NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD

PEST MANAGEMENT
(Acre)
CODE 595

DEFINITION

Utilizing environmentally sensitive prevention, avoidance, monitoring and suppression strategies, to manage weeds, insects, diseases, animals and other organisms (including invasive and non-invasive species), that directly or indirectly cause damage or annoyance.

PURPOSES

This practice is applied as part of a Resource Management System (RMS) to support one or more of the following purposes:

Minimize negative impacts of pest control on soil, water, air, plant, and animal resources and/or humans.

Protect and enhance quantity and quality of commodities.

Protect and enhance non-cropland areas and habitats.

CONDITIONS WHERE PRACTICE APPLIES

Wherever pests (including invasive species) will be managed.

CRITERIA

General Criteria Applicable to All Purposes

Pest management (including invasive species management) will be integrated into other components of a conservation plan and will balance economics, efficacy and environmental risk.

Pest management will include Integrated Pest Management (IPM) strategies such as prevention, avoidance, monitoring and suppression. IPM strives to maintain pest populations below economically damaging levels; minimizes pest resistance; and minimizes harmful effects of pest control on human health and environmental resources.

Prevention and/or avoidance is the implementation of practices that contribute to long term crop protection including planting pest-free seeds, crop rotation, using resistant varieties, cleaning equipment between fields, removing or destroying sources of pest infestations, trap crops and the implementation of practices that preserve biological diversity and improve crop vigor.

Monitoring includes scouting to properly identify pests and using weather forecasts to predict infestation by some pests. Monitoring helps determine the need for suppression strategies. Monitoring is also used to evaluate the effectiveness of pest control strategies.

Suppression techniques include the use of biological, cultural, mechanical, genetic and chemical controls.

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”.

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); Worker Protection Standard (WPS); and the Endangered Species Act (ESA).

State regulations include the Minnesota Pesticide Control Act, Minnesota Groundwater Protection Act, and 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 Ch. 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 Ch. 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 Pesticide 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 Metributzin"; and "Managing Pesticides, Waste Pesticides and Empty Pesticide Containers".

Pesticide pest control options will be evaluated for relative environmental risk on water resources by using NRCS' Windows Pesticide Screening Tool (WIN-PST).

Farmstead pesticide storage and handling will be evaluated for environmental risk using FARM*A*SYST Fact Sheet 2, "Reducing the Risk of Groundwater Contamination by Improving Pesticide Storage and Handling**"** and FARM*A*SYST Worksheet 2 "Assessing the Risk of Groundwater Contamination from Pesticide Storage and Handling".

Pest management will include appropriate mitigation techniques to reduce environmental risk in sensitive areas. Mitigation guidance is found in NRCS Minnesota Amendment "Pest Management Planning" (Currently amendment MN25, March 2008) to the NRCS National Planning Procedures Handbook (NPPH).

Additional Criteria to Protect Water Resources

The number, sequence and timing of tillage operations shall be managed in conjunction with other sediment control tactics and practices in order to minimize sediment losses to nearby surface water bodies.

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 a Windows Pesticide Screening Tool (WIN-PST) "Soil Sensitivity to Pesticide Loss Rating" of high (w) for Soil Leaching Potential (SLP); or,
- having shallow soils over fractured bedrock. Consult NRCS-Minnesota's "Sensitive Soil Features for Nutrient Management" available on the Web Soil Survey or in the E-FOTG under Section II, County Soils Information part k. Waste Disposal Interpretations.

Additional Criteria to Protect Air Resources

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.

Additional Criteria to Protect Plant Resources

Clients will be encouraged to pay special attention to pesticide label instructions including those directed at:

- Removing pesticide residues from sprayers before moving to areas with different planned crops or pest problems.
- Applying pesticides at the correct climatic conditions, crop stage, soil moisture, pH, and organic matter needed to protect plant health.

Additional Criteria to Protect Animal Resources

Clients will 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. To minimize impact on bees, pesticide applicators should use the least toxic insecticide to bees. Beekeepers should be notified several days before any pesticide that is toxic to honey 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.

Additional Criteria to Protect Endangered Species

Minnesota has six federally listed endangered species and four federally listed threatened species. It is illegal to damage an endangered or threatened species or its critical habitat. Pesticide application strategies to prevent damage to endangered or threatened species include 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, http://www.mda.state.mn.us/endangered .

Additional Criteria to Protect Humans

Post and observe re-entry intervals (REI's) 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 Protect Quantity and Quality of Commodities

All appropriate federal, state, and local standards to protect against contamination with transgenic crops, noxious weeds, etc., will be followed. Pesticides must be managed in a way that prevents contamination of nearby organic crops. Pesticide use on organic crops will comply with federal organic certification standards.

Additional Criteria to Protect and Enhance Non-cropland Terrestrial Areas from Invasive Species

An invasive species is a species whose introduction does, or is likely to cause, significant economic or environmental impacts and that does not provide an equivalent benefit to society.

National NRCS policy defines invasive species as those listed on an official federal, state, or county noxious and/or invasive species list. Species appearing on these lists will not be recommended in any NRCS developed conservation plan. The Minnesota Department of Agriculture (MDA) list of Invasive Species includes: Black Swallow-wort, Grecian foxglove, Cut-leaved teasel and Japanese knotweed. See NRCS **MN Agronomy Technical Note 16** for information about the MDA state listing

of prohibited, restricted and secondary noxious weeds.

Control or prevention of establishment of invasive species is accomplished through mechanical, chemical, biological (including grazing with livestock), or manual means, prescribed burning, or a combination of all of these methods. The Minnesota Department of Natural Resources (MDNR); and MDA have fact sheets addressing control of select invasive species. NRCS in Minnesota also has Job Sheets addressing control alternatives for approximately ten invasive or noxious plant species.

Invasive plant species removed from a site should be thoroughly disposed of.

Specific levels of invasive species or noxious weed suppression may be required by law. Thresholds may be zero, especially when the spread of noxious weeds or invasive species may cause severe damage to native habitats and/or agricultural outputs.

CONSIDERATIONS

General Considerations Applicable to All Purposes

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.

Consider prescribed burning on non-cropland. See Conservation Practice Standard 338 (Prescribed Burning).

Consider non-pesticide options to control undesirable woody plants in non-cropland areas. See Conservation Practice Standard 314 (Brush Management) or 666 (Forest Stand Improvement).

On irrigated land, consider using irrigation water management to minimize pest management environmental risk.

Consider the impact of management activities on natural plant and/or animal communities. This includes timing operations to prevent negative impacts on nesting wildlife and preventing changes to the structure and diversity of plants utilized by wildlife. Also, consider the restoration of impacted communities through the application of conservation practices like Tree/Shrub establishment (612), Range Planting (550) and Restoration and Management of Rare and Declining Habitats (643).

On non-cropland areas, consider choosing pest management activities that minimize soil disturbance which could lead to the germination of plant pests.

Early detection and management is an effective way to reduce costs.

Additional Considerations to Protect Animal Resources

Consider applying pesticides in early morning, late afternoon or at night when bees and other pollinators are least likely to be working blooms. However some pollinators, such as *Normia* bees that rest in crop fields overnight as well as moths that are active at night, may be harmed by nighttime application of pesticides.

Consider using ground equipment instead of aerial spraying to apply pesticides.

Consider using liquid sprays or granules instead of dusts.

Consider not using microencapsulated pesticides.

Additional Considerations for Managing Noxious Weeds and Invasive Species

Consider not using “additional plant species of concern” when selecting plant species for conservation practices. See **Agronomy Technical Note 16** for a listing of these additional species of concern.

PLANS AND SPECIFICATIONS

The pest management component of a conservation plan will address the criteria of this standard and guidance contained in Minn. Amendment “Pest Management Planning” to the NRCS National Planning Procedure Handbook (NPPH).

At a minimum, the pest management component of a conservation plan shall include:

- Plan map and soil map of managed site;
- Location of sensitive resources and setbacks, if any;

- Probable pest control option(s);
- Interpretation of the WIN-PST analysis and identification of appropriate mitigation techniques for probable pest management options; and,
- Operation and maintenance information including emergency response information, recordkeeping information; and equipment calibration or maintenance information.

OPERATION AND MAINTENANCE

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.

Keep pesticide application records for a minimum of two years when pesticides are applied by private applicators, a minimum of five years when pesticides are applied by commercial or non-commercial applicators.

REFERENCES

USDA-NRCS Web Soil Survey
http://websoilsurvey.nrcs.usda.gov/app/

USDA-NRCS Electronic Field Office Technical Guide (E-FOTG)
http://www.nrcs.usda.gov/technical/efotg/

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
http://www.nj.nrcs.usda.gov/partnerships/farmasyst/

Windows Pesticide Screening Tool (WIN-PST)
http://www.wsi.nrcs.usda.gov/products/W2Q/pest/winpst.html

Minnesota Dept. of Agriculture - Agricultural Chemical Spill and Safety
http://www.mda.state.mn.us/chemicals/spills/default.htm

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

Pest and Pesticide Management BMPs cited in the Minnesota Pest Management (595) standard:

- Water Quality BMPs for Agricultural Herbicides
- Water Quality BMPs for Acetochlor, Alachlor, Atrazine, Metolachlor and Metribuzin
- Developing and Maintaining an Incident Response Plan (spills and other accidents)
- Handling Pesticides Safely
- Managing Pesticides, Waste Pesticides and Empty Pesticide Containers
- Mixing and Loading Pesticides
- Non-Pesticide BMPs that Help Control Pests
- Pesticide Application How-To's
- Pesticide Selection How-To's
- Timing of Pesticide Use; Before or After Infestation

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

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

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

Minnesota Dept. of Agriculture – Pesticide Applicator Licensing and Certification Program
Commercial and non-commercial pesticide applicator licensing:
www.mda.state.mn.us/licensing/pestfert/pesticideapplicator.htm

Private pesticide applicator certification:
www.mda.state.mn.us/licensing/pestfert/privapp.htm

Minnesota Dept. of Health Groundwater web page containing Health Risk Limits (HRLs) for

drinking water
http://www.health.state.mn.us/divs/eh/groundwater/

Minnesota Pollution Control Agency - Water Quality Programs State Water Quality Standards
http://www.pca.state.mn.us/water/standards/index.html

U.S. Environmental Protection Agency's Region 5 Water Quality Standards Office (Clean Water Act Authorizations)
http://www.epa.gov/region5/water/wqs5/

Minnesota's Impaired Waters and Total Maximum Daily Loads (TMDLs)
http://www.pca.state.mn.us/water/tmdl/index.html

Minnesota Rule Chapter 7050, Waters of the State
https://www.revisor.leg.state.mn.us/rules/?id=7050

University of Minnesota
Applied Weed Science
http://appliedweeds.cfans.umn.edu/index.html

Site includes the publication "*Cultural and Chemical Weed Control in Field Crops*", which contains information on product efficacy; Integrated Weed Management; water quality, human re-entry time; and forage, feed and grazing restrictions associated with various trade names

University of Minnesota Extension
Private Pesticide Applicators Manual
http://www.extension.umn.edu/pesticides/pat/ppatman/ppatmanual.html

- Integrated Pest Management Chapter
- Safe Handling of Pesticides Chapter
- Protecting the Environment Chapter
- Pesticide Poisoning Chapter

University of Minnesota Extension
http://www.extension.umn.edu/pesticides/pesticides/pesticideresources.html

RECORDKEEPING
http://www.ams.usda.gov/science/ or:

http://www.extension.umn.edu/distribution/cropsystems/DC0915.html

Minnesota Agricultural Experiment Station (MAES) Varietal Trials Results
http://www.maes.umn.edu/08varietaltrials/

EMERGENCY SPILL INFORMATION
For advice and assistance with emergency spills and other emergencies that involve pesticides:
(651) 201-6387 (M-F; 8-4:30pm)
or for 24 hour assistance:
Minnesota State Duty officer at **1-800-422-0798** (Greater Minnesota) or **1-651-649-5451** (Twin Cities Metropolitan Area) or National CHEMTREC: **1-800-424-9300**

Minnesota Regional Poison Center
1-800-222-1222

Pesticide Worker Protection Standard
http://www.epa.gov/agriculture/twor.html

INTEGRATED PEST MANAGEMENT SITES

Minnesota Dept. of Agriculture IPM Program
http://www.mda.state.mn.us/ipm

National Information System for the Regional IPM Centers
http://www.ipmcenters.org/index.cfm
Site includes crop profiles potentially helpful when determining pest problems and solutions.

National Sustainable Agriculture Information Center (ATTRA) – Pest Management
http://attra.ncat.org/pest.html

University of Minnesota Vegetable IPM Program
http://www.vegedge.umn.edu/

INVASIVE SPECIES SITES

USDA NRCS Invasive Species Policy
http://policy.nrcs.usda.gov/scripts/lpsiis.dll/GM/GM_190_414.htm

National Invasive Species Council
http://www.invasivespeciesinfo.gov/council/main.shtml

National Invasive Species Management Plan
http://www.invasivespeciesinfo.gov/council/nmp.shtml

MN Department of Natural Resources
State invasive species fact sheets
http://www.dnr.state.mn.us/invasives/index.html

Minnesota Department of Agriculture
Invasive Species Unit
http://www.mda.state.mn.us/invasives/default.htm

Interagency U.S. Invasive Species Information System; http://www.invasivespeciesinfo.gov/

USDA Plants Database
http://plants.usda.gov/cgi_bin/topics.cgi?earl=noxious.cgi Plant Topics, Invasive and Noxious; Plants lists

USDA-NRCS-Minnesota Agronomy Technical Notes
http://www.mn.nrcs.usda.gov/technical/ecs/agron/Tech%20Notes/TechNote.html

USDA-NRCS-Minnesota Invasive and Noxious Weed Job Sheets
http://efotg.nrcs.usda.gov/efotg_locator.aspx?map=MN Click on a county; then Section IV; then Job Sheets; then Invasive species