

## Chapter 3

# Insecticides, Acaricides, and Transgenic Crops and Integrated Pest Management (IPM)

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### What Is IPM?

Insecticides, acaricides, and transgenic crops are often important tactics for integrated pest management (IPM) programs. IPM is a popular idea that many people identify with but think of in different ways that suit their individual purposes and objectives. IPM has been idealized, criticized, politicized, socialized, commercialized, and subjected to wide interpretation by professional pest managers, biologists, ecologists, environmentalists, politicians, and the public. Some people believe that chemical control is the antipathy of IPM, whereas others portray IPM as a process in which pest scouting is used to trigger pesticide application in lieu of prophylactic spraying. Most authorities agree that IPM involves blending multiple pest control methods in a strategic manner to manage pests. One of the many descriptions of IPM is that it consists of “coordinated systems for managing pest populations that utilize preventive and suppressive control tactics, which



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are unified by surveillance to assess hazard for injury to determine if curative action is needed.” (All, J. 2004. Integrated pest management. pp. 49-51. *In*: J. Capinera (ed.), Encyclopedia of Entomology. Kluwer Academic Publishers, Dordrecht, The Netherlands.)

Use of insecticides, acaricides, and transgenic crops are important tactical options for either preventive or suppressive control of pests. IPM ideology generally implies that pesticides should be used only when a pest population exceeds some action threshold triggered through surveillance. In reality, more pesticides are used prophylactically than therapeutically, and it is debated whether preventive use of chemical control can ever be considered as IPM. On the other hand, using pesticidal products as a preventive in combination with other control tactics is considered a cornerstone for IPM in certain commodities when hazard for damaging infestations is high, based on past history of problems.

### Preventive Control

Preventive controls usually are cost-effective production, utilization, or management practices that also have attributes useful for pest management. Preventive controls are designed to discourage pests from developing severe infestations, and usually influence populations in an unhurried, cumulative manner. Often preventive controls allow for a small resident pest population to inhabit the commodity. Many preventive control methods can be used for IPM programs, depending on a variety of factors at a particular time, location, or environment. Preventive pest management can be categorized as cultural, biological, mechanical, chemical (enticements, deterrents, and insecticide/acaricides), and regulatory controls.

### Cultural Control

Cultural control uses production or utilization methods with consideration for positive, negative, or neutral impacts on pest populations. If a production method creates a negative environment for pests, it may be used as a control practice. If, on the other hand, the production method increases the hazard for pest problems then it is avoided if possible; this also is a type of cultural control. Cultural controls often have IPM as a second priority to production or use of the commodity. Considerable knowledge about pest biology, ecology, and natural control is frequently needed for cultural control; therefore, greater professional competence may be required to implement programs. Examples of cultural control methods include:

**Sanitation:** Practices that destroy or disrupt the habitat of pests so that their populations are driven out or exter-