INTEGRATED PEST MANAGEMENT (IPM)

(Acre)

CODE 595

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

PURPOSES
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 such as Prevention, Avoidance, Monitoring and Suppression (PAMS) shall be employed to prevent or mitigate pest management risks for identified natural resource concerns. (See Considerations section of this standard for a description of the PAMS strategies.)
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 the University of Minnesota and University of Minnesota Extension (UMES).

If a comprehensive IPM system is not feasible, utilize appropriate IPM techniques to adequately prevent or mitigate pest management risks for identified natural resource concerns.

Pesticide use on organic crops will comply with federal organic certification standards.

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 (Windows-Pesticide Screening Tool) 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:

<table>
<thead>
<tr>
<th>WIN-PST Identified Hazard Rating</th>
<th>Minimum Mitigation Index Score Level Needed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low or Very Low</td>
<td>None Needed</td>
</tr>
<tr>
<td>Intermediate</td>
<td>20</td>
</tr>
<tr>
<td>High</td>
<td>40</td>
</tr>
<tr>
<td>Extra High</td>
<td>60</td>
</tr>
</tbody>
</table>

Use National 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 National Agronomy Technical Note 5 - Table I to apply appropriate IPM techniques with this practice.

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

Minimize volatilization and drift and transport through wind erosion that may negatively impact non-target plants, animals, and humans. Method of application and pesticide formulation shall be appropriate for the conditions and consistent with pesticide label requirements. Wind speed, temperature, humidity and other climatic factors will be monitored as applicable per pesticide label directions.

For identified natural resource concerns related to pesticide drift, use National 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 National 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.

For Volatile Organic Compound (VOC) emission concerns, apply at least one IPM mitigation technique from the Pesticide Volatilization section of National Agronomy Technical Note 5 - Pest Management in the Conservation Planning Process.

Pesticides must be managed in a way that prevents contamination of nearby organic crops.

Post and observe re-entry (REIs) for fields treated with pesticides.

Use Personal Protective Equipment (PPE) if required or recommended during mixing/handling, application, and re-entry.

Consult Minnesota Department of Agriculture (MDA) web pages "Handling Pesticides Safely" and "Guidelines for Developing and Maintaining an Incident Response Plan" for additional criteria.

**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 National Agronomy Technical Note 5 - Pest Management in the Conservation Planning Process.


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Adhere to pesticide label directions and University of Minnesota recommendations regarding grazing, haying and feeding restrictions and other items necessary to minimize negative impacts to wildlife, domestic animals and non-target insects including pollinating insects such as bees.

The Environmental Hazards section of pesticide labels includes information on toxicity to bees; pesticide applicators should use the least toxic insecticide to bees. Beekeepers should be notified several days before any pesticide that is toxic to bees is applied and application sites should be scouted for the presence of bees and other pollinating insects prior to insecticide application. Insecticide applications should not be made to blooming crops or in the vicinity of blooming weeds.

Use appropriate pesticide application strategies to prevent damage to endangered or threatened species such as buffer set-backs, reduced application rates, and application timing. Pesticide applications should be delayed or forgone if protection of endangered or threatened species cannot be assured. Consult the Minnesota Department of Agriculture (MDA) Endangered Species Protection web page for more information, and the U.S. Fish and Wildlife endangered species page for species that are currently listed as Threatened (T) or Endangered (E) in Minnesota.

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

General Considerations Applicable to All Purposes

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 the University of Minnesota or University of Minnesota 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
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- 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.

All methods of pest management will comply with federal, state, and local regulations and requirements, including management for invasive pest species, noxious weeds and disease vectors; and proper storage, handling, and disposal of pesticides, pesticide residues, and pesticide containers.

Federal regulations include the Food Quality Protection Act (FQPA); Federal Insecticide, Fungicide and Rodenticide Act (FIFRA); Working Protection Standard (WPS); and the Endangered Species Act (ESA).

State regulations include the Minnesota Pesticide Control Act, Minnesota Groundwater Protection Act, and the Minnesota Noxious Weed Law. State statutes governing pesticide use are listed in Minnesota statutes section 18B. State rules regulating pesticide use are listed in Minnesota Rules Chapter 1505. State rules protecting drinking water from pesticide contamination are listed in Minnesota Rules, parts 4717.7100 to 4717.7800, and state rules protecting aquatic life and human health from pesticides in surface water are listed in Minnesota rules chapter 7050.

Local regulations include shoreland zoning ordinances adopted by some counties which prohibits cultivation of crops within a given distance of water bodies.

Pesticide management activities including pesticide selection, application and timing; storage, handling, and disposal of pesticides, pesticide residues and pesticide containers will be in accordance with label directions and University of Minnesota guidance. This includes instructions to reduce the presence of pesticides and pesticide degradates in soil, leachate and runoff; and other instructions to minimize negative impacts on non-target plants/crops, air, animals and humans. Consult the following MDA web pages and fact sheets for additional criteria: “Timing of Pesticides Use: Before or After Infestation”; “Pesticide-Selection How To’s”; “Mixing and Loading Pesticides”; “Pesticide-Application How To’s”; “Water Quality Best Management Practices for Agricultural Herbicides”; “Water Quality Best Management Practices for Acetochlor, Alachlor, Atrazine, Metolachlor, and Metribuzin”; and “Managing Pesticides, Waste Pesticides and Empty Pesticide Containers”.

Pest management on sites susceptible to surface or groundwater contamination will require appropriate mitigation practices. Sites susceptible to surface or groundwater contamination include but are not limited to:

- Within 300 feet of water bodies;
- Within 50 feet of wells and sinkholes;
- Within boundaries of vulnerable Drinking Water Supply Management Areas (DWSMAs) or Source Water Assessment Areas (SWAAs);
- Within watersheds listed by the Minnesota Pollution Control Agency (MPCA) as having a water quality impairment due to a pesticide(s). Consult the Minnesota Pollution Control Agency’s (MPCA) 303(d) Total Maximum Daily Load (TMDL) list of impaired waters: http://www.pca.state.mn.us/water/tmdl/index.html;
• Within areas having high or very high pollution sensitivity of the water table or surficial aquifer as portrayed in county geologic atlas or regional hydrogeologic assessments;

• Having shallow soils over fractured bedrock. Consult NRCS-Minnesota’s “Sensitive Soil Features for Nutrient Management” available on the Web Soil Survey, under Soil Data Explorer, and then Suitability and Limitations for Waste Management.

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.

A number of IPM activities are found on the Minnesota Department of Agriculture (MDA) web page titled “Non-Pesticide Voluntary Best Management Practices That Help Control Pests”.

Consider selecting pesticide application methods that minimize the degree of drift and volatilization such as appropriate droplet size, application of granules or pellets, wicking, spray boom shields, and application as close to the target as possible.

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.

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 (e.g. WIN-PST). 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 annually in order to incorporate new IPM and pesticide management 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.
- Calibrate application equipment according to UMES and/or manufacturer recommendations before each season of use and with each major chemical change.
- Keep pesticide application records for a minimum of two years when these pesticides are applied by private applicators, and a minimum of five years when pesticides are applied by commercial or non-commercial applicators.

REFERENCES

National Information System for the Regional IPM Centers – IPM Elements and Guidelines:
http://www.ipmcenters.org/ipmelements/index.cfm
https://www.ncipmc.org/planning/index.php


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

Using Farming Bill Programs for Pollinator Conservation:

Minnesota Dept. of Agriculture – Voluntary BMPs
https://www.mda.state.mn.us/protecting/bmps/voluntarybmps.aspx

Minnesota Dept. of Agriculture-Endangered Species Protection Program
http://www.mda.state.mn.us/endangered

USDA-NRCS-Minn. Pest Management Site
http://www.mn.nrcs.usda.gov/technical/ecs/pest/pest.htm
Tools and information needed to implement Pest Management (595) including Minnesota NRCS Pest Management Planning Policy.

Farm*A*Syst – A voluntary program that helps identify potential sources of contaminants on farms.

Windows Pesticide Screening Tool (WIN-PST)
https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/technical/ecoscience/invasive/?cid=stelprdb1043180


USDA-NRCS Electronic Field Office Technical Guide (E-FOTG)
http://www.nrcs.usda.gov/technical/eftog/ Minnesota Department of Agriculture-Agricultural Chemical Spill and Safety
http://www.mda.state.mn.us/chemicals/spills/emergresponse.aspx

Minnesota Department of Agriculture-Acetochlor
http://www.mda.state.mn.us/acetochlor

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Minnesota Department of Agriculture-Pesticide Regulation and Enforcement Program
http://www.mda.state.mn.us/chemicals/pesticides/regs.aspx

Minnesota Department of Agriculture-Pesticide Applicator Licensing and Certification Program
Commercial and non-commercial pesticide applicator licensing:
https://www.mda.state.mn.us/licensing/licensetypes/pesticideapplicator.aspx

Private Pesticide Applicator certification:
https://www.mda.state.mn.us/licensing/licensetypes/privapp.aspx

Minnesota Department of Health Groundwater webpage containing Health Risk Limits (HRLs) for drinking water http://www.health.state.mn.us/divs/eh/groundwater/