that are the most common. They are:

DANGER **WARNING** **CAUTION**

Look at the pictures. If you see any of these on a product, you need to be careful. The skull means whatever inside the container is poisonous to humans. The fire? You guessed it. It means whatever is inside burns easily.

The spots with the lines are the symbol that tells you the contents are reactive. Reactive means it is either explosive or it can produce deadly fumes or vapours. The hand that looks like a skeleton tells us whatever is inside is corrosive. That means it will eat, burn or dissolve the skin and tissue it touches. Ouch! Write in beside each of the pictures what it means. Your choices as outlined are: **Poison – Corrosive – Reactive – Toxic.**

Never take these labels off the containers because then others will not know what type of precautions to take when handling the container. Also make sure you find out the proper method to dispose of the leftovers.



Check List of Hazardous Products & Waste
to look for in your home and on the farm.

On the farm or at home, how many of these products do you have? Whenever possible, you should avoid or minimize the use of these products, and seek out safe alternatives.

- ☑ paints, varnishes, stains
- ☐ paint thinner / stripper
- ☐ car batteries
- ☐ pesticides (fungicides, herbicides & insecticides)
- ☐ aerosol containers
- ☐ wood preservative
- ☐ acids
- ☐ lighter fluid
- ☐ oven cleaner
- ☐ drain cleaner
- ☐ turpentine, solvents
- ☐ glues
- ☐ transmission fluid
- ☐ anti-freeze
- ☐ photographic chemicals
- ☐ fibreglass resins, epoxy resins
- ☐ moth balls
- ☐ disinfectants
- ☐ window cleaners
- ☐ pool chemicals
- ☐ old pharmaceutical prescriptions

MYTHS & Other Misconceptions

"They wouldn't sell all those products if they weren't safe."
Like the term "non-toxic," "safe" is a subjective term. Safe to whom or what, under which circumstances, for what use?

"I don't worry about poison control, my kids never touch cleaning stuff."
The Alberta Poison Centre received 12,014 calls for child poisonings (age 5 and under) between 1995 – 2005. They predict this number will rise to more than 13,000 by 2007.

By choosing to buy fewer cleaning products and using the least toxic products, there will be fewer risks with the health and safety of the family and the environment.

Alberta Poison Centre. www.calgaryhealthregion.ca

Chemical Forms And Our Bodies

As we have previously reviewed, chemicals can come in three different states or forms. They are **1) Dry (powder) 2) Liquid and 3) Spray**. These different forms of chemicals or pesticides can enter the body in three different ways. Do you know what they are? Chemicals enter our bodies through our **skin.** A second place it can enter our body is through the **stomach**. We can ingest chemicals through our stomachs quite simply by not thoroughly washing our hands before eating, and swallowing, a natural reflex for humans. The third way chemicals can enter our bodies is through our **lungs**. Once inside, chemicals can then enter our blood stream and the toxins can be carried to other parts of our bodies.

Pesticide Use

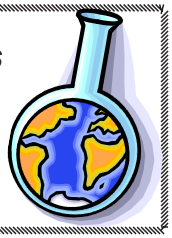
A pesticide is a chemical substance or mixture that is applied to plants to prevent, destroy, control or repel pests. Thus the word “pest” which according to Funk and Wagnall’s Dictionary refers to a “destructive or injurious insect,” and the term “cide” in the same dictionary is defined as the “killer of or destroyer of.”

Did You Know?
There are four groups of pesticides:

- Herbicides - control weeds
- Fungicides - control fungus
- Insecticides - kill insects
- Rodenticides - kill rodents

Pesticides work in a number of ways. They can interfere with the growth or maturing of the pest and stop it from reproducing, or they can kill it.

Pesticides also help to kill organisms that cause disease and control insects, weeds and other pests. In the past pesticides were dangerous as they did not target specific species and would kill all organisms, but new technology has helped them be more efficient, and be less dangerous to humans, animals and the environment. That doesn’t mean we don’t have to be careful when handling pesticides. Some research has linked pesticide chemicals to human health problems. Pesticides come into contact with humans in three areas: swallowing (the stomach), dermal (the skin), and inhalation (the lungs). Like all chemicals, always read the warning labels.



Canadian Regulations

- All pesticides must be registered with the federal Pest Control Products Act (PCP).
- The PCP protects the health of Canadian residents and the environment.
- In order to register with the PCP, scientific tests that span a long time must be done on the product. Only when it meets the health and safety regulations of the PCP is it registered.

Rural and Urban Use of Pesticides

Farmers are not the only ones that use pesticides. Some people use herbicides on their lawns to kill dandelions and other weeds. Others don't mind the weeds or choose to leave them alone. Can you think of reasons why not to spray lawns? The safety of children, pets and the environment are reasons some people do not spray their lawns.

People in rural areas choose to use pesticides for different reasons. A crop such as wheat if not sprayed with pesticide will be full of weeds and may suffer from disease or insects. The wheat field that was sprayed with pesticide will produce a bigger crop, and feed more people. It will also save the farmer time and money.

Control The Risks

Pesticides can be a risk for people, animals and environment if used incorrectly. Knowledge is needed in order to use pesticides safely. Proper management practices by the farmer, which includes taking necessary precautions, reduces risks. Spraying so a lawn looks greener is different from spraying to produce a better crop, but each person needs to make the decision whether to use pesticides for themselves.

IPM – Integrated Pest Management

Integrated Pest Management is a way of managing potential pest problems by using a variety of methods, which include:

- Cultural (the use of pest resistant varieties)
- Mechanical/Physical (using physical barriers to control pests)
- Biological (the use of viral or bacterial pest diseases)
- Genetic (using genetically modified varieties)
- Chemical (using pesticides, herbicides etc.)

By using Integrated Pest Management practices human and animal safety is increased, it is better for the environment and is cost effective. It is becoming a popular way to control pests, as it doesn't just rely on one type of control. The management practice includes three steps:

- Identifying and monitoring the pests,
- Through knowledge determining if action is required,
- Taking preventative measures or action to cure the problem.

Agriculture Awareness (2003) 4-H Manual. Ontario 4-H Council.
www-4-hontario.ca

Senior Supplement

WHMIS

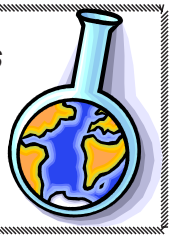
As senior 4-H members very soon you will be graduating from school and obtaining employment. Some of you may continue with your formal education, some of you will find full time or part time jobs working on farms or in industrial places such as factories. It is very important to have the information you need to keep yourself safe in the workplace. WHMIS (the Workplace Hazardous Materials Information System) is one tool that will help you do that. The following is a very short introduction to WHMIS.

What is WHMIS?
WHMIS is a system used in Canada that has been developed to provide information on the use of controlled hazardous materials in the workplace. The information is provided by the use of labels.

WHMIS Labels
The labels that are required by WHMIS laws are much like the hazardous product symbols we have already reviewed. The labels are important, as it may be the first alert for an employee that the product they are using may be hazardous. The labels tell of any precautions that are required when using the product. In Canada all hazardous products must be labeled. There are two types of labels. Supplier labels and workplace labels. They are considered the first level of the WHMIS Information Delivery System.

Supplier Labels
A supplier label has to appear on all products received at the workplace. It has to contain the following information: product identifier, information on safe handling, a statement that says there is a Material Safety Data Sheet (MSDS) available, hazard classification symbols, risk phrases, precautionary measures, and first aid information. The text has to be in English and French. A hatched border surrounds the information label.

Workplace Labels
A workplace label is used in four instances. 1) It is used when some of the controlled substance is put into another container for use. 2) When a controlled product arrives in bulk without a supplier label. 3) Where a product is produced in the workplace. 4) When a label has been accidentally removed. A workplace label must display the following: Product identifier, information on safe handling of the product and a statement that a MSDS is available. There is no specific design for workplace labels except the workplace identifier which could be any type of identification such as colour coding, warning signs and pictures that give the message.

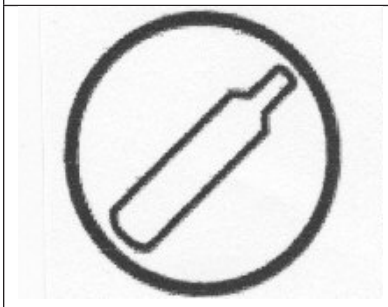


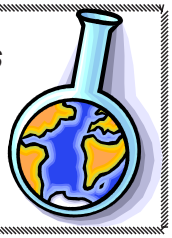
Material Safety Data Sheets

The second level of the WHMIS Information delivery system is the Material Safety Data Sheets (MSDS). These sheets are created by the supplier of the product and must contain the following information: Potential adverse effects to a person's health from exposure, how to work safely with the product, (such as what precautions to take) hazard evaluations on the use, storage and handling of the product, personal protective equipment required and emergency procedures related to the product. This information should be easily available for when a worker wishes to learn more about the product they are handling than is shown on the label. It also should be easily available, should a workplace accident happen. The hospital will need to know what type of chemical exposure the victim is suffering. Every MSDS must be current and updated every three years.

Training

The third level of the WHMIS information system is the employee education program. Employees need to be educated in the content, purpose and importance of the information labels and MSDS. They need education on the use and types of identification, procedures for safe handling and storage, use and disposal of the chemicals/products. Training should also include emergency procedures in the case of an accident or spill.

	What The WHMIS Symbols Mean	
	Class A Compressed Gas Examples: Propane, oxygen, acetylene.	The contents are under pressure. Cylinder may explode or burst when heated, dropped or damaged
	Class B Flammable and Combustible Material Examples: Gasoline, paint thinners	May catch fire when exposed to heat, spark or flame. May burst into flames.
	Class C Oxidizing Material This material can create a fire in the presence of flammable or combustible materials	May cause fire or explosion when in contact with wood, fuels or other combustible material
	Class D Division 1 Poisonous and Infectious Material. Immediate and Toxic Effects. Example: pine oil, cyanide	Poisonous substance. A single exposure may be fatal or cause serious or permanent damage to health.



	Class D Division 2 Poisonous and Infectious Material: Other toxic effects.	Poisonous substance. May cause irritation. Repeated exposure may cause cancer, birth defects or other permanent damage.
	Class D Division 3 Poisonous and Infectious Material: Biohazardous infectious materials Example: Hypodermic needles	May cause disease or serious illness. Drastic exposures may result in death.
	Class E Corrosive Material Example: Sulphuric Acid.	Can cause burns to eyes, skin or respiratory system.
	Class F Dangerously Reactive Material Example: Acetylene	May react violently causing explosion or release of toxic gases when exposed to light, heat, vibration or extreme temperatures.

WHMIS – Workplace Hazardous Material Information System (December 2002) Farm Safety Association. Fact Sheet. Guelph, Ontario. www.farmsafety.ca

OSH Answers: WHMIS – Labeling Requirements (2001) Canadian Centre for Occupational Health and Safety. Retrieved December 4, 2006 from www.ccohs.ca/oshanswers/legisl/msds_lab.html

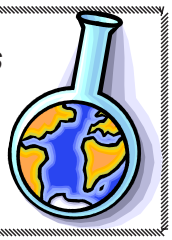
Senior Supplement #2
Label Exercise

It is always important to read the instructions! Labels have a lot of information that we need to know if we are going to be around chemicals.

On the next 3 pages there is a sample label. Read the label on the next few pages in order to answer these questions.

1) What is the chemical designed to kill?
2) What else can this chemical destroy?
3) What types of personal protective equipment should be used?
4) Can this product be mixed with other substances/mixtures?
5) What should you take with you if having to seek medical attention?
6) At what temperatures should this be stored?
7) If spilled on soil how much soil needs to be removed?
8) When was this label last changed?
9) Who manufactures this product?
10) How should the container be prepared for disposal?

On the next page is a copy of an actual product label.



11-SEP-2003 Notification received of a label change. See below for this change.

15-NOV-2001

AMBUSH (R) 50EC

Emulsifiable Concentrate Insecticide

For Use on Greenhouse Ornamentals
Tomatoes and Cucumbers

AGRICULTURAL

KEEP OUT OF REACH OF CHILDREN

READ THE LABEL BEFORE USING

GUARANTEE: permethrin 500 g per litre

REGISTRATION NUMBER **14976**
PEST CONTROL PRODUCTS ACT

Store above 0'C

Syngenta Crop Protection Canada, Inc.
140 Research Lane
Research Park, ~~University of Guelph~~
Guelph, Ontario N1G 4Z3

Notification Change

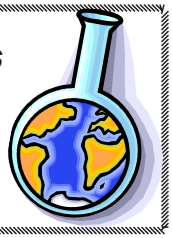
Distributed by:

Plant Products Co. Ltd.
Brampton, Ontario
L6T 1G1

NET CONTENTS:1 Litre

A93/A-3

AMBUSH 50EC is a synthetic pyrethroid insecticide of low mammalian toxicity. It is a fast-acting stomach and contact insecticide with no systemic or fumigant effect. It is recommended for control of whiteflies on greenhouse ornamentals, tomatoes and cucumbers.



PRECAUTIONS: KEEP OUT OF REACH OF CHILDREN. Avoid splashing concentrate in eyes or on hands. Wear suitable protective respiratory equipment when applying in enclosed areas. This product is very toxic to fish. Do not contaminate ponds, lakes, streams or rivers during sprayer filling operations or while spraying. This product is very toxic to bees; avoid spraying when bees are foraging.

FIRST AID : DANGER - This product contains a Petroleum Distillate, therefore, if swallowed, do not induce vomiting. Get medical attention immediately. If patient is unconscious, give him air. If splashed in eyes, wash with plenty of clean water. If on skin, wash with soap and water. Take container, label or product name and Pest Control Product Registration number with you when seeking medical attention.

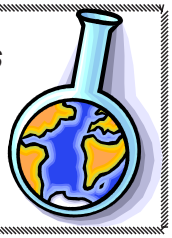
EMERGENCY NUMBER: All hours 1-800-327-8633(FASTMED) **ONLY** for health an environmental information.

STORAGE: Store in a cool, dry, well ventilated area away from foodstuffs and out of the reach of children and animals. Keep product from freezing.

SPILL CLEANUP: Wear appropriate protective equipment (gloves, glasses, apron) when attempting to clean up the spill. If the container is leaking, secure leak and place the container into a drum or heavy gauge plastic bag. Contact Syngenta Crop Protection Canada, Inc. (see EMERGENCY TELEPHONE NUMBER) for further information. For spills and leaks, contain the liquid with dikes of inert material (soil, clay, kitty litter, etc.) Absorb the spill onto inert material and shovel into a sealable waste container.

On hard surfaces - sprinkle spill area with detergent and scrub in a small quantity of water with a coarse broom. Let stand 10 minutes then absorb onto an inert material and shovel into the waste container. On soil - remove the top 15 cm of soil in the spill area and replace with fresh soil. Dispose of all waste including scrub bush in accordance with provincial requirements. For more information on the disposal of waste and the cleanup of spills, contact the Provincial Regulatory Agency and the Manufacturer.

DISPOSAL: Rinse the empty container thoroughly and add the rinsings to the spray mixture in the tank. Follow provincial instructions for any required additional cleaning of the container prior to its disposal. Make the empty container unsuitable for further use. Dispose of container in accordance with provincial requirements. For information on the disposal of unused, unwanted product and the clean up of spills, contact the Provincial Regulatory Agency and the Manufacturer.



NOTICE TO USER: This control product is to be used only in accordance with the directions on this label. It is an offence under the Pest Control Products Act to use a control product under unsafe conditions.

DIRECTIONS FOR USE

GREENHOUSE ORNAMENTALS: Aspidistra, Begonia, Boston Fern, Chrysanthemums, Cordyline, Dieffenbachia, Draceana, Ficus, Fuchsia, Geranium, Gerbena, Impatiens, Petunias, Philodendron, Poinsettias, Roses, Sanseveria, and Spider plants: **Greenhouse Vhitefly** - Mix 20 mL of AMBUSH 50EC Insecticide in 100 L water. Apply to cover all foliage thoroughly. Repeat application as necessary to maintain control. Although no damage has been recorded, it is advisable to keep spray off open blooms in greenhouses. **Chrysanthemum Leafminer** - Mix 20 mL of AMBUSH 50EC Insecticide in 100 litres of water. Apply using conventional spraying equipment when insect populations develop. Repeat applications weekly as needed. **GREENHOUSE TOMATOES AND CUCUMBERS: Greenhouse Whitefly** - Mix 20 mL of AMBUSH 50EC Insecticide in 100 L water. Apply to cover all foliage thoroughly. Repeat application as necessary to maintain control. May be applied up to 1 day before harvest of tomatoes and cucumbers.

NOTE FOR GREENHOUSE USE: Do not mix AMBUSH 50EC Insecticide with other pesticides, as many plant varieties may respond differently to mixtures of chemicals. On waxy leaf ornamentals, the use of a spreader sticker may improve the effectiveness of AMBUSH.

NOTICE TO BUYER: Seller's guarantee shall be limited to the terms set out on the label and subject thereto, the buyer assumes the risk to persons or property arising from the use or handling of this product and accepts the product on that condition.

Contents manufactured in U.K.

* AMBUSH is a registered trademark of Syngenta Crop Protection Canada, Inc.

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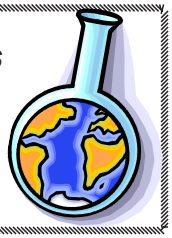
Once this is done, let's get familiar with an MSDS (Material Safety Data Sheet) that is to be completed on every hazardous material in the workplace. This is an actual blank Material Safety Data Sheet. Read the label and complete as many sections of the Data Sheet as you can.

If you can't find certain information on the label, how would you go about obtaining that information in order for your data sheet to be complete?



MATERIAL SAFETY DATA SHEET — 9 Sections

SECTION 1 — PRODUCT INFORMATION

Product Identifier			WHMIS Classification *(optional)*
Product Use			
Manufacturer's Name		Supplier's Name	
Street Address		Street Address	
City	Province	City	Province
Postal Code	Emergency Telephone	Postal Code	Emergency Telephone

SECTION 2 — HAZARDOUS INGREDIENTS

Hazardous Ingredients *(specific)*	%	CAS Number	LD_{50} of Ingredient *(specify species and route)*	LC_{50} of Ingredient *(specify species)*

SECTION 3 — PHYSICAL DATA

Physical State	Odour and Appearance		Odour Threshold (ppm)
Specific Gravity	Vapour Density (air = 1)	Vapour Pressure (mmHg)	Evaporation Rate
Boiling Point (°C)	Freezing Point (°C)	pH	Coefficient of Water/Oil Distribution

SECTION 4 — FIRE AND EXPLOSION DATA

Flammability ❒ Yes ❒ No	If yes, under which conditions?	
Means of Extinction		
Flashpoint (°C) and Method	Upper Flammable Limit (% by volume)	Lower Flammable Limit (% by volume)
Autoignition Temperature (°C)	Explosion Data — Sensitivity to Impact	Explosion Data — Sensitivity to Static Discharge
Hazardous Combustion Products		

SECTION 5 — REACTIVITY DATA

Chemical Stability ❒ Yes ❒ No	If no, under which conditions?
Incompatibility with Other Substances ❒ Yes ❒ No	If yes, which ones?
Reactivity, and under what conditions?	
Hazardous Decomposition Products	

Activities

Activity #1-Safe Pesticide Handling
As a group make a video discussing safe pesticide handling. Show this video on achievement day to other clubs.

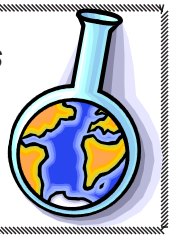
Activity#2 – Find The Potential Gas Attacks!
As a group go out to a silo and barn. See if the members can point out the key locations where gases can accumulate.

Activity#3 – Name That Gas!
Get three jars with lids. Cover the outside with paper so no one can see inside the jars. Ask the members to identify each of the gases that are being emitted from the jars.

1) For carbon dioxide – it is colourless and odourless (so have nothing in the jar but air to simulate this gas.) Label the jar #1
2) For methane gas – boil an egg early in the day of the meeting, and then place it in the jar with the lid on. Do not refrigerate it. Label it jar #2.
3) For nitrogen dioxide – fill the jar about ¼ full of bleach. Label it jar #3.
4) For ammonia – put some smelling salts in the jar. Label it jar#4
5) Just prior to the meeting poke holes in the top of the lids.
6) Ask the members to smell each jar and identify the gas that it is supposed to smell like. Remember we aren't asking them what is in the jar; we want them to remember that all these smells can come from manure gases.

Senior Activity #4 – Hazardous Waste Days
Contact the local waste management site (dump site). Find out what days have been designated as Hazardous Waste Days. These are specific days when hazardous materials can be dropped off. Get a listing from the waste site, municipality or township office of all the types of materials that are considered hazardous wastes. Have senior members present this material at the next meeting.

Activity #5 – Post Those Signs.
Have the seniors organize and contact the Farm Safety Association to request warning signs to be posted on farming sites where potential dangers exist. Have the senior members present each of the signs, and give junior members an idea on where they should be posted. Or have members complete the blank copy at the end of this section to get the idea what information is needed.



Activity #6 –Matching Game

Place the correct number from the left column into the box on the right that matches the correct gas.

1) Methane Gas ☐ Rotten egg smell found in lower levels of manure storage tanks

2) Hydrogen Sulfide ☐ Odourless gas found at the top of manure pits.

3) Carbon Dioxide ☐ Heavier than air so found at the top or bottom of silo.

4) Nitrogen Dioxide ☐ Strong pungent odour takes the breath away

5) Ammonia ☐ Smells like bleach. Fumes can be yellow, red or brown, found in low-lying areas

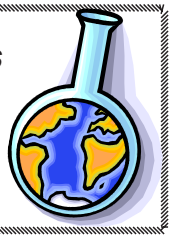
Chemistry Lesson! - Draw a Line to the Correct Gas.

1) N02	Carbon Dioxide
2) C02	Nitrogen Dioxide
3) NH3	Methane
4) CH4	Ammonia
5) CO	Carbon Monoxide

Activity #5 Answers:
Boxes: 2;1;3;5;4. NO_2-Nitrogen Dioxide; CO_2- Carbon Dioxide
NH_3-Ammonia; CH_4-Methane; CO-Carbon Monoxide.

Activity #6
Name 10 types of products found on a farm that could be harmful if mishandled. Review these products with the group, as everyone won't have the same answers.

Examples: Pesticides; Herbicides; Gasoline; Diesel Fuel; Batteries; Treated Grain; Floor Cleaners: Brake Fluid; Antifreeze; Bug Sprays; Paint; Paint Thinners etc.



Activity #7 - ***The Gas Attack Quiz***

1) What gas is responsible for 200 Canadians dying each year and is known as the “silent killer?” _____

2) What gas is odourless, lighter than air, flammable, hard to detect but should be considered to be present in all manure tanks.
_____

3) It smells like rotten eggs, but a person exposed can lose their sense of smell very quickly. It is heavier than air is present on manure surfaces and settles in lower areas of the manure storage area. What is it? _____

4) This gas has a distinct, sharp, pungent odour and can be detected even in low levels.
It is heavier than air. _____

5) It smells like bleach. It has killed unsuspecting farmers hours after exposure. It is heavier than air so can be found in low-lying areas of the barn or silo. The fumes are yellow, red or brown.
_____

6) It replaces oxygen in the air and is heavier than air. It tends to settle right on top of the silage or can flow down the silo chute and build up in the feed rooms or other low lying areas near the base of the silo. The gas may also flow into the barn itself and collect in corners, under feeders or lie just above the floor.
_____

7) Chemicals enter the body in three different ways; what are they?
1)_____ 2)_____3)_____

8) Before entering a manure tank or silo name two things you should do?
1)_____ 2) _____

9) If someone collapses in a manure tank or silo, do not enter the area, call for emergency services immediately and wait for their arrival. True or False _____

10) Manure storage tanks below the ground are more dangerous than ones above the ground. True or False _____

Answers: 1) Carbon Monoxide 2) Methane 3) Hydrogen Sulfide 4) Ammonia 5) Nitrogen Dioxide 6) Carbon Dioxide 7) Lungs (breathing) Stomach (swallowing) Skin (absorption) 8) Wear proper breathing equipment and have a lifeline attached. 9) True 10) True

References

Agriculture Awareness Manual (2003) 4-H Manual. Ontario 4-H Council. www.4-hontario.ca

Alberta Poison Centre. www.calgaryhealthregion.ca

Best Management Practices – Pesticide Storage, Handling and Application (1998) Agriculture and Agri-Food Canada & Ministry of Agriculture, Food and Rural Affairs.

Combustion fumes harbour silent killer (n.d.) Farm Safety Association. Fact Sheet. Guelph, Ontario. www.farmsafety.ca

Johansen, B. *The Relationship of Ozone Depletion and the Greenhouse Effect.* The Global Warming Desk Reference. Greenwood Press. www.ratical.org

Manure Gas Dangers (2002) Farm Safety Association. Fact Sheet. Guelph, Ontario www.farmsafety.ca

OSH Answers: WHMIS – Labeling Requirements (2001) Canadian Centre for Occupational Health and Safety. Retrieved December 4, 2006 from www.ccohs.ca/oshanswers/legisl/msds_lab.html

Ozone Depletion. U.S. Environmental Protection Agency, Washington, D.C. U.S.A. www.epa.gov.docs/ozone

Silo Gas Dangers (2002) Farm Safety Association. Fact Sheet. Guelph, Ontario. www.farmsafety.ca

Strict rules apply to pesticide handling and storage (n.d.) Farm Safety Association. Fact Sheet. Guelph, Ontario. www.farmsafety.ca

WHMIS – Workplace Hazardous Material Information System (December 2002) Farm Safety Association. Fact Sheet. Guelph, Ontario. www.farmsafety.ca

Farm Safety Project

Environmental Safety

Protect Your Family and Your Farm

4-H Ontario

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Environmental Safety

Roll Call #1: Name one thing you can do to protect the environment?
Roll Call #2: Name one hazard on the farm that can damage the environment?
Roll Call #3: Name one way the environment has been damaged by humans?

Every farm needs a good well, with lots of clean water for people and livestock, and other farming needs. In recent years there has been more concern about protecting our water sources. We all need to do our part. By keeping the environment safe, we are also keeping ourselves safe.

Sources of Water

There are three sources of drinking water. They are surface water, springs and groundwater.

Fast Farm Safety Fact and Tips:
Groundwater is a renewable resource. Rainfall and melting snow replenish the water that is drawn from wells. In Ontario 23% of water use comes from groundwater sources.

Water Wells, Best Management Practices

Surface Water

Examples of surface water would be ponds or lakes. Surface water should only be consumed after being treated to remove or destroy disease-causing microbes. Microbes can be very small bugs or germs that can only be seen through a microscope. Don't make the mistake of drinking surface water because it looks clean and doesn't smell. Contaminated water can cause a person to become seriously ill.

Springs

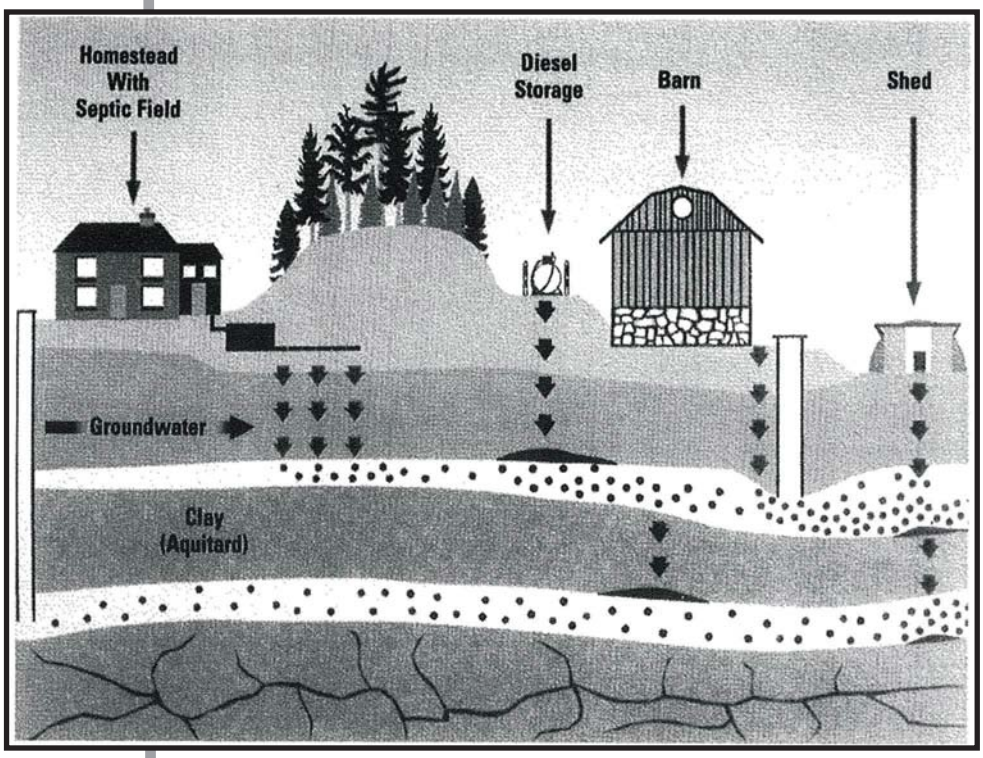
Springs are sources of water that come out of the ground. Often these springs are under pressure, and will be seen bubbling out of the ground. These are called artesian wells. The water that is coming out however may have traveled to that location for some distance just under the ground surface. On it's way it may have picked up contamination from animal or bird feces (another word for waste or manure) that were in the surface soil. Because of this possibility spring water should not be considered safe drinking water unless it too has been treated to remove or destroy the disease causing microbes (bugs and/or germs).

Groundwater

Ground water uses the soil to act as a natural filter. It filters out microbes and other contaminants as the water slowly seeps down through the ground. Water from a source that is deep in the ground is usually free of disease causing microbes, and is usually safe to drink. Finally, water that you can actually drink!

Environmental Safety

But not all groundwater is safe. By understanding how groundwater moves will help us determine if it could be contaminated or not. Groundwater flows from areas of higher elevation and pressure to areas of lower elevation and pressure. Once in an aquifer, groundwater flows mainly in one direction, horizontal and vertical, or up and down. Groundwater moves quickly through bedrock and slowly through clay or silt. Ground water movement varies from 30 cm per day to a few centimeters a year. Groundwater drawn from a deep well may have been in the ground for many decades.



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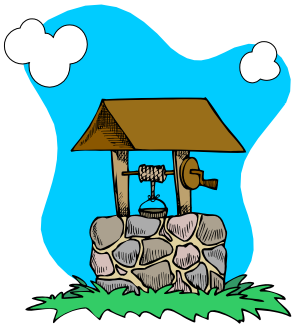
Dug Water Wells

A dug well is one that is dug by a backhoe or by hand. It is usually shallow and has a large-round casing usually made from concrete. Although it is easy to make, is not expensive, and the large casing provides storage there could also be disadvantages and problems. If the well has been dug into a poor aquifer, there may not be enough water produced to keep up with demand, so there could be water shortages during dry times. It is also at a high risk of near the surface contamination. For example, ground that doesn't slope away from the casing allows surface water to pool on the ground beside the casing. If there are any holes or cracks in the casing, or if the well tiles or lids are broken, chipped or not installed properly, the water could be contaminated. Dug water wells should be checked often and repaired to keep the risk of contamination low.

Environmental Safety

True Story:
A man in his mid twenties was pumping out water from an old underground cistern. He was going to convert it into a root cellar. The pump being used was gasoline powered, and emitted carbon monoxide fumes. The victim was in the enclosed space. He was overcome by carbon monoxide fumes, became unconscious and fell into the water. He drowned.

(Farm Fatality Analysis)



Drilled and Bored Wells
Drilled wells are made with rotary or cable well drills. Bored wells are made with a special boring machine. Both can be shallow or deep. With bored wells there is a more controlled hole than a dug well. Drilled wells can drill through bedrock, can reach deeper aquifers, are easier to seal, and have less risk for contamination. However, there is chance of poorer water quality, and a possible risk of tapping into deep aquifer contaminants. Drilled well casings tops that are below the ground can flood. There also could be insects e.g. earwigs inside the cap or breather tubes of the casing. Improper or faulty seals can cause contamination. Another problem occurs when the well is drilled through bedrock, as the bedrock can break near the well and open up a way for direct contamination.

Farm Cisterns
Years ago, many farmhouses had cisterns in them. They were used to store water and were usually concrete structures or tanks located below the floor of the home or in the basement. The cisterns were designed to collect the rainwater after it ran off the roof. Water collected in cisterns today is not safe for drinking. Think about it. These days, rainwater is polluted, by air pollution or acid rain, and then it lands on the roof. On the roof there may be bird droppings, which the rain washes away on the way to the cistern! Get the idea? There should not be any connection between the cistern and the main water supply for the house. If there are cisterns on the farm that are still being used, it is recommended that the water pipes are colour coded to make sure the two systems never get connected.

Prevent Contamination
There are things that can be done to prevent contamination of water wells.

- Make sure the well seal or cap is securely in place and **watertight**.
- Make sure the well cap is at least **12 inches above** the ground.
- **Seal** all joints, cracks and connections in well casings.
- **Screen** the well cap and vent pipe on drilled wells.
- **Direct** all surface water so it drains away from the well.
- Don't allow **surface water** to collect near the well.
- Don't allow **wastes** from garbage, liquids, manure piles or sewage systems to drain towards the well casing.
- Don't use **fertilizers or pesticides** around the well site.
- **Don't flush** any oils, detergents, paints, solvents or other chemicals down the toilet.
- **Chlorinate** and **test** the well after any repairs.
- Check well **pumps** and systems regularly.
- Look into **changes i**n the quantity or quality of the water immediately.

Environmental Safety

Fast Farm Safety Fact:
Older wells were often located to be close to the barn and house. Unfortunately this sometimes increased the risk of contaminated drinking water.

Water Wells, Best Management Practices

Abandoned Wells Should Be Plugged

Many farms have abandoned wells on them. They have been ignored for years, but with the increase in attention towards protecting water sources, they can't be ignored any longer. A natural filter of different soils usually protects groundwater. Abandoned wells are holes in that filter system that can allow sediment, bacteria and chemicals to flow directly into the groundwater supply. Runoff that may enter the abandoned well may contain pesticides, fertilizers, livestock manure and other contaminants. Once in the natural groundwater flow, they can move and contaminate other wells used for drinking water. Abandoned wells are also a safety hazard for people and animals. As the wells deteriorate, they may become larger in diameter at the top. A child could easily fall into an abandoned well, be injured or die.

Water Sampling

If a water well has not had a sample done by the local health unit for over a year, it is recommended to test three samples one week apart. This will help you find out the water quality of the well. After that, it is recommended that well water be tested three times a year, one following the spring time melt, one in the middle of summer and that last one in the fall. Shallow wells are most likely to be contaminated by bacteria. As water travels through the soil and rock it can also pick up chemicals such as heavy metals, nitrates, fluoride, pesticides, gasoline, diesel fuel, oils and radioactive metals. There are also some natural substances such as iron, sulphur, sodium and calcium that can cause unpleasant taste and strong odours.

How To Take Water Samples

It is important to take the correct steps when getting a water sample so it does not become contaminated. Here are the steps:

- Pick up a 200 ml sample bottle from Public Health, or hospital in your area. (Call the local Public Health Unit to find your closest location).
- Keep the bottle sealed and dry until ready to take the sample.
- Do not rinse the bottle before using.
- The sample should be taken in for testing the same day as gathered.
- Take the sample from the kitchen tap, don't take a sample from a hose.
- Remove aerators or other attachments from your tap.
- Disinfect the opening of the tap by wiping with alcohol or passing a match or lighter flame under the tap opening.
- Run the cold water for 2 – 3 minutes before sampling.
- Fill the bottle to the "fill line" directly from the tap without changing the flow rate of the water.
- Do not place the bottle cap on the counter, and be careful not to touch the inside of the cap or lip of the bottle with your fingers.
- Seal the bottle with the cap and drop off at the specified location for testing.

Environmental Safety

How To Disinfect A Well

- Only disinfect after all repairs have been completed and the well is ready to be made watertight and sealed
- The process is called chlorination, and uses normal household bleach
- Add bleach into the well:

Reprinted with permission from Disinfection Instruction Sheet, "Water Wells"–Best Management Practices, Ontario Ministry of Agriculture, Food and Rural Affairs and the Ontario Federation of Agriculture.

Volume of Bleach to Add for Every 3 Metres (10 Feet) of Water in the Well*

Casing Diameter		Volume of Unscented Bleach (5.25% solution)
Millimetres	Inches	Millilitres
50	2	6
100	4	30
150	6	60
200	8	100
250	10	200
300	12	250
400	16	400
500	20	650
600	24	900
900	36	2000 (2 litres)
1200	48	3600 (3.6 litres)

For example: If you have 6 metres (20 feet) of water in your well and it has a casing diameter of 100 mm or 4 inches, you would add 60 mm or 2 fluid ounces of bleach.

- If possible mix the water in the well (attach a hose to a tap, run water from the well through the hose and back into the well).
- Disconnect or by-pass any carbon filters, (if you don't they remove the chlorine from the water, and the pipes won't get disinfected) and replace carbon filters after chlorination.
- Turn on the taps in the house (both hot and cold) until you smell bleach coming out of the taps – if you don't or the smell is weak, add more bleach.
- Drain the water heater and fill with chlorinated water.
- Backflush the water softener and all water filters (except carbon filters).
- Allow the bleach to stay in the system for between 12 – 24 hours (the longer the better).
- Use the outside tap and garden hose to get rid of the chlorinated water, but don't discharge it on the septic system. Then run the faucets until there is no smell of chlorine.
- After at least two days of normal use, after there is no longer any bleach smell in the water take another water sample.
- Avoid putting in too much chlorine as some bacteria needed for septic decomposition may be killed.
- Do not drink the water without boiling until the test results show the water is safe.

Emergency Water Treatment

On the radio we hear of town water supplies being contaminated, and people told to use boiled water until it is safe again. This is what you have to do to make the water safe to drink:

- Bring the water to a full rolling boil for at least one minute.
- Refrigerate boiled water until used

The Myths About Bottled Water

Bottled water in Canada is not necessarily safer or healthier than water from municipal supplies such as town water. Currently the sale of bottled water in Canada is not regulated. Municipal water supplies are checked regularly for more than 100 substances. Only three substances must be checked in bottled water. They are bacteria, fluoride and total dissolved solids (magnesium, iron and sodium). Bottled water may contain natural bacteria. If the bottles are stored improperly or stored for a long time, the bacteria levels can increase to the point where it can be harmful to the person drinking it. It is recommended to refrigerate bottled water to reduce the bacteria growth.

Septic Systems

How Do They Work?

Every farm has a septic system. The septic system is a kind of private sewage treatment plant that processes all the wastewater from the house. Wastewater is piped from the house to the first stage of the system – the septic tank. This tank has two chambers or sections. It has baffles to stop raw waste from flowing into the second stage of the system – the tile bed. The tile bed is a system of pipes that allow water to seep out of them. Bacteria in the system break down sewage and wastewater. The heavier solids settle in the bottom of the tank and become sludge. The lighter solids float to the top as scum. The liquid between the scum and the sludge flows into the tile bed. A final biological change happens as the wastewater makes its way through the bed itself, just before leaving and going into the water table. At every stage of the septic process bacteria are at work digesting the material. The end products still contain nutrients, bacteria and chemicals.

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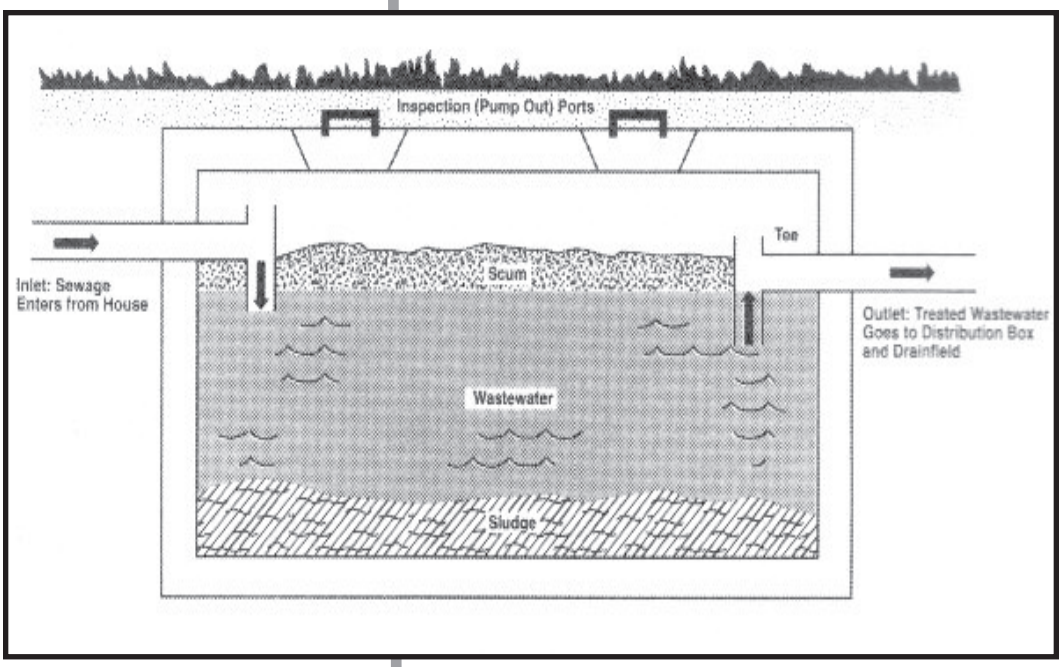


When They Don't Work

If the tank is not pumped out regularly, the sludge or scum layers get so thick that they will be drawn into the tile bed by the wastewater. This overloads the system, and the tile bed will not be able of distributing the wastewater into the ground. This causes "break outs". Breakouts occur when partially treated wastewater seeps onto the ground surface.

It can contaminate well water supplies, and can be a health hazard to people. If too much water is dumped into the tank the tile bed will become overloaded and breakouts will happen as well as the possibility of the waste backing up into your house! Also if household chemicals, soaps and detergents are washed into the septic tank, the bacterial action needed to process the waste will be slowed or killed, and the septic system will fail!

Septic Signs and Symptoms

If the septic system is not working there will be signs of trouble. Some of them may be:

- Grass over the tile bed is unusually green.
- The ground over the tile bed is spongy to walk on.
- The plumbing in the house takes longer to drain away e.g. sinks etc.
- You can smell the sewage in the area.
- You can see gray or black liquids on the surface of the ground.
- Your neighbour's well water shows contamination (if it is close to your septic system).

Environmental Safety

Pesticide Storage and Handling

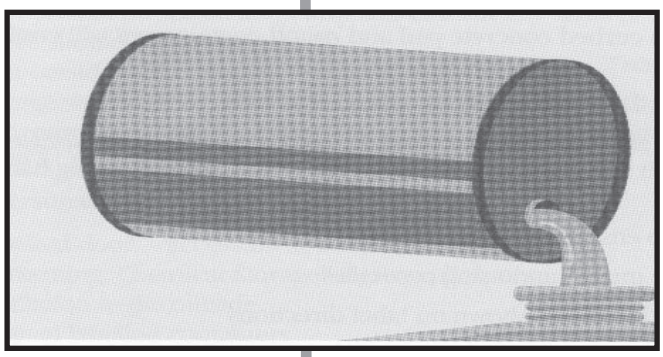
Although pesticides are harmful to plants, insects, animals and people, they help increase farm crop production. They help farmers grow more acres of crops with less work. Unfortunately pesticides can show up where they are not wanted – in surface and ground water. When ground water is contaminated with pesticides it cannot be used for drinking. When surface water is contaminated with pesticides it runs into streams and lakes, effects water quality, can harm fish, wildlife and people. Pesticides must be prevented from getting into water sources.

Pesticides can cause immediate health problems or problems many years later. If a large amount of pesticide gets into a water supply perhaps due to a spill, it can cause immediate (acute) health problems such as skin rashes, nausea, eye irritations or other toxic effects after even short contact. How serious the effects will depend upon how toxic the pesticide is, and the amount of exposure. In Ontario, drinking water supplies so far do not contain high levels of pesticides. The concern is that repeated or exposure over a long time to even a small amount of toxic pesticide could cause chronic health difficulties that may not appear for many years.

What can you do to protect the environment from pesticides?

- Take an Ontario Grower Pesticide Safety Course.
- Handle pesticides very carefully.
- Make sure everyone knows what to do if there is a leak or spill.
- Avoid storing pesticides on the farm – only buy what you will use.
- Make sure you have a safe storage area.
- Dispose (get rid of) empty pesticide containers and the rinse water safely.

All containers that hold pesticides should be triple rinsed or pressure rinsed into a spray tank. This prevents water pollution at disposal sites from seepage. Another reason to rinse is to save money. Between $2.00 and $10.00 worth of chemicals can remain in a 10-litre container.
.
Rinse #1 is to save money and make sure all the chemical gets used. Rinse #2 is for your safety. Rinse #3 is for the safety of the environment.



Reprinted with permission from “Water Management – Best Management Practice”, 1994. Ontario Ministry of Agriculture, Food and Rural Affairs and the Ontario Federation of Agriculture.

When using pesticides, use containers and bulk containers that can be returned whenever possible. Punctured, empty containers should be taken to recycling depots, and if the container cannot be recycled or re-used, take it to a licensed landfill site for disposal.

Have An Emergency Plan

Every farm should have a written plan that farm workers can refer to easily if needed. The plan should outline how to deal with an emergency. It should include: location of emergency equipment, emergency telephone numbers, clean up methods and the necessary steps to follow in case of a spill or fire.

Fertilizer Storage and Handling

Almost every farmer uses some kind of fertilizer to increase crop production. The nutrients in the fertilizer can be dangerous for animals and humans if they reach ground or surface water. Nitrate is the highest risk as it quickly dissolves in water. It can affect the health of young livestock and babies. Only small amounts of fertilizers are stored on farms. But there are other sources of nitrate that can be a hazard on a farm. These would include septic systems, barnyards, manure storage, silo leakage and the rotting of organic matter. The government has strict limits on the amount of nitrate that is safe in drinking water. Water testing has shown that the nitrate levels in some drinking water are unsafe.

Fast Farm Safety Fact:
Nitrate from septic systems, manure, synthetic and mineral fertilizer, and legume plowdown crops is a more common contaminant of rural ground water than pesticides.

Water Wells, Best Management Practices

What can you do to protect the environment from fertilizers?

- Store and handle fertilizers safely.
- Don't store large amounts of fertilizer on the farm.
- Only buy what you will use.
- Make sure the storage area is safe and meets all requirements.

Petroleum Products Storage and Handling

Liquid petroleum products such as gasoline, diesel fuel and kerosene need to be stored safely to prevent spills and leaks. Any of these substances will move through the soil very quickly and contaminate ground water. Did you know that a small leak of one drop per second may release about 900 litres of gasoline into the ground in one year? It only takes a few liters of gasoline to severely pollute a farm's drinking supply. It is almost impossible to smell or taste in the water, however it can cause health difficulties. Explosions are another hazard from petroleum products. Vapours from an underground leak can build up in basements, sump pits or other underground structures and explode! Above ground and under ground storage tanks and piping must be checked regularly for corrosion. Even new tanks and pipes can leak if they are not installed properly. One way to find out if you have a leak is

to keep track of how much you use, and subtract that amount from how much you received. If it is not the same, start looking for a leak!

What can you do to protect the environment from petroleum contamination?

- Make sure storage tanks are installed properly.
- Check tanks and pipes for corrosion regularly that could cause leaks.
- Keep track of the amount of fuel used and subtract it from the amount of fuel purchased.

Disposal of Farm Waste

Farm wastes can cause health difficulties and may affect soil and water quality if they are not stored or disposed of properly. Examples of farm waste would be:

- Dead livestock, poultry or other animals.
- Animal health and care products such as drugs, disinfectants etc.
- Packaging materials such as seed, fertilizer, oil, paint etc.
- Preservatives such as creosote, stain, cleaners, grease, oil etc.

Farmers may have many different things they have to dispose of. Some examples would be old farm buildings, construction materials and worn out machinery and equipment. Anything that can be salvaged to be reused again should be stored in a safe place away from children or animals. If it can't be re-used or recycled it might be difficult to dispose of. Burying or letting these items collect in numbers on the farm is not good management practice. Old materials and farm machinery can affect the soil and water as they deteriorate. Leaving them behind the barn can pose safety problems for children and livestock.

What can I do to protect the environment from farm wastes?

- Reuse or find someone else who can reuse all the material and equipment.
- Recycle whenever possible.
- Take other waste to a licensed landfill site.
- Compost organic waste including leaves and light brush.
- Dispose of toxic wastes and dead livestock safely.
- If you have a dump on your farm, stop using it.
- Make a list of what you think is buried and how much.
- Find out how to decrease the risk of pollution or contamination from these materials.

Livestock and Agricultural Waste

The risk of ground and surface water contamination increases when livestock manure or other organic materials are stored in one place. The storage area must be built to meet all requirements and be large enough to safely store all the waste produced on the farm. If it is not built, maintained or operated properly it is a high risk for overflow or leaks that can contaminate drainage systems and surface or ground water. A small leak may go unnoticed, but it could flow through tile drains or well casings into the water system. If a manure storage facility bursts or breaks down it can cause a great deal of property and environmental damage, killing fish and contaminating streams and rivers.

The storage area must be large enough to store the waste until it can safely be spread. Spreading should only be done when:

- The crop condition is suitable for nutrient use.
- The soil is dry enough to resist surface compaction.
- Soil conditions are able to avoid surface and ground water contamination.

There should be fences, barriers and signs posted warning of the dangers around liquid and semi-solid manure storage areas. All workers who work in and around the storage area must know how to operate it safely, so training is very important. Remove all equipment from the storage area for repairs. Safety equipment needs to be available, and safety precautions should be followed when working around these areas.

What can I do to protect the environment and people from agricultural waste storage?

- Make sure the storage area is big enough to handle all the waste produced on the farm from fall to spring.
- Make sure by checking regularly that the storage is in good condition, with no leaks or damage.
- Repair any problems quickly.
- Check regularly to make sure the fences are in place and warning signs are posted.

Livestock Yards

Livestock manure contains high levels of nitrate and bacteria that can contaminate ground and surface water when found in places such as barnyards, livestock holding areas and feedlots. Livestock yards should be located away from downward slopes that can take the waste to a waterway and away from tile inlet drains so they don't pollute surface water. To protect ground water sources from being polluted the following safety precautions should be taken:

- The livestock yard should not be located over coarse textured soils that will allow the waste to filter into the soil.
- It should not be located where the water table is near the surface.
- It should not be located if the bedrock is within a few feet of the surface.
- It should not be located where the contaminated run off can flow from the yard directly onto bedrock or soil that is permeable (will allow the waste to seep through the soil).

It more recent years, there are more people living on small acreages in rural areas that do not farm. At times the smells from the livestock yard can cause problems with the neighbours. Good planning and good waste management will help avoid complaints.

What can I do to protect the environment from pollution from livestock yards?

- Make sure every farm has a system to collect and store manure.
- Make sure there is a system to collect the polluted run off from the yard.
- Check the soil to make sure it is suitable for a livestock yard before building.
- Check to make sure where the nearest water source is located.
- Make sure that clean water is directed away from the livestock yard.

Fast Farm Safety Fact and Tip:
When you test well water for biological contamination you are testing for two common forms of bacteria: total coliform - a bacteria that is found in animal wastes, surface soils and vegetation. E. coli – bacteria that live in the intestines of warm-blooded animals, their presence indicates fecal contamination of the water supply.

Water Wells –Best Management Practices

Silage Storage

Silage is an important type of feed for livestock. When it is harvested and stored correctly it does not cause pollution. However, if not handled or stored correctly, liquid seepage with high unhealthy levels of nutrients and acid can escape from the silo. This liquid can pollute the soil and surface and ground water sources. Silo seepage is very toxic and can be the most polluting substance produced on the farm. If it gets into a surface water source such as a stream, it can remove so much oxygen from the water that fish and other aquatic life will die. The seepage can also increase levels of acid, ammonia, nitrate and iron in the water to the point that it will smell unpleasant and can cause health difficulties for humans and animals that drink it.

What can I do to protect the environment from silo seepage?

- Make sure silage is stored at the correct moisture level.
- Make sure silage is stored at least 91 metres from a well and at least 152 metres from surface water.
- Heavy clay around the silo will prevent seepage into ground water.
- Collect any seepage that occurs.
- Make sure any seepage does not get into ground water, water wells or surface water.
- Make sure all parts of the silo are in good condition and check them regularly (including the lining).
- Make sure repairs that are needed are done quickly.

Water Management (1994) Best Management Practices. OMAFRA & OFA.
Ontario Environmental Plan (Second Edition, 1996) Agriculture and Agri-Food Canada.

Milking Centre Washwater

Dairy farms produce washwater. Washwater is a substance that is a by-product of the milking center. It needs to be handled carefully so it doesn't pollute ground or surface water. Washwater may contain ammonia, nitrate, detergents, phosphorous and bacteria. Every dairy farm needs a system to get rid of the washwater safely so it doesn't pollute the environment. The size of the disposal system should be big enough to handle all of the washwater that is produced each day. The amount of washwater produced will depend on the number of dairy cows, the type of milking preparation and the equipment used. A dairy milking center can use between 225 litres and 900 litres of water each day. A common way to handle washwater is to have a treatment trench system. The first rinse is collected to reduce the amount of milk solids that enter the sediment tank and treatment trench. This first rinse can be used to feed calves.

What can I do to protect the environment from milking center washwater?

- Check the washwater system on the farm regularly.
- Make sure it is in good condition, and make repairs promptly.
- Make sure it is large enough for the number of cows and type of equipment being used.
- Decrease the amount of water used in the milking center.
- If using a treatment trench system, remove the first rinse.

Noise and Odour

There is nothing better than the smell of fresh cut hay, or cows mooing right? Wrong! For some people the smells and odours that come from farms can be very irritating. It depends upon the individual person. On farms it is almost impossible to set limits for odours and noise, but whenever possible you should think about your neighbours. At times conflicts over noise and odours can be avoided by using a little common sense.

What can you do to protect the neighbourhood against excessive noise and odours?

- Make sure manure is stored in a way that it will not bother your neighbours.
- Make sure you spread the manure in a way the will not bother your neighbours.
- Whenever possible schedule the removal and spreading of manure when it will cause the least amount of disruption for the neighbours i.e. not the day before their outdoor garden party!
- Try to keep the exhaust systems on equipment in good working order.
- Try to avoid jobs that will cause a lot of noise during late evening hours.
- Not everyone enjoys the sound of dirt bikes and ATVs going by at high speeds alongside the property fence line.

Water Efficiency

In the past the amount of available water in Ontario has never been a problem. Ontario has a lot of streams, rivers and lakes. Unfortunately, the amount of available water is becoming a problem, especially in southern Ontario. This is because southern Ontario has the largest populated area of the province and therefore they use more water.

On the radio in the past few years, you have heard about water bans. Cities have had to limit the amount of water being used for lawn maintenance, etc. Some cities and towns have installed water meters on homes to monitor and charge the residents for how much water they use. Some communities are having problems getting enough water,

Fast Farm Safety Facts and Tips:
The average Canadian uses approximately 350 litres of household water per day. Farming operations will use more.

Water Management, Best Practices.

and have had shortages. There is a larger demand for water from municipalities (towns and cities), industries and agriculture. Ground water sources such as wells can't meet all the demands. Streams that are fed by ground sources also may be down during certain parts of the year because of irrigation requirements. When ground and surface water supplies are reduced there is more chance of:

- Water shortages for rural and urban residents
- Damage to fish populations and aquatic eco-systems
- Conflicts around water sources and rights

In some areas several farmers may depend upon one stream to irrigate their crops. When the weather is dry, and there has not been a lot of rain, the levels of the streams and lakes are low. Therefore, one farmer who irrigates and is up-stream from the other farms may leave little or no water for his neighbours to use downstream.

What can I do to protect water sources in Ontario?

- We all need to recognize that Ontario water supplies are limited.
- We all must change how we manage and use water so we can reduce the amounts used e.g. no more half hour showers!
- Replace equipment with new ones that use water efficiently.
- Repair any water leaks, anywhere on the farm.
- Grow crops that will do well with the local conditions and will not need a lot of irrigation.
- Make sure livestock troughs do not leak.
- Prevent spills or overflows of livestock troughs.
- Install enough water facilities to reduce livestock from competing for water.
- Reduce livestock watering needs by providing shade and ventilation in the summer months.
- For swine operations reduce water pressure on nipple waterers to reduce spills.

Energy Efficiency

There are two main sources of energy used in farming operations. They are from burning fuels such as gasoline, diesel fuel, and kerosene and electricity. These are natural resources that are limited and expensive. Burning fuels produces air pollution and contributes to global warming. By using energy efficiently the cost of growing agricultural products is reduced, which computes to greater profits.

Another way of reducing energy costs is to limit the use of fertilizers and pesticides. How are they related to energy? These products use a lot of energy to manufacture them. To use energy efficiently on the farm two things have to happen. By becoming more efficient, the amount of energy used will decrease for the same amount of production. The

second thing is to increase the amount of crop produced without increasing the amount of energy used. How can you do this? Even things that may seem very small can add up if everyone does their part. Some ways would be to use energy efficient equipment such as: lighting, heating, ventilation, refrigeration, crop drying, crop conditioning, feed processing, crop inputs and equipment use. The bottom line is energy efficiency will save the farmer money and will reduce the amount of damage done to the environment.

What can I do to use energy efficiently?

- Turn off the stereo and TV at 6 p.m. each night (Just Kidding –wanted to see if you are paying attention!)
- Look at all the equipment in the house and on the farm and look for ways energy use can be reduced while still getting the job done.
- Reduce the use of chemical fertilizers – have the soil tested to find out what nutrients the soil needs.
- Consider crop rotation and livestock manure to improve the soil.
- Keep all equipment maintained so it is energy efficient.
- Replace old equipment that uses a lot of energy with new, more efficient models.
- When possible use fluorescent lighting, timers etc.
- Gear up and throttle down – this reduces the amount of fuel used by the tractor. The engine speed of the tractor is reduced when a higher gear is used to maintain the same ground speed.

Be Good To The Soil

Ontario crops depend upon healthy, productive soil. With the disappearance of a lot of good farmland due to urban expansion more attention has to be paid to the farmland that remains. Every farm should have a soil management program that protects it from erosion by water and wind, maintains or improves the quality of the soil, and prevents runoff from land into surface water sources e.g. streams, rivers and lakes. Soil erosion occurs when soil particles are moved from one place to another because of wind, water or working the soil. Sometimes soil erosion happens and there is nothing you can do about it. We can't control the amount of rainfall we receive. We can't change the type of soil on our farms. We usually can't do much about the slope of the land. However, we can change the ways we work up the soil, and change the crops produced to decrease potential soil erosion. This makes good farming sense as soil that has lost most or all of its topsoil will not produce as much crop. In fact, sometimes it will produce as much as half the expected amount.

Soil erosion can be reduced by increasing the amount of organic matter in the soil. Organic matter can be left over crop residue, manure

and soil life. This increases the quality of the soil. If soil is allowed to become degraded, it takes a long time for it to recover and become productive again. Commercial fertilizers will not help a lot. Runoff from soil erosion also pollutes streams, lakes and rivers. Whatever chemicals are in the soil runoff will pollute the water, can kill fish and other aquatic life, and can contaminate water sources for people as well.

What can I do to protect the soil?

- Check the land for places where erosion may happen.
- Find out what can be done differently to prevent it e.g. change the crop, use different tillage equipment.
- Use buffer strips – a 3 metre strip of vegetation along side of the water course e.g. stream or lake to prevent soil erosion and pollution.
- Keep the soil in good health – it should have adequate pore space for air and water movement, good supply of nutrients, high levels of organic matter, good drainage and active soil life e.g. earthworms, fungi, bacteria.
- Rotate crops to increase the amount of organic matter.
- Retire marginal land – land with physical features that will limit crop production and the use of farm implements.
- Re-plant marginal lands with native trees and grasses.

Nutrient Management

Every Ontario farmer uses nutrients such as chemical fertilizers, manure, legumes or sewage sludge to improve crop production. These however contain high levels of phosphorous and nitrate, two nutrients that can contaminate ground and surface water. These nutrients get into water sources for three main reasons: The farmer doesn't test the soil and uses too many nutrients for the soil or crop conditions, the nutrients were applied when the crop was not able to absorb them, and the way it was applied was not the right way from the crop or soil conditions.

What can you do to practice good nutrient management?

- Use the right nutrient, on the right crop, at the right time, at the right rate.
- Take soil samples from different areas of the field to get a good idea of what nutrients the soil needs.
- Keep good records of soil tests, crops grown, nutrients added and crop yields.
- Make sure the chemical fertilizers, manure and sludge are worked into the soil well.
- After adding manure, or legume cropping, retest the soil, then reduce the amount of fertilizer needed.
- Consider cover crops – a crop that is grown for ground cover rather than harvest. They absorb left over nutrients, and can release them to the next crop and will reduce the risk of nutrients getting into ground water.

Manure Management

Manure is organic waste. Livestock and poultry on farms produce a lot of waste that can be recycled back into the soil to improve the quality and crop production. But they must be used properly. If manure is not managed properly it can pollute the soil, water and air. That is why manure waste systems must be designed, built, maintained and managed correctly. Some farmers use other waste materials that are not produced on the farm for fertilizing crops. Examples would be sewage and septic tank sludge, food processing wastes, industrial by-products and composted materials. Permits must be obtained from the Ontario Ministry of Environment and Energy before using these materials on their land.

What can I do to practice good manure management?

- Test the soil before adding organic waste or fertilizer to the soil.
- Test the nutrient value of the manure before using.
- Adjust the amount of fertilizers used based on soil and manure tests and crop needs.
- Learn how to apply manure and other organic wastes safely.
- Always get necessary permits before applying off the farm organic wastes.
- Monitor tile drains – check drain outlets every 2 hours while applying manure, and at least 24 hours after for changes in the water. A change in colour, increased solids or foaming indicate contamination.
- Have a written manure management plan for your farm – the plan should include – testing results, safe application rates, and an emergency action plan in case of spills or system failures.

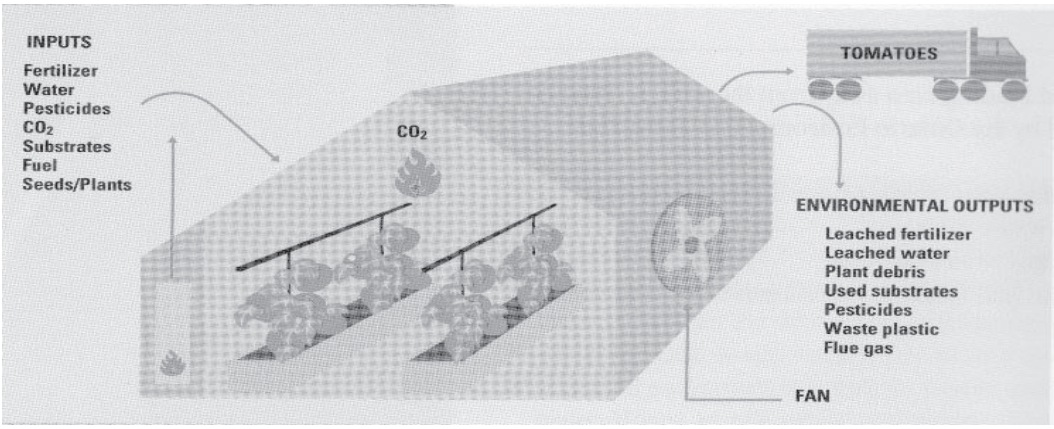
Horticultural Crops

Horticultural crop production in the field or in greenhouses requires high levels of fertilizers, pesticides and packaging. These levels can contaminate the soil, water and air if not managed correctly. Farmers growing horticultural plants and crops often have to meet time schedules for growing and harvesting. Good planning and preparation helps them meet their demands without damaging the environment. Production methods can at times stress the surrounding environment for example with noise from sprayers, or bird control systems, and wastes from the crops e.g. culls.

What can you do to produce horticultural crops and be friendly to the environment?

- Re-circulate irrigation water in greenhouses.
- Review all production methods to identify any hazards to the environment.
- Use methods that would reduce the risk of contamination to soil,

water and air.
- Recycle – Reduce – Reuse whenever possible.
- Limit the noise produced – use devices to reduce noise levels.
- Properly dispose of all waste materials to be environmentally friendly.



Reprinted with permission from Water Management –Best Management Practices (1994) OMAFRA and OFA.

Field Crops

Every farmer's goal is to plant and harvest the best producing crops with the least cost possible. This increases profits! Their ongoing goal is to do this each and every year. In order to achieve this goal, the quality of the soil and water must be maintained or improved on an ongoing basis. This requires good crop management skills which include:

1. **Preventing soil erosion by wind or water.**
- Use proper tillage and planting methods to reduce slope problems.
- Choose crops that protect the soil from erosion.
- Leave plant residue (leftovers) to protect the topsoil.
- Make sure there is always 5 – 10 cm. of grass height on pasture land.

2. **Improve the quality of the soil.**
- Rotate crops to increase or maintain organic matter in the soil.
- Rotate crops to control insects and weeds.
- Use cover crops – crops that are grown for ground cover rather than harvest. They absorb nutrients and release them to the next crop.
- Use winter cover crops – crops that are left in the fields over the winter for soil protection, and are tilled the next spring.
- Use cross slope tillage and planting – the slope is tilled and planted across the slope to slow down the flow of water and allow for more absorption into the soil. **Only use this method if the slope is not too steep. It is not worth a tractor rollover!**

Streams, Ditches and Floodplains

Proper management of streams, ditches and floodplains protects the quality of the water for the landowner, the people living downstream, and the fish and wildlife that depend upon the stream. The use of buffer strips, a permanent strip of vegetation along side a stream, ditch or lake prevents soil erosion, water pollution and helps provide a natural habitat for fish and wildlife. Good farm management should also prevent livestock from spending time in the water or grazing along side it. Health difficulties for people and herds can be reduced if livestock wastes do not get into the waterways. Early environmental damage can be identified by a decrease in number of fish in water source. Good stream, ditch, floodplain and drain management can prevent economic and environmental costs.

What can you do to protect streams, ditches and floodplains?

- Check the condition of stream banks regularly for soil erosion
- Check tile outlets regularly for soil erosion damage
- Keep livestock away from the water as much as possible
- Keep a buffer strip of natural vegetation along side waterways
- Do not intensively crop floodplains

Wetlands and Wildlife Ponds

A wetland is a mucky, low-lying area that can be covered with shallow water for part of the year. Some wetlands can have water up to 2 metres deep and can have fish in them. Wetlands typically offer homes for many different plants, birds, animals and fish. Some examples of wetland wildlife would be ducks, grouse, shorebirds, muskrats, mink, deer, frogs, turtles and snakes. Some examples of the plants found in a wetland are cattails, water-lilies, wild rice, grasses and trees such as willow, white cedar and silver maple. In recent years wetlands are home to many rare or endangered plants and animals that no longer are seen in other areas.

Wetlands are very valuable and are found throughout Ontario. They often will help recharge groundwater, by allowing the water to move into and through the soil below them and then into the water table. If their resources are harvested such as timber and wildlife, it must be done very carefully so the wetland is not damaged and remains productive for the years to come. Wetlands are usually located between uplands, which are often cropland and water systems. Wetlands filter water, help prevent flooding and help to conserve and recharge ground water supplies. Examples of wetlands include marshes, swamps, fens and bogs. They can be large or small, but regardless of size are very important for wildlife. When livestock are allowed to graze or enter wetland areas to drink it affects the soil, plant life, water supply

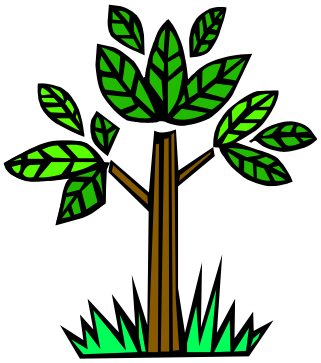
and water quality. When livestock access is limited, you will find a healthy wetland with little evidence of soil compacting or erosion, and little damage to the grasses and trees. When access is not limited the wetland will be damaged. Signs of damage will be soil compaction or erosion, overgrazing, murky water and foul odours coming from the water.

What can you do to protect wetlands and wildlife ponds?

- Leave a buffer strip between the wetland and cropland.
- Harvest renewable resources such as timber and wildlife in a responsible way so the plant and animal population will continue on.
- Don't drain wetlands if at all possible.
- If it is necessary to remove water, take it only when it has the least effect on wildlife.
- Limit livestock access in wetlands.

Woodlands and Wildlife

Woodlands are very important to the environment. Trees help the environment by improving air and soil quality by releasing oxygen and transferring carbon to the soil. Woodlands can help maintain a normal level of the water table, and improve the quality of ground water. Woodlands also provide windbreak and shelterbelts. They are rows of trees planted at right angles (90 degree angles) to the prevailing winds. They slow down the wind speeds at the ground level. Coniferous trees such as evergreens are often used. Trees also create fencerows and provide woodlots. These all protect land from erosion.



Woodlands can also be shelter for buildings and livestock from severe weather conditions. They provide wildlife with food, cover and space. Tall trees provide homes for songbirds, and cavity trees are home to raccoons, owls and squirrels. Healthy ponds with wooded areas are ideal habitat (homes) for many endangered species. They need to be protected or certain wildlife will no longer survive. When land is too easily eroded, stony, hilly or wet to be productive cropland or can't be used for pasture, it should be planted with trees and shrubs. Some areas of Ontario have less than 10% of forest cover!

Woodlands should be managed well to enable the growth of young trees and other plants. Diseased or defective trees should be removed, but some should be left for wildlife habitat. Make sure that woodlands are not intensively grazed. Harvesting a woodlot can be a good source of income, but should be done properly to protect future resources. A correct woodlot harvest rarely removes more than on third of the trees over a 10 – 20 year cutting cycle.

What can you do to protect woodlands and wildlife?

- Learn how to manage your woodlot effectively.
- Retire marginal land from agricultural use.
- Harvest woodlots conservatively to protect habitat.
- Remove defective or diseased trees.
- Plant trees and shrubs in areas that cannot be productive crop or pasture land.
- Make sure wildlife is protected and harvested in moderation during identified hunting seasons.

Ontario Environmental Plan, Second Edition. (1996) Ontario Ministry of Agriculture and Agri-Food.

Activities

Activity #1 Mad-Minute – Noise and Odour
Divide into pairs or small groups. Try to name as many things as possible on the farm that can cause unpleasant odours and loud noises. What can be done to limit these odours and noises? Report your lists back to the large group.

Activity #2 – Watch That Water!
Do some research on your farm. Identify all the areas that use water. Now identify what can be done to limit the amount of water used.

Activity #3 –Water Samples Are Simple!
Have the group participate in obtaining a water sample as part of a meeting. They also could be given water bottles to take home and have their own water sampled in the coming week. When the water sample is returned, they could bring a copy of the test, so members could see what it looks like and learn how to read it.

Activity #4 – Senior Activity – Homestead Review
Use a blank piece of graph paper and give the members copies. Have them draw an overview map of the homestead of their farm. Make sure they include the following: the location of the well or wells; the house; the septic system; fuel storage area; oil tank for the house; pesticide storage area; livestock barn(s); silo(s); livestock yards; manure storage areas; old dumps etc. Ask them to identify any areas of potential risks e.g. slopes to waterways, abandoned wells; etc.

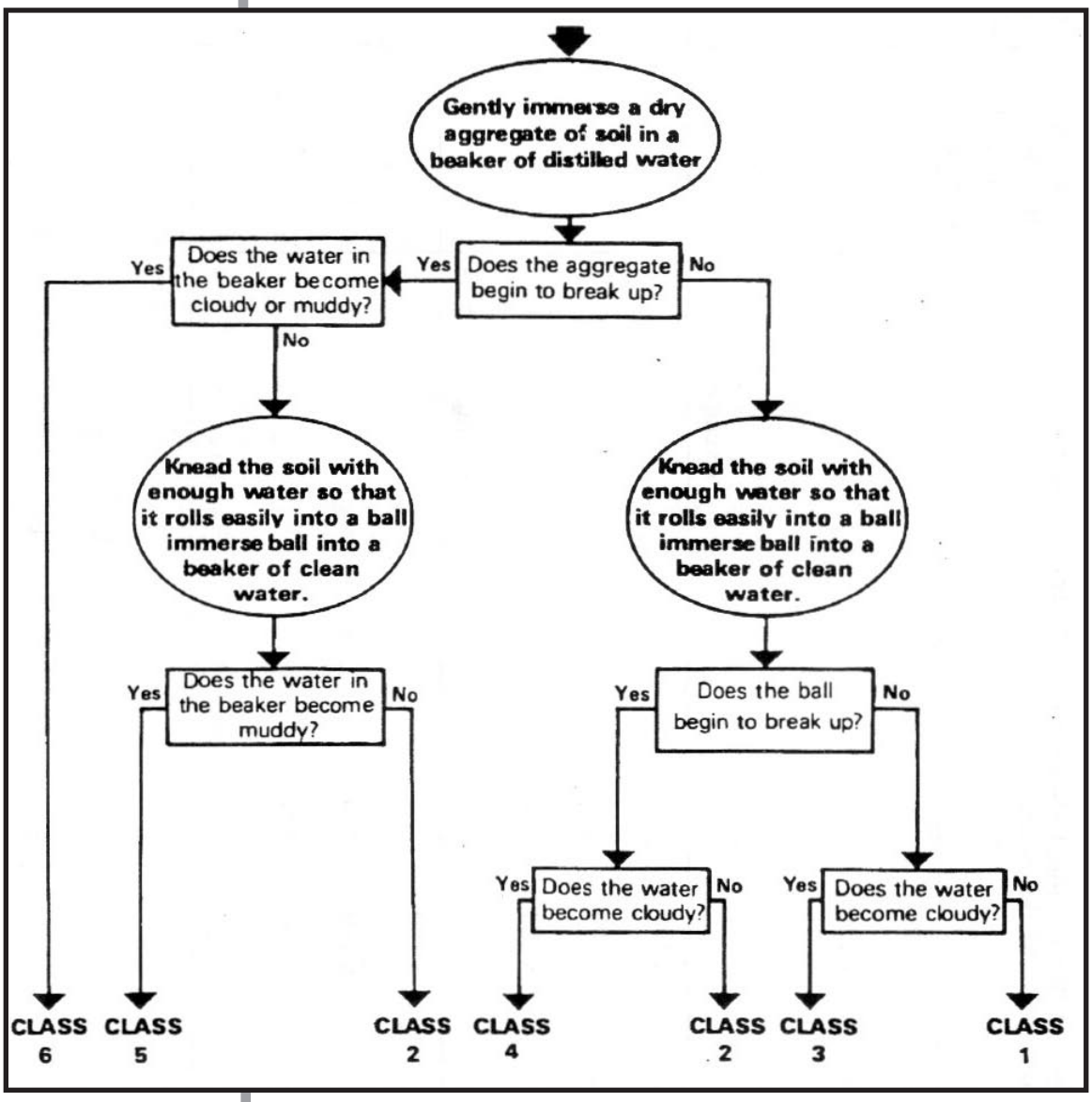
Activity #5
Get a copy of the most recent Ontario Environmental Farm Plan Workbook and review the worksheets. Senior members could then create an “action plan.” If they were able to, identify changes to the farm, and get approximate costs for the changes.

Activity #6
Visit a wetland. Have members identify the following: tracks of different animals that come to the wetland: different species of animals that live there; different kinds of plant life; signs that indicate if the wetland is healthy or not, or if the wetland area is being damaged in any way.

Activity #7 – Soil Testing

Here is a fun way to test the soil ability to erode. You must use distilled water for this activity. Distilled water can be found in most drugstores. Use clean jars for your experimental "beakers." The ovals in the diagram below are the instructions. For this activity, class one is the least easily eroded and class 6 is the most easily eroded. Have the kids bring some soil samples from home, or youth leaders/senior members could go out and bring soil samples from different areas that would demonstrate how different soils erode.

Reprinted from *Be Loyal To The Soil* (1998) 4-H Manual. Ontario 4-H Council.



Activity #8

Look at the diagram below of a pesticide storage area. There are 16 things that are being done correctly in this diagram, and one thing that is not. See how many you can identify:

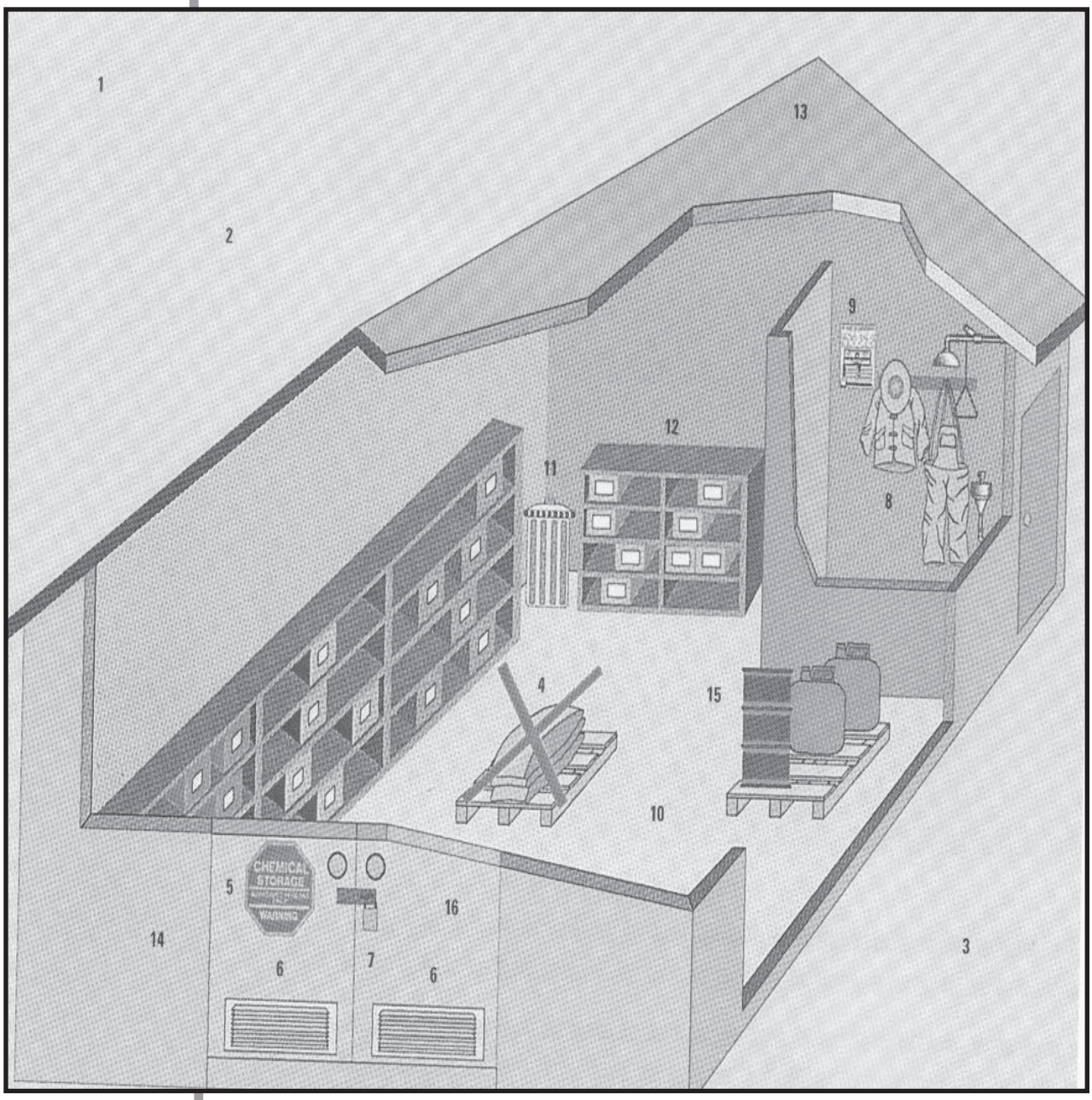


Diagram and information reprinted with permission from *Pesticide Storage – Best Management Practices*, Agriculture & Agri-Food Canada.

See the answers on the next page.

STORAGE

CHECKLIST

☑ 1. **FOOD AND LIVESTOCK KEPT AWAY** – pesticides must be stored in such a manner that the pesticide will not come into contact with food or drink intended for human or animal consumption.

☑ 2. **PRODUCTS STORED SAFELY AND SECURELY** – pesticide products must be stored in such a way that the health and safety of any person are not impaired.

☑ 3. **ENVIRONMENTAL PROTECTION** – stored products must not contaminate the environment or other pesticides. Site storage away from surface water and natural areas.

☑ 4. **ONLY PESTICIDES ALLOWED IN STORAGE** – pesticide storages must only be used for the storage of pesticides.

☑ 5. **SIGN ON DOORS** – a Chemical Storage Warning sign must be permanently affixed to or adjacent to the outside of each entrance leading into the storage area.

☑ 6. **VENTILATION** – the storage should be ventilated to the outside atmosphere. Either natural ventilation or mechanical ventilation may be used to exhaust fumes from the storage, and improve air quality.

☑ 7. **LOCKED DOORS** – the door must be locked to prevent theft and unauthorized entry.

☑ 8. **PROTECTIVE CLOTHING AND RESPIRATORY EQUIPMENT AREA** – these must be readily available and stored so that they do not become contaminated, e.g., in an adjacent room or a nearby building. Protective clothing and respiratory equipment includes: chemical-resistant gloves and apron, long-sleeved shirt and pants or coveralls, boots, waterproof hat, goggles, face shields, and respirators.

☑ 9. **CONTINGENCY PLAN** – emergency telephone numbers must be displayed in a permanent place close to a telephone. Numbers should include hospital, ambulance, physician, poison control centre, spills action centre, fire department, police, and the Ministry of the Environment.

☑ 10. **FLOOR IS IMPERMEABLE, CURBED, AND SEALED** – the storage area should have a floor that does not allow material to leak into or through it. It should NOT have floor drains of any sort. Many operators use sealed concrete. In order to contain any spills, there should also be a curb around the entire floor perimeter of the storage facility. The curb should be adequate to contain 110% of the largest containment vessel or 10% of the aggregate volume of all containers, whichever is the larger of the two. A curb height of 50-100 mm (2-4 in.) is usually adequate.

☑ 11. **ABSORBENT MATERIALS AVAILABLE** – materials such as sawdust, soil, and kitty litter should be available for a spill cleanup.

☑ 12. **SEPARATED BY PESTICIDE TYPE** – the area should be set up so that herbicides are stored separately from insecticides and fungicides.

☑ 13. **STRUCTURE AND PESTICIDES KEPT DRY** – the storage should be kept dry and secure to protect the stored chemicals. Moisture can cause some packaging material to rupture and split, or labels to become difficult to read.

☑ 14. **FIREWALLS** – if the pesticide storage facility is constructed within another building, the interior separation walls of the pesticide storage should have a fire resistance rating of not less than one hour. The primary entrance to the storage area should be from the outside.

☑ 15. **PRODUCTS KEPT OFF FLOOR USING PALLETS** – keep containers off the floor with pallets to maximize the space available for containment of a spill.

☑ 16. **DOOR SIZES ADEQUATE** – make sure you consider the size of the doors so that bulk pesticides may be stored.

References

Be Loyal To The Soil (1998) 4-H Manual. Ontario 4-H Council www.4-hontario.ca

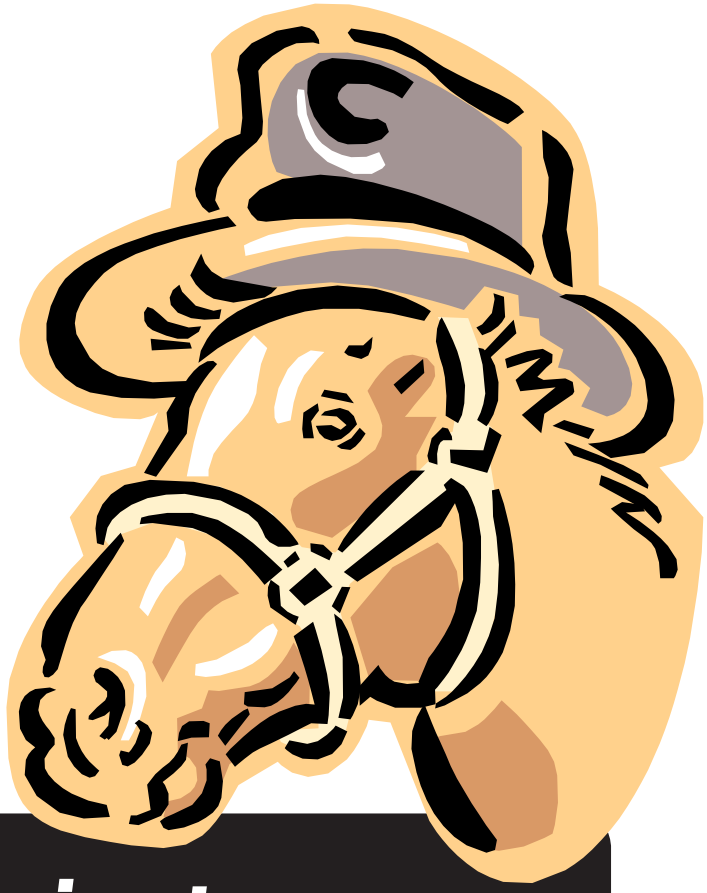
Ontario Environmental Plan (Second Edition, 1996) Ontario Farm Environmental Coalition.

Pesticide Storage, Handling, and Application (1998) Best Management Practices. Agriculture & Agri-Food and Canada and Ministry of Agriculture, Food and Rural Affairs

Safe Water. Water Safety for Cottage and Rural People. (n.d.) Grey Bruce Public Health Unit. Owen Sound, Ontario. www.publichealthgreybruce.on.ca

Water Wells (Revised Edition, 2003) Best Management Practices. Ministry of Agriculture and Agri-Food and the Ministry of Agriculture, Food and Rural Affairs.

Water Management (1994) Best Management Practice. Ministry of Agriculture and Agri- Food and the Ministry of Agriculture, Food and Rural Affairs.



Farm Safety Project

Safe Animal Handling

To Practice Farm Safety You Must Farm Safely Everyday!

4-H Ontario

ONTARIO'S MUTUAL INSURANCE COMPANIES

Protecting Rural Communities For Over 150 Years!

SAFE ANIMAL HANDLING

Roll Call #1: What is your favourite animal and why?
Roll Call #2: Which farm animal is your favourite and why?
Roll Call #3: Name one thing that you need to do to stay safe around animals?

LIVESTOCK AND AGRICULTURE

In agriculture different animals have many different uses. Some animals are kept as pets on the farm, but the majority are kept for meat, eggs, dairy products, wool and sometimes recreation.

Many animals on the farm can have a "dual purpose." That means they are used for more than one thing. For example sheep provide us with meat and wool, which is made into clothing. Certain breeds of goats can be used for wool, meat, and dairy products such as milk and cheese.

The term livestock refers to animals on farms that are kept for sale, for food, or other products. Farm animals such as cattle, sheep and horses were domesticated centuries ago and have become the most common types of farm livestock. There are less common types such as elk, bison, llamas, emus and alpacas just to name a few. These animals are referred to as alternative livestock.

Livestock Safety

In agriculture animals are part of our livelihood. For the most part, domesticated animals are friendly. There are times however, that animals can feel threatened or become aggressive because they are ill or hurt. It is important to be able to "read" an animals behaviour to keep us safe when handling them. Farm animals have been the cause for injuries that cause pain, lifelong disabilities, and even death. Injuries caused by animals include broken bones, crushed limbs, missed days of work and lost income, and unnecessary medical expenses.

When working around animals precautions must be taken regardless of how tame, friendly or calm the animal may appear. An animal's instinct will often override their normal behaviour. At times, regardless of how calm and easy they are to be around, their instincts can cause them to react in unexpected ways that can put you, others and the animal in harms way. Awareness of the animal's instinct can help prevent injuries and accidents. To prevent animal related injuries a person needs to have good judgment, understanding, training and experience. Common sense and knowledge can keep you safe and help you enjoy being

Safe Animal Handling

Fast Farm Safety Facts:
In Canada:
*Bull attacks account for 42% of livestock related fatalities. Most bull attacks occur in stockyards or open fields – not in barns.
*Bull attacks account for 6% of livestock related injuries requiring hospitalization.
*Only 1 in 20 people survive a bull attack.

(Livestock Handling Safety)

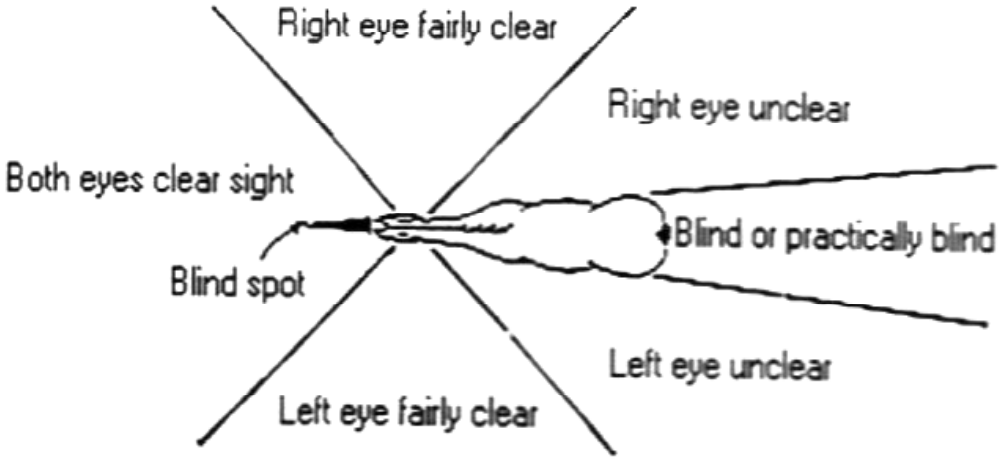
around farm animals whether they are pets, for show, meat production, or recreation.

Animals: What do you really know about them?

Few rural workers consider livestock a potential danger. However, over recent years specialization in agriculture has changed animal handling methods. The large size of many herds makes animal handling awareness very important for efficient and safe farm operations.

Whether large or small, livestock or pet, anyone who has been around animals knows that each animal comes with its own personality, just like us! However cattle, swine and horses see the world differently than humans. For example, cattle have close to 360-degree panoramic vision but a sudden movement from behind them can scare or "spook" them. Horses have close to 320-degree vision as well but have blind spots immediately behind them and in front of them. A human has approximately 180-degree range of vision. A horse does not see three dimensionally, and has weak binocular vision. Binocular vision is when only one image is seen (like people). However, horses, like cattle see different images out of each eye, unless looking straight ahead. Even then, they see flat and in poor detail. Unexpected or sudden movements in these two areas also can spook them.

Farm animals see things in black and white. Cattle and horses, for example have trouble judging distances, which is important to know when handling them or trying to move them. All these things help explain why animals will often "balk" which means resist, or become skittish in certain situations or unfamiliar surroundings.



(Reprinted with permission from *Animal Safety,* Ontario Agriculture Card.)

Farm animals have extremely sensitive hearing, which enables them to hear things you and I cannot. Loud noises can frighten animals, and researchers have learned that high frequency sounds can actually hurt their ears.

All these animal characteristics should be considered when working with livestock, and designing livestock facilities.

LIVESTOCK FACILITIES

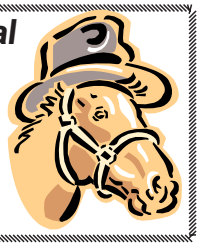
Livestock handling equipment failure and poor building designs or facilities are directly related to many livestock handling injuries. Poor facilities and equipment have caused accidents, not just for the people handling the animals but have caused injuries to the animals themselves. These accidents have resulted in farm income loss. A farmer may only get the chance to design and build a new facility once in his or her lifetime. It only makes sense to put a lot of planning into the building design and consider possible future expansion. There are agricultural engineers who have been specially trained to help with the planning of new buildings or with large renovations of existing buildings. Let's look at a few of the areas that need special attention when designing animal facilities that will be safe for the animals and the workers.

Floors

Poor flooring is a major cause for livestock workers and animal falls. Falls are one of the most common causes of injuries to farm workers. Floors should be made from a material that doesn't allow liquids or substances through. Concrete is often used for floors and the surface is roughened to prevent slips and falls when they are wet. In areas where there is a lot of traffic, the passageways should have grooves. It is important that the floors allow water to drain away easily. Sometimes slatted floors are used to keep animals dry and floors less slippery. Any type of livestock tend to refuse to walk over a drain, grate, puddle, shadow, hose, or change in flooring texture or surface. Livestock are likely to balk even if there is a change in color, so all these things need to be considered when planning livestock handling facilities.

Fencing and Gates

Fencing and gates in any facility that handles animals are extremely important and need to be strong enough to hold up against the strains of animal crowding. When choosing fencing and gates, remember strength and durability are very important. It is not safe to have animals breaking through into areas where they shouldn't be. Fences and gates should not have any sharp objects that stick out, such as nails or wire, as people and animals can get injured. When working with animals in close quarters there should always be an escape route. Avoid entering tight enclosed areas with large animals unless the pen or area has a gate that a person can easily reach.



True Story:
The man was found in a corral where he had been working alone. He had been attacked by a number of the livestock. He died of his injuries.

Farm Fatality Analysis

Alleys and Loading Chutes

Alleys and loading chutes should be wide enough to allow animals to pass, but not wide enough to allow them to turn around and head back in the opposite direction! Chutes should be constructed so they have solid walls, not open fencing. This way the animals cannot see others while in the chute and panic or balk. The loading chute floor should be kept clean to prevent slips and falls. If catwalks along chutes are more than 45 cm off the ground, it should have a guardrail to prevent falls. For safety, directing animals into chutes should be done with crowd gates, not with drivers.

Paddocks and Pens

Ever tried to get a job done in a "make do" pen? A "make do" pen is one that is not really the best for the specific job you are trying to get done. The pen may have been designed with another purpose in mind. The result? The work is hard, you don't enjoy it, and often the job does not get completed. If important jobs such as sorting, vaccinating or de-worming don't get done or are delayed it can have serious consequences for the whole herd and the producer. When designing pens and paddocks, there should be low density holding areas, where fewer numbers of animals are held for longer periods of time. There should also be high-density holding areas that hold larger numbers of animals, in smaller spaces for shorter periods of time. Don't overfill holding pens. A pen should not be more than ½ to ¾ full so that animals can move around easily and be sorted quietly. Depending upon the type of animals in the farming operation, also keep in mind where the workers are going to be stationed to do their jobs. Are they going to be inside the pen or working from the outside? The answer to these questions will effect how the paddocks or pens are designed so they are safe for the animals and handlers.

Lighting

Remember that animals see in black and white. Bright spots and shadows can make animals scared and skittish. Lighting inside buildings should be even and spread out. Avoid facility designs that will have animals looking into the sun particularly when attempting to load them. Basic animal instinct will make animals move easier from a dark area to a light area. Proper lighting is necessary for the animal handler so jobs can be done efficiently with less stress on the animal. Accidents are more likely to happen with poor lighting, and when stresses get high for the animal and the worker!

Restraining Equipment

Restraining equipment is very important in any farming operation. The equipment should be free from any obstacles that could hurt an animal. It should also allow the handler to access any part of the animal without having to reach over or through the chute. Be sure to use anti-kick and back up bars to prevent balking in the chute. Restraining equipment

should be checked regularly for loose or worn latches, pinch points, and broken railings or head gates. Portable squeeze chutes should be anchored securely to the ground before using them. The last thing any handler needs is an angry animal coming at them because the equipment broke! We have already talked about how an animal's hearing is better than ours and how sudden loud noises can cause an animal to become stressed or panic. Rubber bumpers on gates and chutes will reduce the noise, and therefore will lessen the chance of scaring the animal.

Understanding Animal Behaviour

Workers always need to be alert and on guard when working with animals. The lack of knowledge of animal characteristics can result in unnecessary accidents. Most animals show signs of fear, aggression and contentment. As farm workers we need to educate ourselves about different signs so we can "read" the animal and be sensitive to possible changes. Animals usually give warnings when they are feeling threatened or afraid. Some warning signs to look for would be raised or pinned ears, a raised tail, raised back hair, bared teeth, pawing the ground and/or snorting. Use extra care around strange animals. One animal may have a different tolerance level than another. If strangers are around your animals, you also need to use extreme caution.

Handling Methods

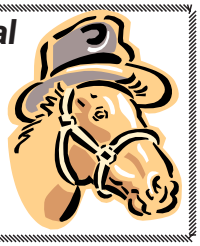
Most healthy animals will react favourably to calm and deliberate movements by the handler. There are some things that we can do to help us make whatever jobs we are doing with the animals go smoother. Make sure there is lots of time to complete the job at hand, so you are not trying to hurry or get impatient. Animals sense a human's emotions, so if you are upset, this can also cause the animal to feel upset.

We have already said that animals don't like loud noises, so trying to get a job done when there is a thunderstorm outside, or high winds causing strange noises, probably is not a good idea. Never prod an animal when it has no place to go. This will make the animal angry and confused. Always announce your approach to animals by talking to them in a calm voice and touching them so they know where you are. Respect but don't fear livestock. Remember that animals will defend their territory, and there is always the potential for harm. It is a basic instinct for animals to protect their young. Be especially careful around newborn animals. Avoid getting between the mother and her baby animal. Any newborn animals that require treatment should be separated from the mother to handle. Extreme caution should always be used when handling male livestock animals.

True Story:

The man was found lying outside a fenced in area where a cow and her calf had been kept. His injuries were from being attacked by the cow. The man managed to drag himself under the fence, but it was too late. He died from the attack.

(Farm Fatality Analysis)



General Animal Behaviour

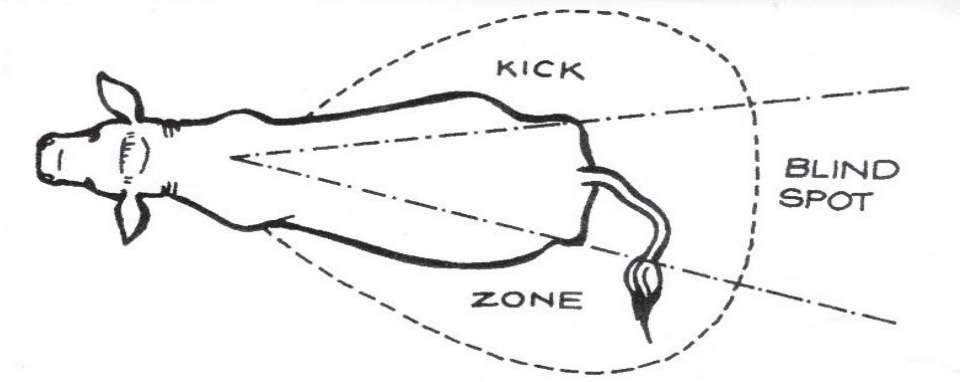
- Animals, just like humans experience hunger, thirst, fear, sickness and pain. Individual animals can learn to kick or bite. It is important for the handler to know about these behaviours and take precautions in order to be safe. One way to be safe is to use personal protective equipment.

- Dairy and beef cattle, swine and horses see in black and white. They also have poor depth perception. They are very sensitive to contrasts, shadows or sudden changes from light to dark, which can cause them to balk. Sheep also see in black and white, but have good depth perception, which makes it difficult for them to pick out small details like a partially open gate.

- Watch out for those kicks! Horses and mules generally kick towards their hindquarters. Cows kick forward and out to the side. Cows tend to kick toward the side where they are experiencing pain from an injury or inflammation. If you are aware of where the site of the pain is, approach from the opposite side.

Fast Farm Safety Fact:
In Canada horses account for 40% of livestock related deaths and 46.5% of injuries requiring hospitalization. Most fatalities are caused by being kicked by the horse.

(Livestock Handling Safety)



Reprinted with permission from *Tips For Safe Livestock Handling*, Agriculture and Agri-Food Canada.

- Livestock with young have a strong instinct to protect them. When possible let the young stay as close to the adult as possible, but if you need to handle or treat the youngster, separate it from the mother first.

- Livestock have a strong instinct around their territory which may be a certain pasture, building, water trough, pathway or feeder. If animals are forced to leave these areas, they can react unexpectedly.

By understanding the animal traits listed above, you can begin to understand why animals will balk or hesitate when going through barn doors, handling and loading chutes, and unfamiliar gates.

Safe Animal Handling

Fast Farm Safety Fact:
In Canada cows are responsible for 33% of animal related injuries and 16% of fatalities. Most cow related incidents happen when a calf is present.

(Livestock Handling Safety)

Additional Handling Tips

- Moving or flapping objects such as a fan blade, or a coat swinging in the wind can cause an animal to balk. Make sure there is nothing that moves at the end of a chute that will cause them not to enter, or try to turn around and escape.
- No one likes to be yelled at - not even animals! Yelling should be kept to a minimum when working around livestock so the animals feel secure and don't get frightened or feel threatened.
- If you are aware an animal is deaf or blind on one side, use extra caution. The animal will favour the side that they are deaf or blind on, and will tend to swing around to look at sudden movements or disturbances. A person standing too close could be knocked down or trampled.
- Animals, just like people respond to the way they have been treated in the past. For example, if an animal has been chased, hit, kicked, slapped or frightened when it was young, it will generally get scared when approached even when fully grown!

The Approach Is Everything

- Think about it! When someone approaches you that you don't know, you look for signs to determine if they are friendly or threatening. You don't even think about it usually because it has become automatic. If someone sneaks up on you from behind or comes out of nowhere, you startle - so do animals.
- If someone approaches you very quickly, with arms waving, and a raised voice, you will suspect that it is not going to be a pleasant encounter. You will tend to take steps to protect yourself, such as backing up, or running away until you feel you are safe. Animals will do the same.

If you are learning something for the first time, is it easier to learn when the person teaching you is calm, supportive and friendly? Would you learn as quickly if the person teaching you yelled at you, did not show respect, or showed impatience and anger?

I bet you would be confused, and probably make more mistakes while you tried to do what was being expected of you. After confusion, you would probably start to get angry, and that is never good. Now think about how an animal feels that doesn't understand our language, and relies on our physical cues and tones of voice to help it figure out what we want it to do. Stay calm, show respect and have patience with the animals. The job will get done easier and quicker.

The Flight Zone

No, the flight zone has nothing to do with airplanes… sorry! The flight zone is actually the animal's personal space. It is the shortest distance between the animal and the handler before the animal will move away. If an animal is kept in a pen it will have little or no flight distance, but if in loose housing or pasture, the flight zone is larger. The best place for the handler to work from is on the edge of the flight zone. By stepping into the flight zone ahead or behind the point of balance the handler will make the animal move ahead, back up or stop. An advantage of working on the edge of the flight zone is that the handler can move into and out of the flight zone easily to guide the animal. By using this animal handling knowledge moving animals can be easier, and they remain calmer.

Point of Balance

When you stand behind an animal at a safe distance it tends to move forward. The magic area that determines if an animal moves forward or backward is usually around their shoulder area. This imaginary line is referred to as the point of balance. By understanding how the point of balance works, where an animal's blind spots are, and flight zone, will help the handler to move animals easily, calmly and with less risk of accidents occurring. Keeping stress to the minimum for the animal, also keeps the stress to the person handling them to a lower level. Everyone is happier! Like humans, animals remember stressful or scary events and the people who caused them pain or to be scared.

Instincts

Many accidents that happen while handling animals are because of a lack of understanding or not paying attention to an animal's basic instincts. Animals have a survival instinct that is called "fight or flight." When an animal feels threatened, it will either stand and defend itself (fight) or run away from the threat (flight). Just like humans, when threatened or scared, an animal's heart rate will quicken, breathing becomes faster, and hormones and adrenaline start pumping. Lucky for us, horses and cattle are by nature animals that will usually choose "flight." They will run away if they feel scared or threatened.

Herd Instinct

As part of understanding animal behaviour, handlers should have a good understanding of "herd instinct." Cattle naturally follow the leader, and therefore follow each other. It follows then that if one spooks, there is a good chance that they will all spook! Each animal should be able to see ahead of it when changing locations. Like people, animals at times need some time to decide if the setting or surroundings are safe. Animals will tend to panic or balk if they are separated or forced or urged to proceed before they are convinced it is safe. Don't expect a tired, hot animal to behave as well as a well-rested, comfortable animal. Be extra cautious around newborn animals, as most animals may become aggressive to protect their young.

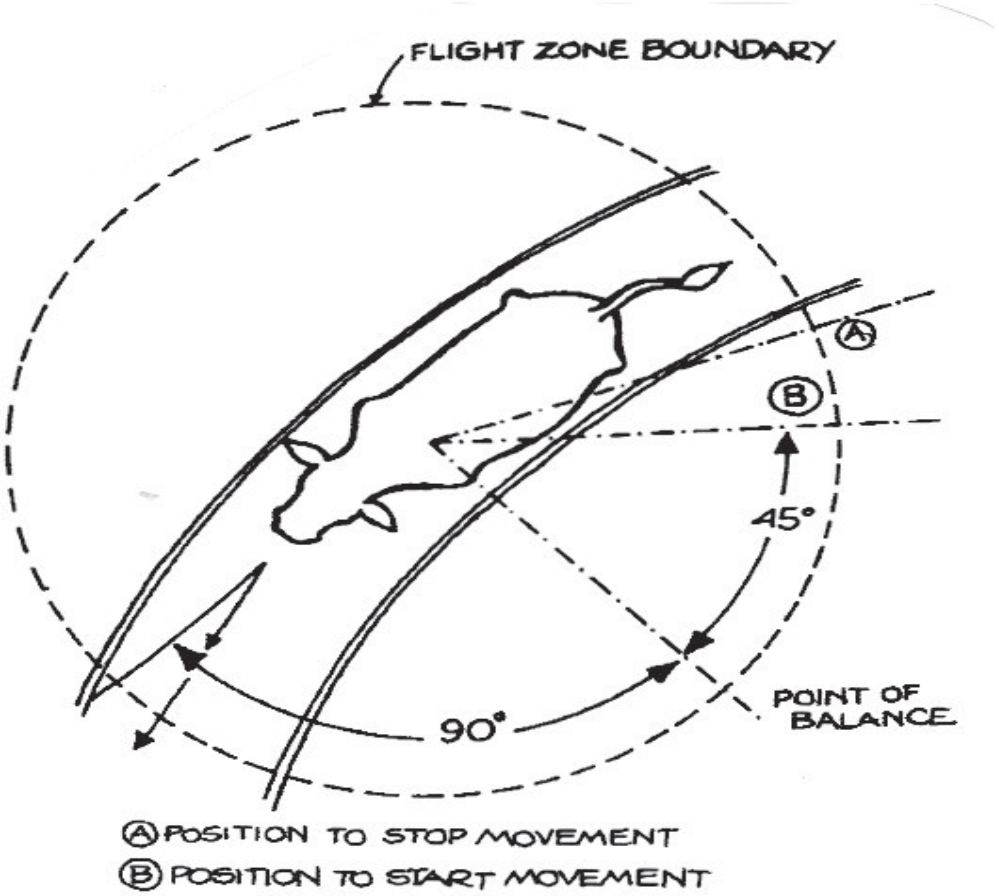
True Story:
The farmer was feeding his cattle in the feedlot on his farm. When he was found, he was lying by the truck he used for that purpose. He had multiple injuries from being trampled by the cattle.

(Farm Fatality Analysis)

Fast Farm Safety Fact:
In Canada:
* 1 in 5 hospitalized farm injuries are caused by livestock.
*Following tractor and machinery accidents, livestock related accidents is the next most common cause of death.

(Livestock Handling Safety)

Flight Zone Diagram



(Reprinted with permission from The Farm Safety Association)

Activities

Activity #1 “Stay Out of My Bubble” - The Flight Zone Activity

We all have a need for personal space. Sometimes we call it our “personal bubble.” In order to get members thinking about the animal’s personal space and the animal’s comfort level have them complete this fun activity.

1) Pick a partner.
2) Have everyone form two lines so they are opposite to and facing their partner.
3) Have one partner stay in one spot.
4) Have the other partner approach their partner one step at a time.
5) When the stationary partner begins to feel “uncomfortable” or that the person approaching is too close, they yell “stop.” The person stops and remains in that location.
6) Once everyone is done look down the line. You will see that some people are very comfortable with people very close to them while others are not.
7) Ask the members how they felt when the other person got too close.
8) Change around and repeat the exercise so the other members have a chance to approach.
9) Explain that this is how animals feel when they are approached. Some will be quite okay with us really close, others will not.

Activity #2: Get the Point? – The Point of Balance That Is!

If possible complete this exercise in a round pen. Choose an animal that is usually calm and has been well handled. Have the members learn the animal’s “point of balance” by approaching the animal one at a time in the following positions:
(A leader should demonstrate the activity before asking members to try)

1) To make an animal move forward, the handler should stand beside the animal, behind the shoulder or the “point of balance.”
2) To make an animal back up, the handler should stand beside the animal in front of the shoulder or the “point of balance.”
3) Make sure the members practice the handling information given in the meeting e.g. calm, firm, no sudden or loud noises, use a firm voice, do not show fear, etc..
4) Have the onlookers watch for animal behaviour signals e.g. ear positioning, eye contact, tail motion, pawing etc.
5) Show where the blind spot is, and the flight zone of the animal.
6) After the demonstration, have each member write down six things to remember when working with an animal.
7) As a group review everyone’s answers and have a general discussion why understanding the point of balance and animal behaviour is important.

Activity #3 – It's Tough To Be An Animal!

(Adapted from: Agriculture Awareness Manual, 2003)

1) Have members break up into groups of three. One person is identified as the helper and the others are the animals.
2) Cover two pairs of sunglasses with petroleum jelly. If you don't have sunglasses some can be made from cardboard and plastic wrap, or cellophane.
3) Have the two "animals" put the glasses on and walk around. The helper's job is to keep them safe while they are doing this.
4) To better understand an animal's hearing, have the members put on winter earmuffs or hearing protectors. (If earmuffs are not available, make up some cardboard cones that can be fitted over their ears and attached with tape, pins or string.)
5) To simulate an animal's sense of touch, have the members put on a thick winter coat and some padded mittens.
6) Have each animal fit himself or herself with a cardboard cone held on by tape or string over their nose to mimic an animal's sense of smell.
7) To simulate 360-degree vision, have the animals in each group link arms so they are standing back to back. Dim the lights to increase the sense of black and white. Have them wear the sunglasses with petroleum jelly.
8) Standing sideways to an object, and both looking straight ahead without turning their heads, ask them to identify when they can no longer see a person who approaches them a step at a time. This will simulate an animal's blind spot.

X

(This is the person approaching one step at a time.)

<-X X ->

(These are the two people with arms linked looking opposite directions.

9) Now have the helper lead the "animal" (the two people with linked arms) through a doorway or around a small course. The "animal" will have to walk so each person is walking sideways to simulate the monocular vision. Each person will have to talk to the other person so they both know what they are seeing, hearing, experiencing. This simulates the animal's brain in action.
10) Rotate so all members have a chance to be helpers and animals.

Group Discussion:

After everyone has had a chance, get the group back together and ask them what it was like for them to be an animal with different senses than ours. An animal goes through life sensing the world around it very differently than a human. Ask them to think about what it would be like to be an animal in a strange place, being approached by an unfamiliar person, gate or object, or being asked to do something they don't

understand, or are scared to do. We often take for granted or assume animals see, hear, feel or sense things, the same as us. This activity has helped us learn that animals are different. It helps us to better understand the “fight or flight response” of an animal and the need for alertness and caution when handling animals.

Activity #4 – Safe Animal Handling Quiz

1) Which animal causes the most livestock related injuries requiring hospitalization?
   a) bull
   b) cow
   c) goat
   d) horse
   e) sheep

2) Which has the best hearing?
   a) a human
   b) an animal

3) The “flight zone” is:
   a) the farthest a scared animal will run before stopping
   b) the shortest distance between the handler and animal before the animal will move away
   c) the longest distance between the handler and animal before the animal will move away
   d) smaller in large pens

4) What is the best type of footwear when working around animals?
   a) running shoes
   b) rubber boots
   c) leather boots
   d) boots reinforced with a steel toe

5) Which does not happen to animals when they become scared?
   a) their heart rate increases
   b) their rate of breathing increases
   c) their eyesight becomes clearer
   d) adrenaline starts pumping

6) To prevent animal related injuries a person needs to have all but one of these:
   a) common sense
   b) knowledge of animal behaviours
   c) training and experience
   d) a strong electric prod

7) The “point of balance” is:
   a) the middle of the animal
   b) the imaginary line that determines if an animal moves forwards or backwards
   c) usually around the rear of the animal
   d) the height an animal can rear before falling over

8) What are the odds of surviving an attack by a bull?
   a) 1 in 10
   b) 1 in 25
   c) 1 in 20
   d) 1 in 50

9) Which are warning signs to look for when working around livestock?
   a) pawing
   b) bared teeth
   c) pinned ears
   d) snorting
   e) raised back hair
   f) all of the above

10) Animals have short memories so they don't remember how they have been treated in the past.
   a) True
   b) False

Activity #5 - Senior Member Activity

Interview someone who has been injured as a result of working with livestock. What were the contributing factors? Find out what they would do differently today to prevent their accident.

Activity #4 Answers

(10-b: 9-f: 8-c: 7-b: 6-abc: 5-c: 4-d: 3-b: 2-b: 1-d)

References

Agriculture Awareness, (2003). Safety Section. 4-H Manual, Ontario 4-H Council.

Animal Handling (n.d.). Ontario Agriculture Card.

Animal Safety (n.d.). Ontario Agriculture Card.

Handling Farm Animals Safely (2002). Fact Sheet. Farm Safety Association Inc. Guelph, Ontario. www.farmsafety.ca

The Horse Project (2000). 4-H Manual. Ontario 4-H Council

Livestock Handling Safety (n.d.). Brochure. Agriculture and Agri-Food Canada. www.agr.ca

Safety With Farm Animals (Sept. 1985). Fact Sheet F-008. Farm Safety Association Inc. Guelph, Ontario. www.farmsafety.ca

Safe Handling of Farm Animals, (Dec. 2002). Farm Safety Association Inc. Guelph, Ontario. www.farmsafety.ca

Tips For Safe Livestock Handling, (n.d.). Agriculture and Agri-Food Canada

Farm Safety Project

Other Farm Safety Topics

4-H Ontario

CANADA

Ontario's Mutual Insurance Companies

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Other Farm Safety Topics

Tornado Safety Guidelines

Over the past several years a disturbing trend is forming. Our weather in Ontario is becoming more and more unpredictable and thunderstorms at times are really severe. These violent thunderstorms can produce funnel clouds. It is important to know how to protect yourselves, your family and other workers from these weather patterns.

You should always be on guard for funnel clouds when there are thunderstorms. Being prepared could mean the difference between survival and death! That is why you need to know what to do and make sure others know what to do in advance. It is too late to figure out a safety plan when you can see a funnel cloud.

First of all whether you are at home or working somewhere else you should know where to find "**Tornado Safe Locations**". If need be, put a sign up so others will know this is a place to go to if a funnel cloud is seen.

Listen to the radio or television for local weather reports. A tornado "watch" means that the storms could form funnel clouds. A tornado "warning" means that funnel clouds have been seen. They will give areas where the funnel clouds have been spotted. If a tornado warning has been issued for where you live or are working, or if you see a funnel cloud, head for tornado safe shelter immediately. If you are working off the farm, make sure you have a cell phone or two-way radio so people can alert you of the possible danger.

How to Choose Tornado Safe Locations

When choosing a good shelter, it is best if it is underground. The basement of your house is a good place and stay under a heavy object that is sturdy, for example a heavy wooden table. This type of object will protect you from flying objects that may fall into the basement if the tornado hits the house. If there is no basement, make sure you are on the first floor, in an interior room and stay away from windows or doors. You don't want to get hit by flying glass! Do not choose to use a parked vehicle for shelter. That means no cars, trucks, tractors, or farm equipment! If you are outside and do not have time to seek shelter in a building, or if you are driving when you see a funnel cloud find a ditch or culvert you can lie in. Underneath a bridge is also a good idea. The most important thing is to make sure you are away from areas where flying debris can injure you.

Farmsafe Services for… Agricultural, Horticultural and Landscape Industries. (February 2006). Volume 31, No. 1 Newsletter.

FIRE, FIRE, FIRE!

The most common cause of agriculture fires is open flame from things like candles, matches, bonfires, sparks, static electricity, friction, welding and equipment. Other fires can start from natural causes such as lightning and spontaneous combustion.

There needs to be three components present in order for a fire to start. They are air, heat, and fuel. To help you understand, below is a diagram known as a fire triangle. Each small triangle represents one of the components. If one component is removed or controlled, then the fire will be controlled or even better, be extinguished or go out!

FACTS ABOUT COMBUSTIBLES, FLASHPOINTS AND MIXTURES

Examples of ordinary combustibles are wood, paper and clothing. Ordinary combustibles start burning between 450 and 500° Celsius. A candle burns at between 1800 and 1900°C.

Fossil fuels such as gasoline have a rating known as **flashpoint.** Flashpoint is the lowest temperature at which a flammable liquid will give off fumes. With combustible fuels it is the fumes that will burn, not the liquid itself. This is why it is really important to know when fumes are produced. The flashpoint for gasoline is +40 °C and for diesel fuel it is 120 °C.

For other fuels like natural gas or propane it is the mixture of the gas in the air that is dangerous. Anywhere from 4 % to 14 % of natural gas mixed with air can cause an explosion if a spark is present. For propane to explode it only needs to be between 3 and 8 % present.

FIRE CLASSES

Class "A" Fires – A class "A" fire is where combustibles are burning such as wood, paper or textiles. To contain or put out the fire, a cooling or quenching effect is needed.

Class "B" Fires – A class "B" fire occurs when flammable liquids such as gasoline, oils, fats and paints are burning. Remember the triangle? To control or put out the fire the oxygen source or flame (heat source) needs to be removed.

Class "C" Fires – A class "C" fire is caused by electrical wiring, motors or appliances. To control or put out the fire, non-conductivity of the extinguishing agent is needed.

Class "D" Fires – A class "D" fire is caused by combustible materials such as magnesium, sodium and potassium.

FIRE PREVENTION IS THE BEST STRATEGY

Take a look around the farm from a possible fire hazard point of view. What do you see? Here are some things to look for and consider.

1) Cut down and remove weeds and brush from around the buildings.
2) Inside buildings, check for large accumulation of dust, feathers, cobwebs and other combustibles. (Bet you never thought feathers and cobwebs could be combustibles!)
3) Reduce the number of items that will burn inside and around buildings and keep them away from any heat sources. (Remember do that housekeeping – dispose of unwanted paper, feedbags etc.)
4) Arrange workshops, drive sheds and barns so that flammable materials are stored safely away from possible ignition sources.
5) Use only approved electrical materials, make sure they are installed correctly and use proper fuses and circuit breakers. Make sure there are waterproof electrical outlets, and that there are enclosures for electrical motors or other electrical equipment that are in buildings that are cleaned with high-pressure equipment. Be sure crop dryers or heaters are equipped with automatic shut offs when temperatures get high.
6) Do regular inspections. Check for exposed wires, broken insulation, improper grounds, build up of combustibles, and improper storage of flammable materials.
7) Check any heating systems to make sure airshafts are clean of dust and debris. Make sure motors are oiled if needed each season and check pulley belts to make sure they are in good

True Story:
The last time she saw him, he had gone to check on the cattle. Shortly after, she noticed the cattle barn was on fire. Her husband had not been able to get back out the doorway because it was blocked by the fire. He was found lying near another exit that had been locked from the outside. The fire had been started by a faulty propane heater.

Farm Fatality Analysis

condition. Check gas, fuel and oil systems for any leaks or unsafe installations or repairs.

8) Only burn garbage (when permitted) in an incinerator that has a spark arrester cover. The incinerator site should be (100 feet) away from any buildings.
9) All major farm buildings should be equipped with working lightning rods that are grounded properly.
10) Make sure buildings have more than one exit clear at all times.

Minimize the Hazards on Agricultural Sites

Post signs and enforce "No Smoking" rules in buildings such as barns, drive sheds or work shops where flammable and combustible materials are stored.

Install smoke detectors (one on each floor) and the proper types of fire extinguishers in buildings and barns.

Keep flammable liquids away from open flames and motors that might spark. Never ever let anyone smoke while refueling machinery!

When moving flammable liquids from metal containers, bind the containers to each other. Then ground the one being emptied to prevent sparks from static electricity. Clean up spills immediately and store oily rags in a tightly covered metal container. Change your clothes right away if you get oil, fuel or solvents on them.

Flammable liquids such as gasoline, or diesel fuel should be clearly labeled and only stored in approved containers. The containers should be stored in well-ventilated areas where they are not close to heat sources or sparks. Above ground fuel storage tanks should be located at least 12.20 metres from any buildings. Pesticides should be stored in a separate building and clearly labeled with a warning sign.

Compressed gases such as propane or natural gas should be stored in secured upright position, outdoors and away from any heat sources. Store different gases separately, away from each other. Also keep full cylinders away from empty cylinders. When heating with propane, 45 kg cylinders should be kept at least 4.5 metres away from heaters, and larger tanks at least 7.5 metres away from heat sources.

Fire Hazards and Machinery

When re-fueling machinery special care needs to be taken. Watch for leaks in fuel lines, carburetors, pumps and filters. Any leaks should be repaired immediately. Keep engines properly tuned and timed so hazardous back firing doesn't occur. Exhaust systems should be maintained in good condition to avoid sparks. Keep machinery

lubricated properly to reduce the amount of friction that can cause heat. Never re-fuel inside a building or while the engine is hot or running.

Fire Hazards and Repairs

When using equipment that produces heat it is called “hot work.” When working with this type of equipment such as portable cutting torches and welding equipment, always keep a fire extinguisher near by. Keep flammables e.g. the fuel tanks at least 11 metres from the immediate hot work area. Make sure tanks and containers that hold flammable materials are completely naturalized and purged before you do any type of repairs on them.

Fire Hazards and Spontaneous Combustion

Many types of material combust spontaneously under certain conditions. That is why rags soaked in vegetable or animal oils, paints or linseed oils need to be kept in sealed metal containers in cool, well-ventilated places away from other combustibles.

Do not store wet hay, and check stored hay for warm spots. Many barns have burnt down due to spontaneous combustion caused by heated hay. If the temperature of the hay is noticeably warmer than when it was put in the barn, keep checking it closely. If the temperature reaches 80°C (175°F) get the hay out of the barn, or divide it into small, shallow stacks.

Watch for spontaneous combustion signs in silos. Know the signs – heat, the release of moisture, vapor or steam, smoke or a charred tobacco smell. A fine chop allows the material to be packed more firmly in both trench and upright silos. Also silos that are designed to be sealed should be kept closed except during times of loading and unloading.

Proper Use of a Fire Extinguisher

Let’s hope you are never in a position where you need to use a fire extinguisher - but if you are, remember the acronym “PASS”. It will help you recall the steps needed to work the fire extinguisher.

1) **PULL** the pin. Depending on the type of extinguisher, you may have to release a lock latch, or press a puncture lever.
2) **AIM** the extinguisher nozzle (it also may be a horn or hose) at the base or the bottom of the fire.
3) **SQUEEZE** or press the handle.
4) **SWEEP** from side to side at the base of the fire. Once out, watch it does not restart.

The Shocking Truth About Electrical Shocks!

The Basic Facts

- Electricity made up of a pulse of energy called electrons.
- Electrons flow through any conductor, such as metal or damp objects.
- Electrons heat elements.
- Electrical lines with too much energy being drawn through them can overheat.
- Older buildings and barns can have poor wiring.

The "Short" Facts About Shorts

A conductor allows electricity to flow through it. Wiring in a house or wiring used for electric fences are two examples of good conductors of electricity. The wire inside electrical cable is designed to let electrons flow freely as possible through it, but some heat is still created. If too many electrons are drawn through the cable at once, the wire could overheat, and the outer insulation of the wire will start to burn. This can happen if the wiring is too old, the fuse in the fuse box is too big, so too much energy flows through at once, or if there are too many electrical appliances or things plugged into one outlet.

Even though electricity can travel through wire freely and easily, it will escape if it gets the chance. For example, if there is a cut in the insulation around the wire, some electrons will leak out. When this happens it causes what is called a "short." Electrical wire has two wires inside the cable. When there is a short in the wire, the electrons bounce back and forth between the two wires. This creates heat, and sometimes enough heat to cause a fire.

Water is a good conductor of electricity but it can be very dangerous. You have heard the term "live wire." A live wire has electricity flowing through it. If it is lying on a dry floor or dry ground, you can get close to it, **but do not touch it.** If the same live wire is lying in a puddle or a damp floor, **don't even go near it.** You will get a shock if you touch the wire, and even if you touch the water that is surrounding the wire.

Electrocution

True Story:
The 14 year old victim was electrocuted. He became in contact with an air compressor that was wired incorrectly.

Farm Fatality Analysis

Every second of every day, your brain sends messages to your heart, telling it when to beat. If you get a mild shock by touching a shorted electrical wire, the message from your brain to your heart gets interrupted. You also will get a severe tingling and numbness on the part of the body that touched the shorted wire. Your heart also becomes confused and doesn't know when to beat. If you get a big shock, it is called electrocution. Your heart will stop beating, and you can die.

Extension Cords

We all use them, right? These days plugs on most modern appliances have a ground wire built in. The ground wire is the third prong on the plug that is in the center. It is there to protect us. If there is a leak of electricity, the ground wire protects the appliance and us. Therefore, never cut off the third prong. Also never try to force a three-prong plug into a two-prong electrical receptacle. It is not safe!

Here are the basic extension cord/appliance rules of safety:

1) Never use a three-prong plug in a two-prong receptacle.
2) Extension cords should never cross doorways or be on the floor of areas that have heavy traffic. People can trip. Whenever possible run them overhead or above doorways.
3) If extension cords have to lie on floors for short periods of time, make a warning sign and tape the cord securely to the floor.
4) Extension cords should never be covered, and should only be used temporarily. If they are covered, heat will be produced.
5) Don't yank the cord out of the electrical socket. This could damage the cord making it unsafe. Always remove the plug from the socket by holding onto the plug.
7) The "ULC" label should be located on new extension cords and appliances. It stands for "Underwriter's Laboratories of Canada" and means it is electrically safe if used properly.
8) In Canada electrical items will also have a "CSA" label. It stands for "Canadian Standards Association" and means the item has met our national standards and is electrically safe.

Ground Fault Devices

Plugs in laundry rooms, bathrooms, near a pool, being used for outdoor use, or in the barn, driving shed or workshop should have a ground fault device. Portable power tools should also be plugged into a cord that is equipped with a ground fault receptacle at the end of the cord. This device ensures power is cut off to the appliance or tool if the setting becomes unsafe, for example, if there is a water spill.

Safety First In and Around the Home, (n.d.). 4-H Manual. Ontario 4-H Council 4-H 2065 99 M

A Safety Strategy

Roll Call: Name some hazards on the farm.

"B" SAFE

"B"
BE SURE YOU KNOW WHAT THE JOB IS
Be sure you understand the job you are about to do. Know what the outcome is supposed to be (what the finished job is to look like). Ask questions to make sure you understand what the whole job is, and what the steps are to complete the job.

"S"
SEE THE HAZARDS
Involve others who have done the job before and ask them for advice, instructions or help. If they have done the job before they will know if there are possible dangers you may encounter while completing the job. It is a good idea to check the workplace, setting or machinery on a regular basis to identify hazards.

"A"
ASSESS THE RISKS
The work "risk" is a word that helps identify the probability that an accident or injury might happen. As risk is usually measured by the terms: "low," "medium" or "high". Every job has risks, so the goal is to keep the risks "low" or the minimal amount of risk possible. Once the risk is identified, the person doing the job needs to prioritize the hazard. This means they decide which hazards need immediate action to fix or change from ones that can be fixed later. A hazard that needs to be fixed immediately would be rated as a high risk. Some hazards would be assessed as medium risks. Regular checks for potential hazards can help farmers determine levels of risk and therefore help them budget, plan, or save time and money for the repairs and maintenance to keep risks low.

"F"
FIX THE HAZARD
Once a hazard has been identified, and the risk determined to be "low", "medium" or "high" then the farmer/workers need to decide how to reduce the risk or keep it to a minimum. Whenever possible, be proactive, and fix the potential hazard before it becomes a problem. Prevention is always the best strategy, but many times the hazard is fixed after an accident or injury. Consider what things can be done to reduce the risk. Can the hazard be removed? Can personal protective equipment be used? Is there another way to get the job done? Can

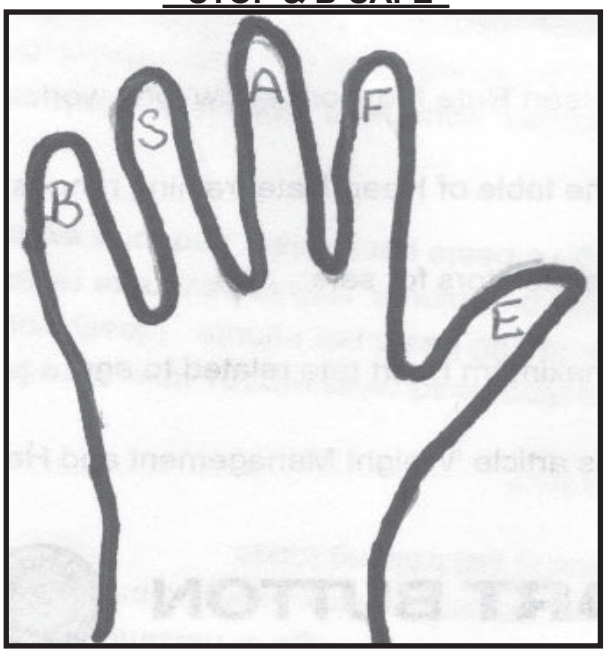
something be changed with the equipment to make it safer? Are available safety features present and in workable condition? Are the weather conditions good for the job to be done, or is it better to wait? The list goes on… The thing to remember is it is better to fix the hazard BEFORE an accident or injury, rather than after.

"E"

EVALUATE THE RESULTS OR CHANGES

After the changes have been made, go back to "A" and assess for risks again. Sometimes the changes made may cause different or higher risks. If you decide to proceed with the job then stop at times to monitor and inspect the equipment, the setting etc. to make sure the changes are working, and additional risks are not presenting themselves.

AN EASY WAY TO REMEMBER
" STOP & B-SAFE"



Raise your hand so it faces away from you, like you are asking someone to "STOP"

1) The little finger represents "B." Identify the job to be done, and the steps needed to complete it. "**Be**" sure you know what the job is.
2) The finger between the middle and little finger represents "S". **See** the hazards if you can. Or go through the different steps of the job in your mind and look for or "see" any hazards that can become present as the job progresses.
3) The middle finger represents "A." **Assess** the hazards. What hazards? Are the risks associated with the hazards "low", "medium" or "high?"
4) The pointer finger represents "F." **Fix** the hazard. Make any changes that are needed to reduce the risk or make it as little as

possible. Remember prevention is the best strategy.

5) The thumb represents "E." **Evaluate** the changes or fixes. Is the risk reduced, or are there new risks? If you think there might be new risks, STOP and start the "B-SAFE" strategy over again.

REMEMBER, ALWAYS HAVE THIS STRATEGY WITH YOU. USE IT AND …"B-SAFE"

Farmsafe Services for… Agricultural, Horticultural and Landscape Industries. (February 2006). Volume 31, No. 1 Newsletter.

True Story:
The farmer was helping a farm worker move a grain auger at the elevator. While moving it, the auger touched a high voltage hydro line. The farm worker died instantly from electrocution.

Farm Fatality Analysis

Battery Boosting

Roll Call: Name some reasons why a battery would go dead.

Battery Boosting – The Safe Way
When boosting a dead battery whether it is on a car, truck, combine or tractor, there are safety precautions that need to be taken.

Precautions

- Make sure both vehicles are in "park" position or in gear, with the emergency brake for vehicles that have standard transmissions.
- Make sure the vehicles are not touching each other.
- Make sure both vehicles are turned off – if one has a dead battery it is already off – right?
- Make sure headlights, turn signals, stereos, air conditioning, etc. are off.
- Unplug all accessories from cigarette lighters such as cell phones, computers etc. (Jump-starting a battery can crank 300+ volts into your system and destroy equipment).
- If the battery is cracked, or you see liquid leaking from, it do not attempt to boost it. The battery may explode hitting you or other bystanders with sulphuric acid.
- Always wear protective glasses when boosting a battery.
- Always stand at the side of the vehicles, never in front.

Method

Before Starting
Find the positive terminal and the negative terminal on the battery. They will be marked on the battery, but might be hidden by corrosion or dirt. The positive terminal or post *usually* has a red battery cable attached to it. The negative terminal or post *usually* has a black cable.

Booster cables usually are colour coded. Red means positive, and black means negative.

Make sure the battery booster cables are untangled. Once you start connecting the cables to the batteries make sure the cable ends to not touch each other!

1. Connect one end of the positive battery cable to the positive post or terminal of the *dead battery 1st*.

2. Connect the other end of the positive booster to the positive post or terminal of the *good battery*.

3. Connect one end of the negative cable to the negative post of the *good battery*.

3. Connect the other end of the negative cable to a good, solid, not rusty, non-painted metal part of the engine on the *vehicle with the dead battery.* This could be a shiny nut on the engine block. Only as a last resort if you cannot get a good ground on the engine block should you connect the negative cable directly onto the *dead battery.* This increases the chance of explosion.

4. With both vehicles off, allow power to get to the dead battery for a minute or so before attempting to start the dead vehicle. If it does not turn over, start the engine of the good vehicle.

Now that your vehicle has started it should be allowed to run for a few minutes before shutting off to recharge the battery.

Removing the Jumper Cables

The booster cables should be removed in the reverse order that you connected them, again being careful that the battery cable clamps do not touch each other.

1. Disconnect the negative cable from the engine block of the car that was jump started. This breaks the circuit.

2. Disconnect the other end of the negative cable from the negative post of the *good battery.*

3. Disconnect the positive cable from the positive post of the good battery.

4. Disconnect the other end of the positive cable from the positive post of the dead battery.

How to Jump Start A Car. (n.d.) Retrieved December 29, 2006 from http://www.carbuyingtips.com/jumpstart.html

Senior Supplement - CHAIN SAW SAFETY

Roll Call: Name places or jobs on the farm where you would use a chain saw.

When working on a farming operation there may be times when you will have to use a chain saw. It may be to cut firewood for winter, or to move dead or dying trees for safety reasons, or to clear the edge of the field or laneways from felled trees or limbs.

A chain saw can be an efficient, time saving piece of equipment, but it is also one of the most dangerous tools a person can use. Chain saws are just like computers. Do you know why? It is because they can only do what you tell them to do. The "thinking" part is all up to you!

Where To Start

What is the first thing you should do before operating a chain saw? Read the operating and safety instructions in the owner's manual. I know you are thinking that would be dull and boring, but it might make the difference between a gruesome accident and ending the day safe.

The chainsaw is a tool that will work best when clean and sharp. It needs to have the proper chain tension, gas mixture and oil weight. The wrong gas or oil can be disastrous to the life of your chainsaw! Make sure any mixed gas is in a container that is properly labeled so it doesn't make its way into the wrong piece of equipment, vehicle or tool.

Safety Equipment

Common injuries from chain saw use include hearing loss, eye injuries, head injuries, and cuts to legs, feet, hands, arms and shoulders. The following safety equipment may not prevent an accident but may reduce the severity of injuries. Recommended safety equipment include:

- **Earplugs or earmuffs** – a chain saw produces about 110 decibels of noise.
- **Eye protection** – either full face screens, goggles or safety glasses. It is recommended that goggles or safety glasses are worn under full face screens.
- **Leg protection** – either chaps or pants made from ballistic nylon fibers that when cut will clog the chain saw and stop it from cutting.
- **Steel-toed boots** – they protect from cuts and crushing accidents.
- **Hard hat** – protect that brain!
- **Gloves** – they protect from cuts and allows a better grip on the chain saw.

Safety Tips

1. Always carry the chain saw with the engine stopped, the guide bar and cutting chain to the rear, and the muffler away from your body.
2. Always use the appropriate guide bar scabbard.
3. Wear appropriate safety equipment and clothing.
4. Never operate a chain saw when alone.
5. Keep bystanders, children and pets at a safe distance away.
6. Do not operate a chain saw when you are tired or fatigued.
7. Do not operate a chain saw if you have been drinking alcohol or taking medications that can cause drowsiness.
8. Do not over reach or cut above shoulder height.
9. Do not operate a chain saw in a tree or from a ladder unless you have been given special training.
10. Keep the chain moderately tight and sharp – a dull chain uses up your strength quickly.
11. Refuel after letting the saw cool for 10 minutes – this is a good time to sharpen the chain.
12. Move the chain saw at least 3 metres away from the fueling location before starting the engine.
13. Never smoke while refueling the saw.

Before Starting To Cut

There are questions you should ask yourself before beginning to cut. Listen closely to the answers you give yourself.

- Do I have all the required safety clothing/personal protection equipment?
- Do you feel comfortable with the job you are about to do?
- Is your chainsaw too small to cut the tree?
- Are there any power lines around to be concerned about?
- Where is the house? The barn? The tractor? (You get the idea).
- Is it too windy or too wet to cut – wind can push trees in an unexpected direction, and wet conditions make footing slippery.

Hazards To Look Out For

1. **Kickbacks** – A kickback is what happens when the tip of the chain saw bar contacts an object while the chain is moving. A single saw tooth jams into the object. The energy from the saw is then redirected back and up. This causes the chain saw to jump (kickback) in your hands. It can cause severe injury. Some newer chain saws have an “inertial” chain brake that if the chain saw gets pushed back at a certain speed the chain brake stops the saw.

2. **Hung Up Trees** – Some times when trees are felled, or have fallen over on their own, they get caught amongst the branches of other trees and are left leaning. Before starting work in a forest check for any hung up trees. If a tree that is being felled becomes hung up **STOP!** Don't work anywhere around hung up trees. The area is a death trap. Before continuing to cut in the area, have the hung up tree pushed or pulled down by a machine that is large enough to do the job.

3. **Chicots –** Chicots are also known as "widowmakers." They are standing dead or dry trees with limbs and tops that can break off with the wind or when falling trees strike them. These are the most deadly kinds of trees in the forest, and have been nicknamed as widowmakers as a result. If you spot a chicot, stop and remove it immediately. Your life may depend upon it.

Plan Your Escape

When cutting wood in the forest, workers often experience problems with footing. Brush, logs, plants, and uneven ground can prevent solid footing and can obstruct your view of your work. Sometimes even the most experienced, professional loggers can have trees fall in the opposite direction of what they anticipated. Make sure before a tree is felled that there are two clear escape paths that lead in the opposite direction of the anticipated fall of the tree. It doesn't hurt to make sure there is a path if needed unexpectedly, in the direction the tree is anticipated to fall just in case. Keep bystanders away and out of range regardless of which way the tree falls. That way if you have to "run for it" the path won't be overcrowded.

Don't Overestimate Your Abilities

Chainsaw use requires a lot of strength. Don't use chainsaws that are too large or too heavy for you. If you are going to be felling trees, get properly trained and for the first few times make sure you are properly supervised. Felling a tree is not worth getting injured or killed. This information is a general overview and does not give you enough to be able to operate a chainsaw or fell trees. Seek out a training course and get trained by a professional.

Disaster Relief Chain Saw Safety: Tree Felling. (n.d.). Missippi State University Extension Service. Retrieved December 29, 2006, from http://msucares.com/pubs/publications/p2250.pdf

Workplace Safety and Health Division Guidelines For Proper Tree Felling. (n.d.) Manitoba Labour and Immigration. Retrieved December 29, 2006, from www.gov.mb.ca/labour/safety/treefelling.hmtl

Nylon Trimmers

Roll Call: Name some places on the farm where you would use a trimmer and why.

Many people who live in rural or urban areas now have gas or electric nylon trimmers to help with weed control. Remember, weed eaters have their limitations and they should not be used for jobs for which they were not originally designed , or not heavy enough to do the job at hand. Here are some safety tips when using weed eaters.

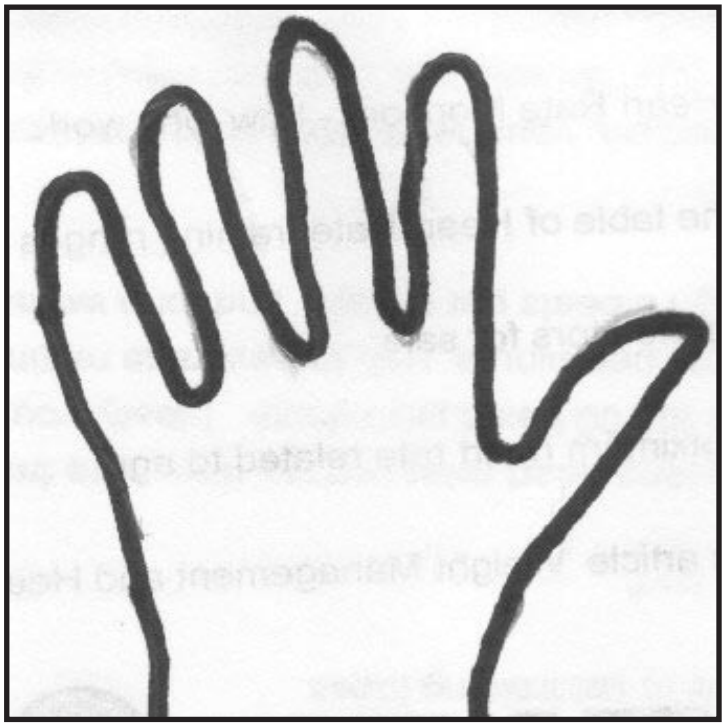
Safety Tips

- Fully read the operators and maintenance manuals.
- Know what each control on the trimmer is used for.
- Make sure all bystanders, children and pets are away from the area where you will be using the weed eater.
- Always get proper training before operating a weed eater.
- Make sure the work area is clear of objects that could be thrown or cause the trimmer to “kickback” into your body.
- Never operate a trimmer after drinking alcohol or taking medications.
- Always use the proper safety equipment e.g. eye protection, face shield, gloves, long sleeved shirts and pants, hat, steel toed boots.
- Always keep the trimmer guard in place.
- Refuel outside where it is well ventilated and restart away from the refueling location – remember no one should be smoking while refueling and the trimmer should not be running.
- Always use both hands while operating the trimmer.
- Never use rigid blades close to fences, buildings, tree trunks etc.
- Before starting make sure all heads are tightened on the shaft.
- Never attempt adjustments or repairs while the engine is running.
- Never attempt to cut woody materials – it is too risky for injury or death.
- Make sure you have good footing to prevent falls.

Weedeater Equipment (Nylon Trimmer). (n.d.). Alabama Department of Transportation. Retrieved December 29, 2006 from http://www.dot.state.al.us/Bureau/Training/weedeat.htm

Activities

Activity #1 - “B-SAFE” ACTIVITY



Above is the shape of a hand in a “STOP” position. Write in the letters of the Acronym “B-SAFE” on each finger and thumb. Read the statements below and put the corresponding letter in the blank provided to identify if it belongs to:

BE SURE YOU KNOW THE JOB: **S**EE THE JOB/IDENTIFY THE HAZARDS: **A**SSESS THE RISK: **F**IX THE HAZARDS: **E**VALUATE THE CHANGES.

__ The instructions: “you need to move “those things” to over “there.”

__ The job is to clean the top of the barn out and you see there is a board missing on the floor .

__ As you are about to refuel but you notice the fuel tank is right beside the driving shed. Inside there are welding repairs being done, and a visitor is approaching with a lit cigarette.

__ The aisle way is cluttered with pails, trash, hoses and feed so you clean it up.

__ The lumber that was all over the work site has now been piled into a high pile, but you notice it is leaning, and doesn’t look very stable.

Make up some more examples of your own and have the members identify the correct answers. Hopefully discussion will come from this exercise, as some members may not agree.

Activity #2 - Mad Minute

Break into groups and problem solve for one minute. Then report back to the large group and see who had the most answers.
The topic: Think of locations on the farm where water and electricity may both be found.

Activity #3 – Know Your Fire Extinguishers

2) On a flipchart or large piece of paper, write the names of the objects below. Beside each type of burnable material have members write the correct class of fire extinguisher that would be used.

Wood	_____	Paint	_____
Gas	_____	Appliances	_____
Electrical	_____	Paper	_____
Magnesium	_____	Oils	_____
Textiles	_____	Sodium	_____
Fats	_____	Motors	_____
Potassium	_____		

Activity #4 – Senior Activity - Chain Saw Review

Have members review the chain saw information by “hands on” familiarization. Show them how to mix the gas, where to put the fuel and oil, how to carry, adjust chain tension, all safety features, proper stance etc.

Activity #5 – Battery Boosting Quiz

The following is a True of False Quiz.

1) T F Jump-starting a car can destroy equipment/accessories in the car.
2) T F Red means negative and black means positive.
3) T F The acid inside the battery is ascorbic acid.
4) T F It is best to stand in front of the vehicle for the best view.
5) T F You should always connect to the negative terminal of the dead battery as your first choice.
6) T F You should always start connecting the battery cables on the positive post of the dead battery.
7) T F Painted, dirty or oily nuts on the engine make a good ground.
8) T F You disconnect jumper cables in the reverse order as when you connected them.
9) T F Jump-starting a battery can crank 300+ volts into your system.

Answers

Activity #1 – "B" SAFE - Answers are B S A F E!

Activity #3 – Fire Extinguisher Quiz Wood – A; Paint – B; Gas – B; Appliances – C; Electrical – C; Paper – A; Magnesium – D; Oils – B; Textiles – A; Sodium – D; Fats – B; Motors – C; Potassium – D.

Activity #5 – Battery Boosting Quiz
1-T; 2-F; 3-F; 4-F; 5-F; 6-T; 7-F; 8-T; 9-T.

References

Disaster Relief Chain Saw Safety: Tree Felling. (n.d.). Missippi State University Extension Service. Retrieved December 29, 2006, from http://msucares.com/pubs/publications/p2250.pdf

Farmsafe Services for… Agricultural, Horticultural and Landscape Industries. (February 2006). Volume 31, No. 1 Newsletter.

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