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Pesticide Management To Protect Water Quality Integrated Pest Management

Growing concerns regarding insecticide resistance, secondary pest resurgence, killing of beneficial insects, and threats to public health are increasing the popularity of integrated pest management (IPM). IPM is the environmentally sound use of combined pest control strategies to limit crop losses because of insects, diseases, and weeds. In many instances, use of IPM techniques can result in an equally effective, less expensive program of pest control than reliance on pesticides alone.

Various estimates suggest that the adoption of currently available IPM practices would permit a 40 to 50 percent reduction in the use of insecticides within a 5-year period and 70 to 80 percent in the next 10 years, without sacrifice of crop yield or grower profits.

Essential activities for an IPM program for insect control include the following:

- Scout fields for insect damage.
- Monitor economic thresholds.
- Use cultural and crop management practices that provide a less favorable environment for pests.
- Follow recommended pest control guidelines and use labeled rates when control measures are needed.

An IPM program for disease and weed control would be very similar. One difference for weed control is that fields should be monitored the previous year so that the more effective herbicides normally applied prior to or at planting can be used where needed for maximum efficiency.

Scouting Fields For Insect Damage

The success of an IPM program hinges on monitoring and mapping fields for insect populations and on recognizing various pests and their damage. Scouting programs are essential for gathering information about pests and the crop condition.

To establish a successful field scouting program

- Determine how and when to scout and allow adequate time for the job.

- Accurately identify insect pests or other pests, beneficial insects, and their populations.

- Accurately assess crop damage or potential damage based on pest nature and population. You may need to call on specialists for this assessment.

- Prepare a thorough set of crop scouting records.

- Prepare field maps showing specific problem areas or areas where potential problems may develop.

With scouting, pesticides are not used until pests become a threat and a treatment is economically justified.

Monitoring Economic Thresholds

The goal of IPM is to keep pest numbers and crop damage below the economically damaging level called the "economic threshold." The economic threshold (ET) is the level of an insect population or other pests that indicates control tactics should be used to stop a pest population from increasing. These levels have been established for most insects, but levels may vary from area to area.

To successfully monitor economic thresholds

- Fully understand the economic threshold level for your area. Economic thresholds will help determine when pest problems are severe enough so that chemical use is profitable in controlling the pests.

- Monitor university and local pest reports during the growing season.

- Consider all possible control alternatives.

The ET helps growers decide when it is economically practical to use a pesticide, and more importantly, when it is not. At ET, the additional cost of treatment equals the additional benefit from the treatment. At population levels below ET, treatment is a waste of money, time, and pesticide.

Using Cultural And Cropping Best Management Practices

The application of good cultural and crop management practices is an important part of a pest control program. The available strategies of cultural and

ANR-790

Water Quality 4.5.3

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mechanical control practices that aid in insect and weed control include crop rotation, proper planting dates, and tillage.

Crop Rotation. Rotating row crops may provide some weed control benefits and more flexibility in herbicide treatments. Rotation to a densely planted crop, such as alfalfa, for several years will prevent most annual weeds from going to seed and potentially reduce populations of some perennial weeds.

Crop rotation also greatly affects soil insect and nematode populations. The complex of disease, insect, and nematode pests will change according to the type of crops rotated, sequence of rotation, and the amount of time devoted to the production of a crop prior to planting the new crop.

Planting Dates. Delaying planting dates may reduce but not eliminate weed problems. Later planting makes it possible to destroy several flushes of weeds with tillage operations and also delays the application of herbicides. Delayed herbicide applications can result in improved control of annual weeds that can germinate late in the season. Late planting is not appropriate, however, for some crops normally planted in early spring in the South.

Tillage. Tillage has been a major weed control strategy used by growers. On the other hand, tillage can enhance germination of weeds, and each tillage practice may result in a new flush of weeds. Although increased emphasis on conservation tillage has resulted in an additional dependence on herbicides, this trend is supported by the reduced soil erosion, improved water quality, and increased farming efficiency.

After the crop has emerged and weed seeds are at or near emergence, rotary hoeing can greatly reduce weed populations. Also, row cultivation is effective when weeds are small, but the crop needs to be tall enough to tolerate soil disturbance from the cultivator.

To prevent potential yield reductions, weeds need to be controlled by tillage or herbicides within 3 to 6 weeks after planting. Weeds that begin growing at the same time as the crop and remain uncontrolled all season can reduce yields significantly. The amount of yield reduction will depend on such factors as number of weeds present, vigor of the weeds, competitiveness of the crop, and the amounts of moisture, nutrients, and light available.

The type of equipment, timing, depth, and frequency of tillage operations can also dramatically influence the survival of some insect species.

Following Pesticide Application Instructions

When a pesticide is needed, its selection should be based on site characteristics and the pesticide's effectiveness, toxicity to non-target species, and costs.

Remember, an important purpose of the pesticide container's label is to instruct users how to apply the pesticide safely and with minimum threat to nontargeted areas, such as surface water or groundwater. Pesticide users are responsible for following label instructions. It is unsafe and unlawful not to do so.

Where To Get Help

Integrated Pest Management programs are conducted by Alabama Cooperative Extension System and local crop consulting organizations. Programs and services might include "scouting" fields for pest population levels and planning appropriate IPM strategies.

Integrated Crop Management

The philosophy of integrated pest management is expanding to include integrated crop management (ICM). ICM means using more efficient farming practices to provide better economic returns and protect the environment. ICM practices include scouting, mapping, planning yield goals, and reducing chemical use on problem soils.

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