

**NATURAL RESOURCES CONSERVATION SERVICE  
CONSERVATION PRACTICE STANDARD**

**RANGE PLANTING**

(Ac.)

CODE 550

**DEFINITION**

Establishment of adapted perennial or self-sustaining vegetation such as grasses, forbs, legumes, shrubs, and trees.

**PURPOSE**

- Restore a plant community similar to the Ecological Site Description (ESD) reference state for the site or the desired plant community.
- Provide or improve forages for livestock.
- Provide or improve forage, browse, or cover for wildlife.
- Reduce erosion by wind and/or water.
- Improve water quality and quantity.
- Increase carbon sequestration

**CONDITIONS WHERE PRACTICE APPLIES**

On rangeland, native or naturalized pasture, grazed forest, or other suitable location where the principle goals and method of vegetation management is herbivore based. This practice shall be applied where desirable vegetation is below the acceptable level for natural reseeding to occur, or where the potential for enhancement of the vegetation by grazing management is unsatisfactory

**CRITERIA**

**General Criteria Applicable to All Purposes**

Specific guidance on seeding dates, rates and depths, seedbed preparation, seeding equipment and calibration, species selection, seed requirements, use of cover and companion crops, management and protection during the

establishment period, and stand evaluations is contained in Range Technical Note No. 4 "Perennial Vegetation Establishment," which is located in Section I of the South Dakota (SD) Technical Guide.

Tables in Range Technical Note No. 4 contain specific information to be used in the installation of this practice as follows: Table 1 lists allowable varieties for use in SD; Table 2 provides seeding rate information; Table 3 provides information on species characteristics and adaptability; and Table 5 lists allowable species by minimum and maximum percentage for each ecological site (ES) by Major Land Resource Area (MLRA).

All seedings will contain a minimum of four species unless otherwise specified in Table 5 of Range Technical Note No. 4.

When two or more ESs are planned to be seeded with the same mixture a single species can be counted toward the required minimum of species on each ES, provided they are eligible species for the included sites. In addition, all required species with a listed minimum percentage requirement for each site occurring in the area to be seeded must be included in the mixture. Limits are set within Table 5 for the minimum and maximum percentage for each species. This requirement may often mean that more than four species will be required, especially on seedings with a diversity of ES, as four adapted species for each site (unless otherwise specified) must be included in the overall seeding mixture.

All ESs that occupy more than five percent of the area to be seeded should be considered in the design of the seeding mix. Selected species should have a reasonable chance of surviving across all ESs. Species with a narrow range of environmental adaptability (i.e., species adapted

to wet sites) will not be used on fields containing ecological sites with diverse site characteristics (i.e., wet to dry).

The percentage that each species makes of the mixture when added together will equal 100 percent.

An alternative to designing a single seeding mixture for multiple sites is to design and apply a unique seeding mixture for each ES occurring in the area to be seeded. This method is recommended when existing sites have very diverse characteristics (i.e., wet vs. dry sites). The logistics of identifying the sites in the field, changing seed mixtures in the drill and making certain all areas are seeded will be considered prior to selecting this method.

Species, cultivars, or varieties selected for richness and or diversity, must be compatible with ESDs, local laws and regulations, management objectives, and adapted to climate conditions, soils, landform, or position, (e.g., aspect), and recommended seed transfer zones.

Due to the possibility of limited success when attempting to interseed native species into existing rangeland, interseeding will only be allowed if the following criteria are met. When interseeding into existing untreated rangeland, a specialized piece of equipment that prepares a seedbed and drills seed in one pass (interseeder) will be used. The interseeder shall make a furrow at least 8 inches wide, at least 3 inches deep, and not spaced more than 42 inches between furrow centers. It should be equipped to plant fluffy and free flowing grass seeds, have double disc openers, and packer wheels. Seeding rates for interseedings will be one-half the rate shown on Table 2 of Range Technical Note No. 4.

Seeding rates will be calculated on a pure live seed (PLS) basis.

Nonnative legumes may be included in the seeding mix up to 10 percent of the mix.

**Additional Criteria to Restore a Plant Community Similar to Its ESD Reference State or the Desired Plant Community.**

Selection of species or combination of species shall be designed to meet or move the site to the

ESD reference state or the desired plant community.

**Additional Criteria to Improve Forages for Livestock**

Selection of a species or combination of species shall be designed to meet the desired nutritional requirements for the kind and class of livestock.

Selection of species or combination of species shall be designed to meet the desired season of use or grazing period.

Species planted as mixtures will exhibit compatible palatability to avoid selective grazing.

**Additional Criteria for Improved Water Quality and Quantity**

Select a species or combination of species that will maintain a stable soil surface and increase infiltration.

Species that have high evapotranspiration rates shall not be planted when watershed yields are the primary objective.

A mixture of functional groups inherent to the site's hydrologic zone(s) shall be planted when riparian area stream bank stability and water temperature criteria are important. Special care will be taken to ensure that the selected species are adapted to the specific sites selected for planting.

**Additional Criteria for Improving Forage, Browse or Cover for Wildlife**

Selection of planted species shall meet nectar, dietary, and palatability requirements for the intended wildlife species.

Species will be selected and planted in a designed manner that will meet the cover and life history requirements of the wildlife species of concern.

**Additional Criteria to Increase Carbon Sequestration**

For optimal carbon storage, select species that increase site biomass.

Where carbon sequestration goals are at an appropriate spatial scale, deep rooted perennial

species that will increase soil carbon storage will be selected.

Reduce the temporal frequency of carbon releases caused by nonhistorical repetition of wildfires on degraded sites by selecting less flammable perennial plants appropriate for the site.

## CONSIDERATIONS

In most instances, fertilization has not proven beneficial, and, may in fact, be detrimental to seedling establishment due to increased weed growth caused by the addition of nutrients. Fertilization prior to seeding is generally not recommended. Fertilization of rangelands is generally cost prohibitive.

On diverse areas having a wide variety of ecological sites, or where unique sites exist that are considerably different in their species adaptation, separate seeding operations may need to be conducted to better match the variety of adapted species. The areas in question will need to be of a large enough extent to justify separate seeding operations.

Planting materials selected should contribute to wildlife and aesthetics when opportunities exist.

Use of certified planting materials should be encouraged; however, distance and source limitations on seed and planting stock should be considered in terms of logistics and costs.

Any special handling requirements for planting materials need to be followed for best results, (e.g., beards or awns on seed, hard seed coats, seed mixture ratios).

Where air quality concerns exist, site preparation techniques should be utilized that will minimize airborne particulate matter generation and transport.

## PLANS AND SPECIFICATIONS

For standard plantings, use the SD-CPA-4, Seeding Plan and Record to develop specifications and documentation. Where plantings require more detailed information or require the use of other conservation practices prior to planting, a specific site specification will be prepared.

## OPERATION AND MAINTENANCE

**Operation.** Identify any required items needed to assist in stand establishment such as mowing, burning, flash or target grazing, or herbicides to control weeds and vestige of invasive plants. Address insect and disease control needs where they are likely to create establishment problems. Focusing on the ecological mechanisms and processes that direct succession is central to successful stand establishment.

**Maintenance.** The cooperators has an understanding of the management required to maintain the resulting plant community. Any necessary replanting due to drought, insects, or other uncontrollable event which prevented adequate stand establishment should be addressed. Recommendations may vary from complete re-establishment to overseeding or spot replanting. Thin stands may only need additional grazing deferment during the growing season.

## REFERENCES

Association of Official Seed Certifying Agencies Native Plant Connection (2003) URL: <http://www.aosca.org/native%20plant%20restoration.htm> (accessed 14 Aug 2008)

Jones, TA. 2005. Genetic principles for the use of native seeds: just the FAQs, please, just the FAQs. *Native Plants Journal* 6:14-18, 20-24.

Mangold, JM, etal. 2007. Revegetating Russian knapweed (*Acroptilon repens*) infestations using morphologically diverse species and seedbed preparation. *Rangeland Ecology and Management* 60:378-385.

Sheley, R.L., J.M. Mangold, and J.J. Anderson. 2006. Potential for successional theory to guide restoration of invasive plant dominated rangeland. *Ecological Monographs*. 76(3):365-379.

USDA-NRCS. <http://www.plant-materials.nrcs.usda.gov/technical/publications/seedplant-pubs.html>

USDA-NRCS. Technical documents related to plant species community dynamics. The Ecological Site Information System (ESIS) is the repository for the data associated with the

collection of forestland and rangeland plot data  
and the development of ecological site

descriptions. [Online]  
<http://esis.sc.egov.usda.gov/>