Natural Resources Conservation Service

CONSERVATION PRACTICE STANDARD

ORGANIC MANAGEMENT

CODE 823

(ac)

DEFINITION

Managing and improving natural resources on land in and adjacent to organic production using methods which integrate cultural, biological, and mechanical practices that foster cycling of resources, promote ecological balance, and conserve biodiversity.

PURPOSE

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

- Improve soil health
- Reduce soil erosion
- Reduce emissions of greenhouse gases (GHG)
- Reduce transport of pesticides and nutrients transported to surface water, groundwater and air
- Improve plant productivity and health
- Reduce plant pest pressure
- Enhance habitat for wildlife, pollinators, and other beneficial invertebrates

CONDITIONS WHERE PRACTICE APPLIES

This practice applies to all lands where organic management methods are used.

CRITERIA

General Criteria Applicable to All Purposes

Must adhere to the USDA's National Organic Program (NOP) Standards. Producers must coordinate all activities/inputs with NOP approved Organic Certifiers or other organic specialists.

Provide erosion control for all areas to tolerable (T) levels.

Protect organic production areas from unintended introduction of prohibited substances through defined boundaries, buffer zones or diversions. Establish or maintain buffers as needed, pick the most appropriate standard for the needed purpose.

All inputs and other materials must follow the National List of allowed and prohibited substances, methods, and ingredients. Within annual production fields, implement a diverse crop rotation to maintain or improve soil organic matter (SOM) content, increase biodiversity, and control erosion to tolerable levels.

Use Land Grant University (LGU) or other science-based nutrient recommendations to manage soil fertility and crop nutrients through crop rotations, cover crops, and the application of nutrient sources, including manure, compost and other organic by-products. Apply organic soil amendments at rates that do not overload phosphorus (P) or other nutrients. For phosphorus, the P Index must be run. When the risk

assessment for the index is low or very low, manure can be applied to meet, but not exceed, the N needed for the crop. When the risk assessment is medium, 1 times the removal rate for P can be applied. No phosphorus application can occur when the P Index is high or very high.

Use certified organic seed for all crops including cover crops, unless organic seed is not commercially available, then use untreated, non-genetically modified organism (GMO), conventionally produced seed.

Pests are managed through an integrated strategy of prevention, avoidance, monitoring, and suppression (PAMS). Utilize NOP-allowed pest control materials only when other tactics have not provided needed control.

Manage animals and manure to prevent contamination of crops, soil, and water resources by nutrients and pathogens. Minimize concentrated livestock areas, trailing, and trampling to reduce soil compaction, excess runoff, and erosion.

Burn crop residues only to suppress the spread of disease or to stimulate seed germination.

Ash obtained from the burning of a plant or animal material may be applied only when the material burned has not been treated or combined with a prohibited substance or the ash is not included on the National List of Prohibited Substances for Use in Organic Crop Production.

Must comply with all federal, state, and local regulations that apply.

When livestock are a part of the operation:

Manage stocking rates and grazing periods to adjust the intensity, frequency, timing, duration, and distribution of grazing and/or browsing to meet the planned objectives for the plant communities, and the associated resources, including the grazing and/or browsing animals. Provide ruminant livestock with sufficient forage to comprise at least 30% of dry matter intake during the grazing season.

Build and maintain a total Pasture Condition Score (PCS) of 35 or higher. Follow a pasture and grazing management plan that improves the plant resources. Use optimum stocking rates and sufficient rest periods to build soil health and minimize soil erosion and compaction. Protect surface water and groundwater from transported nutrients, pathogens, and other contaminants.

When livestock obtain their diet by grazing pastures as well as from mechanically harvested and processed feeds, pasture forages will be tested on an annual basis for nutrient content and accounted for in the feed ration and balance of nutrients. All feeds, including grazed pasture will meet the livestock's nutrient requirements and avoid excess nutrients being fed. Forage tests will meet the LGU acceptance and certification process.

Provide supplemental feed and/or minerals as needed to balance with forage consumptions to meet the desired nutritional level for the kind and class of grazing and/or browsing livestock.

Outdoor access will include access to natural vegetation.

Additional Criteria to Reduce Erosion and Improve Soil Health

Minimize soil compaction, maintain a positive Soil Conditioning Index (SCI) of 0.1 or higher (or equivalent positive trend shown by a soil health assessment). For small areas visual observation and professional judgement based on site characteristics, soil types and input on the rotation, tillage, mulching, inputs can document a positive condition. (NPPH reference)

The SCI, or other NRCS approved, science-based soil health assessments may be used. The SCI value for each field must exceed 0.1 indicating that SOM is maintained or improving for the crop rotation and management. Adjust crop rotation, cover crops, tillage practices, organic inputs, and other management factors, as needed, to build or maintain SOM.

Enhance SOM quality and quantity, habitat for beneficial soil organisms, and soil aggregate stability:

- Follow a crop rotation and use cover crops to maintain year-round soil coverage, biomass production, living roots, and plant diversity.
- Limit fallow periods in the rotation to less than 25 percent of the available growing season (e.g., when temperatures or soil moisture are not adequate to sustain plant growth).
- Minimize soil disturbances by tillage, livestock, concentrated nutrients, and crop protection materials.

Reduce the number and intensity of tillage and cultivation operations and manage timing and sequence of crops and field operations to minimize physical disruption to soil structure and soil life. Cropland management for the rotation must achieve a Soil Tillage Intensity Rating (STIR) of 60 or less. In annual cropping systems where crop production and weed management creates a high STIR, include a perennial sod phase for at least 2 years to lower mean annual STIR to 60 or less.

Grow cover crops long enough to achieve canopy closure and at least 1 ton (dry) above ground biomass per acre or canopy closure of cover crop. Terminate cover crops with no or minimal tillage whenever practical, by roller- crimping, mowing, winterkill, or strip tillage.

Maintain floors and alleys in orchards, vineyards, berries, and other perennial horticultural crops in year-round living plant cover; or in dormant vegetation, residues, or organic mulch during the dry season in rainfall-limited regions.

Limit the use of concentrated organic nitrogen (N) sources such as poultry litter, manure slurry, feather meal, and blood meal to provide not more than 50% of total crop N requirement. Provide the balance of N through legume N fixation, slow-release sources and SOM mineralization. When high soil phosphorus (P) limits the use of manure and compost, increase use of legumes for N.

Additional Criteria to Reduce Plant Pest Pressure and Prevent Transport of Pesticides to Surface and Groundwater

Provide nectar, pollen, and habitat for natural enemies of crop pests by planting and maintaining diversified mixes of flowering plants meeting the criteria of NRCS CPS Conservation Cover (Code 327) or other appropriate NRCS CPS.

Use NOP-allowed pest control products judiciously and only when monitoring indicates they are needed, to minimize environmental risks and development of pest resistance. Utilize the Windows Pesticide Screening Tool (WIN-PST) to estimate risks to water and non-target organisms, and to consider the lowest-impact materials that meet pest management goals. Follow pesticide label instructions to optimize efficacy and minimize environmental and human health risks. Avoid application or drift of pesticides onto beneficial habitat and make applications when pollinators and other non-target organisms are least active.

Implement pesticide mitigation techniques as needed, as described in NRCS directive Agronomy Technical Note (TN) 190, AGR 5, “Pest Management in the Conservation Planning Process,” and Agronomy TN 190, AGR 9, “Preventing or Mitigating Potential Negative Impacts of Pesticides on Pollinators Using Integrated Pest Management and Other Conservation Practices.”

Additional Criteria to Enhance Habitat for Wildlife, Pollinators, and other Beneficial Invertebrates

Establish and maintain perennial habitat plantings on at least 5% of the total acreage of the organic operation.

Select a diversity of primarily native plant species that provide food, shelter, nesting sites, and other habitat needs for desired wildlife, pollinators, and other beneficial organisms. Fifty percent or greater of the cover type must be native species. Cover can have only incidental disturbance i.e., turning on them, but no travel lanes allowed. They can be grazed but for not more than 2 weeks of the growing season or one month when incidentally grazing crop/cover crop during the dormant season. Haying once/year is allowed if included in the habitat management plan.

Plant material specifications shall include only high quality and adapted species.

Site preparation, planting dates, and planting methods shall optimize vegetation survival and growth.

Protect habitat plantings from unintended application, drift, or runoff from pesticide applications.

Equipment movement and other disturbance to habitat shall be restricted during critical periods such as nesting, brood rearing, fawning or calving seasons. States may establish exceptions when certain disturbance causing activities are necessary to maintain the health of the plant community and control noxious weeds.

CONSIDERATIONS

Utilize Conservation and Evaluation Monitoring Activities (CEMA) as appropriate.

Reliance on tillage and cultivation to manage weeds and cover crops without herbicides can accelerate oxidation of SOM and compromise soil health.

Organic nutrient sources require biological processes to release N and tend to be rich in P relative to N.

Organic amendments feed soil organisms and abstinence from soluble fertilizers and synthetic crop protection chemicals protects soil life and functional biodiversity. Organic crop rotations generally build more SOM than conventional systems and can sustain top yields on N, P, potassium application rates below standard LGU recommendation.

Managing pests, weeds, and diseases through a combination of strategic and diversified crop rotations, use of disease-resistant and weed competitive crop varieties, best organic soil health practices, and low-impact physical and biological controls can reduce the need for pesticide applications or cultivation for weeds. Specific microbial biopesticides and bio-fungicides that attack the target pest or pathogen generally have lower environmental and resource impacts than NOP-allowed botanical or mineral pesticides and fungicides.

Maximize the percentage of the year livestock spend on pasture and range (within the climate constraints of the locale of the operation), and the percentage of dry matter intake derived from grazing to reduce livestock feed costs, lessen the volume of animal waste that must be stored and managed, and mitigate associated environmental risks including water quality impairment and GHG emissions.

Use to facilitate transition to organic production or to enhance conservation benefits of a certified or exempt organic operation.

For fields or production areas where topography and inherent soil properties (erodibility) make it impractical to maintain positive SCI or reduce soil erosion rates to Tolerable rates or below during annual crop production, consider converting the area to perennial production (orchard, vineyard, pasture, silvopasture, agroforestry) or conservation plantings.

Apply compost, organic mulches, biochar, or other carbon-based soil amendments to organic cropland soils at the suggested minimum rate of one ton (dry) per acre to enhance the soil health benefits of living vegetation.

Provide livestock with organically produced feed and forage, clean drinking water, organic bedding (as applicable), and year-round access to outdoors, sun, shade, shelter, fresh air, and exercise areas.

Other NRCS CPS that may be utilized in conjunction with this practice to create organic system management plans include, but not limited to:

- Access Control (Code 472)
- Composting Facility (Code 317)
- Conservation Cover (Code 327)
- Cover Crop (Code 340)
- Diversion (Code 362)
- Field Border (Code 386)
- Filter Strip (Code 393)
- Forage Harvest Management (Code 511)
- Forest Stand Improvement (Code 666)
- Heavy Use Area Protection (Code 561)
- Hedgerow Planting (Code 422)
- High Tunnel System (Code 325)
- Irrigation Water Management (Code 449)
- Mulching (Code 484)
- Nutrient Management (Code 590)
- Pest Management Conservation System (Code 595)
- Prescribed Grazing (Code 528)
- Silvopasture (Code 381)
- Upland Wildlife Habitat Management (Code 645)
- Vegetated Treatment Area (Code 635)
- Windbreak/Shelterbelt Establishment and Renovation (Code 380)
- Wildlife Planting (Code 420)

PLANS AND SPECIFICATIONS

Develop plans and specifications for each field, production area, or treatment unit within the operation according to the Criteria and Operation and Maintenance requirements of this standard.

Maintain records to meet NOP Organic System Plan requirements connected to natural resource management.

The plan documentation should include:

- Purpose(s)
- Activities planned to meet the criteria for each purpose.
- Aerial site photograph(s) or site map(s).
- Location of designated sensitive areas and associated setbacks.
- Soil survey map and inherent soil properties of each map unit for all managed areas.
- Initial benchmark and planned rotation data including, as applicable:
    - soil test reports
    - source water analysis for pathogens and nutrient content
    - nutrient analysis or estimates for all inputs (compost, manure, organic by-product, and plant tissue)

  - water and wind erosion rate estimates
  - SCI or other soil health assessment
  - STIR
  - PCS
- As applicable for the operation, all component plans (e.g., nutrient, pest, and grazing management etc.).
- Organic inputs, including NOP-allowed synthetic materials if needed.
- Monitoring Activities.
- Sanitation measures to remove disease vectors, weeds, seeds and habitat for pests.
- Any mitigation activities needed for anticipated impacts to water, soil, or other natural resources.
- Guidance for implementation, monitoring operation and maintenance, and recordkeeping.

OPERATION AND MAINTENANCE

For transitioning operations, the plan should extend, and be adjusted as needed, through the time to meet the required period of prohibited substance application, typically three years but can be less with proper documentation.

Review or revise plans periodically to determine if adjustments or modifications are needed.

Implement the plan continuously throughout the duration of this practice.

Monitor, evaluate, and document outcomes in relation to conservation purposes on a regular schedule.

Monitor fields receiving animal manures and biosolids for the accumulation of heavy metals and P in accordance with LGU guidance and State law. Other contaminants that are rapidly emerging as a concern in the application of biosolids are per- and poly-fluorinated alkyl substances (PFAS). The Environmental Protection Agency has created a roadmap of strategic action to address the environmental and health implications posed by PFAS, which will provide guidance to a currently evolving situation.

Annually inspect and repair structural and vegetative components of this practice.

REFERENCES

National Organic Standards:

https://www.ecfr.gov/current/title-7/subtitle-B/chapter-I/subchapter-M/part-205?toc=1

Websites with additional information:

Extension eOrganic at https://eorganic.info/

NCAT/ATTRA website at https://attra.ncat.org/ has information on crops, pest control, etc.

Organic Materials Review Institute at https://www.omri.org has lists of allowed products.

Organic Farming Research Foundation at https://ofrf.org/resesarch/reports/. Series of Guidebooks on Soil Health and Organic Farming.

NRCS Organic Farming Handbook, updated 2022 (in process)

NRCS Organic Crosswalk, updated 2022 (in process)

NRCS Organic Resources web page

EPA PFAS Explained

Summaries of OFRF Soil Health Guidebooks written for NRCS (in press)

NRCS Guidebook on Organic Tillage and Cultivation Practices (yet to be drafted – part of OFRF/NRCS project)

Bowles, T. M., A. D. Hollander, K. Steenwerth, and L. E. Jackson. 2015. Tightly Coupled Plant-Soil Nitrogen

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Cavigelli, M. A., J. R. Teasdale, and J. T. Spargo. 2013. Increasing Crop Rotation Diversity Improves Agronomic, Economic, and Environmental Performance of Organic Grain Cropping Systems at the USDA-ARS Beltsville Farming Systems Project. Crop Management 12(1) Symposium Proceedings: USDA Organic Farming Systems Research Conference. https://dl.sciencesocieties.org/publications/cm/tocs/12/1.

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