



Module 8:

Pesticides – What to Know and Safety



LSU AgCenter Home Gardening Certificate Course

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What is a Pesticide?

Any material that is applied to kill, attract, repel, or regulate pests (flea control, heartworm prevention, roaches, ants, mice).

A pest is any animal or plant detrimental to humans or human concerns.

-Cide is denoting a person or substance that kills.

In agriculture, they are called Pesticides.

In human healthcare, they are called Medicines.

Types of Pesticides

1. Herbicide, kills plants – weed control
2. Insecticide, kills insects – head lice
3. Fungicide, kills fungi – ringworm, athlete's foot
4. Miticide or Acaracide, kills mites & ticks - chiggers
5. Nematicide, kills nematodes - heartworm
6. Molluscicide, kills mollusks – snails & slugs – Apple Snail
7. Rodenticide, kills rodents – mice, rats
8. Bactericide, kills bacteria - disinfectants

Pesticides Vary By Selectivity

Selectivity: what range of pests they affect

1. Non-selective – kills all related pests – non-selective herbicides kill all plants that get a sufficient dose
2. Selective – kills only certain weeds, insects, plant pathogens – for example, some selective herbicides only kill broadleaf weeds (dicots) not grasses (monocots)

Pesticides Vary By Type of Control

Type of Control: how they work to encounter the pest

1. Systemic pesticides are absorbed through plant tissues and transported throughout the plant
2. Contact pesticides are not absorbed by the plant and must come into direct contact with the target pest in order to control it

Pesticides Vary By Persistence

Persistence: how long they remain active in the environment

1. Residual pesticides – remain active for weeks or longer
2. Non-residual – inactivated immediately or within a few days

IPM – Integrated Pest Management

IPM is an ecosystem-based strategy that focuses on long-term prevention of pests or their damage through a combination of techniques such as biological control, habitat manipulation, cultural practices, pesticides and use of resistant varieties. Pest control materials are selected and applied in a manner that minimizes risks to human health, beneficial and nontarget organisms, and the environment.

IPM – Integrated Pest Management

1. Anticipates and prevents damage
2. Uses several tactics in combination
3. Improves effectiveness, reduces side effects
4. Relies on identification, measurement, assessment, and knowledge



The idea essentially is:

When all else fails to control the pest, **THEN** consider use of a pesticide.

Identification of the Pest or Problem is Essential

1. Always identify the pest/problem before taking any action
2. Misidentification results in errors in knowledge, errors in action, and ineffective control of the real problem
3. Biotic vs Abiotic
4. Beneficial vs Harmful
5. Misidentification also results in lost time and wasted money

After Identifying The Pest

Consider all your options **before** taking action:

1. Biological Control – Introduce predators or use antagonistic organisms
2. Mechanical – Hand remove weeds or bugs
3. Cultural – Stop overhead watering and use drip irrigation
4. Physical – Cover your plants with a net or row crop material
5. Genetic – Change to use of resistant varieties
6. Chemical – Use the appropriate pesticide according to label directions

Before Purchasing a Pesticide

1. Identify the Pest
2. Read the pesticide labels of available options
3. Choose the Best product
4. Be Sure you have the proper equipment for application
5. Be Sure you have the proper Personal Protective Equipment (PPE)

The Pesticide Label

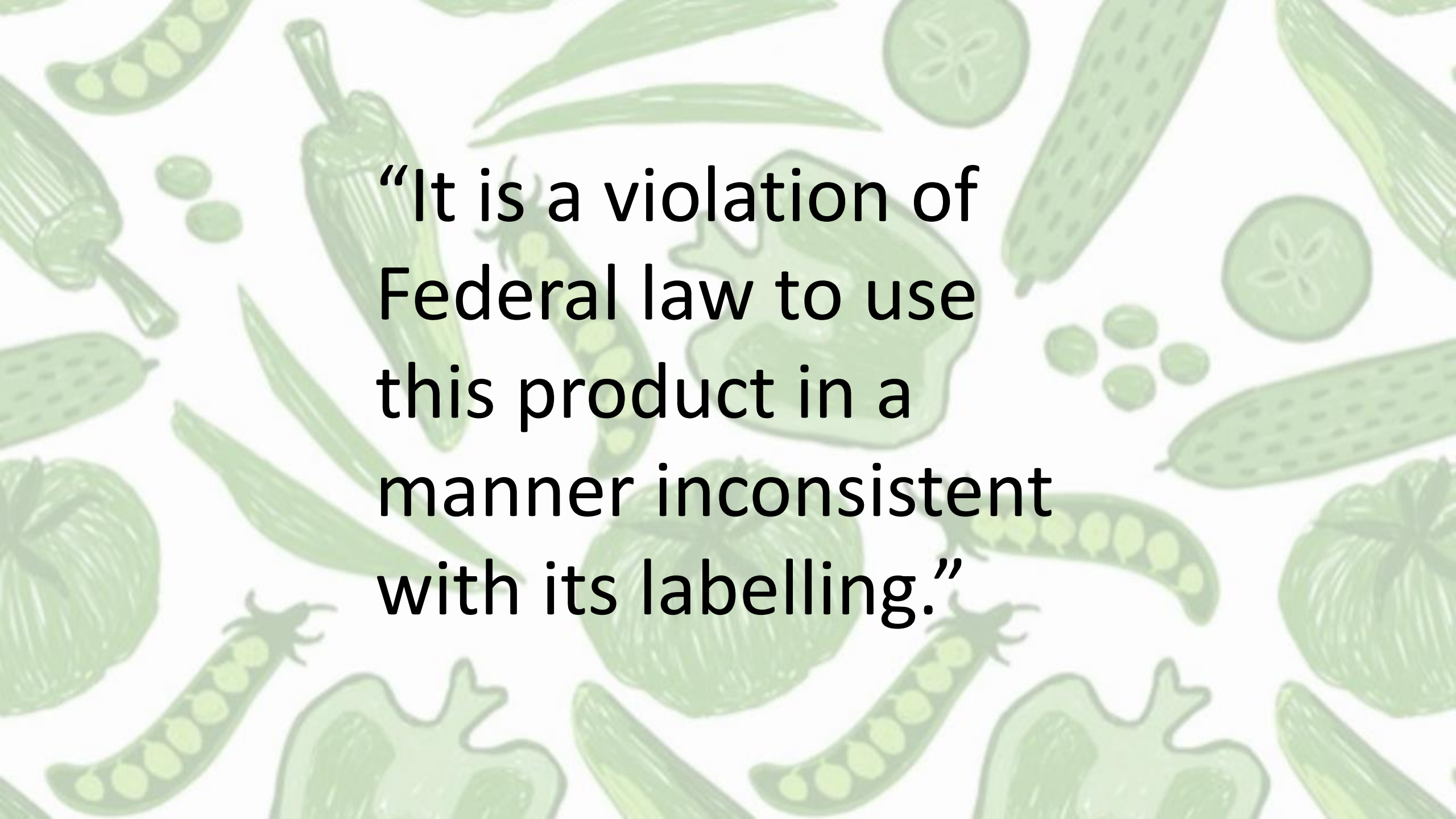
1. It is a legal document – The Label Is The Law
2. Main method of communication between pesticide manufacturer and pesticide user
3. It is unique to each pesticide
4. Overseen and regulated by the EPA
5. EPA requires documentation for claims of effectiveness, safety, environmental effects, - essentially everything on the label
6. Every label has legally required information on it

Attached Label Must Contain

1. Name and address of the producer, registrant, or person for whom produced
2. Restricted Use Statement (if required)
3. Product Name, Brand or Trademark
4. Ingredient Statement
5. Signal Word, including Skull & Crossbones, if either are required
6. “Keep Out Of Reach Of Children” (KOOROC)
7. Precautionary Statements, including Hazards to Humans and Domestic Animals
8. EPA Registration Number and EPA Establishment Number
9. Storage and Disposal Statements
10. Referral Statement to “Directions for Use in booklet”
11. Net weight or measure of contents

When Should You Read The Label?

1. Before buying a pesticide
2. Before mixing and applying
3. When storing pesticides
4. Before disposing of unused pesticides or an empty container



“It is a violation of Federal law to use this product in a manner inconsistent with its labelling.”

Restricted Use Pesticides vs General Use Pesticides

1. RUPs have the potential to cause unreasonable adverse effects to the environment and injury to applicators or bystanders without added restrictions. The "Restricted Use" classification restricts a product, or its uses, to use by a certified applicator or someone under the certified applicator's direct supervision. EPA
2. General use pesticides are those available to homeowners without a license

Concentrated vs Ready-to-Use

1. Concentrated – highly concentrated pesticide preparations that must be diluted prior to use. Concentrated pesticides naturally require higher level of precaution
2. RTUs or Ready-to-Use – pesticides that have already been diluted to the appropriate application concentration. Further dilution may make them ineffective. Usually also have a built-in spray mechanism.

Application Tips

All this is on the LABEL

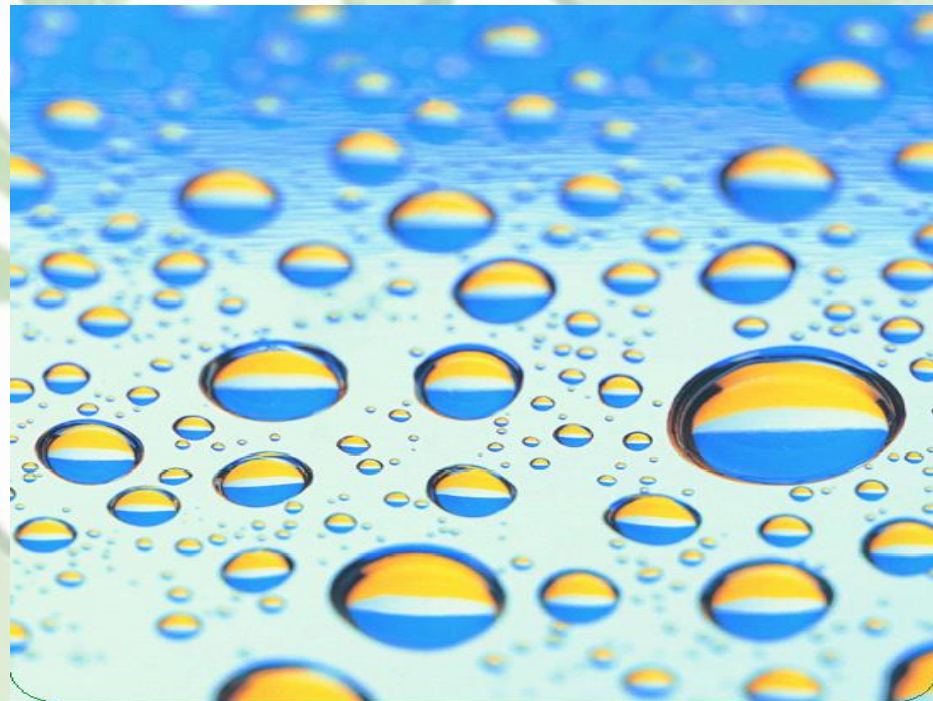
1. Use the correct application equipment
2. Check out your equipment BEFORE filling it with pesticide
3. Use the appropriate PPE – can use more but never less
4. Know what you're spraying and where
5. Use the correct amount of pesticide – do the calculations twice
6. You can use less than the label says (it may be ineffective)
7. You can NEVER use more than the label says (violation of the law)
8. Know the REI (re-entry interval) and the PHI (PreHarvest Interval)
9. Know the proper clean-up and disposal protocols

Drift!

1. Pesticide drift accounts for most of the issues/problems we see as agents related to pesticides.
2. Minimizing or avoiding drift is key to safe pesticide usage at any level, regardless if it is an organic or synthetic product.
3. Spray only what you intend to target.

Drift!

1. Spray your pesticides on calm days with no wind. Wind can carry droplets long distances.
2. Calibrate your sprayer to have larger droplet sizes and avoid vaporized or mist-like application of pesticide products.



Drift Reduction Strategies

1. Use a hand sprayer that allows you to get close to the target insects/plants
2. Use cardboard shields if needed to protect sensitive plants and direct the spray
3. Spray on calm days with little wind. Humid days are good.



Tomatoes Injured By Herbicide Drift



The background of the slide is a repeating pattern of various green vegetables. It includes whole tomatoes, sliced cucumbers, pea pods (some whole, some open showing peas), and several types of leafy greens. The illustrations are in a simple, hand-drawn style with a light green color palette.

What About Homemade Pesticides?

The background is a repeating pattern of various green vegetables. It includes whole and sliced cucumbers, several pea pods (some open showing peas), round tomatoes, and various leafy green vegetables like spinach and lettuce. The style is a simple, hand-drawn illustration in shades of green.

Let's talk about some
common ones!

Homemade “Round Up” (Vinegar + Salt + Dish Soap)

1. Horticultural vinegar is an herbicide, but it is stronger/more concentrated than what you can get at the grocery.
2. Applying salt to a garden/soil situation kills soil biology and prevents growth for a long time (“Salting the soil” was a wartime tactic!). This may be ok depending on the area.
3. Dish soap is not labeled for use on plants (with Dr. Bronners’ being an exception). Most dish soaps are petroleum-based and destroy soil biology.
4. Does it work? Sort of. Small broad leaf weeds will get knocked back. Grasses and larger weeds, not so much. And it ruins the ground in that location for a very long time.

Homemade “Bug Spray”

(Epsom Salt + Dish Soap + Cayenne Pepper)

1. Epsom salts contain magnesium and differ chemically from table salt. Unless your plants are short on magnesium, this is a worthless thing to spray or add to a garden for pest control. It can even reduce the availability of soil nutrients!
2. Dish soap is very harmful to the protective, waxy cuticle of leaves. We get a lot of calls about resulting sunburn or plant death from home gardeners using dish soap on plants.
3. A better alternative is an insecticidal soap product designed specifically for gentle use on plants. These are easy to find and organic.



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