USDA

United States Department of Agriculture

New Mexico

Natural Resources Conservation Service

Plant Materials Program

Rick Strait, State Soil Scientist

Natural Resources Conservation Service

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Overview

- **25 Plant Materials Centers nationwide**
- **Develop vegetative solutions for natural resources concerns**
  - Improved Conservation Plants
  - Conservation Plant Technology
- **Focus on national priorities**
  - Wildlife Habitat
  - Pollinator Plants
  - Cover Crops

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History

- **Albuquerque Plant Nursery**
  - Established in 1935 under the Soil Conservation Act
    - Response to the Dust Bowl
    - 1,400 acres leased from Sandia Pueblo
    - Closed in 1952
- **1952 – 1957 – Planning for partnership with NMSU**
- **1957 – Relocated**
  - Unique Partnership with NMSU
  - 200 shared acres
  - Most of the tree plantings are from original ABQ Plant Nursery Stock

Conservation Plant Releases

USDA
United States Department of Agriculture

A Conservation Plant Released by the Natural Resources Conservation Service
Los Lunas Plant Materials Center, Los Lunas, NM

'Elida' sand bluestem

Andropogon hallii Hack.

'Elida' sand bluestem (Andropogon hallii)

©W.L. Wagner
Courtesy of Smithsonian Institution

Source

Original seed was collected in 1956 from the sand dune area southeast of Elida, New Mexico. Elevation at the collection site was 4,345 feet, and annual precipitation averaged 15.7 inches.

Conservation Uses

- *Erosion control*: Sand bluestem is often used in erosion control plantings on sandy, loamy-sand or sandy-loam sites. It establishes quickly where its rhizomes aid in stabilizing sandy soils. Generally, it is planted as part of a mixture with other warm-season grass species.
- *Forages*: Sand bluestem is good-to-excellent forage due to its palatability and high yield. It is an important component of many native hay meadows and range pastures. The nutritive value of sand bluestem rises and falls with the growing season. It is high in crude protein and palatability until just prior to seed head formation. After seed heads are formed, the nutritive value and palatability decreases significantly.
- *Wildlife*: Sand bluestem is a good-to-excellent forage for all browsing wildlife species. Because it frequently grows in large clumps and retains an upright structure throughout the winter, it makes an excellent nesting habitat for many upland birds and small mammals. Its seed is also a food source for wildlife.
- *Ornamental Landscaping:* As xeric landscaping becomes more popular, the use of sand bluestem has increased in yard plantings. Because of its height and erect growth form, many consider it an excellent plant for lawn and flowerbed borders.

Area of Adaptation and Use

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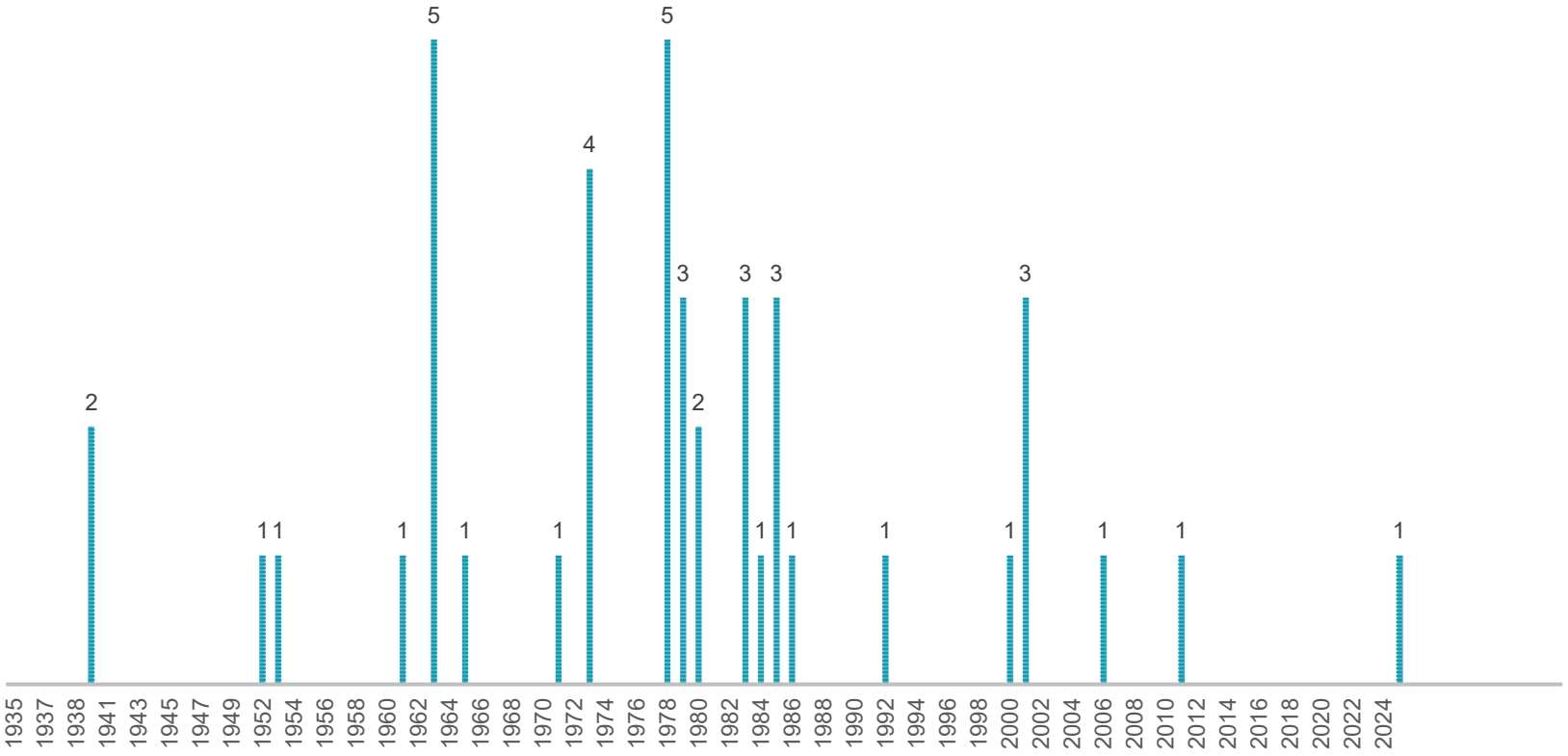
Conservation Plant Releases

41 Releases to date

- **26 grasses**
- **11 trees and shrubs**
- **4 forbs**

CONSERVATION PLANT RELEASES



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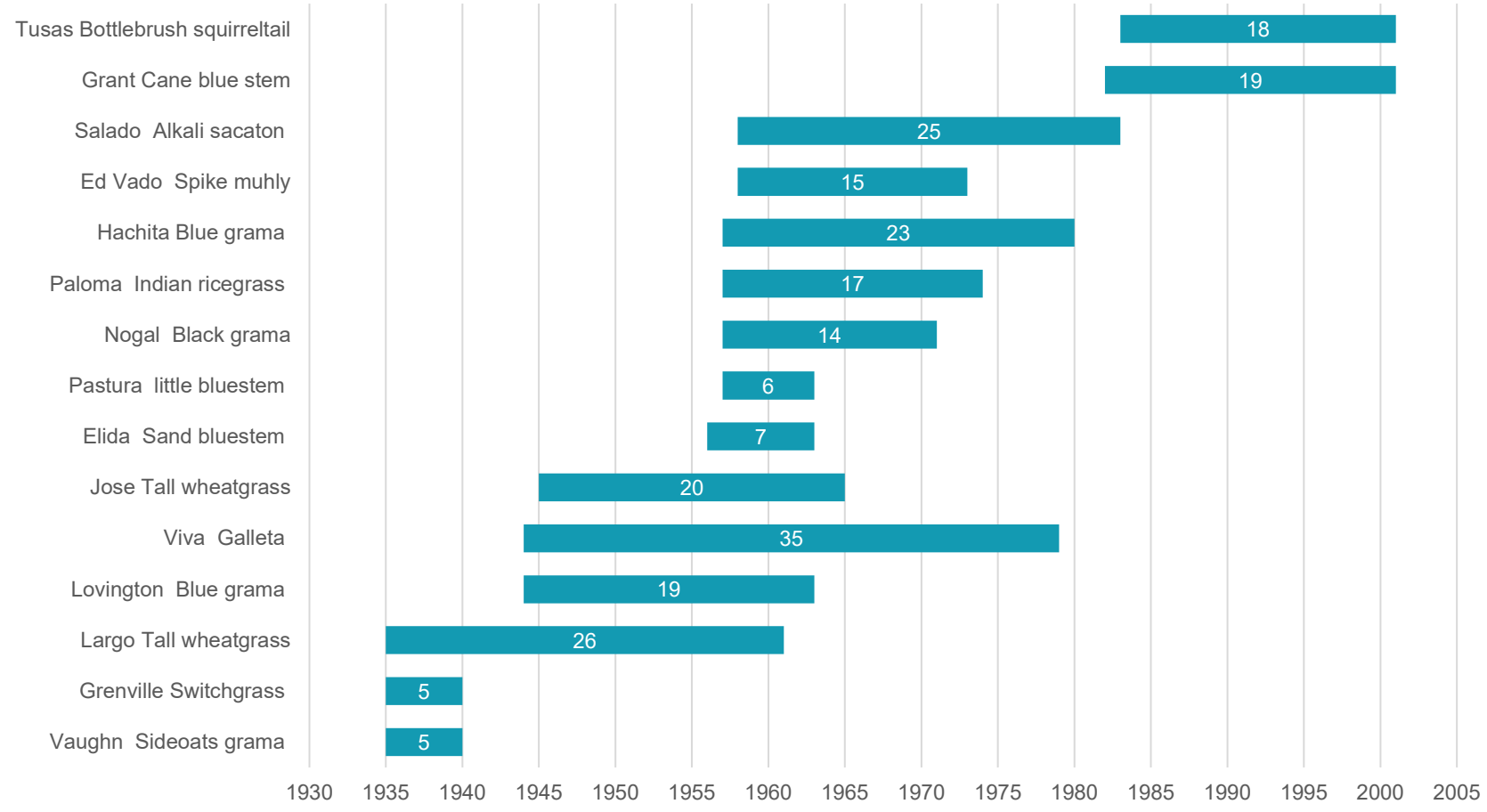
Conservation Plant Releases



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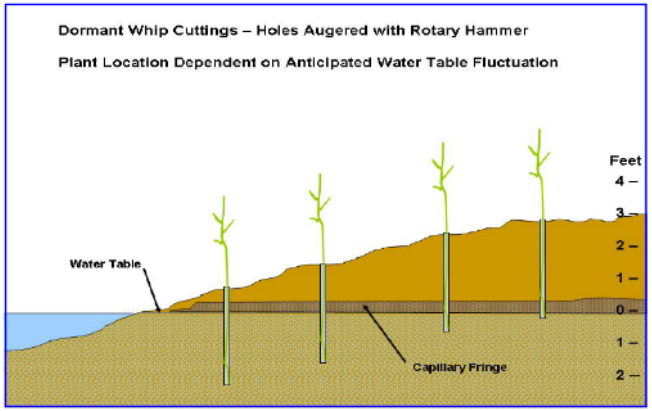
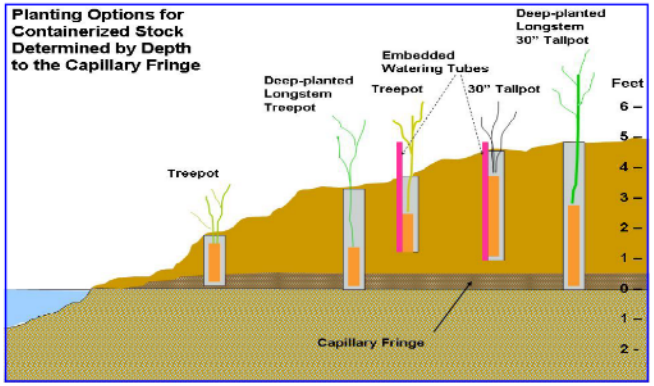
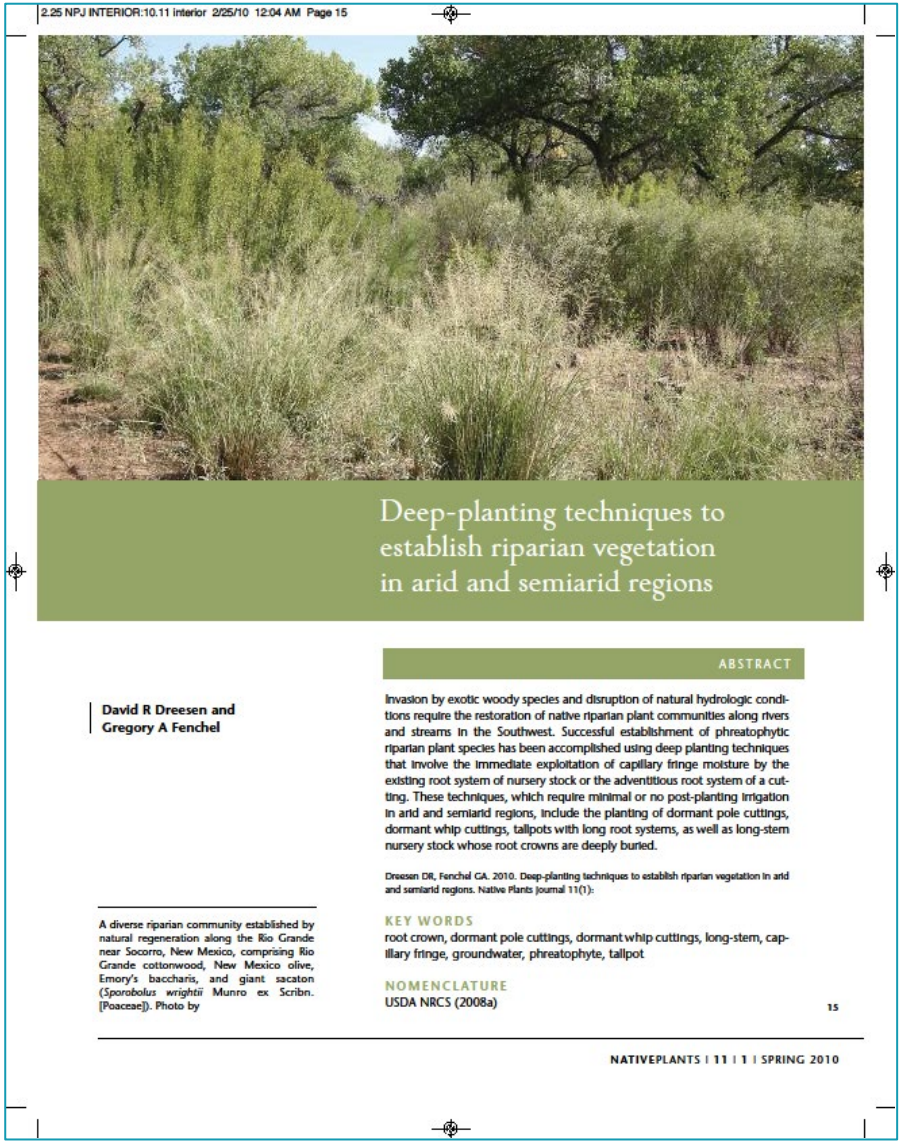
Conservation Plant Technology



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Deep-planting techniques to establish riparian vegetation in arid and semiarid regions

David R Dreesen and Gregory A Fenchel

ABSTRACT

Invasion by exotic woody species and disruption of natural hydrologic conditions require the restoration of native riparian plant communities along rivers and streams in the Southwest. Successful establishment of phreatophytic riparian plant species has been accomplished using deep planting techniques that involve the immediate exploitation of capillary fringe moisture by the existing root system of nursery stock or the adventitious root system of a cutting. These techniques, which require minimal or no post-planting irrigation in arid and semiarid regions, include the planting of dormant pole cuttings, dormant whip cuttings, tallpots with long root systems, as well as long-stem nursery stock whose root crowns are deeply buried.

Dreesen DR, Fenchel GA. 2010. Deep-planting techniques to establish riparian vegetation in arid and semiarid regions. Native Plants Journal 11(1):

KEY WORDS
root crown, dormant pole cuttings, dormant whip cuttings, long-stem, capillary fringe, groundwater, phreatophyte, tallpot

NOMENCLATURE
USDA NRCS (2008a)

A diverse riparian community established by natural regeneration along the Rio Grande near Socorro, New Mexico, comprising Rio Grande cottonwood, New Mexico olive, Emory's baccharis, and giant sacaton (*Sporobolus wrightii* Munro ex Scribn. [Poaceae]). Photo by

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Conservation Plant Technology

Pocket Guide to the Beneficial Insects of New Mexico

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TECHNICAL NOTES

U.S. DEPARTMENT OF AGRICULTURE — NATURAL RESOURCES CONSERVATION SERVICE
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PLANT MATERIALS TECHNICAL NOTE NO. 71 (Final Revision)

Pollinator Plant Recommendations for New Mexico

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In recent years, the phenomenon known as Colony Collapse Disorder and the resultant declines in domesticated honey bee populations (both in the U.S. and elsewhere) have prompted increasing concern over the long-term sustainability of crop pollination services. In many cases, however, it has been shown that native (wild) bee species can provide pollination services equal, or superior to, those of hive bees (Garibaldi et al., 2013), provided that their habitat requirements (such as nesting sites and alternative forage sources) are met. Consequently, there has been considerable interest in creating habitat that will help conserve both native wild bees and domesticated honeybees. Until recently, however, there have been no state-specific guidelines for those wishing to install pollinator plantings appropriate to New Mexico conditions. To address this need, staff from the Los Lunas Plant Materials Center and the NMSU Agricultural Science Center at Los Lunas conducted field trials from 2010-2015 to develop the current recommendations for plants that will sustain bees (and other beneficial insects) throughout the growing season. During the project, a total of 380 plant species were tested, including 260 herbaceous perennials (215 native and 45 introduced), 85 annuals and biennials (60 natives and 25 introduced), and 35 native shrubs. Additional details of the pollinator project, including the trial sites, are given in Dreesen and Grasswitz (2013).

For producers, funding for on-farm pollinator plantings and related conservation practices (such as installing hedgerows and herbaceous wind barriers) is available under the cost-share programs administered by the NRCS (e.g., the EQIP program for both organic and conventional producers). Examples of such conservation practices can be found in National Plant Data Center Technical Note No. 78 (*Using Farm Bill Programs for Pollinator Conservation*) (Vaughn and Skinner 2008); this document was based on the 2008 Farm Bill programs, but the 2014 Farm Bill retains many of these programs and practices.

In most of the arid and semi-arid Southwest, establishing plantings of native species on non-irrigated sites by broadcasting or drilling seeds is fraught with difficulty due to the low likelihood of appropriate precipitation patterns. The high likelihood of seeding failures precludes recommending this practice under non-irrigated conditions because of the high cost of both native wildflower seed and seeding operations.

Sites with reliable irrigation supplies offer a much better opportunity for establishing pollinator plantings by seeding. However, there are still significant obstacles that can substantially impede the establishment of pollinator habitat under irrigated conditions. Some of these difficulties include the following:

1. Competition from weeds common in agricultural settings which can significantly reduce the chances of obtaining a good stand of pollinator plants from seeding.
2. Weather conditions during the spring in the Southwest can pose many impediments to direct seeding and include hot, dry, windy conditions which can rapidly desiccate the soil surface, windblown sand that can abrade newly germinating seedlings or bury the seeds, and wind erosion that can expose newly planted seeds. Extreme temperature fluctuations and late frosts can also reduce establishment. These difficulties suggest that seeding after the spring winds have subsided might increase establishment probabilities despite the higher temperatures that

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Conservation Plant Technology

Common Name	No. of PLS/Pound PLS	Moisture Use	Availability	Relative Cost (per pound)
Indian ricegrass (IR)	160,000	very xeric	yes	medium
Black grama (BG)	1,300,000	very xeric	maybe	high
Sand dropseed (SD)	5,600,000	xeric	yes	low
Spike dropseed	2,800,000	xeric	?	–
Mesa dropseed	3,300,000	very xeric	?	–
Giant dropseed	1,400,000	very xeric	?	–

- Species mixture based upon adaptation and availability
- Selected mix percentages based on cost, seed size, and likely germination – IR 25%, BG 15%, SD 60%
- PLS rates per square foot (based on mix proportions and a total of 40 PLS/ft^2) – IR 10, BG 6, SD 24
- Number of PLS per acre (PLS/ft^2 x 43,560 ft^2/acre) – IR 435,000, BG 260,000, SD 1,050,000
- Pounds PLS per acre (number of PLS/acre divided by number of PLS/pound) – IR 2.7, BG 0 20, SD 0.19
- Hypothetical pure live seed (PLS) from seed testing – IR 0.70, BG 0.40, SD 0.85
- Bulk pounds per acre (PLS pounds/acre divided by PLS fraction) – IR 3.9, BG 0.50, SD 0.22

Basic Guidelines for Seeding Native Grasses in Arid and Semi-Arid Ecoregions

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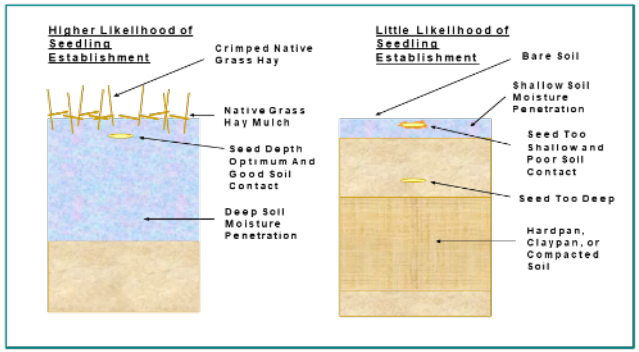
Grass seeding is an uncertain endeavor even in the best of circumstances, but in the arid Southwest it is an extremely risky venture. New Mexico USDA-NRCS standards and specifications for critical area planting and range planting provide detailed information on seeding native grasses. This brochure is intended to present the important factors that influence the success of seeding native grasses in the arid and semi-arid Southwest. To access the USDA-NRCS standards and specifications for critical area planting, go to http://efotg.sc.egov.usda.gov/references/public/NM/342-Critical_Area_Planting_Spec.pdf. To access the USDA-NRCS range planting specifications, go to http://efotg.sc.egov.usda.gov/references/public/NM/550spec.pdf

- *Seed Depth – Emergence versus moisture.* The depth of seed placement is a critical factor; the goal is to balance shallow seeding depths to allow high rates of emergence versus better soil moisture conditions found with increasing depth which are critical to seedling survival.
- *Dormancy – An advantageous trait for seed to persist for later precipitation events or future years.* If less than optimum moisture conditions have allowed most seed to germinate but then die of desiccation, the presence of some dormant seed can be advantageous because it provides a reserve of viable seed.
- *Soil Compaction – Survival is dependent on rapid root extension.* The ability of seedling roots to follow the downward drying front can be inhibited by shallow compaction zones or claypans.
- *Seed to Soil Contact – To facilitate imbibition of soil moisture by seed.* Large soil voids can prevent adequate seed to soil contact and reduce upward capillary movement of soil moisture that can retard germination and growth
- *Moisture Relations and Soil Texture – Infiltration depth versus water holding capacity.* Without a doubt, the most important factor in arid ecoregions is soil moisture. The influence of soil texture on the depth of moisture penetration can be a key variable in seeding success.
- *Mulch – Essential in arid regions.* A layer of mulch retards evaporation, reduces wind and water erosion, and aids infiltration; mulching provides the maximum benefit from the small amount of precipitation received in arid climates. Application of the proper amount of weed-free material is important.
- *Weed Control – Limit the weed seed bank.* Dense stands of annual and perennial weeds can out-compete seedling grasses for soil moisture, light, and nutrients, and prevent establishment.
- *Grass Types and Planting Dates – Cool-season (CS) versus warm season (WS).* The type of photosynthetic pathway determines the optimum temperatures (70-75°F for CS and 85-95°F for WS) and temperature limitations (40°F for CS and 55°F for WS) for growth and germination (these optima and limits are adapted from K.J. Moore et al. in Warm Season Grasses, Agronomy Series 45 and C.J. Nelson in Cool Season Grasses, Agronomy Series No. 34).

Seeding scenarios that either favor or hinder grass seedling establishment



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Current Projects – Vine Mesquite Release

Current Projects – Forage/Cover Crops

Current Projects – Small Plot Planting Guides

Questions?

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