

Multi-story Cropping (379) PLANNER GUIDE

USDA, Natural Resources Conservation Service—Practice Code 379



MULTI-STORY CROPPING

Multi-story cropping means that existing or planted stands of trees or shrubs are managed as an overstory with an understory of woody and/or nonwoody plants that are grown for a variety of products.

PRACTICE INFORMATION

The purpose of multi-story cropping is to:

- 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

This practice applies on all lands where trees, shrubs, and woody or nonwoody crops can be grown in combination. This practice does not apply on land that is grazed.

Multi-story cropping can provide a way to cultivate high-value specialty crops under the protection of a forest canopy. Meanwhile, timber stand improvement can result in a higher value timber crop as a long-term economic strategy.

COMMON ASSOCIATED PRACTICES

Multi-story cropping is commonly applied as part of a Conservation Management System with practices such as: Forest Stand Improvement (666), Tree/Shrub Establishment (612), Tree/Shrub Pruning (660), Tree/Shrub Site Preparation (490), Access Control (472). For further information, refer to the practice standard in the local Field Office Technical Guide and associated practice specifications and job sheets.

Complete the basic header information: client name, farm/ranch location, farm and tract numbers, fields in which the practice will be installed, proposed treatment acres (practice extent), program under which this practice is being installed, planned date for installation and if there is a contract associated with this practice, include the contract item number.

Document the planner who wrote the specification in the space following the “Assisted by”.

Existing (Benchmark) Conditions

1. Define and describe benchmark conditions in a narrative and/or reference to other inventory documents.
2. Name all the Soils present within the treatment area.
3. Climatic conditions: For the treatment area, indicate the average annual precipitation zone; Average minimum and maximum temperatures: average wind direction and average speed.

Practice Purpose

Check all purposes that will achieve the clients objectives and improve the targeted resource concern.

General Specifications

1. Is the definition of the practice.
2. Is the disclaimer requiring the landowner to follow all federal, state and local (or if applicable Tribal) laws and regulations. Plus the landowner is responsible for obtaining all the required permits.

Product Types: Check the box(s) associated with the purpose(s) for which this practice is being applied. The chosen purpose(s) need to meet landowner objectives and treat the resource concerns.

See Inside Agroforestry (summer 2000); Agroforestry Note #7 (which is also #1 in the Forest Farming Series) “Forest Farming: An Agroforestry Practice” or under “More Publications”, in the Specialty Forest Products series: “Productive Conservation: Growing Specialty Forest Products in Agroforestry Plantings” for more information on the types of non-timber products currently being grown. Other pamphlets within the Forest Farming and Specialty Forest Product Series may also be helpful in product identification. For planting information see 612 Tree and Shrub Establishment’s *“Planner’s Guide”*.

Multi-Story Structure: Define the desired (target) structure and species composition for each story in this multi-storied cropping system. List species to be included in each story. Estimate the targeted % canopy cover for each story that will provide optimum compatibility with the other stories at initial step in the transition to desired condition. For the understory non-woody plant provide a target % ground cover. Provide appropriate average spacing for each species at establishment or the initial step in the transition to

desired condition. Provide the average plants or stems per acre for each species in each story for the time of establishment or initial step in the transition to the desired condition.

In this section of the Specification Worksheet, you will want to refer to either Web Soil Survey or the Soil Data Mart and the USDA Plants Database to ensure that the species chosen for this multi-storied cropping system are adaptable to the soil and climatic conditions of the site.

Associated Practices within the Conservation System: Check all associated practices used to move the site from the current conditions to the desired conditions.

Description of Multi-Story Cropping Regime: Explain the sequence of transition from the existing condition to the desired condition. Describe the system of conservation practices, their sequence and time period needed to move from the existing condition to the desired multi-storied cropping system. Then describe the production and management sequence and timing for the chosen multi-storied cropping system, including the harvesting schedule.

Other General Criteria Items: Refer the USDA Plants database, the Web Soil Survey and other references to document the details of these additional elements to the General Criteria.

Establish the moisture needs of each story and determine if a watering system will be needed.

The minimum to optimum light requirements of the understory along with the participants objectives will determine the stocking levels of the overstory.

How will you maintain soil organic matter? Do you need a soil test? Will you need to add soil amendments to optimize growth and production for each crop species in order to meet the participant's objectives for production levels and product quality?

Are there pest resistant varieties or ecotypes for your chosen under- and over-story species? Will protective measures need to be taken to protect the crop, such as damage protection devices or implementation of 472 Access Control? Are the selected crop species beneficial to pollinators?

What kind of crop establishment and harvesting methods will be used? Will equipment be used? Are there operational requirements for the equipment such as turning width?

Will you need to establish erosion mitigation and control measures?

For **Additional Criteria to improve soil quality** and **Additional Criteria to increase net carbon storage**, check all items that apply and describe or clarify how you will address the item.

Other Considerations: check all items that apply and describe and clarify how you will address them. In addition, define any other considerations associated with the crops, site or participants objectives and goals.

Provide **Plan view and Profile drawings, photos or maps** when it is necessary for illustrating the details associated with practice and practice component installation locations and structural design.

Describe the **Operation and Maintenance (O&M) requirements** and the associated sequence and timing of the O&M activities to maintain the production levels and product quality of the multi-storied cropping system that will meet the landowners objectives and quality (or planning) criteria for the natural resources.

Will the protective measures or devices require regular maintenance or removal after a period of time?

Practice Specifications Design Approval Certification

This section documents required Job Approval Authority (JAA) and TechReg Category Certification for the project area and practice's limiting factor. It also documents the planner (or Technical Service Provider (TSP) and their JAA or certification for the TechReg category. The Planner (or TSP) will sign and date this section, print their name and title.

If the planner does not have enough JAA to approve the specifications there is a Reviewer section that allows for someone who does have the appropriate JAA to document their JAA and to approve the design with their signature. Include the date, printed name, and title.

There is a section for the client to sign and date. With their signature the client is accepting the specifications, indicate the planner reviewed the specifications with them, agrees to install according to the specifications and that they are responsible for the permits and notifying the appropriate, governmental agencies or utilities prior to implementation of practice.

Documentation Requirement (Checkout form)

This form is used for quality control of the practice design and checkout of practice installation for practice certification. It provides a list of documentation required in order for the plan to include this practice and for designing this practice.

Complete the basic header information: client name, farm/ranch locaton, farm and tract numbers, fields in which the practice will be installed, treated acres (extent installed), program under which this practice is being installed, planned date for installation and if there is a contract associated with this practice, include the contract item number. Also, include the name of the planner(s) that reviewed the file and checked-out the practice on the ground. This may or may not be the person who has JAA.

Mandatory Documentation within the Plan

Check box of each item that is present within the file and properly completed.

The following additional data/documentation needed for this practice

Check the box of each inventory and analysis documentation that was used to supports the presence of the resource concern and landowner objective. The documentation should be in the file or discussed on P&I notes. Check the box for each Checkout item that is attached or documented in the file. Feel free to hand write notes clarifying the check or lack of check.

Additional Notes on Practice documentation, installation or comments on associated Practices

Planner should include any additional information they deem necessary to support the completion certification of the practice.

Practice Completion Certification

Person with appropriate JAA will sign this form for the certification that this practice was installed according to NRCS standards and specifications.

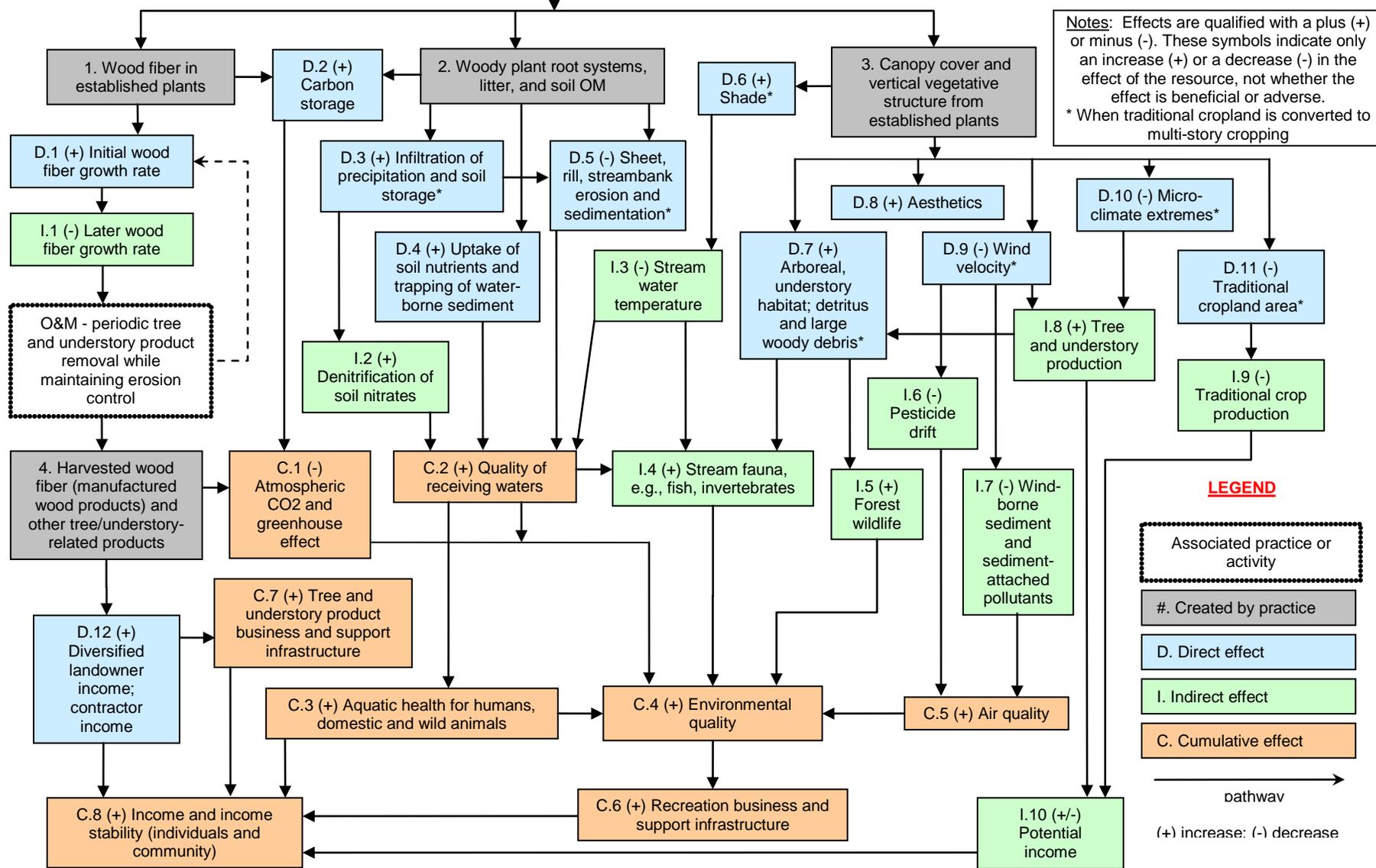
Multi-Story Cropping (379)
7/2008

Multi-Story Cropping (379)

Initial setting: Cropland or unmanaged forest with potential for growing trees or shrubs that may or may not be dissected by streams. Field concerns are water and wind erosion and lack of diverse tree and understory products and habitat



Notes: Effects are qualified with a plus (+) or minus (-). These symbols indicate only an increase (+) or a decrease (-) in the effect of the resource, not whether the effect is beneficial or adverse.
* When traditional cropland is converted to multi-story cropping



The diagram above identifies the effects expected to occur when this practice is applied according to NRCS practice standards and specifications. These effects are subjective and somewhat dependent on variables such as climate, terrain, soil, etc. All appropriate local, State, Tribal, and Federal permits and approvals are the responsibility of the landowners and are presumed to have been obtained. All income changes are partially dependent upon market fluctuations which are independent of the conservation practices. Users are cautioned that these effects are estimates that may or may not apply to a specific site.