Integrated Pest Management

The PAMS Approach

Specific Integrated Pest Management (IPM) tactics are selected to match crop/pest/environment scenarios. Each site should have in place a management strategy for Prevention, Avoidance, Monitoring and Suppression (PAMS) of pest populations.

The Natural Resources Conservation Service (NRCS) uses PAMS as core strategies in the 595 Integrated Pest Management Practice standard. Growers enrolled in the Environmental Quality Incentives Program (EQIP) for pest management are required to have a site-specific IPM plan. The IPM plan uses these PAMS strategies to identify a specific course of action to control pests in the cropping system.

Prevention

Prevention is the practice of keeping a pest population from infesting a field or site and should be the first line of defense. It includes tactics such as: using pest-free seeds and transplants; preventing weeds from reproducing; irrigation scheduling to avoid situations conducive to disease development; cleaning tillage and harvesting equipment between fields or operations; or using field sanitation procedures and eliminating alternative hosts or sites for insect pests and disease organisms.

Abandoned orchards often harbor pests that can be difficult to control. This five acre orchard was removed to help reduce pest-pressure at neighboring commercial orchards.

Monitoring

Monitoring and proper identification of pests through surveys or scouting programs, including trapping, weather monitoring and soil testing where appropriate, should be performed as the basis for suppression activities. Records should be kept of pest incidence and distribution for each field or site to help plan crop rotation selection and other suppressive actions.

Suction traps monitor soybean aphids as they migrate between alternate hosts and soybean plants.

Avoidance

Avoidance may be practiced when pest populations exist in a field or site but the impact of the pest on the crop can be avoided through cultural practices. Avoidance tactics include: crop rotation such that the crop of choice is not a host for the pest; choosing cultivars with genetic resistance to pests; using trap crops or pheromone traps; choosing cultivars with maturity dates that may allow harvest before pest populations develop; fertilization programs to promote rapid crop development; or not planting certain areas of fields where pest populations

A crop rotation can be used to help break the life cycle of pests and perennial weeds.

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are likely to cause crop failure. Some tactics for prevention and avoidance strategies may overlap in most systems.

Suppression

Suppression of pest populations may become necessary to avoid economic loss if prevention and avoidance tactics are not successful. There are four primary suppressive tactics that growers employ: cultural, physical, biological and chemical control(s).

Cultural practices may include narrow row spacing or optimized in-row plant populations, alternative tillage approaches such as no-till or strip-till systems, cover crops or mulches, or using crops with allelopathic potential in the rotation. Crops with allelopathic potential can produce substances that inhibit the growth of nearby plants as a form of chemical protection.

Physical suppression tactics may include cultivation

Using no-till systems combined with crop rotations will improve soil health and increase biological activity in the soil. This benefits natural predators and will increase the plant's own ability to be resilient to insect and disease damage.

or mowing for weed control, baited or pheromone traps for certain insects, and temperature management or exclusion devices for insect and disease management.

Biological controls, including mating disruption for insects, should be considered as alternatives to conventional pesticides, especially where long-term control of an especially troublesome pest species can

Fruit growers have found success using pheromone mating disruption as an alternative to conventional pesticides for pests such as codling moth and oriental fruit moth in apples.

be obtained. Where naturally occurring biological controls exist, effort should be made to conserve these valuable tools.

Chemical controls are important in IPM programs and some will remain necessary. However, pesticides should be applied as a last resort in suppression systems using the following sound management approach:

- The cost-benefit should be confirmed prior to use and depend on economic thresholds where available.
- Pesticides should be selected on their least negative effects on environment and human health in addition to efficacy and economics.
- Where economically and technically feasible, precision agriculture or other appropriate new technology should be utilized to limit pesticide use to areas where pests actually exist or are reasonably expected.
- Sprayers or other application devices should be calibrated prior to use and occasionally during the use season.
- Chemicals with the same mode of action should not be used continuously on the same field in order to avoid resistance development.
- Vegetative buffers should be used to minimize chemical movement to surface water.

Want more information?

North Central NRCS & IPM Working Group,
North Central Fruit IPM tool
http://www.nrcs.ipm.msu.edu/

North Central IPM Center, Fruit: Educational Resources
http://www.ncipmc.org/fruit/resources.cfm

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