

NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD

CONSERVATION CROP ROTATION

(Ac.)

CODE 328



Corn / Cotton / Peanut Rotation

DEFINITION

Growing crops in a recurring sequence on the same field.

PURPOSES

The purpose of this practice is to support one or more of the following:

- Reduce sheet and rill erosion.
- Reduce soil erosion from wind.
- Reduce irrigation induced erosion.
- Maintain or improve soil organic matter content.
- Manage the balance of plant nutrients.
- Improve water use efficiency.
- Manage saline seeps.
- Manage plant pests (weeds, insects, diseases).
- Provide food for domestic livestock.
- Provide food and cover for wildlife.

CONDITIONS WHERE PRACTICE APPLIES

This practice applies to all cropland and other land where crops are grown, except pasture, hay, or other land uses where crops are grown to facilitate renovation or reestablishment of perennial vegetation. It does not apply to land devoted to orchards, vineyards, or nurseries.

CRITERIA

General Criteria Applicable To All Purposes

Crops shall be grown in a planned, recurring sequence as outlined in the Plans and Specifications Section.

Organically grown crops shall have a crop rotation plan that increases soil organic matter content, prevents weed, pest, and disease problems, and manages deficient or excess plant nutrients.

Crops shall be adapted to the climatic region, soils, and goals of the producer. Adapted crops and varieties, listed in appropriate University of Florida/Institute of Food and Sciences (UF/IFAS) publications or other approved sources, shall be selected.

Conservation practice standards are reviewed periodically, and updated if needed. To obtain the current version of this standard, contact a Natural Resources Conservation Service Office or visit the electronic Field Office Technical Guide.

A conservation crop rotation may include crops planted for a vegetative cover or nutrient uptake.

Crops shall be selected that produce sufficient quantities of biomass at the appropriate time to reduce erosion by water or wind to within acceptable soil loss levels. In those instances where crops selected do not produce sufficient biomass to meet this criteria, then a cover crop (see Florida NRCS conservation practice standard, Cover Crop, Code 340) or other appropriate practices shall be used. The amount of biomass needed shall be determined using current approved erosion prediction technology. Soil loss estimates shall account for the effects of other practices in the conservation management system.

Nutrient and pest management will be applied according to Florida NRCS conservation practice standards, Codes 590 and 595.

Impact to cultural resources, wetlands, and Federal and State protected species shall be evaluated and avoided or minimized to the extent practical during planning, design and implementation of this conservation practice in accordance with established National and Florida NRCS policy, General Manual (GM) Title 420-Part 401, Title 450-Part 401, and Title 190-Parts 410.22 and 410.26; National Planning Procedures Handbook (NPPH) FL Supplements to Parts 600.1 and 600.6; National Cultural Resources Procedures Handbook (NCRPH); and The National Environmental Compliance Handbook (NECH).

Additional Criteria To Reduce Irrigation Induced Erosion

To reduce erosion in furrows, crops or cover crops shall be selected that are grown within the wetted perimeter of the furrow, or produce the amount of residue needed to be maintained in the furrow to achieve the soil loss objective.

To reduce erosion induced by sprinkler irrigation, crops or cover crops shall be selected that develop surface cover or canopy rapidly, or produce the amount of residue needed to achieve the soil loss objective.

The amount of residue needed may be determined by approved research. The National Engineering Handbook (NEH), Part 652 National Irrigation Guide may be used as a reference to meet these criteria.

Additional Criteria To Maintain Or Improve Soil Organic Matter Content

Crops shall be selected that produce the amount of plant biomass needed to maintain or improve soil organic matter content, as determined using the current approved Soil Conditioning Index Procedure or determined by approved research. The Soil Conditioning Index can be calculated using the current erosion technology.

If partial removal of residue by means such as baling or grazing occurs, enough residue shall be maintained to achieve the desired soil organic matter content goal.

Cover and green manure crops planted specifically for soil improvement may be grazed, as long as grazing is managed to retain adequate above ground biomass.

Additional Criteria To Manage the Balance of Plant Nutrients

Crop selection and sequence shall be determined using an approved nutrient balance procedure. Florida Agronomy Field Handbook (FAFH), National Engineering Handbook (NEH), Part 651, and Agricultural Waste Management Field Handbook (AWMFH) may be used to develop the selection and sequence.

When crop rotations are designed to add nitrogen to the system, nitrogen-fixing crops shall be grown immediately prior to or interplanted with nitrogen-depleting crops.

To reduce excess nutrients, crops or cover crops having rooting depths and nutrient requirements that utilize the excess nutrients shall be grown.

Additional Criteria To Improve Water Use Efficiency

Selection of crops and varieties, sequence of crops, or the annual decision to plant a crop, shall be determined using approved water balance procedures. Where irrigation is used, apply irrigation water management in accordance with Florida NRCS conservation practice standard, Irrigation Water Management, Code 449.

Additional Criteria to Manage Saline Seeps

Crops grown in the recharge area of saline seeps shall be selected for rooting depths and water requirements adequate to fully utilize all plant available soil water. Summer fallow will not be used. Crop selection and sequence shall be determined using an approved water balance procedure.

Crops grown in the discharge area of saline seeps shall be selected for their tolerance to salinity levels in the discharge area.

Additional Criteria To Manage Plant Pests (Weeds, Insects, Diseases)

Crops shall be alternated to break the pest cycle and/or allow for the use of a variety of other control methods. Affected crops and alternate host crops shall be removed from the rotation for the period of time needed to break the life cycle of the targeted pest.

Resistant varieties shall be selected where there is a history of a pest problem. Publications from University of Florida/IFAS (UF/IFAS) may be used as a source for these varieties.

Organic crop rotations shall utilize sanitation measures to remove disease vectors, weed seeds, and habitat for pests.

Additional Criteria To Provide Food For Domestic Livestock

Crops shall be selected to balance the feed supply with livestock numbers. The needed amount of selected crops shall be determined using an approved forage-livestock balance procedure.

Additional Criteria To Provide Food And Cover For Wildlife

Crop selection to provide either food or cover for the targeted wildlife species will be grown, managed, or left unharvested as per the needs of the targeted wildlife as determined by an approved habitat evaluation procedure. Selection and management of unharvested crops will be consistent with the Florida NRCS conservation practice standard, Upland Wildlife Habitat Management, Code 645 and the specification supplement for Florida, *Management for Wildlife*.

CONSIDERATIONS

An organic crop rotation may include sod, cover crops, green manure crops, and catch crops.

When used in combination with Florida NRCS conservation practice standard, Stripcropping, Code 585, the crop sequence should be consistent with the stripcropping design.

When used in combination with Florida NRCS conservation practice standards for Residue Management, Codes 329, 345, and 344, selection of high residue producing crops and varieties, use of cover crops, and adjustment of plant population and row spacing can enhance production of the kind, amount, and distribution of residue needed.

Where irrigation caused erosion of furrows is a concern, consider changing method of application to subsurface applied or trickle system.

Where erosion induced by sprinkler irrigation is a concern, the hazard can be reduced by contour farming, stripcropping, or conservation tillage.

Where maintaining or improving soil organic matter content is an objective, the effects of this practice can be enhanced by managing crop residues, tillage practices, utilizing animal wastes, or applying mulches to supplement the biomass produced by crops in the rotation. Carbon sequestration would also be improved with managing soil organic matter and by the use of minimum tillage.

Where excess plant nutrients or soil contaminants are a concern, utilizing deep rooted crops or cover crops in the rotation can help recover or remove the nutrient or contaminant from the soil profile.

Where precipitation is limited, seasonal or erratic, moisture can be conserved for crop use by maintaining crop residues on the soil surface to increase infiltration and to reduce runoff and evaporation.

Where improving water use efficiency on deep soils is a concern, rotating or combining deep-rooted crops with shallow rooted crops can effectively utilize all available water in the soil profile.

Crop damage by wind erosion can be reduced by selecting crops, which are tolerant to abrasion from wind blown soil or tolerant to high wind velocity. If crops sensitive to wind erosion damage are grown,

potential plant damage can be reduced by crop residue management, field windbreaks, herbaceous wind barriers, intercropping, or other methods of wind erosion control.

Where pesticides are used, consider application methods and the crop rotation to avoid negative impacts on the following crop due to residual herbicides in the soil or adverse affects on aquatic wildlife or habitat through surface runoff or leaching.

Soil compaction can be reduced by adjusting crop rotations to include deep rooted crops that are able to extend to and penetrate the compacted soil layers, as well as avoiding crops that require field operations when soils are wet.

Leaving several rows unharvested around the edges of the field will provide protection and/or food for over wintering wildlife.

Crop plantings may be developed to benefit desired species or life stages of wildlife. Food plots or crops for wildlife could be provided as part of a habitat restoration project as an initial food and cover source for wildlife until natural food and cover producing vegetation becomes established.

Crop residues may be a valuable food source for wintering wildlife where winter browse is sparse.

Careful consideration should be given to pesticide use if applied to crops grown for wildlife.

PLANS AND SPECIFICATIONS

Specifications for establishment and operation of this practice shall be prepared for each field or treatment unit according to the Criteria, Considerations, and Operation & Maintenance described in this standard. As a minimum the specifications shall include:

1. Location of practice.
2. Sequence of crops to be grown.
3. Length of time each crop will be grown.
4. Total length of the rotation.
5. Soil Condition Index (SCI) – Needed only if the purpose is to improve or maintain soil organic matter content.

Specifications shall be recorded using approved specification sheets, job sheets, narrative statements in the conservation plan, or other acceptable documentation.

OPERATION AND MAINTENANCE

Operation and maintenance will consist of rotations that will provide for acceptable substitute crops in case of crop failure or shift in planting intentions for weather related or economic reasons. Acceptable substitutes are crops having similar properties that meet the criteria for all the resource concerns identified for the field or treatment unit.

REFERENCES

Agricultural Waste Management Field Handbook
 Florida Agronomy Field Handbook
 Florida NRCS Conservation Practice Standards
 Cover Crop, Code 340
 Irrigation Water Management, Code 449
 Nutrient Management, Code 590
 Pest Management, Code 595
 Residue Management, Codes 329, 345, and 344
 Stripcropping, Code 585
 Upland Wildlife Habitat Management, Code 645
 General Manual
Management For Wildlife (A supplement to Wildlife Standard and Specifications for Florida)
 National Engineering Handbook, Parts 651 and 652
 National Planning Procedures Handbook
 Section III, FOTG
 University of Florida/IFAS Publications
 National Organic Program Rule 205.205 and 205.206