

Unit D: Controlling Pests and Diseases in the Orchard

Lesson 1: Managing and Controlling Pests of Fruit and Nut Crops

Terms

- Action threshold
- Best management practices (BMPs)
- Economic or aesthetic injury level
- Integrated pest management (IPM)
- Scouting

I. Integrated pest management (IPM) is a pest management strategy that uses a combination of best management practices (BMP) to reduce pest damage with the least disruption to the environment.

A. Studies have shown that no single control measure works consistently over a long period of time.

1. A reason for this is that pests can develop resistance to certain control measures.

- B. The goal of IPM is to keep pest populations below the **economic or aesthetic injury level**, the point at which plant losses due to the pests are equal to the cost of control.
1. IPM provides protection against hazards to humans, domestic animals, plants and the environment.
 2. This optimizes pest control within the constraints of economic, social, and environmental conditions.

- C. IPM is an ecologically based pest control strategy that includes natural factors, such as natural enemies and weather, to assist in controlling pest populations.
 1. Control strategies that disrupt these factors as little as possible are used in this strategy.

2. There are two basic phases of integrated pest management.
 - a. Phase One involves pest identification, monitoring, and action thresholds.
 - i. **Action threshold** is the predetermined level at which pest control is needed.
 - b. Phase Two is to evaluate all possible control measures.
 - i. If the action threshold is met, control options are evaluated and an option is selected and implemented. Possible control options may include:
 - A. Chemical
 - B. Biological
 - C. Mechanical

II. ***Best management practices (BMPs)*** are those practices that combine scientific research with practical knowledge to optimize yields and increase crop quality while maintaining environmental integrity. Through the use of BMPs, pest management can coexist in harmony with a natural setting.

A. Best management practices can effectively eliminate the risk of unwanted materials reaching environmentally sensitive areas. The following is a list of some BMPs used in orchard situations.

1. Management of surface and subsurface water runoff

- a. Erosion control

- i. Reducing erosion into nearby water sources will improve water quality for everybody.

- b. Cultural control of pests
 - i. Reducing the amount of pesticides used will reduce environmental issues.
- c. Soil testing
 - i. Testing the soil will reveal exactly how much of each fertilizer is needed thereby reducing excess usage.
 - ii. This will reduce water pollution and save money.

- d. Timing and placement of fertilizers
 - i. If fertilizers are placed on the crop just before a rainy season most of the fertilizer will wash off.
 - ii. Fertilizer placed on a slope will wash off easily.
- e. Controlled release fertilizers
 - i. These fertilizers release nutrients in small amounts over a longer period of time so the plants can absorb the nutrients without excess runoff.
- f. Irrigation management
 - i. Using water wisely will improve water quality and ensure everybody has water to use.

- g. Biological control of pests
 - i. Using natural enemies of pests will keep the ecosystem in balance and reduce pollution from chemicals
- h. Pesticide selection
 - i. Choosing the proper pesticide will be more effective and save money.
- i. Correct pesticide use
 - i. Improper pesticide use will have negative consequences on the environment and can even be deadly to the grower.

- III. Certain pests commonly cause major damage in any production system.
- A. It is very important to correctly identify the pest and understand its life cycle.
 - B. Individuals must monitor plants regularly to determine current levels of pest activity, know as ***scouting***.
 - C. Scouts check to identify the presence of a pest, the stage of development, and the amount of damage done.

- D. Basic elements of an integrated pest management (IPM) program include:
1. People—system devisers and pest managers
 2. Knowledge and information needed to devise the system and make sound decisions
 3. Program for monitoring the ecosystem elements
 4. Pest densities at which control methods are put into action
 5. Techniques used to manipulate pest populations
 6. Agents and materials

Review

1. What is the proper procedure for propagating cuttings?
2. What is the proper procedure for the asexual propagation methods of layering?
3. What are the asexual propagation methods of budding and grafting?
4. What are the procedure for grafting and budding in the fruit and nut orchard?