NATURAL RESOURCES CONSERVATION SERVICE

CONSERVATION PRACTICE STANDARD

COVER CROP

(acre)

CODE 340

DEFINITION

Grasses, legumes, forbs, or other herbaceous plants established for seasonal cover and conservation purposes.

PURPOSES

- Reduce erosion from wind and water
- Increase soil organic matter
- Manage excess nutrients in the soil profile
- Promote biological nitrogen fixation
- Increase biodiversity
- Weed suppression
- Provide supplemental forage
- Soil moisture management
- Protect seedling crops from wind abrasion

CONDITIONS WHERE PRACTICE APPLIES

On all lands requiring vegetative cover for natural resource protection and where seasonal cover can be established. In addition, on orchard land where seasonal or perennial cover is needed for one of the listed purposes.

CRITERIA

General Criteria Applicable to All Purposes

Plant species, seedbed preparation, seeding rates, seeding dates, seeding depths, and planting methods will be consistent with NM 340 Cover Crop Specification. The seeding rate will be determined to establish a pure live seed (PLS) rate of 20 seeds/ft^2 on dryland sites and 30 seeds/ft^2 on irrigated land. Stared rates in table 1 of the NM 340 specification can be different than the above mentioned criteria.

The species selected will be compatible with the nutrient management and pest management provisions of the plan.

Cover crops will be terminated by harvest, frost, mowing, tillage, and/or herbicides in preparation for the following crop.

Herbicides used with cover crops will be compatible with the following crop.

Cover crop residue will not be burned.

Volunteer herbaceous vegetation may be managed to meet one or more of the purposes as long as there are no noxious weeds in the cover, and the cover is destroyed before hard seed is made by problem plants.

Additional Criteria to Reduce Erosion from Wind and Water

Cover crop establishment, in conjunction with other practices, will be timed so that the soil will be adequately protected during the critical erosion period(s).

Plants selected for cover crops will have the physical characteristics necessary to provide adequate protection.

The amount of surface and/or canopy cover needed from the cover crop shall be determined using current erosion prediction technology.

Additional Criteria to Promote Biological Nitrogen Fixation

Either the specific Rhizobia bacteria will be present in the soil or the seed will be inoculated at the time of planting legumes.

Nitrogen credits from legume cover crops will be accounted for in the Nutrient Management Practice code 590.

Additional Criteria to Manage Excess Nutrients in the Soil Profile

Cover crops will be established and actively growing before expected periods of high precipitation or irrigation that can cause leaching.

Cover crop species will be selected for their ability to absorb large amounts of nutrients from the rooting profile of the soil. Plants high in protein and that have high biomass (yield) capability will absorb more nutrients. Fall planted grass species such as winter wheat and cereal rye has the best chance of establishment before winter sets in.

The above ground biomass can be removed from the field for maximum nutrient removal efficiency. This can be done by grazing, green chop or haying.

The aboveground biomass can also be recycled into the soil and used by the next planted crop. Plan the incorporation of the cover crop so that the breakdown (decomposition and mineralization) of plant nutrients coincides with the growth needs of the next crop.

Additional Criteria to Increase Soil Organic Matter

Cover crop species will be selected based on producing high volumes of organic material to maintain or improve soil organic matter.

The NRCS Soil Conditioning Index (SCI) procedure will be used to determine the amount of biomass required. See NM Agronomy Technical Note 42.

The cover crop will be terminated as late as feasible to maximize plant biomass and still prepare the seedbed for the subsequent crop.

Additional Criteria to Increase Biodiversity

Cover crop species shall be selected that, have different maturity dates, attract beneficial insects, serve as a trap crop for damaging insects, and/or provide food and cover for wildlife habitat management.

Additional Criteria for Weed Suppression

Species for the cover crop will be selected for their chemical or physical competition with weeds.

Cover crops residues will be left on the soil surface to maximize allelopathic (chemical) and mulching (physical) effects.

For long-term weed suppression, perennials and/or biennial species can be used.

Additional Criteria to Provide Supplemental Forage

Species selected will have desired forage traits, be palatable to livestock, and not interfere with the production of the subsequent crop.

Forage provided by the cover crop may be hayed or grazed as long as sufficient biomass is left for resource protection.

Additional Criteria for Soil Moisture Management

Terminate growth of the cover crop sufficiently early to conserve soil moisture for the subsequent crop. Terminated cover crops shall be left on the soil surface until the subsequent crop is planted.

In areas of potential excess soil moisture, allow the cover crop to grow as long as possible to optimize soil moisture removal.

Additional Criteria for Protecting Seedling Crops from Wind Abrasion

Crops listed on **TABLE 1 - CROP TOLERANCES* TO BLOWING SOIL** as Very Low Tolerance will be planted into a standing dead cover crop using narrow tilled bands.

TABLE 1 - CROP TOLERANCES* TO BLOWING SOIL
(*From seedling emergence to field stabilization)

Tolerant T	Mod. Tolerance 3 t/ac	Low Tolerance 2 t/ac	Very Low Tolerance 0 - 0.5 t/ac
Barley	Corn	Alfalfa	Alfalfa Seedlings
Buckwheat	Cotton	Broccoli	Asparagus
Flax	Cucumbers	Cabbage	Carrots
Grain Sorghum	Onions (>21 days)	Lima Beans	Celery
Millet	Orchard Crops	Peas	Eggplant
Oats	Soybeans	Potatoes	Lettuce
Rye	Sunflowers	Snap Beans	Muskmelons
Wheat	Sweet Corn	Sweet Potatoes	Onion seedlings (<21 days)
			Peppers
			Spinach
			Squash
			Strawberries
			Sugar Beets
			Table Beets
			Tomatoes
			Watermelons

Developed in consultation with ARS Researchers, Manhattan, KS (3/98)

NOTE: When working with crops not listed above, compare their vegetative characteristics with the crops above and select the tolerance factor that best meets the needs of the crop. Contact the State Conservation Agronomist for additional assistance.

CONSIDERATIONS

Select species capable of rapid growth especially when using annuals.

Select species that are compatible with the overall cropping management system. This is especially important when selecting perennial or annual reseeding species for orchards, vineyards and similar plantings.

Consider esthetic values, fire hazards, and wildlife food and cover when selecting species.

Consider past or probable herbicide treatments, legume inoculation, tillage requirements and nitrogen needs when selecting species.

The cover crop should be terminated as late as feasible to maximize plant growth and still prepare the seedbed for the subsequent crop.

Deep-rooted species provide maximum nutrient recovery.

Consider that grasses utilize more soil nitrogen, and legumes utilize both nitrogen and phosphorus.

Avoid cover crop species that attract potentially damaging insects.

Acceptable benefits, for most purposes, are usually accomplished when the plant density is at least 20 stems per foot^2, the combined canopy and surface cover is at least 60 percent, and the above ground (dry weight) biomass production is at least 2700 lbs/acre.

Cover crops may be used to improve site conditions for establishment of perennial species.

PLANS AND SPECIFICATIONS

Plans and specifications will prepared for the practice site. Specifications will include, but are not limited to, **recommended species**, **seeding rates and dates**, **establishment methods**, **nutrients needed**, and **other establishment information**. Specifications will be recorded on NM 340 job sheets, or forms designed to provide specific requirements for the practice.

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Acceptable species, seeding rates, and planting dates for annuals can be selected from **Table 1 and Table 2**. Acceptable species can be perennials can be selected from **Table 3.**

OPERATION AND MAINTENANCE

Growth of the cover crop should be managed. Growth can be by mechanical forage harvest, tillage, grazing, or herbicide. Planting date can also regulate growth if cold weather stops growth.