

NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE SPECIFICATION
CONSERVATION CROP ROTATION
(acre)
CODE 328

SCOPE

This document establishes the technical details, workmanship, and quality and extent of materials required to install the practice in accordance with the Conservation Practice Standard. The information shall be considered when preparing site-specific specifications for the practice.

The site-specific specifications for installing, operating, and maintaining the practice on a specific field or treatment unit shall be documented via the NRCS Hawaii Jobsheet for this practice and given to the client. Other documents such as practice worksheets, maps, drawings, and narrative statements in the conservation plan may be used to plan or design the practice and to prepare the site-specific specifications.

REDUCTION OF SHEET AND RILL EROSION

The Revised Universal Soil Loss Equation (RUSLE) is the current approved erosion prediction technology that shall be used to determine if the crop produces enough plant biomass to control erosion within the soil loss tolerance (T) or any other planned soil loss objective. The RUSLE calculations will account for the conservation system for the field. If a specific crop rotation is not available, contact the Conservation Agronomist. Use the Sheet and Rill Erosion worksheet to document the soil loss for the rotation.

REDUCTION OF SOIL EROSION FROM WIND

Maintain at least 1,000 pounds of flat small grain equivalent on the surface of the soil during the critical wind erosion period. Refer to wind speed maps in **Conservation Tillage** (Code 329) practice, in the FOTG, dated November 1991. Conversion for flat grain equivalents is found in the *National Agronomy Manual*, Part 502.

MAINTAIN OR IMPROVE SOIL ORGANIC MATTER CONTENT

Refer to the **Cover Crop** (Code 340) practice in the FOTG for more information such as: seeding rates, establishment methods, amount of dry matter and N addition.

The type of organic matter, and depth of incorporation will have a major impact towards improving the organic matter content of the soil. Most of the “activity” in the soil takes place within the top 4 inches. Deep burial of unignified tissue will have little effect on the surface layer.

The Soil Conditioning Index Procedure (SCIP) is the procedure that shall be used to determine the “correct” amount of organic matter necessary to maintain a healthy soil (it is currently in the process of being released for use in the field). The SCIP uses factors such as; the rate of

sheet and rill erosion, type of tillage implements used and the amount of crop residue after harvest.

Cover and green manure crops planted specifically for soil improvement may be grazed, as long as the grazing is managed to retain the desired biomass.

MANAGE DEFICIENT OR EXCESS PLANT NUTRIENTS

Deficient Plant Nutrients

When crop rotations are designed to add nitrogen to the system, the following procedure shall be used to determine the additional N added or provided by a green manure crop and also the revised nutrient application rate:

- Determine the above-ground biomass of the green manure crop, in pounds per acres using the NRCS Hawaii Vegetative Technical Note No. 1, **Biomass Determination Worksheet** located in the Hawaii Technical Notes binder.
- Determine the amount of N provided by the carry-over from the green manure crop, in pounds per acre, using the NRCS Hawaii Vegetative Technical Note No. 2, **Nutrient Carry-over Determination Worksheet** located in the Hawaii Technical Notes binder.
- Determine the revised nutrient application rate due to addition of N from the green manure crop using the **Nutrient Management** (Code 590) practice.
- Consult with the local Cooperative Extension Service agent, as necessary.

Excess Plant Nutrients

If the objective is to reduce excess nutrients, the following guidelines shall be used to select crops or cover crops:

- Utilize crops that have a deeper rooting depth than the prior crop. The Effective Moisture Extraction Depth shown in Table 1 may be used as a guide to root depth.
- Utilize crops that have high N requirements. In general N uptake by plant families are as follows (high N uptake to low): Cruciferaeae > Gramineae > Leguminoseae. The % N shown in Table 1 may be used as an indicator of N use of crops.
- Consider the removal of catch crop from the field.

MANAGE PLANT PESTS (WEEDS, INSECTS, DISEASES)

Crops shall be alternated to break the pest cycle and/or allow for the use of a variety of other control methods. Affected crops and alternate host crops shall be removed from the rotation for the period of time needed to break the life cycle of the targeted pest.

Under specific circumstances the producer may choose to plant another crop for control of a pest that might not otherwise be effectively controlled because the pesticide is not labeled for the existing crops in rotation. As an example, there are no good herbicides labeled for nutsedge when onions are grown, but, herbicides are available for nutsedge when corn is grown. If control of nutsedge is desired, the producer might want to include corn into the rotation.

Pest resistant crop varieties, listed in appropriate Cooperative Extension Service publications or recommended by an agronomic expert with the concurrence of NRCS, shall be selected where

there is a history of a pest problem. Check with the local Cooperative Extension Service agent for specific information.

FOOD FOR DOMESTIC LIVESTOCK

To determine the amount of available feed for livestock use the worksheets in the *National Range and Pasture Handbook*, Chapter 5, Section 3, Exhibits. Leave sufficient residue to prevent soil erosion.

For additional information about the use of Conservation Crop Rotation for livestock food refer to the *National Range and Pasture Handbook*, Chapter 5, Section 2, (h) Facilitating practice-Conservation Crop Rotation, page 5.2-79. Consult with the Grazing Land Specialist for specific situations.

FOOD AND COVER FOR WILDLIFE

Crop selection for game birds shall be determined using guidelines from the **Upland Wildlife Habitat Management** (Code 645) and the **Wetland Wildlife Habitat Management** (Code 644) practice in the FOTG. Consult with the NRCS Biologist for specific situations.

Table 1. Crop Effective Moisture Extraction Depth and % N

The information shown in this table can be used to select crops to include in a conservation crop rotation, if the objective is to reduce excess nutrients.

The Effective Moisture Extraction Depth may be used as a guide to root depth when selecting crops that have a deeper rooting depth than the prior crop.

The % N may be used as an indicator of N use of crops when selecting crops that have high N requirements. The %N in the plant is based on the amount of dry matter in the harvested portion. Although the N in the harvested portion is not the same as the total N in the plant, it does provide a good indication of N use and N that can be returned to the soil. These values are approximate and will vary with site and climate conditions, and crop maturity and variety.

CROP	Effective Moisture Extraction Depth (ft.)	% N
Alfalfa (vegetative)	4 to 6	3.6
Asparagus	5	5.5
Barley (vegetative)	3	0.9
Bean, (pods)	3	3.0
Beets (top + root)	3	2.5
Broccoli (flower)	2	5.9
Cabbage, Chinese	1.5	----
Cabbage, head	1.5	2.8
Cabbage, Mustard	1.5	-----
Carrot (top +root)	3	1.9
Cauliflower (flower)	2	4.4
Celery	1.5	1.6
Clover (vegetative)	2	3.5
Corn (ears)	3	1.3
Cucumber (fruit)	2	2.4
Eggplant	2	-----
Grasses (vegetative)	3	2.75
Lettuce, head	1	4.1
Melons (fruit)	2 to 3	1.25
Oats	2.5	-----
Onion, bulb	1.5	2.2
Onion, green	1	-----
Pea (pea + vine)	2 to 3	3.1
Pepper (fruit)	2	2.3
Potato, Irish (tuber)	2 to 3	----
Potato, Sweet (tuber)	2 to 3	1.1
Pumpkin (fruit)	4	1.6
Radish	1	-----
Spinach, Horenso	1 to 2	4.7
Squash (fruit)	3	3.1
Sugarcane	4	-----
Tomato (fruit)	3	2.7
Turnip	3	