Dandelions - good or bad?

They are bad when they take from the beauty of a lawn, but good when they are a food crop.

Termites - good or bad?

They are bad when they eat the wood in your house, but good when they break down dead and fallen trees.

Honey bees - good or bad?

Are honey bees good or bad? They are good when they pollinate and produce honey, but bad when they sting.

Good or Bad?

Are lady beetles good or bad? Well, they are good when they eat aphids, but bad when hundreds collect inside your house.

- ***Pesticides*** are the materials used to control pests.
  - These chemicals may be natural or man-made.
  - Although once used almost exclusively, is now viewed as only one component of an IPM program.
  - In fact, use of chemical pesticides is now often done only when absolutely necessary.

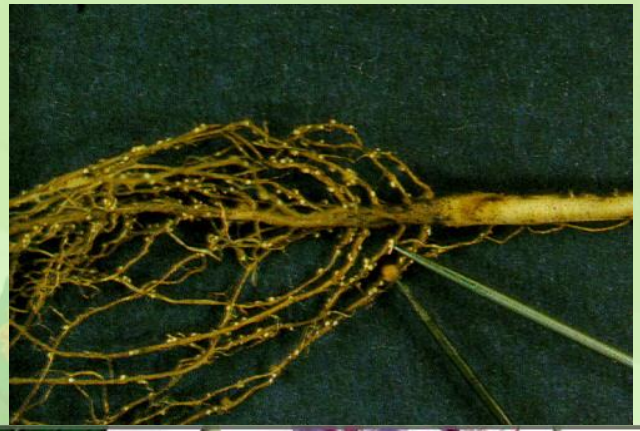
- ***Insecticides*** are used to control ***insects***, which are a group of animals with an exoskeleton and three body parts.
  - Most insects have six legs and four wings.
  - Insects are killed by body contact with the chemical, by swallowing the insecticide, or by insecticides that enter through the respiratory system.

- ***Miticides*** are used to control mites and ticks.
  - They are usually killed by coming in contact with the chemical.

- ***Fungicides*** are used to control fungal disease.
  - Fungicides are used to prevent a plant from becoming infected.
  - Therefore, they are applied before the disease is present.

- ***Herbicides*** are used to kill unwanted plants.
- ***Rodenticides*** kill rodents, such as rats and mice.
  - These chemicals are usually applied as bait.
  - Eating the chemical poisons the rodents.

- ***Nematocides*** kill ***nematodes***, which are tiny hair-like roundworms that feed on the roots of plants.
  - Nematocides are usually applied in the form of a ***fumigant***, which is a substance that produces a smoke, vapor, or gas when applied.



- Herbicides are classified by selectivity, contact versus translocation, timing, and mode of action.
- Herbicides are classified as being selective or nonselective.
  - ***Selective herbicides*** act on certain plant species and not others.
  - ***Nonselective herbicides*** kill all vegetation.

What is pesticide toxicity?

- ***Toxicity*** refers to the degree of poison in a material.
  - Some pesticides are more toxic than others.
  - The amount of active ingredients in a material as well as the chemical nature of the poison determines toxicity.
  - The method used to measure toxicity differs slightly between the different types of exposure.

What is pesticide toxicity?

- The method used to measure oral and dermal toxicity is ***LD50***.
  - The LD stands for ***lethal dose***,
  - The 50 means that 50 percent of the test animals are killed at this dose.
  - The lower the LD50 number of a pesticide, the more poisonous it is.
    - In other words, a substance with an LD50 of 10 is much more toxic than a substance with an LD50 of 500.
  - LD50 values are given in milligrams of substance per kilogram of test animal body weight.

What is pesticide toxicity?

- Pesticides are classified into two categories: general use and restricted use based on toxicity.

  1. ***General-use pesticides*** are less toxic than restricted-use pesticides.
     - These pesticides are less hazardous to the applicator and the environment.
  2. ***Restricted-use pesticides*** have higher toxicity levels than general-use pesticides.
     - As a result, they present a greater hazard to humans and the environment.

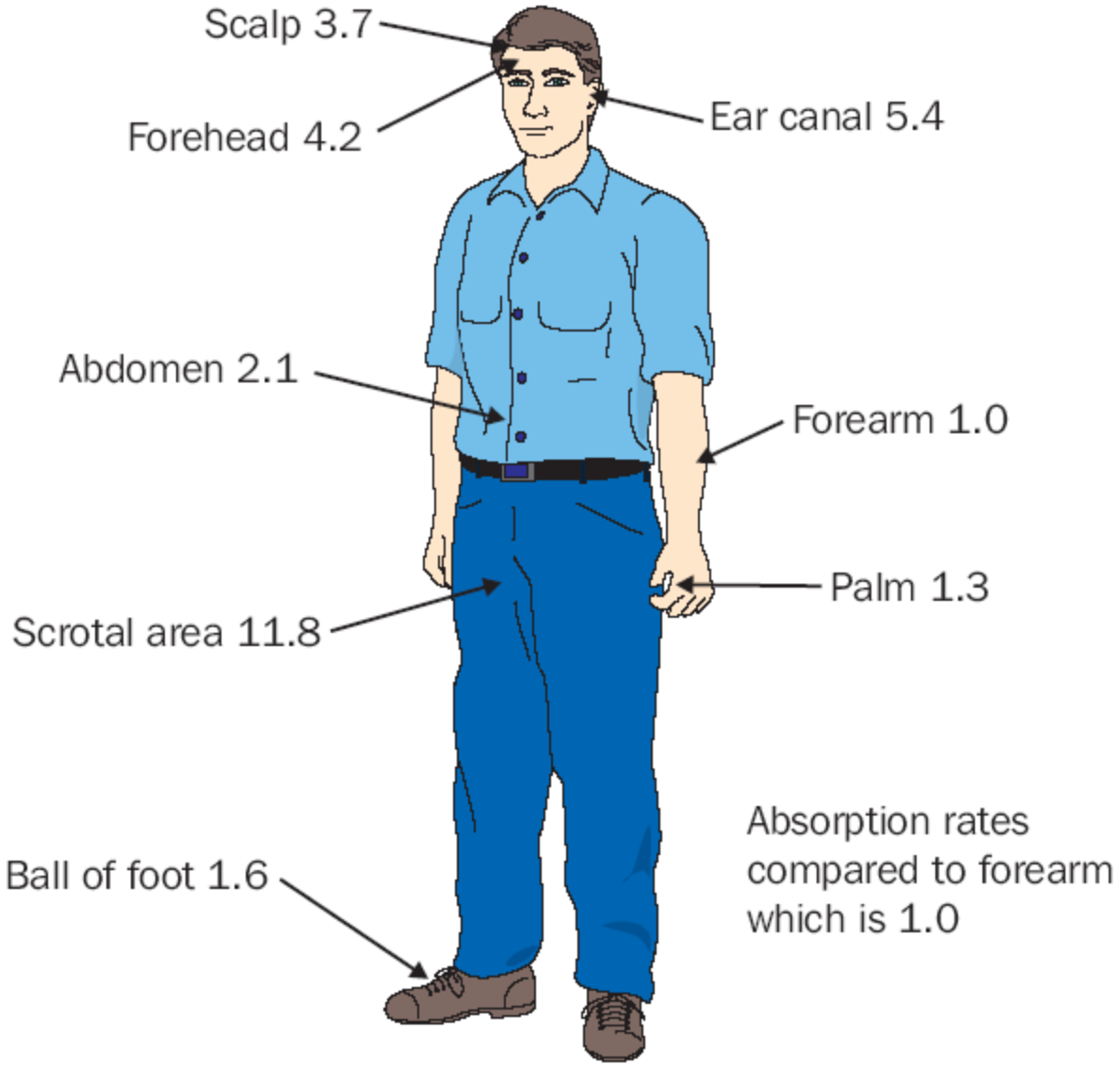
What are the different types of pesticide exposure?

- ***Oral exposure*** means the pesticide enters through the mouth and digestive system.

What are the different types of pesticide exposure?

- ***Dermal exposure*** is the absorption of pesticides through the skin.

DERMAL EXPOSURE RATES



What are the different types of pesticide exposure?

- ***Inhalation exposure*** is the entry of pesticides through the nose and respiratory system.

What are the different types of pesticide exposure?

- ***Eye exposure*** is the entry of pesticides through the eye.

What safety practices should be followed when applying pesticides?

- Pesticides are a useful and productive tool used in horticulture production.
  - However, pesticides can pollute the environment and contaminate water and food supplies if not used properly.
  - These chemicals can be dangerous to the applicator, other people, and wildlife if safety practices are not followed.
  - A concern for worker protection dealing with pesticide application is covered under the federal ***Worker Protection Standard (WPS)***.

What safety practices should be followed when applying pesticides?

1. Use only approved pesticides.
   - Government regulations allow only certain pesticides to be used.
2. Know the pesticide.
   - The ***applicator***, the person who applies the pesticide, must be informed about all aspects of the chemical.
   - Labels on the containers provide much of the needed information. Use the pesticide according to the directions.
   - Do not use pesticides for uses for which they were not intended.

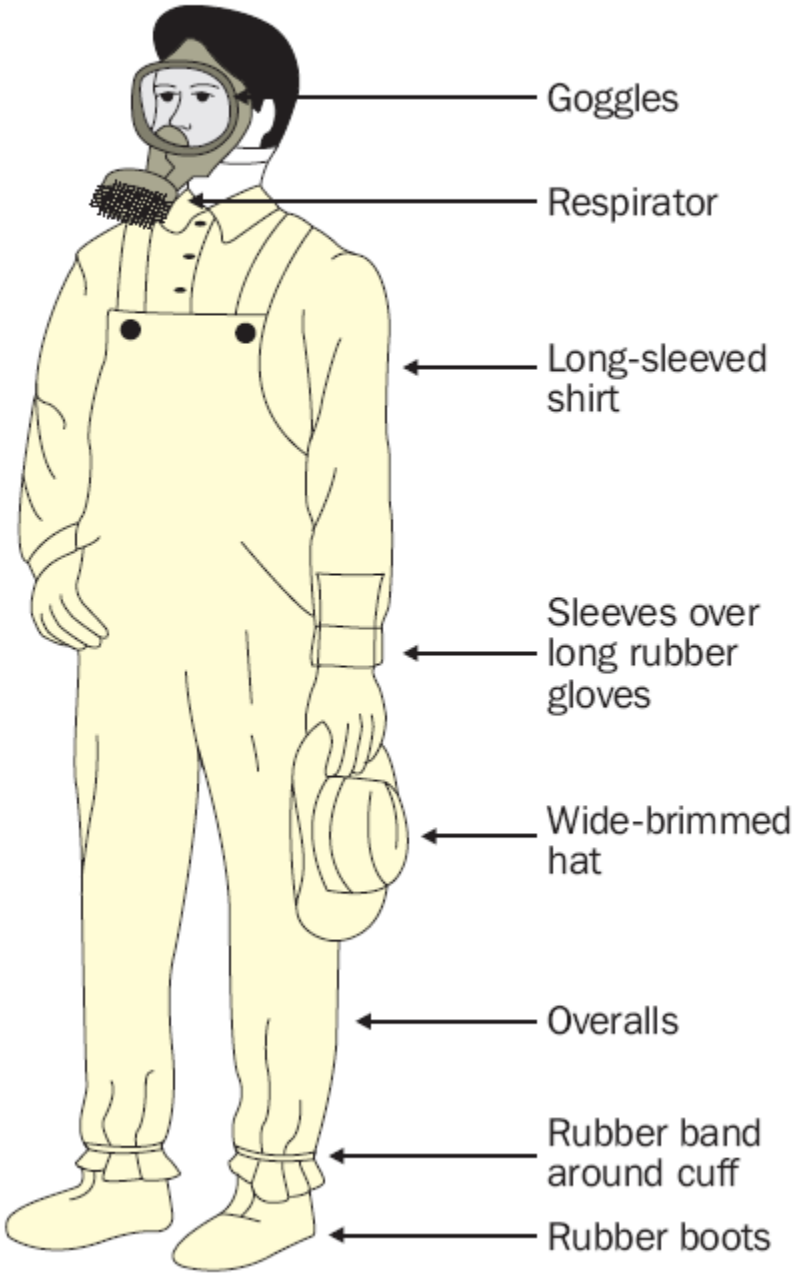
What safety practices should be followed when applying pesticides?

3. Use a pesticide with low toxicity.
   - Use the pesticide that will do what needs to be done, but a pesticide that is no stronger than necessary.
4. Use pesticides only when needed.
   - Pesticides should only be used when pests need to be controlled.
   - Using a pesticide without need damages the environment and wastes money.

What safety practices should be followed when applying pesticides?

5. Do not contaminate resources.
   - Pesticides can pollute the environment.
   - They should never be dumped into streams or on the ground.
   - Leftover pesticides should be disposed of properly following all federal, state, and local regulations.
6. Wear protective clothing.
   - Applicators need to protect themselves from pesticides when they are applying them.
   - They should always wear protective clothing such as rubber gloves, goggles, a respirator, and any other protective gear called for on the label.
   - These protective items are called ***personal protective equipment*** or PPE.
   - The clothing should be properly washed after it is worn.

PPE IN PESTICIDE APPLICATION



What safety practices should be followed when applying pesticides?

7. Dispose of empty containers properly.
   - Empty containers should never be thrown into creeks or gullies.
   - Some manufacturers take empty containers back.
   - Empty containers should be rinsed out three times and returned for recycling or sent to an approved solid waste facility.
8. Apply pesticides in good weather.
   - Pesticides should be used when they will be most effective.
   - Wind causes pesticides to drift.
   - ***Drift*** is the physical movement of pesticide droplets or particles through the air at the time of pesticide application or soon thereafter from the target site to any non- or off-target site.
   - Sometimes drifting pesticides can damage other plants, water, or animals.

What safety practices should be followed when applying pesticides?

9. Use the right equipment, which includes funnels to help in pouring, measuring, and mixing.
   - Spraying equipment should be adjusted properly so it applies no more than is needed.
   - This is important to protect the environment and to save the producer.
10. Know the right emergency measures.
   - Anyone who applies, or is around people who are applying pesticides, should know what to do in case of an accident.
   - Local physicians know whom to contact for help when people have been poisoned.
   - You should always have the emergency telephone numbers nearby.

How do you properly use the pesticide label?

1. Read the label.

- All users should discipline themselves to read and reread the label.
- This is the only way the user can find a proper handling and mixing procedure.
- The label should be read completely before any handling of the chemical takes place.

How do you properly use the pesticide label?

2. Understand the label.

- In addition to just reading the label, the pesticide applicator must understand the information printed on the label.
- This may require the applicator to receive some special training.
- If after reading the label the applicator does not understand some piece of information, the pesticide distributor should be contacted for clarification before the pesticide is applied.

How do you properly use the pesticide label?

3. Follow label directions.

- Just knowing what should be done is not enough.
- By law, users must follow label directions.
- People who use pesticide in a manner that conflicts with the labeling can be charged with civil and criminal penalties.

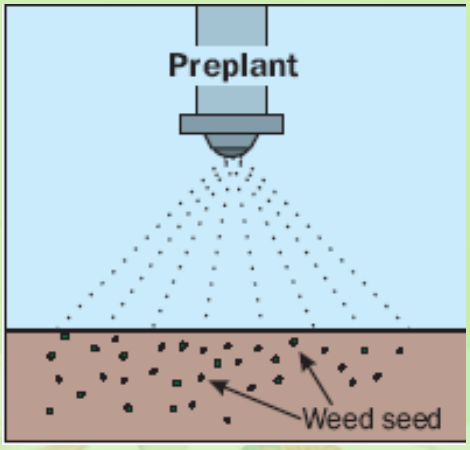
http://www.afpmb.org/sites/default/files/pubs/standardlists/labels/6840-01-108-9578_label_roundup_pro.pdf

How can pesticides be categorized according to time of application?

- ***Time of application*** is when pesticides are applied relative to the stage of growth of the crop.
  - Some pesticides can only be used at certain times.
  - If used incorrectly, they may damage the crop or fail to control pests effectively.
  - Pesticides may be applied during three different times.

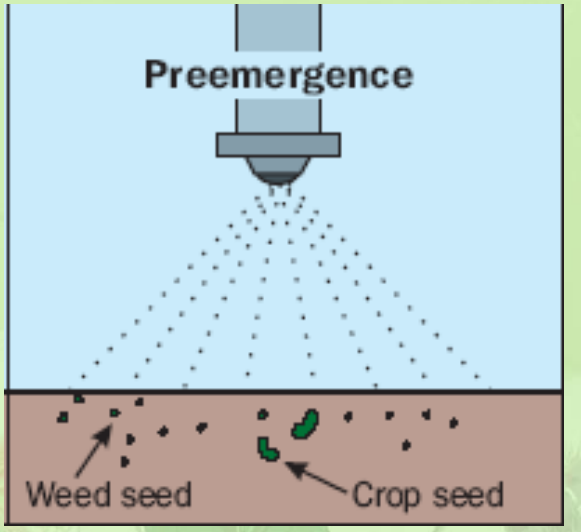
How can pesticides be categorized according to time of application?

- ***Preplant application*** is made before a crop is planted.
  - The seedbed may be prepared and the pesticide applied.



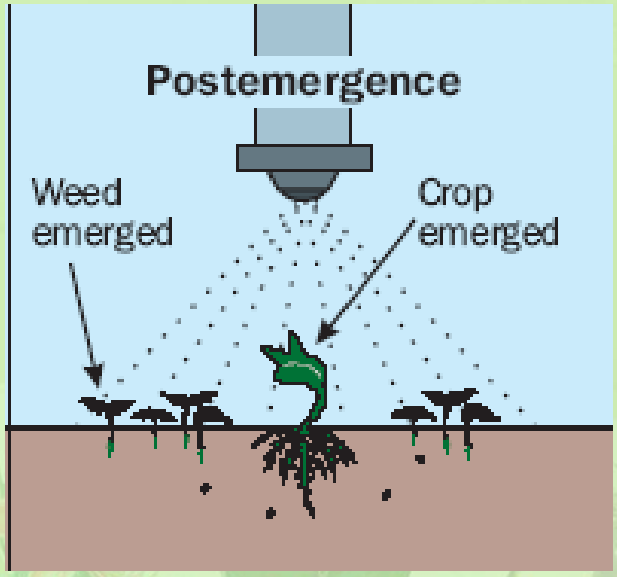
How can pesticides be categorized according to time of application?

- ***Preemergence application*** involves the application of the pesticide before the crop has ***emerged*** or broken through the soil surface.



How can pesticides be categorized according to time of application?

- ***Postemergence applications*** involve pesticide applications made after the crop is growing and pests are present.



What are the different areas of application in applying pesticides?

- ***Area of application*** deals with the extent of coverage of a crop or turf.

What are the different areas of application in applying pesticides?

- ***Spot application*** is treating only certain areas in a field.

How do you properly calibrate pesticide application equipment?

- The performance of any pesticide depends upon the proper application of the correct amount of chemical.
- Most performance complaints about chemicals are directly related to errors in dosage or to improper application.

How do you properly calibrate pesticide application equipment?

- ***Calibration*** is setting equipment to meter the exact amount of herbicide needed.

What is integrated pest management?

- IPM provides protection against hazards to humans, domestic animals, plants, and the environment.
- Studies have shown that no single control measure works consistently over a long period of time.
- A reason for this is that pests can develop resistance to certain control measures.

What is integrated pest management?

- The key to a successful IPM program is ***scouting***, which involves regularly monitoring pest populations and crop conditions.
- A scout collects data about which pests are causing damage, what stage of life each pest is in, and whether the pest population is increasing or decreasing.
- Knowing how to identify key pests and their biological characteristics is important.

What is integrated pest management?

- The benefits of IPM to the horticulture industry:

  a. There are reduced pesticide costs in addition to fewer pesticides used with IPM.

  b. Application costs are reduced due to time, and the cost of labor for pesticide application is reduced.

  c. Less pesticide resistance develops within populations of insects, weeds, and diseases.

What is integrated pest management?

2. IPM also benefits the environment, which is made more sustainable and friendly to people.

- Benefits of IPM to the environment:

Reduced contamination of the environment occurs through the use of IPM.

  - Pesticide residues do not build up in soil, water, and other natural resources.
  - Less pesticide residue on food products means a decreased chance of people ingesting pesticides.

How are the types of pests identified and described?

- ***Noninfectious diseases*** are caused by environmental imbalances and cannot be spread to other plants.
  - Noninfectious disease examples include over watering, nutrient deficiencies, and air pollution damage.
  - Plants are most susceptible to disease when they are under some type of stress.
  - The stress is usually associated with environmental factors.