

Pesticide Use:

Best Practices To Ensure On-farm Food Safety



If you grow fruit or vegetable crops, you are going to have issues with pests (plant pathogens, insects, and weeds). Knowing all of your options is paramount to successful pest management and control.

Among the options are pest prevention, nonchemical pest controls and chemical pesticides. Most pest management experts agree the most effective strategy for pest control is combining several methods in an approach called Integrated Pest Management, or IPM. The goal of IPM is to prevent pest damage in the most economical way and the least possible hazards to the environment and the community.

Proper pesticide use, handling, storage and disposal affect the safety of fruits and vegetables grown on your farm. All growers should read and follow the label instructions for use, handling, storage and disposal to keep the commodities they grow safe.

Pest Management Steps

1. Identify the pest. This is the most important step, because you have to know what the pest is to figure out how to manage it. Pest identification can be accomplished using several sources including library reference books, gardening books, insect field guides, local Cooperative Extension Service agents or specialists and university IPM factsheets and Web resources. Many universities also have diagnostic facilities that can provide assistance.
2. Determine how much control is necessary to solve the problem. Do you need 100 percent control of the pest? Can you tolerate some damage to your fruits and vegetables? Can you use specialized treatments that won't harm beneficial insects?
3. Choose an effective option that has minimal effects on the environment and the surrounding community.
4. Evaluate the results. You always should evaluate the effectiveness of a control method by comparing the pre-treatment and post-treatment conditions. How well did it work? Will you use it again in the future?

Mechanical Control Methods

- Using hoes, spades and rakes to remove weeds or diseased plants.
- Hand-picking weeds from around plants.
- Mulching around plants to prevent weed growth and soil splashing onto the plants or produce.
- Hand-picking insect pests from plants.
- Setting mechanical traps to capture insect pests.
- Fly paper and colored sticky traps to manage some insects.
- Row covers to enclose single or multiple rows of plants.
- Water pressure sprays to dislodge insects from plant foliage and stems.

Biological Control Methods

- Beneficial predators – including birds, predatory insects and spiders.
- Parasitoids – such as certain beetles, flies and wasps.
- Microorganisms – including fungi, bacteria and viruses.
- Biochemical pesticides – such as pheromones and juvenile insect hormones, plant growth promoters and immune boosters.

Reducing Risks of Pesticides

- Choose the right pesticide product for the problem. Compare product labels and learn as much as you can about the products. Confirm that the product you choose is registered for use in your state.
- Read the product label and follow the label instructions. This is the law! Important information on the label includes the EPA registration number, the active ingredients, signal words (caution, warning, danger), precautionary statements, environmental hazards, directions for use, first-aid instructions and storage/disposal information.

- Determine the necessary quantity to purchase for the pest problem. Pesticides should be used only on crops listed on the label and only in the amounts and concentrations listed on the label.
- Correctly use the product, following all safety precautions.
- Dispose of any extra product mixture properly, and store the chemical product correctly.

Pesticide Signal Words

- **Caution** – appears on pesticides that are minimally hazardous or least harmful to you. Slightly toxic if eaten, absorbed through the skin or inhaled, or exposure will result in slight eye irritation or skin irritation.
- **Warning** – moderately hazardous to you, more poisonous than one labeled with caution. Moderately toxic if eaten, absorbed through the skin or inhaled, or exposure causes moderate eye or skin irritation.
- **Danger** – pesticide is very poisonous, corrosive or irritating. It is highly toxic by at least one route of exposure or can result in irreversible damage to the eyes or skin. Use with extreme care.

Control Measures

- Individuals should follow all instructions when applying a pesticide. Be sure it can be used legally for the intended purpose. Most pesticides have a full set of instructions on their packaging.
- Use pesticides and other agricultural chemicals only when necessary.
- Calculate the amount of spray mixture needed for a given size of field ahead of time to avoid leftover diluted chemicals.
- Mix and dilute chemicals outdoors, rather than inside, your farm buildings.
- Carry clean water in a “nurse tank” to the field to measure and mix with chemicals.

Pesticide Application and Post-Application

- Crops should be inspected for pests during critical periods of crop and pest development (for example, early growth, flowering, fruit development). The farm should actively practice integrated pest management and only apply pesticides when pest populations are large enough to cause economic losses.
- No spray applications should occur if winds are greater than 10 miles per hour (small branches moving in wind). Spray applications should be

postponed if heavy rain is forecast within 24 hours. A drift management plan should be written and followed by the applicator.

- Spray water should originate from a municipal treated water source or from groundwater obtained from a properly constructed capped well, in good condition, that can be readily treated if indicator organisms are detected in water tests.
- All pesticide applicators should have access to and wear proper safety equipment for applying pesticides.
- Pesticides should be applied according to label rates and directions. A good spill kit should be readily available near the mixing area. A holding tank for rinse wastewater should be available, and excess material and rinse wastewater should be used or disposed of according to label instructions.
- Warning signs should be posted stating pesticide applications are being conducted. Workers should be prevented from re-entry into fields until the re-entry period has expired.
- No produce should be harvested until the legal number of days after application, as stated on the pesticide label.

Safe Storage of Pesticides

- Storage needs can be reduced by buying only the amounts of pesticides you will need to control pests for that growing season.
- Farms should never store pesticides in cabinets with or near food, animal feed or medical supplies.
- Pesticides should be stored only in their original containers, complete with labels that list active ingredients, directions for use and first-aid steps in case of accidental poisoning.
- Do not leave chemicals out in the open. Store separately from where people work for extended periods of time. Keep in a locked, labeled and weather-tight storage area.
- All chemicals should be stored off the floor. Powders should be on higher shelves, separated from liquids, and all should be appropriately labeled.
- Pesticides should be stored on impermeable shelves over an impermeable floor with curbs or dikes to contain leaks or spills. There should not be a floor drain, or any floor drains should flow to an acceptable holding tank.
- Do not store pesticides in places where flooding is possible or in places where pesticides might spill or leak into wells, drains, groundwater, or surface water.

- Liquid containers should be triple rinsed and the rinse wastewater should be applied to a labeled site or placed in an approved holding tank for disposal. Containers should be returned to the supplier or taken to a hazardous waste collection service.

Pesticide Record Keeping

- Any person who handles and applies pesticides should be certified through a state regulatory agency.
- A spill response plan should be written, updated and routinely reviewed by the farm management and employees. Phone numbers of emergency response personnel should be posted near all phones, and authorities should be notified immediately after a spill of a hazardous compound.
- Pesticide records should be kept in accordance with state and federal regulatory agencies rules and instructions. Information that should be recorded for all pesticide applications include date, chemical and trade name; EPA registration number; the rate per acre and total amount applied; weather conditions; developmental stage of crop; target pest; area treated; and name and certification number of applicator. These records should be kept in an accessible location.

Equipment Safety

- All application equipment should be maintained in good working order and calibrated regularly.
- Chemical applicators should check the accuracy of sprayers periodically to make sure they are applying the amount recommended on the pesticide label.

- Spray equipment should be periodically cleaned and rinsed to keep it in good working condition and when the applicator is switching from one chemical to another.
- Standard operating procedures should be available for routine maintenance, calibration and inspection of equipment.
- Records of equipment maintenance should be kept and easily accessible.

Worker Safety

- Farms should provide regular worker safety classes that review the farm's standard operating procedures.
- Workers should use appropriate protective equipment and clothing, according to labels of pesticides being applied.
- Applicators should not apply pesticides during very hot weather or in windy conditions.
- Workers should wash their skin and clothing if spills occur and after applying chemicals.
- Workers should not smoke while working with chemicals.
- Post-chemical application information should be located in a central area so employees know when and where it is safe to work after a chemical application.

Additional information on safe pesticide use, handling, storage and disposal is available from local Cooperative Extension Service agents or state regulatory agencies.



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