United States Department of Agriculture

Natural Resources Conservation Service

CONSERVATION PRACTICE STANDARD

PEST MANAGEMENT CONSERVATION SYSTEM

CODE 595

(ac)

DEFINITION

A system that combines an integrated pest management (IPM) decision-making process with natural resource conservation to address pest and environmental impacts.

PURPOSE

This practice is used to accomplish one or more of the following purposes:

- Reduce plant pest pressure
- Reduce injury to beneficial organisms
- Reduce transport of pesticides to surface and ground water
- Reduce emissions of particulate matter (PM) and PM precursors (chemical droplet drift)
- Reduce emissions of ozone precursors (pesticide volatilizations)

CONDITIONS WHERE PRACTICE APPLIES

On lands where pests are managed.

CRITERIA

General Criteria Applicable to All Purposes

Use LGU or science-based IPM professionally accepted resources to develop a pest management conservation system (PMCS) based on prevention, avoidance, monitoring, and suppression (PAMS) strategies.

Adapt the IPM system for the specific crop or crop rotation in a specific location and adhere to applicable elements and guidelines of LGU standards. Where LGU standards are not available, use science-based standards appropriate for the crop and the region.

Identify target pests including plants, insects, and pathogens. Obtain information on their life cycles and natural enemies in the impacted area.

Evaluate and document the PAMS techniques chosen for the PMCS in the crop systems.

When choosing tillage or soil incorporation activities, evaluate impacts with the current NRCS wind and water erosion prediction technologies to plan systems that will address any resulting soil erosion resource concerns.

Document all activities and resources used to avoid development and to manage for pest resistance.

Additional Criteria to Reduce/Discontinue Use of. or Mitigate for Effects of. Pest Management Activities That May Create Environmental Impacts to Water, Animal, or Air Natural Resources

When pesticides are part of a PMCS, use the current version of the pesticide risk assessment tool (Windows Pesticide Screening Tool (WIN- PST)) to evaluate site-specific water quality impacts associated with chosen pesticides. WIN-PST uses U.S. Environmental Protection Agency data for labeled pesticides and USDA Soil Survey, as well as locally observed soil properties to predict pesticide movement through one of three pesticide loss pathways. They are—

- Leaching.
- Solution runoff.
- Soil adsorbed runoff (pesticides adsorbed to soil carried in surface runoff water).

Determine if any pesticides considered for use in the planned area pose potential impacts to humans or fish, and their associated potential loss pathways.

Use the following technical notes to evaluate current or planned techniques and existing or planned conservation practices' mitigation value. Plan additional techniques to further mitigate at least one resource concern such as, but not limited to, water quality, beneficial organism habitat, etc.

- Agronomy Technical Note 5 (Title 190), "Pest Management in the Conservation Planning Process"
  - Table 1—"IPM techniques for reducing pesticide environmental risk"
  - Table 2—"Conservation practices for reducing pesticide environment risk"
- Agronomy Technical Note 9 (Title 190), "Preventing or Mitigating Potential Negative Impacts of Pesticides on Pollinators Using Integrated Pest Management and Other Conservation Practices"
  - Table 2—"Risk Mitigation Practices and Techniques for Pollinator Protection **Within** Treatment Areas."
  - Table 3—"Risk Mitigation Practices and Techniques for Pollinator Protection **Outside** Treatment Areas."

CONSIDERATIONS

IPM guidelines from the LGU or extension service may be supplemented with information from appropriately certified professionals including extension specialists, certified crop advisers, technical service providers, etc.

Support naturally occurring beneficial organisms, particularly when they are included as a pest control strategy. Use an appropriate habitat assessment tool to evaluate the availability of adequate larval and adult habitat for predator and parasitoid species of the target pests.

Improving the habitat for beneficial insects may include hedgerows and conservation cover plantings on adjacent land, and practices within the crop field such as crop rotation, intercropping, cover crops, and mulching.

On cropland, diverse crop rotations are an effective means to minimize the development of pest pressures from weeds, insects, diseases, and nematodes.

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

Design water management to avoid conditions conducive to disease development and minimize offsite contaminant movement. Poor soil drainage may increase soil-borne diseases that thrive in moist conditions (e.g., many root rot diseases).

Tillage for weed control and other physical soil disturbance reduces the presence of mycorrhizal fungi and soil organic matter (i.e., carbon loss to the atmosphere) content which have benefits for both soil and plant health.

When providing technical assistance to organic producers, follow USDA Agricultural Marketing Service National Organic Program standards including, but not limited to—

- Improving soil health.
- A diverse crop rotation that reduces habitat for major pests and increases habitat for natural enemies.
- Creating beneficial organism habitat.
- Planting of locally adapted, pest-resistant crop cultivars.

Resistance management techniques including but not limited to—

- Rotating crops to disrupt the host plant/pest cycle and reduce the use of the same pesticides season after season.
- Managing the soil and crop/plant residue to maximize conservation goals and beneficial organisms while reducing pest populations.
- Planting certified (or tested by a certified lab) crop, cover crop, and pollinator habitat seed to reduce introduction of new weed pests.
- Manage the soil seedbank by reducing seed inputs and manage the soil and crop environment to lessen the probability of weed establishment and to enhance seed decay and predation.
- Using grazing animals in some cases to reduce (some) weed populations.
- If available, using scientifically verified methods to sample pest populations and correlating them to economic estimates of crop damage before applying pesticides.
- Timing chemical applications when the most susceptible life stage of the pest is present for the pesticide selected (e.g., adult emergence as detected in monitoring traps, or using degree day models to predict egg deposition or larval emergence, or using preventive fungicide applications when weather models predict conditions appear to be conducive to disease development).
- Scouting before and after pesticide application to correctly identify the pest and to determine if the application provided effective control.
- Monitoring for favorable environmental conditions in the development of a given pest, such as with a validated weather forecasting model for temperature relative humidity and rainfall (if applicable) that could favor disease development.
- Managing the crop according to recommendations from local IPM advisors for the location to promote overall crop vigor, resilience, and competitiveness.
- If thresholds are not available for a pest, then providing general decision-making guidelines for each typical pest to assist determining when treatment is warranted.
- Rotating or tank mixing products with different modes of action (MOA) based on consultation with IPM experts.

PLANS AND SPECIFICATIONS

Prepare a plan for each crop and record the information in an implementation requirements document or equivalent. Include the recommendations of the LGU or science-based resources.

The PMCS for each crop must include—

- Plan and soils map where implementing the practice, if applicable (use conservation plan maps if available).
    - Location of sensitive resources and setbacks.
- Identification of resource concerns used to guide development of the system.
- List by crop or cropping system to include—
    - The specific pests (weeds, insects, and disease-causing pathogens) of concern either identified on the planned acres or have a historical presence in the area or State.

    - The prevention and avoidance activities planned to reduce pest pressures.
    - The schedule for monitoring and scouting for each typical pest that can cause economic loss or environmental degradation associated with the land use, crop, or plant community.
        - Description of thresholds or methods to determine a threshold before treatment is warranted.
        - If thresholds are not available for a pest, then provide general decision-making guidelines for each typical pest to assist determining when treatment is warranted.
    - Suppression techniques for identified pests.
- Completed implementation requirements documentation.
- Results of an evaluation of the IPM plan as implemented, noting efficacy of methods employed for control of target insect, nematode, disease, and weed pest.
- When addressing additional criteria include environmental impact analysis including WIN-PST report for all pesticides identified as suppression alternatives in the Pest Management Conservation System Plan. Where mulitple soil types are present, include a WIN-PST run for each signficant soil/pesticide combination.

OPERATION AND MAINTENANCE

- Develop an operation and maintenance (O&M) plan that is consistent with the purposes of the practice, its intended life, safety requirements, and the criteria for its design.
- Producers and applicators are responsible for following all pesticide label restrictions and instructions and complying with all applicable Federal, State, and local regulations.
- At a minimum, plans must be reviewed and revised as needed, when crops, pest pressure, or management options change.
- Maintain records for at least the year in which practice implemented and 1 year after for conservation planning purposes. Records of the use of federally restricted use pesticides (RUPs) are required for at least 2 years. Pesticide application records shall be in accordance with USDA Agricultural Marketing Service's Pesticide Recording Keeping Program (see https://www.ams.usda.gov/rules-regulations/pesticide-records), and any State and local requirements.

REFERENCES

USDA NRCS. 2014. Agronomy Technical Note No. 5 (Title 190). Pest Management in the Conservation Planning Process. Washington, D.C. https://directives.sc.egov.usda.gov/OpenNonWebContent.aspx?content=35618.wba

USDA NRCS. 2014. Agronomy Technical Note 9 (Title 190). Preventing or Mitigating Potential Negative Impacts of Pesticides on Pollinators Using Integrated Pest Management and Other Conservation Practices. Washington, D.C. http://directives.sc.egov.usda.gov/OpenNonWebContent.aspx?content=34828.wba.

USDA NRCS. 2011. National Agronomy Manual, Part 503, Section 503D, Integrated Pest Management. Washington, D.C. https://directives.sc.egov.usda.gov/OpenNonWebContent.aspx?content=29608.wba.

USDA NRCS. 2009. General Manual (Title 190), Part 404, Pest Management Policy. Washington, D.C. http://directives.sc.egov.usda.gov/RollupViewer.aspx?hid=17015.

USDA Agricultural Marketing Service. Organic Regulations. Washington, D.C. https://www.ams.usda.gov/rules-regulations/organic.

Xerces Society for Invertebrate Conservation, Beneficial Insect Habitat Assessment Form and Guide. Portland, OR. (http://www.xerces.org/wp-content/uploads/2015/07/HAG_BeneficialInsects_June2015_web.pdf).

Xerces Society for Invertebrate Conservation. 2016. Habitat Planning for Beneficial Insects: Guidelines for Conservation Biological Control. Portland, OR. (http://xerces.org/habitat-planning-for-beneficial-insects/).

Council for Agricultural Science and Technology. 2017. Crop Protection Contributions Toward Agricultural Productivity, Issue paper no. 58. Ames, IA. Go to http://www.cast-science.org/publications/ and search for document title.

National Roadmap for Integrated Pest Management. 2018. https://www.ars.usda.gov/ARSUserFiles/OPMP/IPM%20Road%20Map%20Final.pdf

USDA Regional IPM Centers. A national umbrella site for the regional IPM centers. https://www.ipmcenters.org/index.cfm/

University of California Integrated Pest Management program. Davis, CA.http://www.ipm.ucdavis.edu/.

USDA Agricultural Marketing Service, National Organic Program, National List of Allowed and Prohibited Substances. Washington, D.C. www.ams.usda.gov/rules-regulations/organic/national-list.