

TECHNICAL NOTES

Range Technical Note No. 108

Evaluating Seeding Success for Forage and Biomass Planting (Code 512) and Range Planting (Code 550)

Rangeland and pasture seeding success can be assessed quantitatively by measuring the density of emerged live seedlings. Numbers of desired plants per unit area or number of desired seedlings per linear foot of seeded row are common measurements to determine success. While quantitative measurements allow for a standardized measure of seeding success, evaluation of seedlings should also be based on local experience and site condition. Productive sites such as moist lowlands are expected to produce much denser stands than drier upland site types. Some important considerations when evaluating the success or failure of a seeding are:

- Dryland seedings should be evaluated no sooner than the end of the first growing season post seeding.
- Irrigated seedings should be evaluated no sooner than 90 days after spring seeding or after six weeks of growing season.
- Late fall or dormant season plantings should be evaluated the following spring.
- If a seeding contains few annual weedy species and seedlings are uniformly distributed, the seeding is probably successful.
- Seedings should be evaluated for 1-3 years before a final determination of success or failure is issued.

QUANTITATIVE METHODS FOR EVALUATING SEEDINGS

Seeding success can be determined by measuring seedling density:

Take some time prior to sampling to assess germination and degree of success of the seeding on a majority of the field and get your eye adjusted to the plant community and the ground cover—perennial vs. annual grasses vs. annual weeds, etc. This would also be a good time to evaluate any damage to the seeded plants by insects and/or pathogens and the degree of competition from annual weeds in the stand. It may be more efficient to sample areas within a field that appear to have less perennial plant densities than other areas of the same field.

Two sampling methods that may be used include:

1. Begin the sampling by walking in a straight line perpendicular to the drill rows (for drilled seedings) stopping every 10 paces to count the number of live seedlings within a 1 sq. ft. area. At least 10 readings per field are recommended. The samples need to be stratified according to topography, soils and other obvious field variables. Seedling counts are best accomplished by using a 1 sq. ft. frame or other measurement reference. When all 10 samples have been completed, simply divide the total number of plants by 10 to determine the plants/square foot.

OR

2. Walking perpendicular or diagonally to the drill rows (for drilled seedlings) place a 4.8 or 9.6 square-foot hoop at regular intervals across a seeded field (10 locations should be sufficient) and record the total number of seedlings in each hoop. Then total the number of plants in all 10 hoops and divide by 48 if using the 4.8 hoop or use 96 if using the 9.6 hoop (to estimate the plants/square foot in the field).

ONLY HEALTHY SEEDLINGS (THREE GREEN LEAVES OR MORE), MOST LIKELY TO SURVIVE THE GROWING SEASON, SHOULD BE COUNTED DURING THE SAMPLING.

If percent composition of the stand by species is needed to determine success then it will be necessary to determine the species of each plant seeded and count that in the hoop. A simple average composition will be calculated to determine composition by species. At least 3 sample lines at different location of the seeding where the ground looks different due to soil changes, or rocks, etc. will be required to adequately represent stand success. More intensive sampling methods may be necessary for program appeals.

EVALUATION GUIDELINES

Seedling densities in New Mexico usually range from 1.0 to 3.0 plants per square foot, depending on the seeding, management and site. Ecological Site Descriptions should be used in the planning process to choose appropriate plant species as well as to determine expected ground cover and plant productivity on specific sites. The following table should be used as a guide for assessing desired seedling densities on various sites in New Mexico.

EXPECTED SEEDLING DENSITIES FOR SUCCESSFUL SEEDINGS IN NEW MEXICO		
PRECIPITATION	ECOLOGICAL SITE/FORAGE SUITABILITY GROUP	PLANTS/SQ. FT.
22+	Sandy to Loamy to Clayey Shallow or Gravelly, etc.	3.0 -5.0 2.0 -4.0
16 - 22	Sandy to Loamy to Clayey Shallow, Gravelly, Eroded, etc.	2.0- 4.0 1.0-3.0
<10 - <16	Sandy to Loamy to Clayey Shallow, Gravelly, Eroded, etc.	1.0-3.0 0.6-2.0

REFERENCES

USDA, NRCS 2003. Wyoming Plant Materials Technical Note 10.

USDA, NRCS 2006. Pasture and Range Seedings, Planning – Installation – Evaluation. Idaho Plant Materials Technical Note 10 (revised).

Seeding Native Grasses in the Arid Southwest, David R. Dreesen, Agronomist, USDA-NRCS Plant Materials Center, Los Lunas, NM.

<http://www.nm.nrcs.usda.gov/news/publications/SeedingNativeGrasses.pdf>

USDA, NRCS , Boise, Idaho – Salt Lake City, Utah – Spokane, Washington, TN PLANT MATERIALS NO. 12 JANUARY 2008, GUIDELINES FOR DETERMINING STAND ESTABLISHMENT ON PASTURE, RANGE AND CONSERVATION SEEDINGS, Jim Cornwell, State Range Conservationist, NRCS, Boise, Idaho (retired) Dan Ogle, Plant Materials Specialist, NRCS, Boise, Idaho, Loren St. John, Manager, Plant Materials Center, Aberdeen, Idaho, Mark Stannard, Manager, Plant Materials Center, NRCS, Pullman, Washington
<http://www.plant-materials.nrcs.usda.gov/pubs/idpmstn7707.pdf>

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