NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE GENERAL SPECIFICATION

RANGE PLANTING
(Acre)
CODE 550

GENERAL USE

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.

Generally, seeding will not be done when 15% composition by weight of the desirable plants are present, are well distributed over the treated area, and can be managed to a stand within an acceptable time frame.

Specified seeding/plant material rates, methods of planting, date of planting and/or species selection shall be consistent with documented guidance cited by Plant Materials Program, research institutions or agency demonstration trials for achieving satisfactory establishment.

Species, cultivars or varieties selected for richness and or diversity, must be compatible with ecological site description(s), local laws and regulations, management objectives and adapted to climate conditions, soils, landform, or position, (e.g., aspect), and recommended seed transfer zones. (Appendix 1-Planting table, seeding rates)

Seedbed preparation and planting methods will be suitable to meet any special needs for obtaining an acceptable establishment of planted materials.

Recommended planting depths, hydrologic conditions, dates, seeding rates, soil amendments needed for establishment, minimum seed quality standards and management during the establishment period such as weed control and deferment from grazing shall be followed to enhance establishment success.

On soils subject to wind erosion, cover needs will be planned to keep erosion rates down to the tolerance level of the soil to be seeded.

Seeding rates will be calculated on a pure live seed (PLS) basis unless noted otherwise. Seeding rates of 100% should always be planned, however, in certain cases due to planting conditions; a tolerance is acceptable of 75 to 125 percent of the seeding rate.

Seeding should be planned so the cooperator has an understanding of the management required to maintain the desired plant community.

Consideration should be made for the utilization of early and mid seral species as part of the mixture on biologically degraded sites.

Consideration should be made regarding soil quality criteria including utilization of all four crop types when available (i.e warm season grasses, cool season grasses, warm season forbs and cool season forbs).

If introduced species are included in the seed mixture, they will comprise no more than 25% of the total seed mix.

NRCS, TEXAS
October, 2015

Species Selection Criteria-

Restore a Plant Community Similar to Its Ecological Site Description

- Selection of species or combination of species shall be designed to meet or move the site to the Ecological Site Description reference state.
- Should include grasses, forbs, and/or woody species similar to the ecological site description composition.

Forages for Livestock

- Selection of species shall be designed to meet the desired nutritional and palatability requirements during the desired season for the kind and class of livestock.
- Species planted as mixtures will exhibit compatible palatability to avoid selective grazing.

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.

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.
- Refer to Texas NRCS EFOTG State supplements, as available for specific species habitat requirements.

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 non-historical repetition of wildfires on degraded sites by selecting less flammable perennial plants appropriate for the site.

VARIANCES

Any requests for variances are to be submitted to the State Rangeland Management Specialist.

RANGE PLANTING PLAN

The Range Planting Plan will include:

1. **Goals and Objectives** clearly stated.
2. **Planning Support Documentation** that identifies:
    a. Soils and ecological site map
    b. Existing Site Condition documentation (i.e. Rangeland Similarity Index Worksheet, Step Rank Transect, Rangeland Health Assessment, Forage Inventory, Photo, etc.)
    c. Range planting plan map (special treatment areas delineated)

d. Range planting job sheet including:

i. Seeding rates

ii. Planting dates

iii. Planting method

iv. Seed bed preparation

3. **Monitoring plan** identified ensuring stand establishment. (i.e. monitoring competition, and establishment stages, etc.)

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 evidence 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 cooperator 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.

GENERAL SPECIFICATIONS

1. Seedbed Preparation

- The seedbed shall be firm, free of weed competition, and not have a restrictive layer such as a plowpan.
- Other practices such as Brush Management (314), Herbaceous Weed Control (315), or Grazing Land Mechanical Treatment (548) may be used for site preparation.
- Where air quality concerns exist, site preparation techniques should be utilized that will minimize airborne particulate matter generation and transport.

Cover Crop

- If a cover crop is needed to enhance the chance of success of the range planting practice, the Cover Crop (340) standard and specification shall be used for guidance in establishing a cover or dead litter crop. Fertilizer may be necessary to ensure adequate cover.

Managing Competitive Cover

- If current vegetative cover consists primarily of highly competitive species, the area can be plowed and seeded to a noncompetitive sorghum, small grain or cover crop for a minimum of two consecutive years prior to seeding as long as soils are suitable.

Fertilizer

Fertilizer normally will not be recommended when reseeding native rangeland because it will encourage excessive weed growth. However, it may be necessary to fertilize on coarse textured or severely eroded soils that may not have residual or inherent fertility of sufficient levels to support emerging grasses during establishment. In these cases, fertilize following the emergence of the seeded grasses to limit weeds from using the fertilizer. Before fertilizer can be required, it must be called for in a recent soils test (less than one year old). The soil test should note "for establishment" instead of listing a yield goal that would be for production purposes.

2. Seeding Operation

Drilling

- Whenever possible native grasses will be seeded with a grass drill equipped with double disk openers having depth bands followed by cultipacker, press wheels or drag chains. (Press wheels or cultipacking are preferred).

- Seed planting depth will be planted as recommended in Appendix 1.
- The distance between rows will not exceed 12 inches.

Broadcasting

- Broadcasting will not be used unless good seed to soil contact will be achieved.
- Broadcasting will not be used when Herbaceous Weed Control (315) is the only seed bed preparation.
- Broadcasting may be used where dead litter crops are not required and the seed can be firmly anchored into the soil.
- Seedbed modification by cultipacking or other means will be needed to accomplish this. Cultipacking before and after seed placement is preferred.
- Hand broadcasting is acceptable where equipment cannot be operated because of terrain, and an adequate stand of grasses can be expected on the seeded area.

Re-seeding Native Range or Forest Lands Following Brush Management (314)

- Range Planting (Code 550) following mechanical brush management will be based on a **documented technical determination** of existing seed sources or seed bank. Range planting can be planned in order to meet landowner goals and objectives.
- Mechanical methods to remove brush, such as dozing, rootplowing, raking, chaining and/or burning can be a part of the seedbed preparation. See Brush Management (314) standard and specifications. Additional seedbed preparation may be needed with heavy or farm type equipment so that seeding equipment can get over the area.
- It may be necessary to plant cover crops for two consecutive years prior to seeding to reduce resprouting of brush species, especially the oak species. A technical determination will be made on the need for additional years of cover crops.
- Drill or broadcast to adapted species. Seed must have mineral contact with the soil. Seed into a firm seedbed. Use aerial application only when conventional equipment or broadcasting is impractical.
- Pits left from individual treedozing can be an excellent seedbed as long as the treedozing is done during the normal seeding time. In these cases, pro-rate the seeding rate based on the percent ground disturbance. Hand application before the soil has crusted is permissible.
- Other methods will be limited to special conditions with prior approval of the State Range Management Specialist.

3. Origin of Seed

- The first preference for seed selection will be adapted certified named varieties, followed by adapted non-certified named varieties, then followed by common local ecotypes (local native harvest).
- 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, and seed mixture ratios).

4. Native Sources

- The origin of native harvest seed shall not exceed the following distance guidelines from the area of intended use:
    - 200 miles to the north
    - 300 miles to the south
    - 100 miles to the east

- 200 miles to the west

- Named varieties are exempt from mileage requirements, so long as they are seeded within their range of adaptability.

5. Seed Quality and Definitions

Seed analysis

- Texas Seed Law specifies the kind and amount of weed seed permitted; the requirements for a current analysis report; and labeling of all seed to show its purity, germination, date of last germination test, and weed seed content. Tetrazolium tests (TZ) are not allowed except for plains bristlegrass.
- Cooperators who harvest seed for their own use must have an analysis completed.
- Regardless of who grows or sells the seed, a copy of the current (within nine months) analysis must be provided.
- The analysis will show purity, germination, harvest location, and weed content.

Texas Seed Law

- The germination test is valid for 9 months after the end of the month the test was made so long as the seed remains in Texas. (Note: The state law pertains to the sale, offer for sale, expose for sale or transport for sale of any agricultural seed within Texas.) Seed purchased outside of Texas must comply with all federal seed laws.

Interpretation of Current Analysis Report.

- For seed purchased during the valid period of the germination test, the analysis report may be considered current for the full seeding period in effect as the time of purchase. (If seed is purchased March 1 and the valid date expires March 31, the analysis report may be considered current if the seed is planted by June 1, which is the end of the spring seeding period. If the seed is to be planted during a late seeding season, a new germination test will be obtained.)

- Noxious or weed seed content in excess of that permitted by state seed law will not be allowed for use.

Pure Live Seed (PLS) Determination

- Compute by adding percentage of germination and firm seed. Multiply this sum by purity. Divide the product by 100 for percent PLS.

$$\frac{(\%\ \text{Germ.} + \%\ \text{Firm Seed}) \times \text{Purity}}{100} = \%\ \text{PLS}$$

(Firm, hard or dormant are congruent terms)

6. Seeding Rates and Mixtures

- Nurse crops or other species used for quick establishment can be added in addition to a full seeding rate at .5 to 1.0 lbs. per acre as a filler grass.

- Deviations from the standards and specifications can only be approved by the State Range Management Specialist.

7. Planting Dates (Statewide)

- Planting dates are listed by Zone in (Appendix 1) Planting Rates for Drill and Broadcast Seeding and Sprigging in Texas.

- Deviation from these dates requires approval from the State Range Management Specialist along with a written statement of justification from the responsible technician.

8. Management during Establishment

- Refer to Prescribed Grazing (528) for required deferment periods following planting.
- Refer to Herbaceous Weed Control (315) for managing excessive amounts of competitive weedy plants.

9. Existing Terraces

- When seeding on terraced land, a technical determination should be made concerning terrace removal prior to seeding.
- Terraces should be removed if:
    1. low places are allowing water to concentrate that prevents plant establishment,
    2. it is anticipated that future livestock trails will cause concentrated flow and excessive erosion,
    3. leaving them in place will cause poor water distribution,
    4. litter damming can cause overtopping, or
    5. water starvation will have a significant impact on the seeded species below the terraces.
- Generally, it is recommended to remove the terraces prior to seeding.

10. Criteria for Determining Stand Establishment

Number of plants per square foot - Well distributed throughout field

- **Failure - 0 to 0.05 -** Reapplication required.
- **Probable Failure- 0.05 to 0.1 -** Reapplication recommended.
- **Questionable- 0.1 to 0.5 -** Technician and producer will decide whether or not to reapply. Factors to consider are vigor of existing plants, potential to spread, extent of competition, length of contract, weather considerations, adequacy of erosion control and desires of producer.
- **Satisfactory- over 0.5 -** Transects will be located in representative areas of the field. One hundred readings, 3 - 5 steps apart with one-foot square quadrats are recommended for recording the plant counts. Count the total number of plants occurring within the quadrats and divide by 100 to get the number of plants per square foot. More than one transect may be needed on large fields or where stand establishment is not uniform. Delineate those areas of the planted area that do not meet establishment criteria

Time of Making Stand Evaluations

- Determinations will be made at the end of the second growing season unless the technician knows the grass emerged and died during the first season, in which case the determination will be made the first year.

Technical notes of reference:

Pollinator Plants for Texas Conservation Practices
Calibrating a Seed Drill for Conservation Planting
Seedbed Preparation

REFERENCES

Association of Official Seed Certifying Agencies Native Plant Connection (2003) URL: http://www.aosca.org/page/Native_Plant_Restoration.aspx(accessed 14 Aug 2008)

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

Mangold, JM, et al. 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] https://esis.sc.egov.usda.gov/

APPROVAL AND CERTIFICATION

RANGE PLANTING
(Acre)

CODE 550

PRACTICE SPECIFICATIONS APPROVED:

/s/ Jeff Goodwin — 10/1/1015

State Rangeland Management Specialist — Date

/s/ Kristy Oates — 10/1/2015

State Resource Conservationist — Date

Reviewed By:
Zone Rangeland Management Specialists
State Office Specialists