

## Principles of IPM

### Integrated Pest Management: A Combination of Management Tactics

IPM involves the integration of cultural, physical, biological, and chemical pest management techniques such as exclusion, sanitation, scouting, using compatible pesticides, accurate pest identification, threat assessment, and record keeping. The main focus of this manual is biocontrol, but the basic principles of IPM are scouting and thresholds. Scouting is simply inspecting the crop (usually weekly) for the presence of pests. Thresholds are simply deciding whether pests are abundant enough to require a control treatment. If scouting and thresholds were the only IPM methods practiced by a grower, pesticide use could usually be reduced by at least 50 percent compared to spraying on a regular schedule.

Understanding the life cycle and behavior of insect pests is important in developing an effective control strategy. Knowledge about the weak link in a pest's life cycle can help growers choose the most appropriate control strategy. Knowledge of the biocontrol organism's life cycle is also essential for a proper biocontrol release strategy.

#### SCOUTING

Scouting is accomplished in various ways including using sticky traps, pheromone traps, baits, visually inspecting plants, among others. Specific scouting tactics for pests are listed where appropriate.

Various resources are available to help identify the pests that may occur in greenhouses. A monthly guide from Cornell and Rutgers, *Northeast Greenhouse IPM Notes*, is available at <http://www.rce.rutgers.edu/pubs/greenhouseipmnotes/> (accessed 6/3/2004).

#### THRESHOLDS

Economic threshold (ET) is the number of pests whose injury to the plants cause a crop loss in dollars greater than the amount of money managing the pest would cost. Basically, the ET is the level that actually produces damage that is more expensive than intervention. The ET is usually expressed in numbers of pest individuals per some unit (e.g., pests per square foot, per plant, per feet of row).

The purpose of the ET is to give growers time to implement a management tactic before economic loss is reached, thereby saving as many dollars as possible while making sure that it is cost-effective to implement the management tactic. The ET is the signal to take action.

In practice, many crops have no established ET. Over time, growers must determine their individual ETs for a given pest. One grower may accept 10 to 15 thrips per sticky card per week, while another grower with a history of Impatiens Necrotic Spot Virus (INSV) will not accept five thrips per sticky card per week. Or the ET may depend on the growth stage of the crop. A generally acceptable threshold for whiteflies might be one-half per card per day when the crop is young, and two per card per day as the crop reaches maturity. In some cases, biocontrol organisms should be released as soon as a pest is detected.

County extension educators can provide current information on pest outbreaks as well as other recommendations on management.

#### REFERENCES

- Calvin, D. D., et al. 2001. *Field Crop Integrated Pest Management Training and Reference Manual*. The Pennsylvania State University.
- Greer, L., and S. Diver. 1999. *Integrated Pest Management for Greenhouse Crops: Pest Management Systems Guide*. Appropriate Technology Transfer for Rural Areas. <http://attra.ncat.org/attra-pub/gh-ipm.html#general/> (accessed 11/20/2003).