

**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:

- Enhance quantity and quality of commodities.
- Minimize negative impacts of pest control on soil resources, water resources, air resources, plant resources, animal resources and/or humans.

CONDITIONS WHERE PRACTICE APPLIES

Wherever pests will be managed.

CRITERIA

General Criteria Applicable to All Purposes

A pest management component of a conservation plan shall be developed.

NRCS employees in Maine who provide pest management guidance shall obtain and maintain certification as a "Certified Pesticide Applicator (Commercial)" in the area of "Agricultural Pest Control – Plants 1B" as granted by the Maine Department of Agriculture, Food and Rural Resources –

Board of Pesticides Control.

All methods of pest management must comply with Federal, State, and local regulations, including management plans for invasive pest species, noxious weeds and disease vectors. Compliance with the Food Quality Protection Act (FQPA); Federal Insecticide, Fungicide and Rodenticide Act (FIFRA); Worker Protection Standard (WPS); and Interim Endangered Species Protection Program (H7506C) is required for chemical pest control.

Integrated Pest Management (IPM) that strives to balance economics, efficacy and environmental risk, where available, shall be incorporated into planning alternatives. (IPM is a sustainable approach to pest control that combines the use of prevention, avoidance, monitoring and suppression strategies, to maintain pest populations below economically damaging levels, to minimize pest resistance, and to minimize harmful effects of pest control on human health and environmental resources. IPM suppression systems include biological controls, cultural controls and the judicious use of chemical controls.)

IPM programs available in Maine are administered through the University of Maine Cooperative Extension, Pest management Office in Orono and are on their web site <http://www.umext.maine.edu/topics/pest.htm>. The following IPM programs are available:

- Apples
- Blueberries
- Cranberries
- Potatoes
- Strawberries

- Sweet Corn
- Broccoli

The Pest Management Office also operates the Insect and Plant Disease Diagnostic lab.

An appropriate set of management practices and conservation practices (mitigation techniques) must be planned and implemented to reduce the environmental risks of pest management activities in accordance with quality criteria in the local Field Office Technical Guide. Suggested practices are listed in Table 1.

All methods of pest management must be integrated with other components of the conservation plan.

Clients shall be instructed to pay special attention to all environmental hazards and site-specific application criteria listed on pesticide labels and contained in Extension and Crop Consultant recommendations.

Additional Criteria to Protect Quantity and Quality of Commodities

As an essential component of both commodity-specific IPM and IPM general principles, clients shall be encouraged to use the minimum level of pest control necessary to meet their objectives for commodity quantity and quality.

Additional Criteria to Protect Soil Resources

In conjunction with other conservation practices, the number, sequence and timing of tillage operations shall be managed to maintain soil quality and maintain soil loss at or below the soil loss tolerance (T) or any other planned soil loss objective. The Revised Universal Soil Loss Equation (RUSLE) will be used for soil erosion prediction.

Clients shall be encouraged to pay special attention to pesticide label instructions for limiting pesticide residues in soil that may negatively impact non-target plants, animals and humans.

Additional Criteria to Protect Water Resources

Pest management environmental risks, including the impacts of pesticides in ground and surface water on humans and non-target plants and animals, must be evaluated for all identified water resource concerns. Identified water resource concerns may include:

- Public and private wells
- Water bodies used for public water supplies
- Groundwater Aquifers
- Endangered Species Habitats
- States 303(d) list of impaired surface waters for which TMDLs have been developed and where pesticides have been identified as a pollutant.

Environmental risks will be evaluated using NRCS' Windows Pesticide Screening Tool (WIN-PST).

When a chosen alternative has significant potential to negatively impact important water resources, (e.g., WIN-PST "Extra High", "High" or "Intermediate" soil/pesticide human risk ratings in the drainage area of a drinking water reservoir), an appropriate set of management practices and conservation practices must be put in place to address risks to humans and non-target plants and animals. Table I contains a list of management and conservation practices which can help reduce the adverse impacts of pesticides depending upon pesticide loss pathways.

Clients shall be encouraged to pay special attention to pesticide label instructions for limiting pesticide residues in leachate and runoff that may negatively impact non-target plants, animals and humans.

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.

Additional Criteria to Protect Air Resources

Clients shall be encouraged to pay special attention to pesticide label instructions for minimizing volatilization and drift that may negatively impact non-target plants, animals and humans.

Consider weather conditions and environmental behavior of pesticides to reduce volatilization and drift.

Additional Criteria to Protect Plant Resources

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

- Preventing misdirected pest management control measures that negatively impact plants (e.g., removing pesticide residues from sprayers before moving to the next crop and properly adjusting cultivator teeth and flame burners).
- Appropriate climatic conditions, crop stage, soil moisture, pH, and organic matter in order to protect plant health.
- Limiting pesticide residues in soil that can carry over and harm subsequent crops.

Additional Criteria to Protect Animal Resources

Clients shall be encouraged to pay special attention to pesticide label instructions that minimize negative impacts to animals.

Additional Criteria to Protect Humans

Clients shall be encouraged to pay special attention to pesticide label instructions that minimize negative impacts to humans.

CONSIDERATIONS

If commodity-specific IPM is not available, the following IPM principles should be considered: **Specific IPM Strategies are listed in Table 2.**

- **Prevention - Preventing Pest Populations.**
- **Avoidance** - Avoiding Pest Populations.
- **Monitoring** - Identifying the extent of pest populations and/or the probability of future populations to help target suppression strategies and avoid routine preventative pest control.
- **Suppression** - Using cultural, biological and chemical controls to reduce a pest population or its impacts. Chemical

controls should be used judiciously in order to minimize environmental risk and pest resistance.

Adequate plant nutrients and soil moisture, including favorable pH and soil conditions, should be available to 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 minimize pest management environmental risk.

PLANS AND SPECIFICATIONS

The pest management component of a conservation 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(s).

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

- Plan map and soil map of managed site, if applicable (use RMS plan maps if available).
- Location of sensitive resources and setbacks, if applicable (use RMS plan maps if available).
- Environmental risk analysis, with approved tools and/or procedures, for probable pest management recommendations by crop (if applicable) and pest.
- Interpretation of the environmental risk analysis and identification of appropriate management and conservation practices to mitigate the risks identified.
- Operation and maintenance requirements.

OPERATION AND MAINTENANCE

The pest management component of a conservation 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 technology, respond to cropping system and pest

complex changes, and avoid the development of pest resistance.

- Maintain management and conservation practices identified in the plan in order to ensure continued effectiveness.
- Develop a safety plan for individuals exposed to chemicals, including telephone numbers and addresses of emergency treatment centers for individuals exposed to chemicals and the telephone number for the nearest poison control center. The National Pesticide Telecommunications Network (NPTN) telephone number in Corvallis, Oregon may also be given for non-emergency information:

1-800-424-7378

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 emergency telephone number should be provided. The national 24-hour CHEMTREC telephone number may also be given:

1-800-424-9300

- Follow label requirements for mixing/loading setbacks from wells, intermittent streams and rivers, natural or impounded ponds and lakes, or reservoirs. Maine Department of Agriculture, Board of Pesticides Control Chapter 29 - Standards for Water Quality Protection (<http://www.state.me.us/sos/cec/rcn/apa/01/chaps01.htm>) specifies the following:
 - A. No person shall mix or load any pesticides or fill a sprayer or mix tank within fifty (50) feet from the high water mark of any surface waters of the State.
 - B. No person shall use a pump that pumps pesticide concentrate or formulation or any hose that has been in contact with pesticide solution to draw liquid from any surface waters.
 - C. All pesticide pumping systems that come in contact with any surface waters shall be equipped with an anti-siphoning device.
- 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. See Maine Department of Agriculture, Board of Pesticides Control Chapter 21 – Pesticide Container Disposal and Storage (<http://www.state.me.us/sos/cec/rcn/apa/01/chaps01.htm>).
- 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.
- Maintain mechanical equipment in good working condition. Replace worn nozzle tips, cracked hoses, and faulty gauges. Replace worn components on other pest management implements as well.
- Maintain records of pest management for at least two years. Pesticide application records shall be in accordance with USDA Agricultural Marketing Service's Pesticide Record Keeping Program. State of Maine specific requirements are described in Maine Department of Agriculture, Board of Pesticides Control Chapter 50 – Record Keeping and Reporting Requirements (<http://www.state.me.us/sos/cec/rcn/apa/01/chaps01.htm>). This rule requires **all Commercial Agricultural Producers** (food crop, forage, forest product, animal, turf, greenhouse, nursery, Christmas tree, aquaculture, and organic growers) to keep records of **all applications** using **any pesticide** (organic or synthetic), indoors and outdoors and using **any method of application**, powered or non-powered. This rule also lists required reporting items. A Pesticide Applicator Log, which includes all the required reporting items, can be obtained from the University of Maine Cooperative Extension.

TABLE I – Practices to Reduce the Adverse Effects of Pesticide Losses

Practice	Pesticide Loss Pathways			Comments
	Leaching	Adsorption	Runoff	
Management Practices ^{1/}				
Lower Application Rate	+++	++	++	Most effective with highly soluble pesticides
Partial Substitution	+++	++	++	Use pesticides with lower environmental risk
Partial Treatment	++	+++	+++	Banding and directed spraying, most effective with strongly adsorbed pesticides
Formulation	+++	+	+	Less soluble pesticides move slower
Erodibility, Runoff, Leaching control	+++	++	++	Follow special label restrictions where pesticides will be applied to soils which are subject to erosion, runoff, or leaching
Soil Incorporation	++	++	++	Reduces amount of pesticides at the soil surface, reduces macropore flow
Application Timing	+++	+++	+++	Pesticide losses decrease with time between application and storm events
Set-back	++	++	++	Greater distance from surface water and less inadvertent application to water body, greater distance to entry point
Conservation Practices				
Agrichemical Handling Facility (702)	+++	+++	+++	Pesticides can be captured during mixing and rinsing operations
Deep Tillage (324)	-	+	+	Shattering of restrictive layers reduces runoff and sedimentation
Conservation Cover (327)	+++	+++	+++	For use when land is retired from production
Conservation Crop Rotation (328)	++	+++	+++	Pesticide use can be reduced due to rotational effects on pest complex
Contour Farming (330)	0	+	+	Infiltration improved, runoff reduced
Cover Crop (340)	+	++	+	Reduces transport of adsorbed pesticides

Practice	Pesticide Loss Pathway			Comments
	Leaching	Adsorption	Runoff	
Field Border (386)	0	+++	++	Buffer action reduces runoff and suspended sediment
Filter Strip (393)	0	+++	++	Reduces runoff, sediment deposited above filter strip
Grade Stabilization Structure (410)	0	+++	++	Reduces mass movement of soil and adsorbed pesticides
Grassed Waterway (412)	0	+++	+	Some trapping of adsorbed pesticides
Irrigation Water Management (449)	+	++	+	Reductions in runoff and suspended sediment
Pasture and Hay Planting (512)	++	+++	+++	Rotation including perennial grasses and legumes generally require fewer pesticides
Prescribed Grazing (528A)	++	+++	+++	Proper management of grazing and browsing animals improves plant health reducing the need for pesticides
Residue Management, No-Till and Strip Till (329A)	0	+++	++	Significant reduction in adsorbed and highly soluble pesticide leaving a field
Residue Management, Mulch-Till (329B)	0	+++	++	Significant reduction in adsorbed and highly soluble pesticide leaving a field
Residue Management, Ridge Till (329C)	0	+++	++	Significant reduction in adsorbed and highly soluble pesticide leaving a field
Residue Management, Seasonal (344)	0	++	+	Slight to moderate reductions in adsorbed and highly soluble pesticides leaving a field
Riparian Forest Buffer (391)	+	+++	+++	Slight to significant reduction in pesticide contamination of shallow ground water and surface water
Subsurface Drain (606)	++	++	-	Moderate reductions in pesticide movement in ground water and adsorbed pesticides on suspended sediment
Terrace (600)	-	+++	++	Moderate to significant reductions of runoff and suspended sediment carrying soluble or adsorbed pesticides

Practice	Pesticide Loss Pathways			Comments
	Leaching	Adsorption	Runoff	
Tree and Shrub Establishment (612)	++	+++	+++	Moderate to significant reductions in pesticide usage
Well Decommissioning (351)	+++	0	0	Closure of entry points of pesticides into ground water
Wetland Wildlife Habitat Management (644)	++	++	++	Filtering and degradation of pesticides entering wetland environments

(-) detrimental effect (0) Negligible effect

(+) slight positive effect (++) moderate positive effect (+++) significant positive effect

^{1/} Additional information on management practices can be obtained from pesticide labels, UMCE Pest Management Specialists, MOFGA, publications, and pest management consultants.

Table 2 Integrated Pest Management Principles and Strategies

PREVENTION “Preventing Pest Populations”

- Using pest free seeds and transplants
- Preventing weeds from reproducing
- Irrigation scheduling to avoid situations conducive to disease development
- Cleaning tillage and harvesting equipment
- Using field sanitation procedures
- Eliminating alternate hosts or sites for insect pests and disease organisms

AVOIDANCE “Avoiding Pest Populations”

- Crop rotation
- Choosing cultivars with resistance to pests
- Using trap crops or pheremone traps
- Choosing cultivars with maturity dates that may allow harvest before pest populations develop
- Fertilization programs to promote rapid development
- Not planting in certain areas where pest populations are likely to cause crop failure

MONITORING “Identifying the extent of pest populations and/or the probability of future populations”

- Surveys and scouting programs including:
 - trapping
 - weather monitoring
 - soil testing
- Records should be kept of pest incidence and distribution for each field.
- Records form the basis of:
 - crop rotation selection
 - economic thresholds
 - suppressive actions

SUPPRESSION “Using Cultural, Physical, Biological, and Chemical controls to Reduce a pest population or its impacts”

- **Cultural Practices**
 - Crop rotations
 - Narrow row spacings
 - Optimized in-row plant spacings
 - Alternate tillage approaches such as no till or strip till systems
 - Cover crops or mulches
 - Using crops with allelopathic potential in the rotation
- **Physical Suppression**
 - Cultivation, hoeing, handweeding

- Pruning, vacuuming
 - Mowing for weed control
 - Baited or pheremone traps for certain insects
 - Temperature Management
 - Exclusion devices for insects or disease management
- **Biological Controls**
 - Mating disruption for insects
 - Conserving naturally occurring biological controls
- **Chemical Controls**
 - Used as a last resort following sound management that includes:
 1. Cost-benefit should be confirmed before use.
 2. Pesticides selected on least negative effects on environment and human health in addition to efficacy and economics.
 3. Limit applications to areas where pests actually exist or are reasonably expected.
 4. Sprayers or other application devises should be calibrated prior to use and occasionally during the use season.
 5. Chemicals with same mode of action should not be used continuously.
 6. Vegetative buffers should be used around stream banks to minimize chemical movement to surface waters.