Extension Pesticide Applicator Training Series–#2 Pest Management Practices

Guide A-611

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This publication is scheduled to be updated and reissued 2/11.

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PEST CONTROL OPTIONS

When determining the appropriate pest control method, there are usually several options from which to choose. Alternative pest management techniques, in addition to the use of pesticides, can provide growers with a long-term plan that is beneficial to natural resources as well as to the profit margin. When pesticides are the chosen control method, it is important that the products be used properly to insure personal and environmental safety and legal compliance.

A pest management plan that incorporates mechanical, biological, and chemical control methods is called "Integrated Pest Management" (IPM). IPM can work equally well for large commercial producers of agricultural commodities, home gardeners, and landscapers. Although there are varying definitions of IPM, most are based on three key points:

- Using multiple tools including cultural and other non-chemical methods.
- Avoiding the disruption of beneficial biological controls, or naturally occurring enemies of pests.
- Tolerating some level of pest damage below that point at which cost of treatment would be economically sound (economic threshold).

CULTURAL PRACTICES

Field scouting, or monitoring provides the basis for an IPM strategy. When monitoring is conducted by a trained, knowledgeable person it can reveal which pests and beneficials are present and the level of damage expected if left untreated. County Extension Agents and other professional consultants can assist with pest identification and recommended control methods. A crop should be monitored most closely at stages when it is most vulnerable to anticipated pest damage, such as at germination, flowering or fruit set. For domestic pests such as fleas or cockroaches, investigate alternative controls such as cleaning, removing pest breeding areas, or using non-toxic products before resorting to chemical controls.

There are a number of cultural practices that should be considered in an IPM strategy. Crop selection or rotation is effective against pests that cannot survive long without a suitable host. Companion crops that attract or repel pests can sometimes be used to improve control. Pest-resistant plant varieties are commonly available for both agricultural and ornamental uses.

Pest management should also include reducing or eliminating breeding habitat or over-wintering sites for pests. Crop residues, harvest trash, and non-crop host plants are examples of where to look for off-season pests. Alternate hosts or habitat should be recognized and removed from fence rows, ditch banks, rights-of-way, etc.

Biological control depends upon using predators, parasites, or diseases of the target pest for keeping populations below the economic threshold. Biological controls may include pathogens such as fungi, bacteria or other insect predators, keeping pests below economic thresholds. Biological controls usually fall into one of the following categories:

- Maintaining existing, naturally occurring beneficials by providing habitat and protecting them from pesticides.

- Increasing beneficial populations by releases or providing more favorable habitat.

- Introducing natural enemies from the pest's native habitat. This method is usually supported by extensive university research and implemented by governmental agencies.

Biological sprays containing microbial agents, such as Bacillus thuringiensis (Bt) have some of the conveniences of chemical sprays but have little or no effect on non-target organisms. Use of botanical pesticides, insect pheromones and selective or time-release pesticides also may help retain beneficial populations.

USE OF PESTICIDES

Safe and effective use of pesticides requires knowledge of chemical behavior and interaction with the ecosystem. Properties of the pesticide being used, such as leachability, solubility, soil bonding, and toxicity to non-target species, partially determine the risk level. Site specific information, such as irrigation or rainfall, crop residues, tillage, and other cultural practices is needed to select the most appropriate pesticides.

Using the same pesticide (or active ingredient) repeatedly or exclusively will cause pests to develop resistance, making the chemical less effective or even useless over time. Strategies to avoid developing resistance include limiting pesticide use, choosing products from different chemical classes or with different modes of action, and applying mixtures (pre-packaged or tank mixes). The chemical class or mode of action may occasionally be found on the label or Material Safety Data Sheets (MSDS). County Extension agents or pesticide dealers can help you locate this information.

Pesticide labels are the first source for information on safe and effective use.
Signal words indicate the acute (immediate) toxicity to humans.
Information about protecting the environment is found under the heading "Environmental Hazards." Additional considerations are necessary to protect surface water. Avoid applying pesticides near open water if possible. Slope of the land, vegetative cover, and structural control devices may slow or prevent runoff from the fields.
ALWAYS READ AND UNDERSTAND THE LABEL