

**NATURAL RESOURCES CONSERVATION SERVICE  
CONSERVATION PRACTICE SPECIFICATION**

**RANGE PLANTING**

(Ac.)

**CODE 550**

**MANAGEMENT**

- I. Range planting will be undertaken only in areas where grazing by domestic livestock will be controlled to permit plants to become well established.
- II. Range plantings will be protected from grazing from the date of the seeding for at least two successive growing seasons, or until the seeded plants are well established. "Flash Grazing" as described under weed control can be used if normal periods of grazing are not allowed.
- III. **Weed control for establishment**
  - A. Grass Seedlings
    1. Broadleaf and grass weeds may be controlled with pre-plant, pre-emergent, post-plant or post-emergent herbicides. Caution must be taken because chemicals for broadleaf weeds will most likely kill or severely damage any legumes or forbs in the seed mix. **Herbicides will be applied according to manufacturer's labeled instructions** <sup>1/</sup>. It may be necessary to treat twice the first year and once the second year after planting.
    2. Mowing or shredding may be used in place of herbicides. Mowing or shredding should be used prior to weeds reaching a height of 18 inches and may need to be performed several times during the growing season. Mowing must be completed prior to weed seed set.
    3. When perennial noxious weeds and winter annuals such as field bindweed, Canada thistle, jointed goatgrass, cheatgrass, etc. are present, they will be controlled prior to seeding.
    4. When foxtail barley, barnyardgrass, sandbur, crabgrass, and annual bromes are competitive to the planted species, they will be mowed/shredded. Mowing/shredding should be discontinued in late July and August. The height and time of mowing/shredding must be such that more leaves are cut from weedy plants than from seeded species.
  - B. In plantings with forbs and shrubs
 

When forbs, legumes, and shrubs are used to supplement the grass seed mix, the broadleaf and grassy weeds may only be controlled by mowing/shredding, "Flash Grazing," or herbicides that will not harm the desirable species.

Grazing management must be included to maintain the stand after the seeding is established. When grazing is prohibited other practices such as mowing, shredding, Prescribed Burning (338), and Grazing Land Mechanical Treatment (548) shall be used when the stand is deteriorating due to decadence and species shift due to non-use.
  - C. Flash Grazing
 

"Flash Grazing" is defined as a weed control practice that uses livestock to reduce weed growth instead of mechanical equipment. On all seedlings where weeds are a problem, "Flash Grazing" may be used to control weeds during the establishment period unless grazing is prohibited by program restrictions. "Flash Grazing" may be used in place of mowing for weed control if the operator has adequate livestock to obtain the desired benefits.

The stocking rate is to be at least three Animal Unit Equivalents <sub>2</sub> per acre, and the grazing period is limited to a maximum of three days.

If an area to be grazed is too large, it should be subdivided with temporary fencing and grazed according to a Prescribed Grazing System (528). If seeded species are being pulled up by the livestock, they will be removed immediately.

"Flash Grazing" is to begin when palatable immature weeds such as kochia, Russian thistle, barnyardgrass, crabgrass, and other palatable annuals reach 6 to 12 inches in height. Area is to be grazed until the weeds are grazed uniformly to a height of 3 to 5 inch stubble. Grazing may be repeated as necessary until August 15. A minimum of 30 days rest is required before regrazing is permitted. No grazing is permitted after August 15 during the growing season, so that seedlings will have adequate time to store root reserves.

Livestock are to be grazed on seeded fields under dry soil conditions. If wet muddy conditions occur, livestock will be removed and not allowed to reenter until a firm surface is again present.

- IV. Infestations of harmful rodents and insects will be controlled as necessary during the grass establishment period. <sub>1</sub>

## **SEEDBED PREPARATION:**

### **I. Cropland Conversion to Rangeland**

- A. Seedbeds for range sites in Major Land Resource Areas 67 (Central High Plains), 69 (Upper Arkansas Valley Rolling Plains), 70 (Pecos-Canadian Plains and Valleys), 72 (Central High Tablelands), and 77 (Southern High Plains) are required to have satisfactory protection from wind and water erosion by means of one of the following methods or conditions as selected and approved by the local conservationist.
- B. Fields or areas that are too gullied, hummocky, or in need of mechanical conservation measures should be shaped as necessary to plant and grow a suitable cover crop and to establish a stand of native plants.
- C. A preparatory dead litter stubble cover of sterile forage sorghum, long-season grain sorghum or sudangrass, will be left standing to give maximum protection from blowing. Stubble from short growing millets and hybrid grain sorghum (milo) harvests should not be used. They rarely produce adequate cover for range seeding purposes.
  1. On sandy soils, drill forage sorghum, grain sorghum or sudangrass in rows not to exceed 20 inches, between May 15 and July 1. If more growth is produced than desirable, or if the cover crop will produce mature seed, the cover will be clipped to a 12 to 15 inch stubble height and should be removed from the field unless restricted by program regulations.
  2. Seed cover at rates that will produce an adequate cover to prevent erosion for several years following grass seeding. Seed forage sorghum or grain sorghum at 6 to 8 lbs per acre on sandy soils and sudangrass at 10 to 15 lbs per acre. On loamy and heavy textured soils use the same procedures as listed above for sandy soils and maintain a minimum 12 inch stubble height. Seeding rates on these soils may vary from 4 to 8 lbs per acre for forage sorghum, or grain sorghum. Sudangrass may vary from 8 to 15 lbs per acre.
  3. To have adequate cover for a minimum of two consecutive years after seeding the following actual residue amounts are required at seeding time. The "I" soil factor from the Wind Erodibility Index is used to determine minimum residue levels.

**Table 1** – Minimum lbs. residue/acre

Soil "I" Factor	At seeding time
56 or lower	1750
86	2000
134	2250
220 or higher	2250*

\* *If adequate residue cannot be produced, additional approved mulch may need to be applied and critical area treatment procedures used for mulching and seeding*

4. Use weed free seed of forage sorghum, grain sorghum or sudangrass that has a germination rate of 85% or higher to insure that adequate plant populations can be established.
- D. Existing cover may be used in place of a cover crop in MLRA's 67, 69, 70, 72, and 77 if one of the following situations is available.
1. Harvested sorghum with a stubble height of 12 inches or more may be used, providing there is adequate cover to protect the grass seedlings and the soil from wind and water erosion for several years following grass seeding. Weeds and volunteer sorghum will be controlled as needed to prevent competition with the grass seedlings.
  2. Millet with a minimum stubble height of 12 inches may be used if adequate cover exists to protect the land from wind and water erosion. Weeds and volunteer millet will be controlled as needed to prevent competition with the grass seedlings.
  3. For mixtures containing warm-season grasses, mature small grain stubble other than cereal rye may be used. Mature cereal rye stubble will not be used for any range seeding. Delay grass seeding into wheat or barley stubble until the spring seeding season. Herbicides <sub>1/</sub> will be used to control weeds between harvest and grass seeding as needed. If weeds are not controlled in the small grain stubble, tillage will be required and the area seeded to a warm season annual cover prior to grass seeding.
  4. When temporary small grain cover (wheat or barley) is used for winter protection, these covers may be used under the following conditions. The cover will be clipped or killed with a contact herbicide at least 30 days prior to maturity to prevent volunteer small grain. Seeding will be delayed until the following spring. Herbicides <sub>1/</sub> will be used for weed control.
  5. All existing covers will meet the same residue requirements for cover as shown in Seedbed Preparation, I.C.3.
- E. In MLRA's 34, 35 36, 47, 48, 49, and 51, the following procedures may be used in preparing a seedbed where a temporary cover is needed to control erosion during the grass establishment period.
1. A firm, weed free, clean till seedbed may be prepared on slopes less than 6 percent. A sterile wheat or oat cover crop is preferred so that erosion is kept at a minimum.
  2. On fields with slopes averaging 6 percent or more, establish a sterile wheat or oat cover crop. After the first hard freeze seed directly into the standing cover crop residue.
  3. Seed the oats or sterile wheat during the normal planting period in the area. Clip the oats as needed to prevent seed formation.
  4. Use appropriate herbicides <sub>1/</sub> to control weeds and volunteer prior to seeding and during establishment. Mowing, shredding or "Flash Grazing" may be used in place of herbicides. If seed mixture contains species susceptible to herbicides only mowing, shredding or "Flash Grazing" will be used.

5. Seeding into existing wheat, oat or barley stubble harvested to previous growing season may be used. Use herbicides 1/ as needed to control weed growth prior to seeding. Tillage is not recommended so that a firm seedbed can be maintained.

## II. Depleted Rangeland or "Go-Back" Fields (*Abandoned Cropland*)

- A. Reseeding of depleted rangelands in very poor conditions may be accomplished using the following techniques in combination with Prescribed Grazing (528):
  1. The existing plant cover can be controlled by use of herbicides 1/ or mechanical tillage methods that are practical for the range site and result in a satisfactory seedbed for planting adapted species.
  2. All plant residues are left on the surface to prevent soil blowing. If the residue is inadequate, establish an appropriate annual cover adapted to the MLRA and range site before seeding.
- B. Reseeding "go-back" fields (formerly cropland) or converting pastureland or hayland to rangeland.
  1. To adequately reduce competition from biennials, short-lived perennials, and remnants of introduced grasses, it generally will be necessary to prepare a seedbed and grow an adapted crop two or more years. The application of a non-selective broad spectrum control herbicide 1/ can be used in place of tillage and cover crop if adequate amounts of residue are present to control erosion.

## III. Dewatered or abandoned irrigated cropland conversion to Rangeland in MLRA 69

- A. Due to chemical and physical changes that have occurred special procedures are needed to effectively establish vegetation on these dewatered soils. Dryland planting attempts in this low precipitation zone along with the chemical and physical changes of these soils will usually result in failure of the seeded vegetation. Refer to **Seeding Mixture A. 1-2** for additional requirements.
- B. Seedbed preparation is the same as previously described for seedbed preparation for MLRA's 67, 69, 70, 72, and 77. However, row spacing can be changed to 36-40 inch spacing to accommodate irrigation furrows. Cover crops that can be used remain the same as listed previously for dryland seeding. Residue amounts required for grass seeding remain the same as required previously based on the soil "I" factor. Clipping and removal of excess material is permitted if not limited by program limitations. Irrigation will be used to establish an adequate cover crop and grass seeding, when available and possible. Weed control will be used as needed to obtain a weed free cover crop.
- C. Previously harvested crops of corn, grain sorghum, and forage sorghums may be used for cover if adequate residue is left. The residue remaining must meet the soil "I" factor requirements. Production in excess of 5,000 pounds residue per acre will be clipped and removed from the field to allow good seed soil contact during the drilling operation.

## IV. Conversion of introduced grass stands to native rangeland

- A. Because of the persistence of some introduced species, conversion to native rangeland may be difficult. Control of the introduced species is required to increase the chances of the new seeding being a success.
- B. Termination of the introduced species is the first step.
  1. Option one is the use of a contact herbicide at a prescribed rate in the fall followed by spring tillage to prepare seedbed for the necessary cover crop. An additional application of the contact herbicide may be required in the spring prior to seedbed preparation depending on regrowth of introduced grasses and again prior to seeding the native species.

2. Option two is to strictly use tillage to control the introduced grass species. This option may increase the potential for soil erosion by eliminating the soil protective cover via heavy disking and/or moldboard plowing in conjunction with multiple ground preparation operations. A cover crop will be needed for this option.
  3. The third option is to strictly use chemicals to control the undesired grass and using a no-till grass drill for seeding grasses. Multiple applications are required starting in the fall through the spring and summer with another application possible in the fall prior to seeding the native species.
- C. Seedings of native grasses where less than 10 percent of the introduced grass remains will be considered a successful seeding.

## METHODS OF GRASS SEED PLANTING:

### I. Drill Method

- A. The best type of seeding equipment is a grass drill with 7-12 inch spacing and capable of planting fluffy seeds, equipped with a seed box agitator, small seedbox, double disc furrow openers with depth bands on all disc openers, and packer wheels. Drills used will be capable of dropping the seed between the double disc openers and not behind them when planting light fluffy seed. Fluffy and free-flowing grass seeds will be planted directly into the cover crop residue without additional seedbed preparation. The grass drill should be operated as near to the contour as practical. To accurately maintain seeding depth, drilling speed is limited to 3 to 4.5 mph.
- B. Drag chains may be used in place of packer wheels only on deep sand and similar range sites to prevent seeding too deep.
- C. Any modified drills that control seeding depth with packer wheels must be able to insure proper seeding depth, uniform seed distribution, and firm seed-soil contact. Ground speed will not exceed 3 to 4.5 mph so that proper seeding depth can be maintained.
- D. Aerial seeding will not be used for any range seeding except broadcast seeding on Pinyon and Juniper sites that are to be mechanically manipulated (e.g. chaining, hydroax, etc.).
- E. When seeding land that is to be irrigated with furrows or corrugations, the soil must be firmly compacted and in a condition to take irrigation water. In addition, the seeding must be drilled into the residue parallel to irrigation direction. In this seeding situation, the grass drill must have depth control bands on both discs and meet the other drill requirements listed above in A.

### II. Range Interseeding Method

- A. Where applicable

The Range Interseeding Method is an exception to the seedbed preparation requirements specified previously. This method is for seeding sandy sites which are highly susceptible to wind erosion and where the introduction of seed can be done with a minimum disturbance of soils and existing cover or where desirable established grasses are found in a very thin stand or in patches, not uniformly throughout, but too abundant to destroy.

Where the cover is principally annuals and no more than a thin (1-5 percent density) or scattered stand of perennials, range interseeding will not apply and stand improvement must follow new seeding requirements.

1. Range interseeding will apply only to **Sands, Choppy Sands, and Sandy Bottomland** ecological sites in Eastern Colorado and special soil and cover problem seedings on Sandy eco-sites.
2. Seedings with this method are to be performed with a range interseeder capable of making a furrow at least 14 inches wide and 3-4 inches deep.

3. Seeding rates are to be 1/2 to 2/3 the rate specified for the species under "seeding rate" in Plant Material Tech. Note No. 59.

**B. Equipment**

1. The interseeder shall make a furrow at least 14 inches wide, 3 to 4 inches deep, and shall be spaced not more than 42 inches apart. The interseeder shall be equipped to plant fluffy and free-flowing grass seeds at the proper depth in the furrow. The interseeder will be equipped with double disc furrow openers, depth bands, and packer wheels.
2. The operation shall be on the contour, where practical.

**III. Broadcast Seeding on Pinyon and Juniper Sites to be Mechanically Manipulated**

- A. These seeding specifications apply only to lands where pinyon/juniper are mechanically manipulated and pertains to the practice of broadcasting seed of adapted species in advance of the chaining operation.
- B. Seeding rates will be two times greater than the drilled rates specified under the Plant Materials Technical Note No. 59.
- C. Time of seeding will coincide with the time specified for Range Seeding. Seeding will be performed prior to the operation but will not be more than one week before the chaining.

**PLANTING DEPTHS:**

Grass drills and interseeders will be adjusted to plant the seed to a depth of not less than 1/4 inch and not more than 1/2 inch. An exception is Indian ricegrass, when seeded alone plant it two inches deep.

**PLANTING DATES:**

Grasses, legumes, and other seeded species shall be planted within the seeding periods specified in Plant Materials Technical Note No. 59, with the provision that up to 10 days tolerance from the specified periods may be allowed for the purpose of adapting to local soil moisture conditions. Rocky Mountain penstemon, native legumes and Indian ricegrass should be planted in the fall so that freezing and thawing can break seed dormancy for spring germination.

**SEEDING RATES:**

For the seeding rate, refer to Colorado Plant Materials Technical Note No. 59, "Seeding Rates," and enter data on Job Sheet Grass Seeding Planned CO-ECS-5.

**SEEDING MIXTURE:**

**I. To determine the best seeding mixture**

- A. Where available follow the Standards and Specifications developed by the Area Range Conservationist for the Area. In other areas determine the dominant range site or sites of the area to be seeded and select the species from the potential Historic Climax Plant Community (HCPC) that will be dominant for the site based on seed availability.
- B. Based on availability, native legumes, forbs, and shrubs should be added to the seeding mixes to enhance productivity on range sites where they are part of the plant community. The seeding rate should not exceed the percentage of forbs and shrubs shown for the range site. Introduced legumes including sweetclover and alfalfa will not be included in the seed mixture.

## II. Seed mixtures on dewatered formerly irrigated land MLRA 69

- A. Based on test results only the following species listed in Table 2 are recommended for use on dewatered areas according to soil type:

**Table 2 – Species for Use on Dewatered Land**

Species	Soil Type		
	Clays	Loams	Sandy
Alkali sacaton	R	R	NR
Blue grama	R	R	R
Galleta	R	R	NR
Little bluestem	NR	R	R
Sand dropseed	NR	R	R
Sand lovegrass	NR	R	R
Sideoats grama	R	R	R
Western wheatgrass	R	R	R

**R = Recommended      NR = Not Recommended**

- B. Irrigation is required for the first year after seeding. The following irrigation schedule is recommended.
- Two shallow irrigations to a 12" soil depth within 10 days of each other at the end of April.
  - One deep irrigation to a 24-36" soil depth in May, June, and July. An August irrigation is optional.
- C. To enhance wildlife habitat and winter feed, add forb and shrub species adapted to the ecological site or sites being seeded.

## III. Seed Source

- A. Adapted improved varieties and cultivars of native grasses, forbs, and shrubs will be used when available in the following order of preference.
- Certified named varieties
  - Named varieties
  - Common seed
- B. Certified named varieties will be required on all NRCS cost shared programs. Exemptions will be granted by Area Range Management Specialist or State Resource Conservationist only if "Certified Seed" is not available from a commercial source or a seed producer.
- C. If "a" and "b" above are not available, native grass seed originating from the same general locality of the planting site may be used. As a general rule, the seed should originate not more than 250 miles south or 150 miles north or 200 miles east or west from where it will be planted.

## IV. Seed Analysis

All seed used either purchased or grown for personal use and to be certified as applied will meet the following minimum standards.

Seed labeling, quality, and seed testing will be in accordance with the Colorado Seed Law. This requires that seed be tested according to "Rules for Seed Testing" Association of Official Seed Analysts (AOSA) and Rules and Regulations under the Federal Seed Act.

Seed tags from the product applied will be required to certify amount and kind of seed applied.

A farmer-rancher who raises seed, for personal use and wants the application certified must have it analyzed and furnish a copy of the current (within 12 months) analysis. In addition, a written statement must be provided certifying that the seed used was produced is the same seed that was analyzed and seeded. The amount seeded must also be furnished on this statement.

**V. Seed Quality**

NRCS in Colorado in cooperation with the Colorado Seed Laboratory, representatives of the Grass Seed Industry and Colorado Department of Agriculture agreed that "chaffy seed" will meet the following minimum requirements (Table 3.) for seeding purposes in Colorado:

**Table 3 – Minimum Requirements for Chaffy Seed**

<b>Species *</b>	<b>Percent Weed Seed (Maximum)</b>	<b>Pure Live Seed Index**</b>
Bluestem, big	3.0	15
Bluestem, little	3.0	12
Bluestem, sand	3.0	15
Buffalograss	0.50	30
Grama, blue	3.0	30
Grama, side-oats	3.0	15
Indiangrass, yellow	3.0	15

\* In determining purity and germination for these species, the seed unit shall be defined by AOSA (Association of Official Seed Analysts) rules. The TZ (tetrazolium) test will not be used as an official method to determine total viability but may be used as an estimator of viability of ungerminated seed, seed which is designated as dormant.

\*\* The pure live seed label shall bear the percent germination, firm seed, and purity. Pure live seed equals percent purity times percent germination divided by 100.

**VI. Stand Establishment**

To determine adequacy of grass stands follow guidelines in Plant Materials Technical Note 56. A minimum of two years and maximum of four years should be allowed before declaring a stand a failure.

**PLANS AND SPECIFICATIONS**

Plans and specifications shall include the required seedbed condition and acceptable preparation methods; soil and seed amendments needed, if any; the acceptable variety or origin, and amount of each species to be planted; acceptable planting dates and depths; and description of acceptable planting equipment. Instructions will be provided as needed for placing different seed types (i.e., fluffy, large, small, slick & dense) in suitable drill boxes.

**REFERENCES:**

[National Range and Pasture Handbook](#)

**FOOTNOTES:**

- 1/ Follow recommendations in current Colorado Pesticide Guides in selection and application of appropriate herbicides for weed control and insecticides for insect control.
- 2/ An Animal Unit Equivalent is defined as the forage requirement for a 1,000 pound cow, make appropriate adjustments when using other kinds and /or classes of livestock.