

NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD

CONTOUR BUFFER STRIPS

(Ac.)
CODE 332



DEFINITION

Narrow strips of permanent, herbaceous vegetative cover established around the hill slope and alternated down the slope with wider cropping strips that are farmed on the contour.

PURPOSE

This practice is applied to achieve one or more of the following:

- Reduce sheet and rill erosion.
- Reduce transport of sediment and other water-borne contaminants downslope.
- Increase water infiltration.

CONDITIONS WHERE PRACTICE APPLIES

This practice applies on all sloping cropland, including orchards, vineyards and nut crops.

Where the width of the buffer will be equal to or exceed the width of the adjoining crop strips, the Florida NRCS Conservation Practice Standard, Stripcropping, (Code 586), applies.

CRITERIA

General Criteria Applicable to All Purposes

Surface flow from contoured crop rows must be delivered to a stable outlet. Stable outlets include grassed waterways, pipe outlets for terraces, diversions, water and sediment control basins, field borders, headlands or end rows, or similarly stabilized areas.

Design the width of the cropped strip to accommodate some multiple of full equipment width.

Do not plant any species found on the Florida Dep. of Agriculture and Consumer Services or the Florida Dep. of Environmental Protection noxious or prohibited weed lists. Additionally, do not plant any species listed as a Category 1 invasive species by the Florida Exotic Pest Plant Council (<http://www.fleppc.org/list/list.htm> or See FOTG Section I [F][4][b]).

Do not use buffer strips as travel lanes for livestock or equipment.

Conservation practice standards are reviewed periodically, and updated if needed. To obtain the current version of this standard, contact the Natural Resources Conservation Service State Office, or download it from the electronic Field Office Technical Guide for your state.

Buffer strips are not a part of the normal crop rotation, and shall remain in the location they were originally established until they require renovation or re-established.

Follow all federal, state and local laws, rules and regulations.

Impact to cultural resources, wetlands, and Federal and State protected species needs to be determined prior to implementation of this practice. Any impacts need to be 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).

Row Grade. When the grade of any crop strip reaches the maximum allowable design grade, establish a new baseline up or down slope from the last buffer strip and use this new baseline for the layout of the next crop strip.

Arrangement of Strips. Place a crop strip at the top of the hill unless unusually complex topography requires vegetating the hill top in order to establish a farmable system.

When used in combination with terraces, diversions, or water and sediment control basins, coordinate the layout of buffer strips with the grade and spacing of the terraces so that the buffer strip boundaries will parallel the terraces as closely as possible. Locate the buffer strip immediately upslope from the terrace channel or the storage area of the water and sediment control basin.

Additional Criteria to Reduce Sheet and Rill Erosion

Minimum Row Grade. The cropped strips shall have sufficient row grade to ensure that runoff water does not pond and cause unacceptable crop damage.

Maximum Row Grade. The maximum row grade shall not exceed:

- one half of the up and down hill field slope percent used for conservation planning, or

- 2 percent, whichever is less.

Up to 3 percent row grade is allowed for a maximum of 150 feet as crop rows approach a stable outlet.

When the row grade reaches the maximum allowable design grade, establish a new baseline up or down slope from the last contour line, and use this new baseline for layout of the next contour pattern.

Width of Strips. The minimum width shall be

- at least 15 feet wide for strips planted to grasses or grass-legume mixtures with at least 50 percent grass, or
- at least 30 feet wide when legumes are used alone or legumes make up more than 50 percent of the stand.

Buffer strip widths can be increased as needed to keep the width of the cropped strips uniform.

Keep cropped strips widths uniform between buffer strips and do not exceed 50 percent of the slope length (L), used for the erosion calculation.

Vegetation. Use perennial grasses, legumes or grass-legume mixtures for buffer strips designed to reduce sheet and rill erosion.

Use species adapted to the site, and tolerant of the anticipated depth of sediment deposition.

For recommended vegetative species, seeding rates, and fertility recommendations refer to the Florida NRCS Conservation Practice Standards, Pasture and Hayland Planting, (Code 512), or Critical Area Planting Guidance, (Code 342), for recommended species, seeding rates, and fertility recommendations.

The buffer strips shall have at least 95% ground cover during periods when erosion is expected to occur on the cropped strips.

The stem densities shall be at least 50 stems per square foot for grasses and grass-legume mixtures, and at least 30 stems per square foot for pure legume stands.

Additional Criteria to Reduce the Transport of Sediment and Other Water-Borne Contaminants Downslope

Minimum Row Grade. The cropped strips shall have sufficient row grade to ensure that runoff

does not pond and cause unacceptable crop damage.

Maximum Row Grade. The maximum row grade within the crop strips shall not exceed

- one-half of the up-and-down-hill field slope used for conservation planning, or
- 2 percent, whichever is less.

Up to 3 percent row grade is allowed for a maximum of 150 feet as crop rows approach a stable outlet.

Vegetation. Only use permanent sod forming vegetation with stiff, upright stems when designing these buffer strips.

Width of Strips. Buffer strips for this purpose shall be at least 15 feet wide. The buffer strip widths can be increased as needed to keep the width of the cropped strips uniform.

The maximum width of cropped strips shall be one half of the field slope length or 150 feet, whichever is less.

Arrangement of Strips. In addition to the buffer strips established on the hillside, a buffer strip needs to be established at the bottom of the slope. This strip shall be two times the width of the narrowest buffer strip in the system.

Additional Criteria to Increase Water Infiltration

Row Grade. The grade along the upper edge of the buffer strip shall not be ≤ 0.2 percent.

CONSIDERATIONS

General. This practice is most effective when the slope length on the cropped strips is between 100 and 400 feet long. On slopes longer than 400 feet, the volume and velocity of overland flow exceeds the capacity of the contour ridges to contain them. Consider increasing residue cover, as well as roughness to change the vegetative cover-management conditions and decrease overland flow velocities, thus increasing the slope length at which this practice is effective. Increasing roughness alone is not sufficient to produce this effect.

Contour buffer strips are more difficult to establish on undulating to rolling topography because of the difficulty of maintaining parallel strip boundaries

across the hill slope or staying within row grade limits.

In areas of existing or potential concentrated flow erosion, use Florida NRCS Conservation Practice Standards, Grassed Waterway, (Code 412), Water and Sediment Control Basins, (Code 638), Diversion, (Code 362); or Terrace, Code 600), to protect the area.

Where contour row curvature becomes too sharp to keep equipment aligned with rows during field operations, increasing the buffer strip width can help avoid sharp ridge points. In drainage ways, establishing grassed waterways at least up to the point of sharp curvature to allow the equipment to be lifted and/or turned to meet the same rows across the turn strip.

Prior to design make changes in field boundaries and shape, where needed. Prior to layout, remove any obstructions and inspect the field's position on the landscape to find key points for starting layout or getting the width of one set of strips (one cultivated and one buffer) to pass by an obstruction or ridge saddle. Proper design and layout improves the effectiveness of the practice and the ease of performing farming operations.

Whenever possible, run strip boundaries parallel with fence lines or other barriers.

Wildlife Food and Cover. Consider the following management activities to enhance wildlife benefits while maintaining the effectiveness of the buffer strips:

- Plant herbaceous species that provide habitat enhancement for the wildlife species of concern.
- Add native forbs to the seeding mixture to increase habitat diversity.
- Mow the buffer strips every other year or every third year depending upon geographical location. The standing cover provides early and late season nesting and escape cover for many species of wildlife displaced from adjacent disturbed areas.
- Delay mowing until after the nesting period of ground-nesting species (March 15 – July 15), but mow early enough to allow for regrowth before the growing season ends (August to October).

For individual species requirements, refer to NRCS' *Management for Wildlife: A supplement to the Wildlife Standard and Specifications for Florida*.

PLANS AND SPECIFICATIONS

Prepare specifications for installation, operation, and maintenance of Contour Buffer Strips shall be prepared for each field according to the Criteria, Considerations, and Operations and Maintenance described in this standard. The plans need to include, as a minimum:

- percent land slope used for conservation planning;
- the minimum and maximum allowable row grades for the contour system;
- the designed width of the buffer strips;
- the species to be established in the buffer strips and
- a sketch map or photograph of the field showing:
 - the approximate location of the baselines used to establish the system and
 - the location of stable outlets for the system.

Record this and other pertinent information on specification sheets, job sheets, in practice narratives in conservation plans, or other acceptable documentation.

OPERATION AND MAINTENANCE

Conduct all farming operations parallel to the strip boundaries except on headlands or end rows with gradients less than the criteria set forth in this standard.

Time mowing of buffer strips to maintain appropriate vegetative density and height for optimum trapping of sediment from the upslope cropped strip during the critical erosion period(s). If wildlife enhancement is desired, delay mowing until after the prime nesting or young bearing period for the desired species of ground nesting wildlife have hatched. Refer to the Florida NRCS Conservation Practice Standard, Upland Wildlife Habitat Management Standard, (Code 645), for guidance.

Fertilize buffer strips as needed to maintain stand density. Refer to the Florida NRCS Conservation Practice Standard, Nutrient Management Standard, (Code 590), for guidance.

Mow sod turn strips and waterways at least once a year.

Spot seed or re-establish buffer strip systems damaged by herbicide application after residual action of the herbicide is complete.

Redistribute sediment that accumulates along the upslope edge of the buffer strip/crop strip interface as needed. Spread this sediment evenly upslope over the cultivated strip when needed to maintain uniform sheet flow along the buffer/cropped strip boundary.

If sediment accumulates just below the upslope edge of the buffer strip to a depth of 6 inches or more, or stem density falls below specified amounts in the buffer strip, relocate the buffer/cropped strip interface location.

Rotate cultivated strips and buffer strips so that a mature stand of protective cover is achieved in a newly established buffer strip immediately below or above the old buffer strip before removing the old buffer to plant an erosion-prone crop. Alternate repositioning of buffer strips to maintain their relative position on the hill slope.

Renovate vegetated headlands or end row areas as needed to keep ground cover above 65 percent.

REFERENCES

Florida NRCS Conservation Practice Standards:

Nutrient Management, Code 590
Critical Area Planting Guidance, Code 342
Pasture and Hayland Planting, Code 512
Upland Wildlife Habitat Management,
Code 645
Stripcropping, Code 586

Revised Universal Soil Loss Equation

NRCS, 1979, Management for wildlife: a supplement to wildlife standards and specifications for Florida, Gainesville, FL. 89pp. 