United States Department of Agriculture

NRCS Natural Resources Conservation Service

Integrated Pest Management

Alabama Job Sheet No. AL595

What is Integrated Pest Management?

Integrated Pest Management (IPM) is defined as "utilizing environmentally sensitive prevention, avoidance, monitoring, and suppression (PAMS) strategies, to manage weeds, insects, diseases, animals and other organisms that directly or indirectly cause damage or annoyance." Effective pest management relies on the use of many tools or strategies to reduce the impacts of pests on crops in order to meet landowner objectives.

Purpose

The IPM conservation practice is applied as part of a resource management system to help minimize negative impacts of pest control on soil, water, air, plant, animal resources, and/or humans.

Integrated Pest Management - IPM

Agricultural pesticides are potential pollution threats to surface and groundwater quality. Integrated pest management (IPM) can help protect water quality by minimizing the amounts of pesticides that producers use and by helping producers to apply pesticides in ways that decrease the risk of chemicals entering into lakes and rivers or leaching into groundwater. This IPM conservation practice provides an opportunity for the producer to develop multiple management strategies that will integrate all aspects of pest management within the agricultural production system while reducing negative impacts of these strategies.

IPM Prevention, Avoidance, Monitoring, and Suppression techniques include:

- Prevention – Activities such as cleaning equipment and gear when leaving an infested area, using pest-free seeds and transplants, and irrigation scheduling to limit situations that are conducive to disease development.
- Avoidance – Activities such as maintaining healthy and diverse plant communities, using pestresistant varieties, crop rotation, and refuge management.
- Monitoring – Activities such as pest scouting, degree-day modeling, and weather forecasting to help target suppression strategies and avoid routine preventative treatments.
- Suppression – Activities such as the judicious use of cultural, mechanical, biological and chemical control methods that reduce or eliminate a pest population or its impacts while minimizing risks to non-target organisms.

Practice Specifications

This practice applies on lands where pests are being managed. Producers eligible for this practice have an identified water quality or plant condition concern, and must meet all criteria in the Integrated Pest Management (595) Standard. This includes:

- An environmental risk analysis developed using Win-Pst, and implementation of mitigating practices if an Intermediate or greater hazard is identified. Recommended mitigating or companion practices include grassed waterways, filter strips, riparian buffers, irrigation water management,

residue management, or other appropriate practices to fully address the water quality concerns.

- Development and implementation of an IPM plan for the major pest(s) of concern is required. When an IPM plan is not available through a qualified professional, then IPM guidelines will be followed and documented using IPM principles identified through the Alabama Cooperative Extension System (ACES) publications http://www.aces.edu/pubs .
- Evaluation and treatment methods will be fully documented and subject to review.

Non-Chemical Alternatives

Over-reliance on any single pest control measure can have undesirable effects. Pesticides can contribute to pest outbreaks by eliminating natural enemies and allowing pests to rebound without checks. Cultural methods are those good farming practices that make the environment less suitable for pest colonization and survival. Biological control involves using predatory, parasitic, and disease-causing organisms for insect pest control as well as using competitive or antagonistic organisms for weed suppression. It also includes conservation of naturally occurring beneficial insects.

The goal of IPM is to take maximum advantage of farming practices that promote plant health (e.g., nutrient and irrigation water management) and allow crops to escape or tolerate pest injury, and to enhance the impact of beneficial insects and other natural controls already present. This minimizes the need for chemical pesticides to control pests. These practices must be based on crop-pest specific recommendations or other science-based information sources such as ACES.

Scouting

A crucial component in any IPM program is to identify the pest. The effectiveness of both proactive and reactive pest management measures depend on correct identification. For this reason, scouts must be properly trained. Proper monitoring (scouting) can determine pest population levels and locations within the field and whether infestations are at the Economic Threshold, the point where the cost to control the pest equals the crop damage caused by the pest. Controlling a pest prior to this level is therefore not cost effective.

Field scouting, pest forecasting, and economic thresholds should be described in the IPM plan to ensure that pesticides are only used against real (not perceived) pest problems. Descriptions of pest damage and economic thresholds can be found in ACES IPM publications.

Field scouting uses different techniques to classify the status of a pest population for decision-making purposes. Field scouting procedures are available for many of the major pests in Alabama. If no specific guidance is available, field sampling should be done randomly, with samples taken from across the entire field. For insects, sweep nets, sticky traps, and pheromone traps may be used. Leaf counts are one method for recording plant growth stages. Square-foot or larger grids laid out in a field can provide a basis for comparative weed counts.

Pest forecasting uses information or data to predict pest problems early. For example, records of rainfall and temperature are sometimes used to predict the likelihood of disease infections. Regional pest monitoring systems can complement scouting. In addition, various models have been developed which can help determine when scouting should begin, or when pesticide application will have the maximum control.

Scouting reports must be kept, along with the management decision based on the individual scouting report. Decisions to suppress a pest need to be based on economic thresholds, when available from ACES or other science-based source. If no threshold is available, then the basis for the decision to suppress should be included. For example, “Past experience indicates that insect damage beyond this point will lead to significant crop yield loss.” All decisions made to use a pesticide to suppress an insect pest must be made on the basis of a scouting report. Where feasible, use lower risk or “Reduced Risk” pesticides or reduce use of pesticides through spot spraying, seed treatments, etc.

Use of Advanced Technologies

The use of advanced technologies supports the implementation of IPM. GPS systems may be used for mapping pest infestations based on scouting

reports. Mapping infestations over time is a good way document scouting activities, and may help in predicting pest populations in future years. Some scouting activities, such as grid sampling for nematodes, will complement advanced technologies for pesticide application. GPS in combination with Precision Agriculture technologies to reduce the amount of pesticide applied (reduced spray overlap technology.) is a useful way to merge these advanced technologies.

Recordkeeping
Records are an important tool to track pest populations over time, and can document reduction in pesticide use. An IPM plan must be developed or IPM principles followed and documentation provided to NRCS. Non-chemical pest management practices must be recorded. Documentation shall include target pest, method or technique used, date and/or crop stage when used. All pesticide use must be recorded. Documentation shall include product name or active ingredient, application location (field identification), target pest, application rate, application timing, and extent of application (entire field vs. spot treatment, for example).

The attached worksheets may be used to document scouting and management decisions, and pesticide use. The producer may use blank copies of the worksheets to keep annual records, or may use any format for record keeping that provides the required information. Also, documents similar to the NRCS *Idaho Checklist/Guidance for Integrated Pest Management* (http://www.id.nrcs.usda.gov/technical/guidance_ipm.html) can be used to assist in the development of an IPM plan.

Operation, Maintenance, and Safety

- Review and update the IPM plan periodically in order to incorporate new IPM technology, respond to cropping system and pest complex changes, and avoid the development of pest resistance.
- Maintain mitigation techniques identified in the plan in order to ensure continued effectiveness.
- Develop a safety plan for individuals exposed to chemicals including telephone numbers and addresses for emergency treatment centers and the telephone number for the nearest poison control center. For human exposure questions, the local center is:

Name: _____
Location: _____
Phone: _____
The National Pesticide Information Center (NPIC) contact information in Corvallis, Oregon, for non-emergency information is:

1-800-858-7378
FAX: 1-541-737-0761

E-mail: npic@ace.orst.edu

Monday - Friday
6:30 a.m. to 4:30 p.m. Pacific Time

For advice and assistance with emergency spills that involve agrichemicals, the local contact is:

Name: _____
Location: _____
Phone: _____

The national 24-hour CHEMTREC[V] contact information is:

Emergency: 1-800-262-8200

Email: chemtrec@chemtrec.com

- Follow label for mixing near water. If label does not provide guidance, then mix chemicals down gradient and a minimum of 100 feet from a well or from a surface water body.
- Post signs according to label directions and/or Federal, State, and local laws around sites that have been treated. Follow restricted entry intervals.
- Dispose of pesticides and pesticide containers in accordance with label directions and adhere to Federal, State, and local regulations.
- Read and follow label directions and maintain appropriate Material Safety Data Sheets (MSDS).
- Calibrate application equipment according to Extension and/or manufacturer recommendations before each seasonal use and with each major chemical change.
- Replace worn nozzle tips, cracked hoses, and faulty gauges.
- Maintain records of pest management for at least 2 years. Pesticide application records shall be in accordance with USDA Agricultural Marketing Service's Pesticide Record Keeping Program and state specific requirements.

Clients Acknowledgement:

The Client acknowledges that:

a. The implementation of an IPM plan for the major pest(s) of concern is required following a prepared IPM plan or IPM guidelines established by ACES. PAMS strategies will be followed. An agriculture professional must develop the plan and properly trained persons perform pest scouting.

b. The IPM plan will include mitigation practices and strategies to offset negative impacts of pest control efforts.

c. As part of the IPM plan, the producer must keep scouting reports, along with the management decision based on the individual scouting report. Decisions to suppress a pest need to be based on economic thresholds, when available, from ACES or other science-based source.

d. The use of advanced technologies (GPS combined with technologies to reduce pesticide use) should be included where feasible.

e. The producer will keep annual records of all pesticides applied, as well as records of non-chemical pest management practices.

f. The producer has received a copy of this practice specification and understands the contents and requirements.

Accepted by:/s/_____Date:_____

PEST MANAGEMENT WORKSHEET

Producer_____ Date _____ Time _____am/pm
Field ID _____ County _____ Scout _____

PLANT POPULATION Set Counts Total Plants Plants/Acre

Plants per 1/1000 of an acre* | | | | | | | | | | | _____ _____

Total Plants ÷ # Set x 1,000 =

36“ row width = 14’ 6” length of row, 30” = 17’ 5”, 20” = 26’ 2”, 15” = 34’ 10”, 10” = 52’ 3”, 7” = 74’ 8”

INSECTS	**Plants/Set**	**Set Counts**										**Total**	**%**	**# per Plant**
	/set													
	/set													
	/set													
	/set													
	/set													

WEEDS		**SOIL CONDITIONS**
Grasses **(Scattered, Slight, Moderate, Severe)**		Wet Moist Dry
_ SC SL MD SV	Avg. height _____	Loose Light Crust Hard Crust
_ SC SL MD SV	Avg. height _____	**WEATHER**
Broadleaves		Cool Warm Hot
_ SC SL MD SV	Avg. height _____	Partly Sunny Cloudy Rainy
_ SC SL MD SV	Avg. height _____	Calm Light Wind Strong Wind

DISEASES **(Rating 1, 2, 3, 4 or 5)**

_____ _____

_____ _____

CROP GROWTH STAGE _____

Comments:

MGT. DECISION BASED ON SCOUTING REPORT:

Map (or attach map)

NOTE: COMPLETION OF SHADED AREAS IS OPTIONAL.

PESTICIDE DATA COLLECTION SHEET

Crop	Target Pest	Product Name or Active Ingredient (AI)	% AI	Broadcast or Banded	Application: Surface, Foliar, or Soil Incorporated	Rate Used (Note if Reduced Spray Technology Used)