

Pest control principles and pesticide labels

**By Ryan Atwood
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This article is the first in a four-part series on general pesticide principles required for the safe use and application of pesticides. The article and subsequent test have been approved for one continuing education unit (CEU) in Core category for pesticide license renewal. The article and test set will be valid for up to one year from the publication date. After one year, they expire and CEU credit will no longer be available.

WHAT IS A PESTICIDE?

A pesticide is any substance or material intended for preventing, destroying, repelling or mitigating any pest or pests. Pesticides are herbicides, insecticides, miticides, nematocides and fungicides. In the citrus industry, a pest is anything that competes with the tree for food, water or light, causes plant injury, spreads disease to citrus trees or humans working in the groves.

The first step for an effective pest management program is the proper identification of the pest. The greater your knowledge of the pest and the factors that influence its development and spread, the greater success you will have in trying to control the pest.

Pest control should be applied only when the pest is causing or is expected to cause more harm than is acceptable. Another key principle of pest control is to cause as little harm as possible to other organisms besides the pest.

PREVENT, SUPPRESS OR ERADICATE

Determining your pesticide goal is essential to developing a successful pest control program. When applying a pesticide, your goal is to prevent, suppress or eradicate a pest. Preventive sprays are applied to keep pests from becoming a problem. Suppressive sprays are applied to reduce pest numbers to an acceptable level, whereas eradication attempts to destroy an entire pest population.

Prevention can be successful if the presence or abundance of the pest can be predicted in advance. For example, many fungal diseases are only problematic during the spring when susceptible tissue (young leaves and small fruit) are present; thus you may want to make a preventive spray to limit leaf or fruit infection.

Suppression is a common goal

in many instances. In citrus, psyllid pesticide applications often have the goal of suppressing psyllid population levels. The goal is to limit the psyllid population levels, thereby limiting the potential of the vector to spread the greening bacteria.

Eradication of a pest is rarely the goal in citrus, mostly because of the difficulty in achieving the goal. However, pests such as Mediterranean fruit fly have been successfully eradicated after their introduction into Florida.

MONITORING

Pest monitoring is important to determine

- what pest(s) are present,
- if their numbers are great enough to warrant control,
- when is the right time to begin control
- and have your efforts resulted in reducing the numbers of the pest.

Monitoring pest populations can be done by trapping or scouting. When thinking about pest management, ultimately one would like to be able to use Integrated Pest Management (IPM) techniques. IPM combines multiple pest control tactics into a single plan. IPM considers factors such as natural enemies, climatic conditions, geographic barriers, pest food, water supply and their effect on the success of a pest management program. Biological, cultural and mechanical control, sanitation and chemical control all have a role in IPM for successful pest reduction.

If one is relying on just one element, such as chemical control, problems with pest resistance can occur. If a pesticide fails to control a pest due to repeated use, usually it is because the pest has developed resistance to the chemical. Thus, rotating between pesticide classes is important to minimize pest resistance. Other problems can cause pesticide application failures such as incorrect dosage or rate, failure to identify the pest properly, selecting the wrong pesticide for the pest or the pesticide was not applied at the appropriate time. Do not forget that the continuing presence of pests may be part of a new infestation that occurred after the pesticide application.

PESTICIDE LABELING

Pesticide labeling on a product is the main method of communication

between the user and the pesticide manufacturer. Pesticide labeling gives the user instructions on how to apply the product properly and safely. Pesticide users are required by law to comply with all the instructions and directions for use that are stated in the pesticide label. Remember the label is the law.

The Environmental Protection Agency (EPA) reviews all labels and products to ensure the health and safety of the applicator and the environment. If the manufacturer changes the label after its initial registration, the EPA must approve the change.

There are three major types of registration: 1) federal, 2) special local needs, and 3) emergency exemptions.

Federal EPA registrations are the most prevalent, with most pesticides being registered this way.

Special local needs (SLN) registrations give states additional control on how pesticides are used within their boundaries. Often these registrations involve adding application sites, pests, or alternative techniques of control to the federally registered label. Applicators must have a copy of the SLN label in their possession in order to apply the pesticide for that purpose and only apply in the location where the supplemental label specifies.

Emergency exemptions known as Section 18 exemptions are used during an emergency situation where no pesticide is registered and federal and SLN registrations would take too long. Strict controls and regulations are required for a Section 18 label.

Every pesticide is classified as "restricted" or "unclassified". Restricted use pesticides have the potential to harm humans and/or the environment unless handled properly. Certified applicators have been trained and licensed to handle these pesticides in an appropriate manner. When a pesticide is labeled restricted use, the label will state "Restricted Use Pesticide" on the front of the label. Accompanied with this designation will be a statement describing the reason why it was labeled for restricted use.

Signal words and symbols help the users quickly identify the toxicity of the product they are using. Either Danger, Warning or Caution will appear on the front of the pesticide label and reflect the hazardous nature of any

ingredients in that formulation.

Danger on the label signals that the product is high toxicity; is likely to cause illness from breathing it, drinking it or exposure to skin or eyes if the directions are not properly followed. Warning on the label signals that the product is moderately likely to cause illness, whereas Caution is slightly

or relatively non-toxic and has only a slight risk of illness occurring if used improperly.

All labels are required to state hazard potential for humans and animals where there are acute, delayed or allergic effects. Labels also include information on personal protective equipment, environmental hazards,

physical or chemical hazards, directions for use, storage and disposal. Understanding pest control principles and following the label ensure that you and the environment remain healthy while producing an economically viable crop of citrus.

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