



Natural Resources
Conservation Service
CONSERVATION PRACTICE
STANDARD MULTI-STORY
CROPPING
CODE 379
(ac)

DEFINITION

Existing or planted stands of trees or shrubs that are managed as an overstory with an understory of woody and/or non-woody plants that are grown for a variety of products.

PURPOSE

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

- Improve crop diversity by growing mixed but compatible crops having different heights on the same area
- Improve soil quality by increasing utilization and cycling of nutrients and maintaining or increasing soil organic matter
- Increase net carbon storage in plant biomass and soil

CONDITIONS WHERE PRACTICE APPLIES

On all lands where trees, shrubs, woody or non-woody crops can be grown in combination.

CRITERIA

General Criteria Applicable to All Purposes

Combinations of overstory and understory woody and/or non-woody plant species must be compatible and complementary.

Select plants based on their adaptation to the climatic region and soil properties and capabilities. A precondition for any tree/shrub establishment is appropriately prepared sites. Refer to Conservation Practice Standard (CPS) Tree/Shrub Site Preparation (Code 490).

Planting and care of selected tree and shrub species will comply with CPS Tree/Shrub

NRCS reviews and periodically updates conservation practice standards. To obtain the current version of this standard, contact your Natural Resources Conservation Service State office or visit the Field Office Technical Guide online by going to the NRCS website at <https://www.nrcs.usda.gov/> and type FOTG in the search field.

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Establishment (Code 612).

Balance and manage canopy cover to optimize health and growth of plants in each story or level as determined by client objectives for each story of vegetation.

Select plants and cultural practices that will maintain or improve soil organic matter content. Select pest- resistant plant varieties.

Select species that enhance habitat for beneficial insects including pollinators.

Avoid selecting tree or shrub species, which provide habitat to pests of the accompanying crop or forage.

Determine the desired overstory canopy density using the following tree or shrub management objectives:

- Light requirements and growth period of the managed crops dispersed in the understory.
- Erosion control needs.
- Machinery widths and turning areas.

Leave more dense canopies toward the windward side(s) for areas with frequent or periodic high to severe winds.

Ground-level vegetation will be of sufficient coverage to reduce surface water runoff and erosion on erosion-prone sites and will be oriented on or near the contour where feasible. Use mulch as needed to cover bare areas. Planting beds used for any story of vegetation will be placed on the contour.

Consider mature plant height and width and rooting characteristics in relation to structures and above- or below-ground utilities.

Additional Criteria to Improve Soil Quality by Increasing Utilization and Cycling of Nutrients and Maintaining or Increasing Soil Organic Matter

Select plants that will improve soil organic matter content while also providing the desired product(s). Select deep-rooted species for the overstory.

Include nitrogen fixing species in the overstory and/or understory. Retain thinning and pruning material on-site.

Additional Criteria to Increase Net Carbon Storage in Plant Biomass and Soil

Optimize carbon storage by selecting plants that are adapted to the site to assure strong health and vigor and plant the full stocking rate for the site.

Manage the appropriate density for the site that will maximize above and below ground biomass production.

Minimize soil disturbance during establishment of the site.

Minimize soil disturbance during cultivation of the understory crop(s).

CONSIDERATIONS

Select crop, forage, tree and/or shrub varieties based on their tolerance to agriculture chemicals that will be used at the site.

Consider species diversity and use of native species to avoid loss of function due to species-specific pests or to enhance pollinator and wildlife needs.

Select high value trees or shrubs to maximize economic returns. Consider selecting plants that are culturally important.

Consider the use of CPS Windbreak/Shelterbelt Establishment (Code 380) on the windward side(s) of multi-story cropped areas with frequent or periodic high to severe winds.

Anticipate possible off-site effects and modify the practice design accordingly.

Consider the coppice ability of selected species of trees and shrubs when they are to be pruned periodically.

Remove thinning and pruning materials if they harbor pathogens or pose a fire hazard.

PLANS AND SPECIFICATIONS

Prepare plans and specifications for each site using approved specification sheets, job sheets, technical notes, and narrative statements in the conservation plan, or other acceptable documentation.

OPERATION AND MAINTENANCE

Inspect trees, shrubs, crops, and/or forages periodically and protect from adverse impacts including insects, diseases or competing vegetation. Protect newly planted trees or shrubs from fire and damage from livestock or wildlife.

Continue all other specified maintenance measures until plant survival and establishment are assured. This includes replacement of dead and dying trees or shrubs, pruning of dead or damaged branches for safety reasons, periodic pruning of selected branches for control of product quality, and control of undesirable competing vegetation.

Any removals of tree or shrub products, use of agricultural chemicals, and maintenance operations shall be consistent with the intended purpose of the practice. Avoid damaging the site and soil and comply with applicable federal, state and local regulations pertaining to on-site and off-site effects.

REFERENCES

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