



**NATURAL RESOURCES CONSERVATION SERVICE
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. Refer to WI NRCS Conservation Practice Standard (WI NRCS CPS) 330, Contour Farming for guidance on establishing contour lines on crop fields.

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, 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 the new key line shall be used for the 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 greater than 24 hours, establish a row grade of not less than 0.2 percent.

Critical Slope Length

Do not install on hill slopes that are 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 the current Revised Universal Soil Loss Equation (RUSLE2) to determine the critical slope length.

Stable Outlets

Runoff from contour rows shall not cause erosion as the volume of water increases to the stable outlet.

If contour rows show visible erosion as a result of an extended row length, reduce the row grade and/or seed perennial grass, or perennial vegetative mixes within 150 feet of the stable outlet.

Contour rows that deliver runoff to the field boundaries where erosion is expected shall refer to WI NRCS CPS 386, Field Border.

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 have irregular topography are not well suited for this practice because of the difficulty of meeting the row grade criteria.

Use topographic surveys, topographical maps or other planning tools to determine whether planting patterns will fit the slopes.

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

Outward sloping benches are subject to erosion caused by runoff from slopes above the bench.

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 using Wisconsin NRCS Job Sheet 331 Contour Orchards and Other Perennial Crops or other appropriate material. Plans and specifications will include:

- Percent land slope used for conservation planning,
- The minimum and maximum allowable row grades for the contour system,
- A site map, and photograph of the field showing:
 - the approximate location of the baselines used to establish the system
 - the location of stable outlets for the system
- Temporary cover specifications, where appropriate

An evaluation of the conservation system, determined using the current RUSLE2 program computations to verify maximum row grades and critical slope length shall be documented in the job sheet.

OPERATION AND MAINTENANCE

Maintenance needed for this practice includes:

- Performing all cultural operations between tree or vine rows on or near the contour.
- Periodic inspection and repair of stable outlets, after intense storm runoff events.
- Protecting uphill and downhill farm roads from erosion.
- Maintain adequate vegetative cover to control erosion at field boundaries and other susceptible erosive locations within the planning unit.

FEDERAL, TRIBAL, STATE, AND LOCAL LAWS

Users of this standard should be aware of potentially applicable federal, tribal, state and local laws, rules, regulations or permit requirements. This standard does not contain the text of federal, tribal, state, or local laws.

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.

USDA, NRCS, Wisconsin Electronic Field Office Technical Guide (eFOTG), Section IV, Practice Standards and Specifications.

USDA, NRCS, Wisconsin Practice Standard 386 Field Border.

USDA, NRCS, Wisconsin Job Sheet 331 Contour and Other Perennial Crops.

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