**NATURAL RESOURCES CONSERVATION SERVICE**

**CONSERVATION PRACTICE STANDARD**

# INTEGRATED PEST MANAGEMENT (IPM)

(Ac.)

**CODE 595**

## DEFINITION

A site-specific combination of pest prevention, pest avoidance, pest monitoring, and pest suppression strategies.

## PURPOSE

1. Prevent or mitigate off-site pesticide risks to water quality from leaching, solution runoff and adsorbed runoff losses.
2. Prevent or mitigate off-site pesticide risks to soil, water, air, plants, animals and humans from drift and volatilization losses.
3. Prevent or mitigate on-site pesticide risks to pollinators and other beneficial species through direct contact.
4. Prevent or mitigate cultural, mechanical and biological pest suppression risks to soil, water, air, plants, animals and humans.

## CONDITIONS WHERE PRACTICE APPLIES

On all lands where pests will be managed.

## CRITERIA

### General Criteria Applicable to All Purposes

IPM strategies (Prevention, Avoidance, Monitoring and Suppression, or "PAMS") shall be employed to prevent or mitigate pest management risks for identified natural resource concerns. NRCS does not develop pesticide recommendations nor change label instructions or recommended specifications for pesticide applications.

A comprehensive IPM plan utilizing PAMS strategies will be developed in accordance with this standard to document how specific pest management risks will be prevented or mitigated. The IPM plan must be crop and/or land use specific and adhere to applicable elements and guidelines accepted by NCSU and NC Cooperative Extension.

Information on IPM in North Carolina is found at http://ipm.ncsu.edu . Crop-specific pest management strategies are found there, as well as crop specific regional Pest Management Strategic Plans.

If a comprehensive IPM system is not feasible, or specific NCSU IPM guidance is not available, utilize appropriate IPM techniques (appropriate techniques are defined by PAMS explanation in "Considerations" section of this standard) to adequately prevent or mitigate pest management risks for identified natural resource concerns.

### Additional Criteria to Prevent or Mitigate Off-site Pesticide Risks to Water Quality from Leaching, Solution Runoff and Adsorbed Runoff Losses

For identified water quality concerns related to pesticide leaching, solution runoff and adsorbed runoff, the current version of the USDA-NRCS WIN-PST program will be used to evaluate potential risks to humans and/or fish, as appropriate, for each pesticide to be used.

The minimum level of mitigation required for each resource concern is based on the final risk ratings in the "WIN-PST Soil/Pesticide Interaction Hazard Ratings" Table below:

| WIN-PST Identified Hazard Rating | Minimum Mitigation Index Score Level Needed |
|---|---|
| Low or Very Low | None Needed |
| Intermediate | 20 |
| High | 40 |
| Extra High | 60 |

The most current version of WIN-PST, as well as support documentation, is available at: http://www.wsi.nrcs.usda.gov/products/W2Q/pest/winpst31.html

WIN-PST shall be used to assess all pesticides specified for planned use by the client, or on recommendations the client has received from consultants or the Cooperative Extension Service. When specific recommendations from these sources are not available, WIN-PST may be used with commonly used chemicals for the crop/pest, as found in the current N.C. Agricultural Chemicals Manual.

Use national Agronomy Technical Note 5, Pest Management in the Conservation Planning Process—Table II to determine if planned conservation practices provide adequate mitigation (at least meet the minimum mitigation index score). If they do not, use Agronomy Technical Note 5 - Table I to determine appropriate IPM techniques to apply in addition to planned conservation practices.

In management or establishment situations on forestland or wildlife habitat land where chemical use is specified and generally consists of a single or limited application, specifications prepared by a qualified forestry or wildlife professional may be provided as part of the forest or wildlife management plan. In these cases, WIN-PST and the use of the 595 Job Sheet is not required as long as guidance provided adheres to Forest Practice Guidelines (FPGs) and the respective forest/wildlife habitat management plan is implemented.

**Additional Criteria to Prevent or Mitigate Off-site Pesticide Risks to Soil, Water, Air, Plants, Animals and Humans from Drift and Volatilization Losses**

For identified natural resource concerns related to pesticide drift, use Agronomy Technical Note 5, Pest Management in the Conservation Planning Process – Table II to determine if planned conservation practices provide adequate mitigation. If they do not, use Agronomy Technical Note 5 - Table I to apply appropriate IPM techniques with this practice. The minimum level of mitigation required for drift is an index score of 20.

Resource concerns related to pesticide drift shall be identified based on planning area specific site conditions. Examples of conditions where drift may be a resource concern include:

- Planned area susceptibility to high winds.
- Proximity of planned area to environmentally sensitive areas such as surface water.
- Pesticides applied close to organic cropland.
- High likelihood of drift due to chemical selection and/or application technique.

For Volatile Organic Compound (VOC) emission concerns (this resource concern may apply to fumigants such as methyl bromide), apply at least one IPM mitigation technique from the Pesticide Volatilization section of Agronomy Technical Note 5 - Pest Management in the Conservation Planning Process. In cases where the WIN-PST chemical database does not include selected fumigants, a WIN-PST environmental risk assessment is not required for these chemicals.

**Additional Criteria to Prevent or Mitigate On-site Pesticide Risks to Pollinators and Other Beneficial Species through Direct Contact**

For direct contact pesticide risks to pollinators and other beneficial species in the application area, apply at least two IPM mitigation techniques from the Pesticide Direct Contact section of Agronomy Technical Note 5 - Pest Management in the Conservation Planning Process.

**Additional Criteria to Prevent or Mitigate Cultural, Mechanical and Biological Pest Suppression Risks to Soil, Water, Air, Plants and Animals**

For identified natural resource concerns related to cultural, mechanical and biological pest suppression, (e.g. air quality concerns with burning for weed control or soil erosion concerns with tillage for weed control), natural resource concerns shall be addressed to FOTG quality criteria levels.

## CONSIDERATIONS

IPM strategies that keep pest populations below economically damaging levels and minimize pest resistance should be utilized because they also help prevent unnecessary pest management risks to natural resources and humans.

For noxious weed and invasive species control, the minimum level of pest suppression necessary to meet natural resource objectives should be used; however, for the eradication of invasive species, the acceptable pest threshold may be zero.

IPM Prevention, Avoidance, Monitoring, and Suppression (PAMS) 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 pest resistant 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.

IPM guidelines from NC State University or Extension may be supplemented with information from appropriately certified professionals.

When providing technical assistance to organic producers, the IPM approach to managing pests should be consistent with the USDA-Agricultural Marketing Service National Organic Program standard which includes:

- A diverse crop rotation that reduces habitat for major pests and increases habitat for natural enemies.

- Use of “farmscaping” principles to create borders of beneficial species habitat.

- Farming techniques to improve soil quality.

- Planting of locally adapted, pest resistant crop cultivars.

Adequate plant nutrients and soil moisture, including favorable pH and soil quality, can reduce plant stress, improve plant vigor and increase the plant's overall ability to tolerate pests.

On irrigated land, irrigation water management should be designed to avoid conditions conducive to disease development and minimize offsite contaminant movement.

Producers should be reminded that they are responsible for following all pesticide label instructions and complying with all applicable federal, state and local regulations, including those that protect Threatened and Endangered Species.

Consider utilizing the NCSU WEBHADSS website (http://www.webhadss.ncsu.edu/) to make decisions on the effectiveness and economic impact of pest management/chemical alternatives.

Enhancement Considerations

1. A more intensive level of IPM focused primarily on prevention and avoidance strategies can further minimize pest management risks to natural resources and humans.
2. Precision pesticide application techniques in an IPM system can further minimize pesticide risks to natural resources and humans.

## WEED MANAGEMENT CONSIDERATIONS IN ORGANIC CROPPING SYSTEMS

Weed control is perhaps the most important issue that confronts organic producers. To plan an effective weed management strategy in organic crops, producers should consider the following:

- Weed biology for historical plant pests.

- Field rotation of organic crops and alteration of planting dates to disrupt weed life cycles.

- Establishing cover crops and cover crop grain/legume mixtures that produce high density biomass and are terminated at maturity may be effective in early season weed suppression. High density biomass cover crops also help build soil organic matter.

- Tillage and cultivation are often a primary component of organic weed control, but field operations should be minimized if maintaining positive trends in soil organic matter content is a primary goal.

- Only herbicides listed by the Organic Materials Review Institute (OMRI) are allowed in organic production systems.

- Weed prevention—removal or destruction of nearby or in-field weed seed and plant parts can be critical to successful weed management.

Producers are also encouraged to contact NCSU Cooperative Extension organic cropping specialists to get weed management information specific to North Carolina.

**PLANS AND SPECIFICATIONS**

The IPM plan shall be prepared in accordance with the criteria of this standard and shall describe the requirements for applying the practice to achieve its intended purpose.

NOTE: USE OF NC PEST MANAGEMENT CONSIDERATIONS IN CONSERVATION PLANNING WORKSHEET AND 595 JOB SHEET EXCEL DOCUMENT IS RECOMMENDED TO DOCUMENT EXISTING IPM TECHNIQUES, ASSESS NEED FOR FURTHER RESOURCE MITIGATION, AND ASSIST IPM PLANNERS IN DOCUMENTING REQUIRED PLAN ITEMS.

The IPM plan shall include at a minimum:

1. Plan map and soil map of site/affected area, if applicable (use conservation plan maps if available).
2. Location of sensitive resources and setbacks, if applicable (use conservation plan maps if available).
3. Interpretation of the environmental risk analysis. Note: all pesticide label requirements and federal, state, and local regulations must be followed for all pesticide applications.
4. Identification of appropriate mitigation techniques. See Agronomy Technical Note 5 - Table I for pesticide risk mitigation management techniques.
5. A list of pest prevention and avoidance strategies that will be implemented, if applicable.
6. A scouting plan and threshold levels for each pest, if applicable.
7. Other monitoring plans, if applicable, such as weather monitoring to indicate when pesticide application for prevention is warranted.
8. A list of accepted pest thresholds or methods to determine thresholds that warrant treatment, if applicable.

Note: Items 5, 6, 7 and 8 are required to document a comprehensive IPM system, but they may not be applicable when only a limited number of mitigation techniques are sufficient to address identified natural resource concerns.

**Record Keeping**. The following records, where applicable, shall be maintained by the producer:

1. Monitoring or scouting results including the date, pest population/degree of infestation, and the crop or plant community condition.
2. When and where each pest suppression technique was implemented.
3. When and where special IPM techniques were implemented to mitigate site-specific risks (e.g. soil incorporation of a pesticide to reduce its surface runoff to a nearby stream).

Note: Applicability will depend on the level of IPM adoption and mitigation requirements.

## OPERATION AND MAINTENANCE

The IPM plan shall include appropriate operation and maintenance items for the client. These may include:

- Review and update the plan periodically in order to incorporate new IPM strategies, 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.
- Calibrate application equipment according to Extension and/or manufacturer recommendations before each season of use and with each major chemical change.
- Maintain records of pest management for at least two years. Pesticide application records shall be in accordance with USDA Agricultural Marketing Service's Pesticide Recording Keeping Program and site specific requirements.

## REFERENCES

National Information System for the Regional IPM Centers – IPM Elements and Guidelines:

http://www.ipmcenters.org/ipmelements/index.cfm

USDA-AMS National Organic Program, National List of Allowed and Prohibited Substances.

http://www.ams.usda.gov/AMSv1.0/ams.fetchTemplateData.do?template=TemplateN&navID=NationalListLinkNOPNationalOrganicProgramHome&rightNav1=NationalListLinkNOPNationalOrganicProgramHome&topNav=&leftNav=NationalOrganicProgram&page=NOPNationalList&resultType=&acct=nopgeninfo

USDA-NRCS GM-190-404 Pest Management Policy:

http://directives.sc.egov.usda.gov/RollupViewer.aspx?hid=17015

Using Farming Bill Programs for Pollinator Conservation:

http://plants.usda.gov/pollinators/Using_Farm_Bill_Programs_for_Pollinator_Conservation.pdf