



Welcome to Module 6. This module will cover Pesticide licensing law, including fertilizer-pesticide mixtures; integrated pest management, environmental effects, and safety.

TRAINING OBJECTIVES



At the end of this module, you will be able to:

1. Describe the laws and licenses that regulate pesticide application.
2. Explain Integrated Pest Management concepts.
3. Explain the environmental hazards involved with pesticide application.
4. Interpret and implement the information on a pesticide label.
5. Minimize personal exposure when using pesticides.



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LAWS AND LICENSES THAT REGULATE PESTICIDE APPLICATION

We will begin by discussing the laws and licenses that regulate pesticide application. It is illegal to apply any pesticide commercially, for hire to a lawn, residential site, or other structural site without the proper license.

FDACS

This is the state regulatory agency responsible for administering the state laws that govern pesticide and fertilizer licensing in Florida.

Florida Department of Agriculture & Consumer Services

Licensing Requirements for Pesticide Use in Lawn and Landscape Maintenance Not only should pesticides be used carefully, existing laws regarding pesticide applications and licensing requirements for conducting a business should also be complied with. There are three categories of licenses, (local occupational license, limited certification for commercial landscape maintenance license, or a pest control business license and a certified operators certificate) that could apply to persons who practice landscape maintenance as a business. In most cases, if a person or company is providing services that only include mowing, edging, landscaping, and fertilizing, only a county or municipal occupational license is needed. (This does not apply to “weed and feed” or “insect control” applications.)

If a person or company also applies any herbicide (even a granular product of a pesticide coated onto fertilizer), fungicide, or insecticide, to residential lawns or plant beds, a license for pesticide application is required from the Florida Department of Agriculture and Consumer Services (FDACS) Bureau of Licensing and Enforcement.

FDACS is the state regulatory agency responsible for administering the state laws that govern pesticide and fertilizer applicator licensing in Florida.

FDACS: STATUTORY AUTHORITY

Chapter 482

Florida Structural Pest Control Act

- Commercial pest control operators
- Commercial landscape maintenance industry
- Government and private employees or owners

Chapter 487

Florida Pesticide Law

- Restricted-use and supervision of pesticides



The licensing and regulation of persons who apply pesticides in Florida are controlled by two statutory laws, which are administered by the Florida Department of Agriculture and Consumer Services (FDACS) Bureau of Licensing and Enforcement.

Chapter 482 – Florida Structural Pest Control Act administers and services the commercial pest control operators, commercial landscape maintenance industry, government and private employees or owners applying pesticide products.

Chapter 487 – Florida Pesticide Law administers and services the use, purchase, and supervision of restricted-use pesticides.

All persons who apply restricted use pesticides to agricultural areas, industrial areas, and any outdoor areas not associated with buildings or public health pest control must have a pesticide applicator license issued by the Bureau of Licensing and Enforcement.

FDACS: BUREAU ADMINISTRATION

Bureau of Licensing and Enforcement (Chapter 482) Urban Related Areas

- Pest Control Operator (PCO)
- Limited Commercial Landscape Maintenance
- Limited Lawn and Ornamental
- Limited Urban Commercial Fertilizer Applicator

(Chapter 487) Restricted Use Pesticide”

- Private – Farmers and Nursery Growers
- Commercial – Contract or for-hire applications
- Public – Government or Institutional Employees

Chapter 482, Pest Control Law, is administrated by the Bureau of Licensing and Enforcement. It addresses BUILDINGS, STRUCTURES, OR LAWNS & PLANT BEDS ASSOCIATED WITH A BUILDING.

For this presentation we will address those persons who apply any pesticide (either restricted use or general use) to ornamentals or turf associated with a building, including lawns and plant beds.

Areas regulated by Chapter 482 include contract pest control and pest control performed by governmental employees or private and commercial property owners or their employees on non-agricultural property.

Chapter 487, Ornamental and Turf Category and Restricted Use Licenses, is also administrated by the Bureau of Licensing and Enforcement.

It addresses all persons who apply or supervise the application of restricted-use pesticides to private agricultural areas, commercial industrial areas, and any private/public outdoor areas not associated with buildings or public health pest control.

PESTICIDE LICENSES: APPLICATOR

Pest Control Operator (Lawn and Ornamental)	<ul style="list-style-type: none"> • Perform pest control on ornamentals and lawns. • ID Cardholder
Limited Commercial Landscape Maintenance	<ul style="list-style-type: none"> • Commercial landscape maintenance personnel who apply certain pesticides to plant beds and ornamentals only, e.g. Glyphosate.
Limited Lawn and Ornamental (Institutional Employees)	<ul style="list-style-type: none"> • Government, school employees and personnel in condos, businesses who apply pesticides on their business property.
Ornamental and Turf (Chapter 487)	<ul style="list-style-type: none"> • Persons who apply or supervise use of RUP pesticides; non urban pesticide use.

Commercial L & O Pest control operators are licensed to perform pest control on ornamentals and lawns. They are responsible for supervising and training of non-certified employees.

Non-certified employees who perform pest control or solicit pest control for a licensed company must have an EMPLOYEE IDENTIFICATION CARD. Each identification cardholder must be an employee of the licensed company and work under the direct supervision of the certified operator in charge and may not be an independent contractor.

Certified limited commercial landscape maintenance personnel may not supervise the application of pesticides made by non-certified employees. Likewise, certified limited lawn and ornamental personnel may not supervise the application of pesticides made by non-certified employees.

Certified ornamental and turf personnel who use or supervise use of restricted-use pesticides are allowed to supervise up to 15 non-certified applicators; however, supervisors must be immediately available by voice, phone or radio.

APPLICATION SUPERVISION

Pest Control Operator (Business Operation)	<ul style="list-style-type: none"> Supervises unlimited number of non-certified employees with identification cards.
Limited Commercial Landscape Maintenance	<ul style="list-style-type: none"> May not supervise the application of pesticides made by non-certified, unlicensed employees.
Limited Lawn and Ornamental	<ul style="list-style-type: none"> May not supervise the application of pesticides made by non-certified, unlicensed employees.
Ornamental and Turf (Chapter 487)	<ul style="list-style-type: none"> Supervision up to 15 applicators Must be immediately available by voice, phone or radio.

Application supervision:

A pest control operator is certified to perform pest control services on ornamentals and lawns. They are responsible for supervising and training of non-certified employees. A limited commercial landscape maintenance person is certified to provide commercial landscape pest control only in ornamental plant beds with certain labeled pesticides. They may not supervise the application of pesticides made by non-certified, unlicensed employees.

Limited lawn and ornamental including institutional employees, can apply pesticide treatments to lawn and ornamental beds on government or private property owned by their employer. They too may not supervise the application of pesticides made by non-certified, unlicensed employees.

Ornamental and turf, also known as O & T addresses all persons who apply or supervise, up to 15 applicators, the application of restricted-use products in golf courses, parks, cemeteries, and athletic fields. Applicators must be immediately available by voice, phone or radio.

FAILURE TO BE LICENSED...

It is illegal to apply any pesticide commercially to a lawn, residential sites, or other structural sites without a license.

Commercial applicators:

- Civil fines up to \$5,000
- Criminal fines up to \$25,000
- Possible Prison Time

Including the application of:

- "Weed and feed"
- "Insect control"



If a person or company applies any herbicide, fungicide, or insecticide, to residential lawns or plant beds, a license for pesticide application is required from the Florida Department of Agriculture and Consumer Services (FDACS) Bureau of Licensing and Enforcement.

Failure to obtain a license can result in fines up to \$25,000, jail and/or prison time. This includes the application of "weed and feed" or "insect-control" pesticide/fertilizer mixtures to lawns.



PEST MANAGEMENT

Transition Slide:

Now, let's discuss the principles of a good pest management program.



A pest is anything that competes with humans, domestic animals, or desirable plants for food or water; injures humans, animals, desirable plants, structures, or possessions; spreads disease to humans, domestic animals, wildlife, or desirable plants; or annoys humans or domestic animals. Less than 1% of all insects are harmful to plants.

Types of pests include the following:

- Arthropods such as insects and arachnids;
- Microbial organisms such as bacteria, fungi, viruses, and Mycoplasma;
- Weeds, which are plants growing in an area where they are not wanted;
- Nematodes
- Mollusks such as snails and slugs
- Vertebrate pests.

Who can identify the following (raise your hands to answer)?

1. Spider Mites

2. Dollar Weed
3. White Fly
4. Lubber Grasshopper
5. Pink Hibiscus Mealybug
6. Nematodes

Integrated **Pest Management** is the coordinated use of pest and environmental information and available pest control methods:

- Prevention: keep the pest from becoming a problem.
- Suppression: reduce pest and damage by the most economical means with the least possible hazard to people, property and the environment.



INTEGRATED PEST MANAGEMENT

The philosophy of IPM evolved in the 1950s because of concerns over increased pesticide use, environmental contamination, and the development of pesticide resistance. IPM's main goal is efficient use of pesticides by using a combination of tactics to control pests.

Integrated Pest Management is the coordinated use of pest and environmental information and the most up-to-date available pest control methods: To prevent unacceptable levels of pest damage, by the most economical means, with the least possible hazard to people, property and the environment.

It is important to note: IPM is not “anti-pesticide”, but it does promote the use of the least-toxic and most selective alternatives when chemicals are necessary.

Pesticides are only one weapon against pests and should be used responsibly and in combination with other, less-toxic control tactics.



STEP 1: ACCURATE IDENTIFICATION

Let's take a moment to review the necessary steps for IPM, starting with accurate identification. Accurate identification is critical to knowing if a pest is harmful or beneficial.

Which one is the real chinch bug?

(Pause)

If you think the one on the right, you are correct. What is the other bug?

(Pause)

If you think it's a big-eyed bug that eats chinch bugs you would be correct. When the insect is correctly identified, then you can find information about its life cycle, food preference, host plants, and habits.



Chinch Bugs



STEP 2: MONITOR THE PEST POPULATION

Another important part of a successful IPM program is pest monitoring. This includes understanding the life cycle of a pest and knowing which plants and conditions it may prefer. By monitoring populations, understanding historical trends, and knowing where a pest is most likely to occur you can target control practices to a specific pest in a specific location. Maintaining records and histories of pest populations can help a manager forecast pest occurrence and apply pesticides wisely.

Realistic threshold of injury:

- ✓ Aesthetics
- ✓ Plant health
- ✓ Timing
- ✓ Control strategy

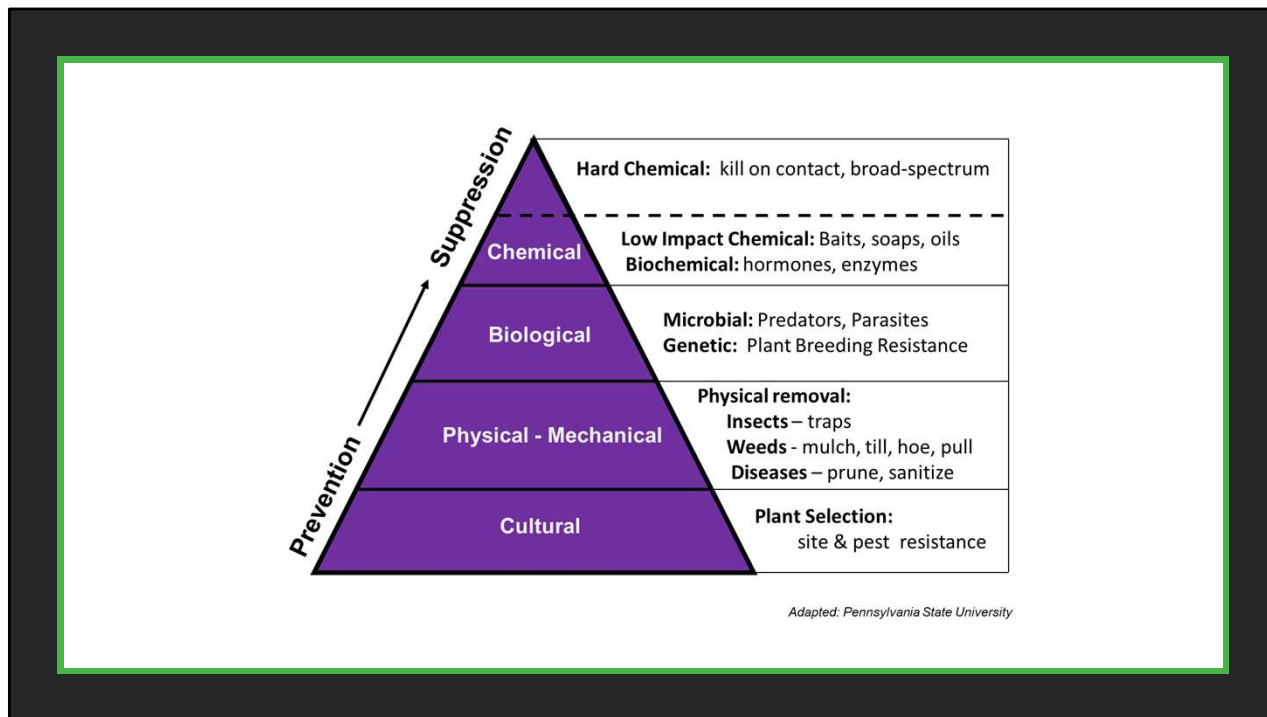


STEP 3: EDUCATE CLIENTS ABOUT TREATMENT

The Green Industry is sensitive to aesthetic damage, and customers are often intolerant of anything that could affect the appearance of ornamental plants. Increased education of growers, consumers, and maintenance personnel could moderate the aesthetic threshold and allow for minor damage without compromising plant health and beauty.

A pest-control strategy should be used only when the pest is causing or is expected to cause more damage than what can be reasonably and economically tolerated. A control strategy should be implemented that reduces the pest numbers to an acceptable level while minimizing harm to non-targeted organisms.

When monitoring a site, decide how much damage is acceptable. This may depend on your client's needs and on injury levels. Consider treatment thresholds and timing. In this photo, plant health decline is evident. There is a question of whether to treat or not to treat. Fertilizer and pesticides are not the fix-all for dead tissue. Time is required for growth. Educate your customers about when treatment is needed and what treatment is best.



Starting from the bottom of the IPM management triangle, treatment should always begin with proactive cultural practices to avoid more reactive, hard chemical treatments.

The cultural component consists of the proper selection, establishment, and maintenance, such as pruning, fertilization, and irrigation of turf and landscape plants. Keeping lawns and landscapes healthy reduces their susceptibility to diseases, nematodes, and insects, thereby reducing the need for chemical treatment. In the service industry, unfortunately, many of the cultural components of IPM are not under the control of the pesticide application professional. It is essential that customers be made aware of their responsibility for cultural factors, whether in doing their own work or in selecting qualified professionals for third-party activities such as irrigation and mowing.

The physical or mechanical component is more related to “housekeeping.” Removal of dead, diseased or infested materials and debris will go a long way toward reducing pest occurrences.

The biological component involves the release and/or conservation of natural

enemies (such as parasites, predators, and pathogens) and other beneficial organisms (such as pollinators).

The genetic component relies on the breeding or genetic engineering of turfgrasses and landscape plants that are resistant to key pests.

Last, chemical control, includes a wide assortment of conventional, broad-spectrum pesticides and more selective, newer chemicals, such as microbial insecticides and insect growth regulators. Pesticides are designed to kill or alter the behavior of pests. When, where, and how they can be used safely and effectively is a matter of considerable public interest. If they are not used wisely, pesticides may pose risks to pesticide applicators and other exposed people, and may create long-term environmental problems.

- Was the pest **identification** correct?
- Was the pest control **method** effective?
- Was the type of **application** correct?
- Was the **rate** appropriate?
- Was the **timing** correct?

FOLLOW-UP MONITORING CHECKLIST

Determine if the “corrective actions” actually reduced or prevented pest populations, were economical, and minimized risks. Record and use this information when making similar decisions in the future. A successful IPM program always follows up with monitoring pest activity and effectiveness. It is important to question outcomes to determine success or control failures.

- Was the pest **identification** correct?
- Was the pest control **method** effective?
- Was the type of **application** correct?
- Was the **rate** appropriate?
- Was the **timing** correct?
- And, were there pests that were **resistant**?

HOW ROUTE-BASED BUSINESSES USE IPM

- Educate customer on acceptable imperfections
- Monitor yard and neighborhood for potential problems
- Keep records – note problems in the last few years
- Identify special cases



The control and monitoring of pest populations presents special difficulties for the service industry, because the service professional may only be on-site one day per month or less.

While spot applications are generally preferable, in certain situations preventative measures may be necessary. If a preventative control is used, use the recommended amount of pesticide and least toxic product

Route based businesses may not visit a property often enough to catch early infestation. However, wholesale preventative spraying is not good either.

IPM principles apply but must be flexible. It is important to:

- Instruct customers about acceptable thresholds of damage.
- Monitor yard and neighborhood for potential problems
- Record and review records for several years to identify and chart early warning signs of damaged areas. Note conditions like temperature, rainfall, and humidity.



ENVIRONMENTAL CONCERNS

The Green Industries Best Management Practices training focuses on water quality; however, equally important are the other effects of inappropriate pesticide application in the environment. This can affect: air quality, soil, beneficial insects, plants, and wildlife.



HOW CAN PESTICIDE AFFECT WATER QUALITY?

Quite simply, pesticides are designed to kill or alter the behavior of pests. When, where, and how they can be used safely and effectively is a matter of considerable public interest. If they are not used wisely, pesticides may pose risks to pesticide applicators and other exposed people, and may create long-term environmental problems. Inappropriate use of pesticides can kill or harm aquatic animals and microorganisms; kill aquatic algae and plants; foul the water and get into our drinking water supply.

PROTECT SURFACE AND GROUND WATER

- Identify the soil type and area geology
- Do not apply pesticides to paved surfaces or near storm drains
- Water in products per label instructions, but do not overwater
- Do not apply pesticides before a heavy rain



Photo: G. Hochmuth (Gainesville, FL)

Factors that determine the susceptibility of the soil to leaching and pesticide movement include soil texture, organic-matter content, soil moisture and permeability. Some pesticides readily move through soils that are well drained, sandy, or low in organic matter. Information on the label alerts users to these situations.

Do not apply pesticides to paved surfaces or near storm drains. The slope of the field and the location of lakes, ponds, streams, canals, or wetlands relative to the application site also determine the vulnerability of these surface-water bodies to contamination from pesticides.

Water in products per label instructions, but DO NOT over-water and DO NOT apply pesticides before a heavy rain. When applying pesticides, evaluate the pesticide and follow the directions on the label.

Select pesticides that are less likely to leach.

- Highly water soluble pesticides have the greatest potential to leach to groundwater.

- Some pesticides are classified for restricted use and have label statements about water contamination.

PROTECT NON-TARGET ORGANISMS

- **Children**
- **Pets**
- **Hypersensitive individuals**
- **Beneficial insects**
- **Wildlife**
- **Desirable plants**



Non-target organisms such as children, pets, hypersensitive individuals, beneficial insects, wildlife or desirable plants can be affected by pesticide applications. Before making a pesticide application, it's important to become familiar with the area to be treated and its surroundings. When children and pets are a consideration: Remove their toys before applying a pesticide; remove or cover pet food and water dishes.

DRIFT IN AIR: PESTICIDE MOVEMENT

Droplet diameter in microns	Droplet called	Time required to fall 10 ft. in still air	Distance covered falling 10 ft. in 3 mph breeze
5	Fog	66 minutes	3 miles
100	Mist	10 seconds	409 feet
500	Light rain	1.5 seconds	7 feet
1000	Moderate rain	1 second	4.7 feet

Pesticides must be correctly applied, to prevent exposure due to drift. Spray when conditions for drift are minimal per label instructions.

DRIFT means the airborne movement of pesticide particles into non-target areas. Droplet size and wind speed are the most important factors that influence drift.

Use appropriate nozzles and determine wind speed before spraying pesticides. Please take a few minutes to review the various combinations that may affect pesticide movement due to drift.



PESTICIDE LABELING

Pesticide labeling is more than the sticker on the bottle or bag; it can be several pages of information and instructions that users are legally required to follow. Every word on a label is reviewed and approved by the Environmental Protection Agency (EPA).



THE PESTICIDE LABEL THE LABEL IS THE LAW!

A pesticide label is the manufacturer's primary way to communicate with the end-user. Look at the labels to learn what a manufacturer is communicating. Always follow the directions on the label.

These directions have been developed after extensive research and field studies on the chemistry, biological effects, and environmental fate of the pesticide. The label is the single most important document in the use of a pesticide.

State and federal pesticide laws require following label directions!

PESTICIDE LABEL INFORMATION

- **Ingredients and formulation**
- **Directions for use**
- **Storage and disposal information**
- **Safety information**
- **Personal protective equipment (PPE)**



Label information provides the handler and applicator information to make informed decisions. Be sure that labels are organized and available for easy access.

The label includes:

- **Ingredients and formulation**
- **Directions for use**
- **Storage and disposal information**
- **Safety information and Personal Protective Equipment (PPE)**

SERVICE CONTAINERS

PESTICIDE CONCENTRATE

- Name, address, and phone number of pest control firm
- Product name
- EPA registration number (from product label)
- Name and percentage of active ingredients
- Signal word from registered label

USE-DILUTION PREPARATIONS

(READY TO USE)

- Name, address, and phone number of pest control firm
- Product name, preceded by the word "diluted"
- EPA registration number preceded by the word "derived from"
- Name and percentage of active ingredient as diluted
- Signal word from registered label

Pesticides kept in service containers, such as tip'n pours and ready-to-use containers for transport and temporary storage of pesticides **have specific label requirements**. Labeling of service containers requires that pesticides kept in containers other than application equipment shall be accurately identified by permanent, durable label or tag, showing the common or chemical names(s) of principal active ingredient(s) and providing information required by EPA regulations or recommendations.

An abbreviated label must be securely attached to the service container for pesticide concentrates, including diluted ready-to-use formulations. It is the responsibility of certified operators in charge, licensees, and their identification cardholders to see to it that their service containers are properly labeled. For more information see FDACS's Memo 824 to properly label, transport and temporary use containers.

Signal Word	Category	Oral Lethal Dose*
Danger, Poison/Peligro (Skull and Crossbones)	I. Highly Toxic	- Few drops to 1 teaspoon - LD ₅₀ Trace to 50 mg/kg
Warning/Aviso	II. Moderately Toxic	- 1 teaspoon to 1 oz. - LD ₅₀ 50 to 500 mg/kg
Caution	III. Slightly Toxic	- 1oz. to more than a pint/pound - LD ₅₀ > 500 to 5,000 mg/kg
Caution (or no signal word)	IV. Relatively Toxic	- Over one pint/pound - LD ₅₀ > 5,000+ mg/kg


*Based on a 150-pound person

LABEL INFORMATION: SIGNAL WORDS

A signal word is displayed in large letters on the front of the label to indicate approximately how acutely toxic the pesticide is to humans. The signal word is not based on the active ingredient alone, but on the contents of the formulated product. It reflects the hazard of any active ingredients, carriers, solvents, or inert ingredients.

The signal word is determined by the most severe toxicity category assigned to five acute toxicity studies. The signal word indicates the risk of acute effects from the five routes of exposure to a pesticide product (oral, dermal, inhalation, eye irritation and skin irritation) and is based on the one that is greatest. All highly toxic pesticides that are very likely to cause acute illness through oral, dermal, or inhalation exposure have DANGER as their signal word and will carry the word POISON printed in red with the skull-and-crossbones symbol. Products that have the DANGER signal word due to skin and eye irritation potential will not carry the word POISON or the skull-and-crossbones symbol.

The signal word does not indicate the risk of delayed effects or allergic effects. A common way to document toxicity is by oral LD 50 values. LD 50 is the amount of chemical required to provide a “lethal dose” to 50% of the test population. LD 50 is measured in mg of chemical administered per kg of body weight.

Signal word	Typical Statements	STATEMENTS: ACUTE DERMAL TOXICITY
DANGER-POISON (Skull and Crossbones Required)	Fatal if absorbed through skin. Do not get in eyes, on skin, or on clothing. Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, or using tobacco.	
		
WARNING	May be fatal if absorbed through skin. Do not get in eyes, on skin, or on clothing. Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, or using tobacco.	
CAUTION	Harmful if absorbed through skin. Avoid contact with skin, eyes or clothing. Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, or using tobacco.	
CAUTION (optional)	No statements are required. However, manufacturers may choose to use category III labeling.	

The acute toxicity of a chemical refers to its ability to do systemic damage as a result of a one-time exposure to relatively large amounts of the chemical. A pesticide with a high acute toxicity may be deadly if even a very small amount is absorbed. The signal words on the label are based on the acute toxicity of the pesticide. Acute toxicity may be measured as acute oral (through the mouth), acute dermal (through the skin) and acute inhalation (through the lungs or respiratory system).

This table lists some but not all the typical statements one would find for acute dermal toxicity. A more common name for “Dermal” is skin. Pesticide applicators must avoid pesticide contact to hands, feet, head and neck areas. It is unlikely that you would purposely eat or drink the chemicals you are using, but you may breathe them in, splash them on your skin, or expose yourself to pesticide drift. Healthy skin can slow the absorption of a pesticide when dermal contact occurs. Liquid pesticides containing solvents and oil-based pesticides are absorbed quickly compared to dry pesticides. Applicators and handlers must know that damaged skin (chapped, cut, or

abraded) increases the chances of pesticide entry into the body. Therefore, it is important to know the signal words and statements associated with the pesticide chemicals you are applying.



SAFETY DATA SHEETS (SDS)

- Proper procedures for handling/working with chemical
- SDS must be accessible to ALL employees
- Keep SDS organized and accessible in case of emergency
- A master copy should be at hand for office management

The purpose of the SDS and label is to provide handlers of chemicals, including pesticides, with the proper procedures for handling and working with the chemical. People who are primary users of a SDS would include employees who handle a certain material in their daily occupations, those who store chemicals at their place of business, and emergency response crews who need to understand procedures should an emergency occur. The SDS is not designed for someone who may apply a lawn and garden pesticide once or twice a year. It is written in an occupational fashion for those who handle a material routinely.

In addition to checking the container labeling, also check the Safety Data Sheet (SDS) to determine the required safety equipment for each chemical used in the operation. Keep a written pesticide inventory and SDS file for the chemicals on site. A master copy should be at hand for office management. Do not store this information in the pesticide storage room itself. SDS must be accessible to ALL employees. Keep a copy of the label and SDS in your truck. "Right to Know" includes employees, customers

and their neighbors.

GLOBALLY HARMONIZED SYSTEM (GHS)



1. Signal Word

2. Symbols (Hazard Pictograms)

3. Manufacturer Information

4. Precautionary Statement

5. Hazard statement

6. Product Name

As of March 2012

- **New system for classification of hazardous substances**
- **Hazardous Communication System (HCS)**
- **Workplaces that manufacture, transport or store chemicals**
- **Emergency responders, poison control centers and transporters of dangerous goods**

On March 26, 2012, the Department of Labor adopted the United Nations' Globally Harmonized System of Classification and Labeling of Chemicals—otherwise known as GHS. This change ensures that OSHA's current Hazard Communication Standard (HCS) is aligned with internationally-developed guidelines for the categorization and labeling of hazardous substances.

Under the new GHS ruling, material safety data sheets (MSDS), will be referred to and called SDS (or Safety Data Sheets). The new standards affect any workplace that manufactures, uses, transports, or stores hazardous chemicals. One specific change in this ruling is to the ANSI Standardized MSDS format. The original 16-section MSDS format created by ANSI Z400.1 (2010 Rev.) will be replaced by the new SDS under the GHS system for classification for hazardous chemicals.

SDS's are the backbone of the Hazardous Communication System (HCS). They provide comprehensive and specific chemical information used not only by workplaces that manufacture, use, transport or store hazardous chemicals, but also by emergency responders, poison control centers and transporters of dangerous goods.

LABEL RESTRICTIONS

- Violation of Federal law to use a pesticide in a manner inconsistent with its labeling.
- Do not apply products at:
 - Higher dosage
 - Higher concentration
 - Extra applications
- Pesticides may only be used on the plants, animals or sites listed on the label.

All registered pesticides, including all end-use and manufacturing-use products, have labels with the following statement immediately below the Use Classification: “It is a violation of federal law to use this product in a manner inconsistent with its labeling.”

These other statements related to misuse may be seen on **household use products** in addition to the previous general misuse statement:

- “STOP! – Read the label before using.”
- “Use only as directed on this label.”
- “Read label very carefully, including any special requirements which pertain to your growing area.”
- “Failure to follow all precautions and directions is illegal.”

Unless label prohibits, it is ok to...

1. Use more personal protective equipment than required
2. Use equipment that is not label prohibited
3. Mix with another pesticide
4. Mix with fertilizer
5. Apply less than the labeled rate

EXCEPTIONS TO THE LABEL

It is important to remember the following five exceptions to the pesticide label. Unless the label prohibits, it is ok to use more Personal Protective Equipment than the label requires, use equipment that is not labeled prohibited, mix with fertilizer, or apply less than the labeled rate.

Reduce Exposure

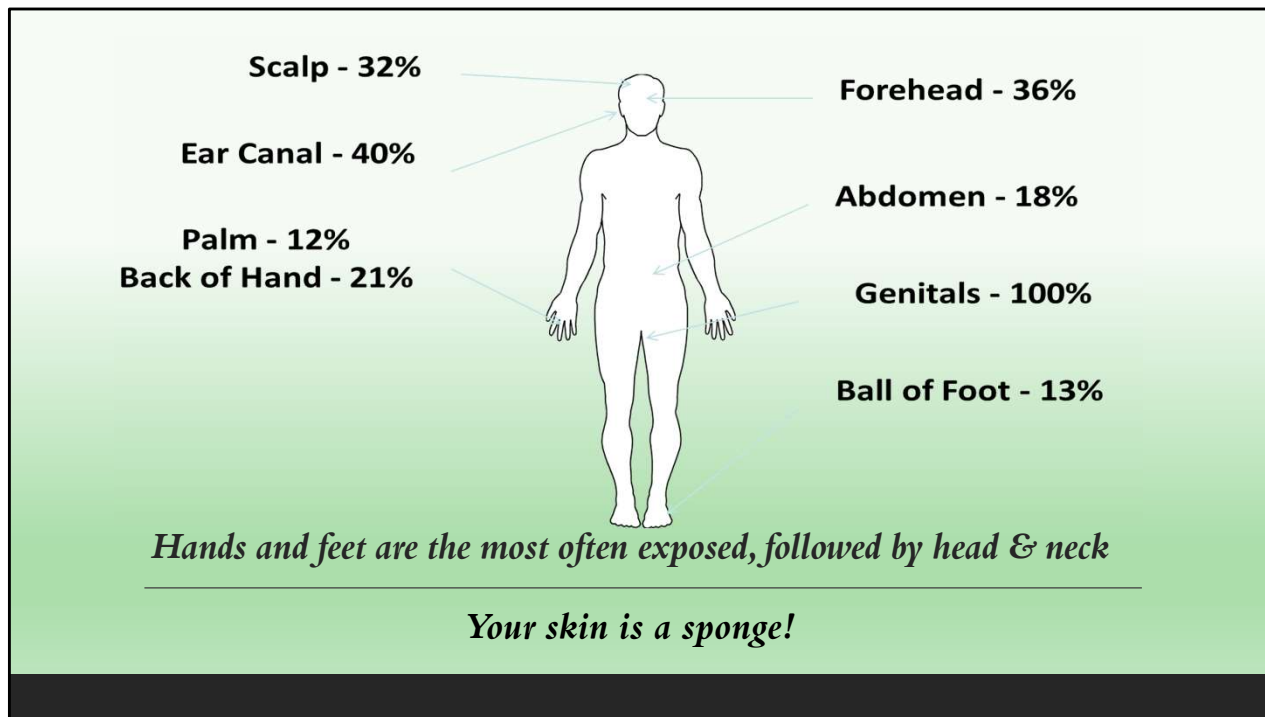
Pesticide Contact of Unprotected Areas



The example of using a black light and fluorescent tracers dramatically demonstrate the extent to which pesticide exposure may occur, even with the use of PPE. To minimize exposure, follow the specified PPE for each product. Simply wearing gloves and long-sleeves will significantly reduce dermal exposure.

About 97 percent of human exposure to pesticides during spraying occurs through contact with the skin. To prevent exposure to pesticides, applicators should wear protective clothing and personal protective equipment (PPE). Every pesticide product label contains specific information about necessary clothing and equipment to be worn while mixing, loading and applying that product.

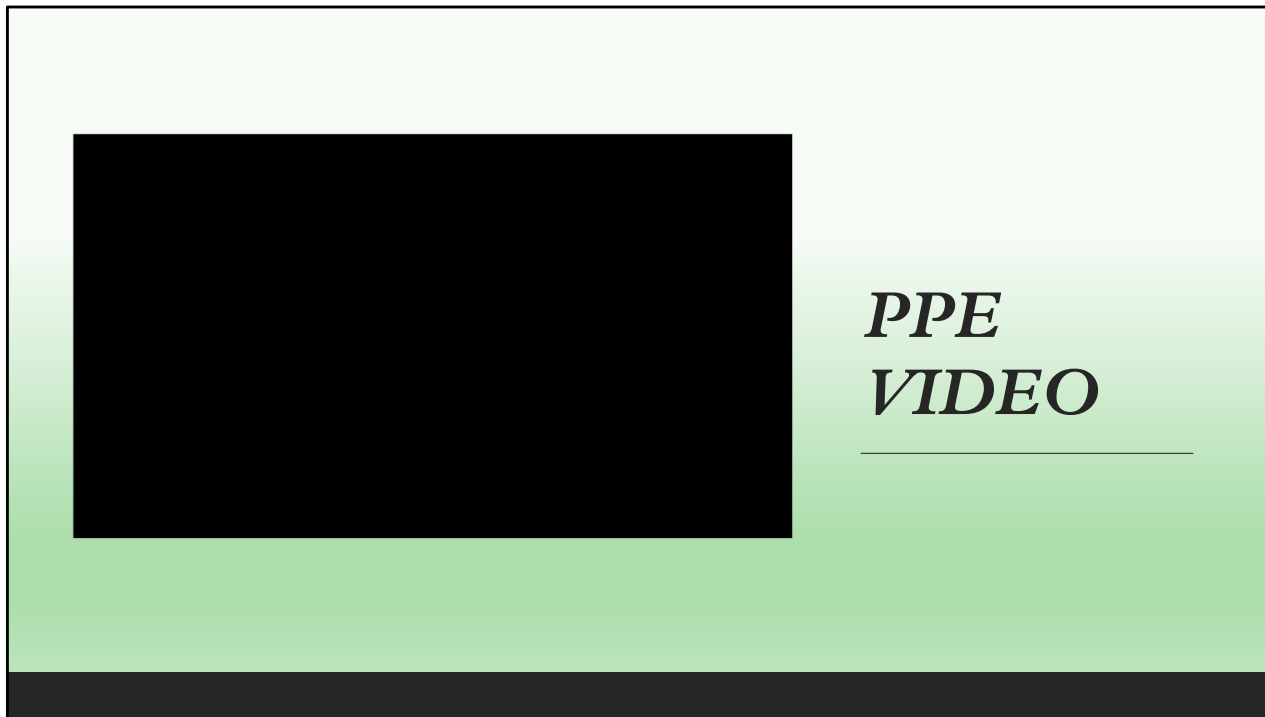
This information may be found in the "Precautionary Statements" section of the label. Remember, the label is the law. Read it and wear the appropriate equipment.



The applicator must know that damaged skin (chapped, cut, or abraded) has lost its ability to slow the entry of a pesticide into the body.

The dermal and inhalation routes of pesticide entry are likely to be the most important routes of pesticide applicator exposure. You can be poisoned no matter which way pesticides enter your body. It is unlikely that you would purposely eat or drink the chemicals you are using but you may breathe them in, splash them on your skin, or expose yourself to pesticide "fallout."

Don't smoke or eat while handling pesticides! While there are few chemicals that are equally poisonous by all routes of entry, some pesticides can poison you through all four routes. For example, parathion is toxic regardless of how it is absorbed.



VIDEO SCRIPT

The key to personal safety when handling pesticides is to avoid exposure to them. If the proper protective clothing and equipment, also known as PPE, are used and other safety precautions are followed, a highly toxic pesticide may present little hazard to the applicator.

Store personal protective equipment where it is easily accessible in an emergency, but not in the pesticide storage area because then it may be unavailable during an emergency.

At the minimum, pesticide applicators and other handlers must wear: Protective eyewear; long-sleeved shirt and long pants; chemical-resistant gloves and shoes plus socks.

Remember that PPE is specified for normal application and handling activities. Regular PPE may not be protective in emergency situations, such as fires or reactions with other spilled chemicals.

Maintaining personal protective equipment is critical to reducing exposure to

chemicals. If you get conflicting information about the minimum personal protective equipment needed for a pesticide application, comply with the labeling on the product. Always follow the directions on the label. These directions have been developed after extensive research and field studies on the chemistry, biological effects, and environmental fate of the pesticide.

The label is the single most important document in the use of a pesticide. State and federal pesticide laws require following label directions! The label tells you what personal protective equipment to use. Remember, the label is the law!

After applying pesticides, you must correctly clean and secure your equipment and PPE items in order: First, clean your spray equipment. Then, clean your personal protective equipment. Remember to leave your gloves on until you are completely finished working with the pesticide, cleaning equipment, disposing of garments or securing contaminated laundry.

To be sure that no one in your family is exposed to the pesticides you used, wash your application clothing separately from all other laundry.

Remember, the key to Personal safety is to avoid exposure to pesticides. Use PPE.

Minimize Storage/Handling Risks

Minimize amounts on hand

- Minimize amounts on hand
- First in - first out
- Keep secure and isolated
- Lockable door
- Do not smoke in area
- Restrict access to unauthorized persons



If you store pesticides for your operation, this storage must be properly constructed and maintained to prevent problems or an expensive cleanup in the event of an accident. **The best way to minimize storage problems is to minimize the amount you store. Purchasing only small** amounts that you can use quickly is the best approach for many turf management professionals.

Do not store large quantities of pesticides for long periods. Adopt the “first in–first out” principle, using the oldest products first to ensure that the product shelf life does not expire. If you must store pesticides, follow these guidelines:

- Design and build pesticide storage structures to keep pesticides secure and isolated from the surrounding environment.
- Store pesticides in a roofed concrete or metal structure with a lockable door.
- Keep pesticides in a separate facility, or at least in a locked area separate from areas used to store other materials, especially fertilizers, feed, and seed.
- Do not store pesticides near flammable materials, hot work (welding, grinding),

or in shop areas.

- Do not allow smoking, eating or drinking in pesticide storage areas.
- Secure area where unauthorized persons are restricted from entering.

CHEMICAL HANDLING

3 commandments:

- Anticipate the worst
- Be prepared for the worst
- Prevent problems before they occur



Use extreme caution when mixing chemicals. Handling chemicals consists of mixing and loading chemicals into tanks or other storage units. Often this requires the handler to climb steps, ladders, or walk around hoses and other objects.

When handling chemicals, follow these 3 commandments:

- 1) Anticipate the worst
- 2) Be prepared for the worst
- 3) Prevent problems before they occur

EMERGENCIES

- Control the situation
- Contain the spill
- Clean up the spill
- Store waste properly until disposed of



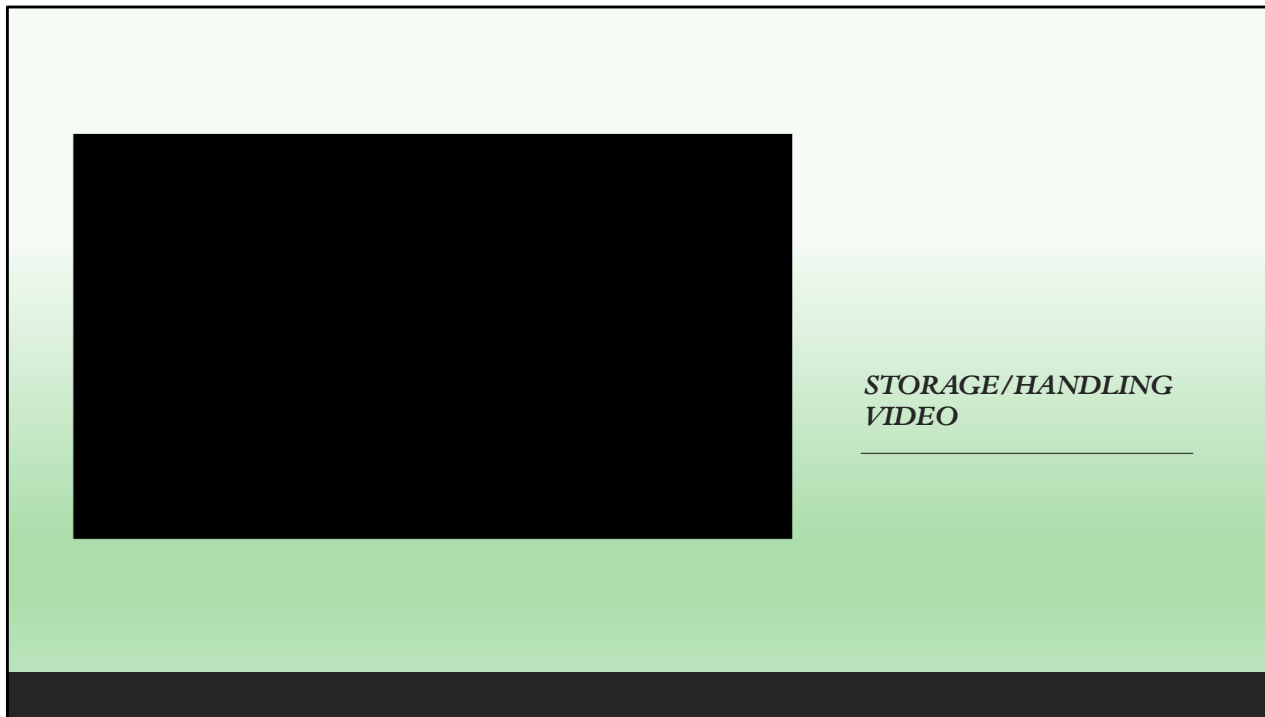
It is essential that you are prepared for major or minor pesticide spills. Remember the 3 Cs: Control, Contain and Clean up the spill.

Clean up spills as soon as possible. Unmanaged spills may quickly move into surface waters and injure plants and animals.

Always use the appropriate personal protective equipment for a chemical as indicated on the SDS and the label. In addition, follow these four steps:

- **CONTROL** actively spilling or leaking materials by setting the container upright, plugging leak(s), or shutting the valve.
- **CONTAIN** the spilled material using barriers and absorbent material. For small spills, use kitty litter, vermiculite, shredded newspaper, absorbent pillows, clean sand, or pads.
- **COLLECT** spilled material, absorbents, and leaking containers and place them in a secure, properly labeled container. Some contaminated materials could require disposal as hazardous waste.

- STORE the containers of spilled material until they can be applied as a pesticide or appropriately disposed of.



If you store pesticides for your operation, storage must be properly constructed, secured, and maintained to prevent problems or an expensive cleanup in the event of an accident. Store pesticides in original containers. Never put pesticides in containers that might cause children and others to mistake them for food or drink.

It is important to maintain an accurate inventory and label all pesticide containers legibly. Keep containers securely closed and regularly inspect them for splits, tears, breaks, or leaks.

To decrease storage problems and damage, minimize the amount you store. Purchase only necessary quantities. Remember to always keep pesticides in locked storage areas.

When transporting chemicals: Secure all containers to prevent rolling and sliding. Don't allow chemicals to sit in the sun for long periods of time, never carry pesticides in the cab of your truck or compartment of your car, and do not leave your vehicle unattended when transporting pesticides. Handling chemicals consists of mixing and loading chemicals into tanks or other storage units. Often this requires the handler to climb steps, ladders, or walk around hoses and other objects.

When handling chemicals, follow these 3 commandments:

- 1) Anticipate the worst
- 2) Be prepared for the worst
- 3) Prevent problems before they occur

Use extreme caution when mixing chemicals. In most cases, the mixing and loading of pesticides into application equipment should be done adjacent to the application site. Florida Law requires an air gap or anti siphoning device when mixing chemicals.

If chemicals are routinely mixed and loaded at a shop or storage site, spilled material can accumulate causing expensive cleanup procedures. To prevent problems when mixing chemicals on-site, use a mixing tray or portable pad to avoid spillage that could be transported to non-targeted areas. Use standard measuring devices to ensure pesticides and diluents are accurately prepared.

It is cost effective as well as good practice to keep application equipment properly calibrated and in good repair. Correct calibration keeps you in compliance with the label, reduces the risks to applicators, workers and the environment, and saves money.

There are different ways to calibrate equipment. It is important to select a method you understand and perform it faithfully. Even though pesticide granules seem similar, they are not. Each granular pesticide has its own flow characteristics, which can change with moisture and temperature changes. You must calibrate your applicator when conditions change, as well as when you switch pesticides.

Be sure to inspect sprayer performance using clean water. Nozzle wear in sprayers may increase the application rate and change spray patterns. Applicator nozzles are not all the same. Small differences in equipment may cause changes in the application rate. Broadcast and drop spreaders can wear and may cause streaking, resulting in poor control or plant injury.

After using application equipment, be sure to clean all equipment. Wear protective clothing when you clean equipment that has been used with pesticides. Remember that pesticide residues on equipment can be harmful, so use the same safety precautions as when you handle the pesticide itself. Clean pesticide application equipment in an area with a wash rack, cement apron, and sumps to catch the contaminated rinse water. Don't wash equipment near water bodies, wells, or drains.

Private pesticide applicators that do not have a washing facility to collect rinse water may clean the sprayer equipment in a field with a crop labeled for that pesticide. However, if more than a small amount of rinse water is produced when cleaning a

sprayer in the field; the rinse water should be collected, secured and reused in future tank mixtures according to label directions.

Triple rinse containers; clean all visible chemicals from the container including the container cap and cap threads. Once rinsed, puncture and crush the containers then follow label directions for container disposal. Collect and reuse rinse water in future pesticide mixture according to label directions.

It is essential that you are prepared for major or minor pesticide spills. Remember the 3 Cs: Control, Contain and Clean up the spill. Clean up spills as soon as possible. Unmanaged spills may quickly move into surface waters and injure plants and animals. The sooner you can contain, absorb, and dispose of a spill, the less chance of causing harm. Small liquid spills may be cleaned up using an absorbent such as cat litter or soil.

Always use the appropriate personal protective equipment indicated on the SDS and the label for the involved chemical. Certain chemicals have reportable quantities for spills. If you spill one of these, you must notify the National Response Center and ChemTrec. The phone numbers are located in the back of your training manual. Be prepared for accidents, spill kits should contain the following:

- First aid kit
- Telephone numbers
- PPE: gloves, footwear, apron, eyewear, respirator
- Absorbent material
- Shovel, broom, dustpan
- Heavy duty detergent
- Fire extinguisher (for all types of fires)
- Large sturdy plastic container

REVIEW TRAINING OBJECTIVES

1. What licenses and laws regulate pesticide application in Florida?
2. What is IPM?
3. What are the health and environmental hazards involved with pesticide application and handling?
4. What information may be found on a label?
5. How can we minimize health and environmental risks when using pesticides?



Now that you have reviewed the overview module, you will now be able to:

1. Know what licenses and laws regulate pesticide application in Florida.
2. Understand what is IPM.
3. Know what are the health and environmental hazards involved with pesticide application and handling.
4. Know what information may be found on a label.
5. Understand how can we minimize health and environmental risks when using pesticides.

Thank You

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This concludes the pesticide module.

Mention of trade names in this presentation is solely for providing specific information. It is not a guarantee or warranty of the products named, and does not signify that they are approved to the exclusion of others of suitable composition. Use pesticides safely. Read and follow directions on the manufacturer's label.