Natural Resources Conservation Service

NEW JERSEY CONSERVATION PRACTICE STANDARD

CONTOUR ORCHARD and OTHER PERENNIAL CROPS

Code 331

(Ac.)

DEFINITION

Planting orchards, vineyards, or other perennial crops so that all cultural operations are done on or near the contour.

PURPOSE

- Reduce sheet and rill soil erosion
- Reduce transport of excessive sediment and other associated contaminants
- Improve water use efficiency with improved infiltration

CONDITIONS WHERE PRACTICE APPLIES

This practice applies on sloping land where orchards, vineyards, or other perennial crops are to be established. For annually planted crops use CPS Code 330, Contour Farming.

CRITERIA

General Criteria Applicable to All Purposes

Where sites are disturbed, install temporary erosion control measures until plantings and companion cover is established.

Divert overland flow from adjacent sites to ensure the proper functioning of this practice.

Avoid applying this practice on areas that have evidence of mass movement or have the potential for landslides.

Row Grade. Maximum row grade will be aligned as closely to the contour as feasible, but not to exceed:

- one-half of the up and downhill slope percent used for conservation planning, or
- 4 percent (or 10 percent when conservation cover is provided in the alley areas), whichever is less.

Up to a 25-percent deviation from the design row grade is permitted within 150 feet of a stable outlet.

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

On soils with slow to very slow infiltration rates (hydrologic soil group C or D) or where the planted crop could be damaged by ponded water conditions for periods of less than 48 hours, establish a row grade of not less than 0.2 percent.

Critical Slope Length. Do not install on a hill slope that is longer than the critical slope length.

When the critical slope length is exceeded shorten slope lengths through the use of diversions, terraces, or other structures.

Use current erosion prediction technology to determine the critical slope length.

Stable Outlets. Deliver runoff from contour rows to a stable outlet. Acceptable stable outlets include grassed waterways, field borders, filter strips, water and sediment control structures, or underground outlets for terraces and diversions.

Additional Criteria to Improve Infiltration and Reduce Transport of Sediment and Other Associated Contaminants

Provide an inward-sloping bench or berm at or near the tree or vine row.

CONSIDERATIONS

Fields that are cut by gullies or have strongly undulating topography are not well suited for this practice because of the difficulty of meeting the row grade criteria. Avoid applying this practice on areas that have evidence of mass movement or have the potential for landslides.

A topographic survey or topo map helps to see if the desired planting pattern will fit the slopes.

Planting orchard and fruit areas on the contour generally requires a bench or terrace to be constructed to provide access to the growing trees and/or shrubs. The bench or terrace may reduce surface runoff and increase the opportunity for infiltration. Either inward sloping or outward sloping benches may be constructed.

Outward sloping benches are subject to erosion caused by runoff from slopes above the bench. If planned properly, outward sloping benches may reduce runoff reduction. The degree of runoff reduction will depend on the angle of the outward slope, the amount of cover on the bench at the time of runoff, the amount of storage available, the intake rate of the surface soil, and the amount of water received (either rainfall or irrigation).

Inward sloping benches will reduce runoff, depending on the amount of surface storage and the intake rate of the soil.

Following the level contour may not be desirable where slow drainage may increase disease problems or where furrows could fill with water and overtop.

This practice works best as a system in combination with vegetative ground cover and appropriate irrigation conveyance practices, where applicable.

Vegetative ground cover, particularly in alleys between rows of trees/vines, in row furrows, and on terraces and diversions can increase infiltration, reduce runoff, aid in controlling erosion, provide habitat for beneficial species and pollinators, and facilitate nutrient cycling.

PLANS AND SPECIFICATIONS

Plans and specifications shall be prepared for each field site where contour orchards or other perennial crops will be installed. Record practice specifications on the Contour Orchards and Other Perennial Crops Implementation Requirement document. Plans and specifications will include:

1. Percent land slope used for conservation planning
2. The minimum and maximum allowable row grades for the contour system

3. A sketch map or photograph of the field showing:
    - the approximate location of the baselines used to establish the system
    - the location of stable outlets for the system
4. Temporary cover specifications if appropriate

The evaluation report of the conservation system using the currently approved water erosion prediction technology will be documented in the plan.

OPERATION AND MAINTENANCE

Maintenance needed for this practice includes:

1. Performing all cultural operations between tree or vine rows on or near the contour
2. Periodic inspection and repairs to runoff water outlets
3. Protecting uphill and downhill farm roads from erosion
4. Maintaining adequate vegetative cover to control erosion

REFERENCES

Foster, G.R., D.C. Yoder, G.A. Weesies, D. K. McCool, K.G. McGregor, and R.L. Binger. 2003. User's Guide – Revised Universal Soil Loss Equation (RUSLE2). Version 2. USDA. http://fargo.nserl.purdue.edu/rusle2_dataweb/RUSLE2_Index.htm.

Renard, K. G., G. R. Foster, G. A. Weesies, D. K. McCool, and D. C. Yoder. 1997. Predicting soil erosion by water: A Guide to conservation planning with the Revised Universal Soil Loss Equation (RUSLE). Agriculture Handbook 703. USDA.