

Plant Species Selection and Source

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Five Consideration when Selecting Species/Sources:

1. Seeding Date
2. Land Use.
3. Seed Placement
- 4 Seed Quality
- 5 Species/Sources

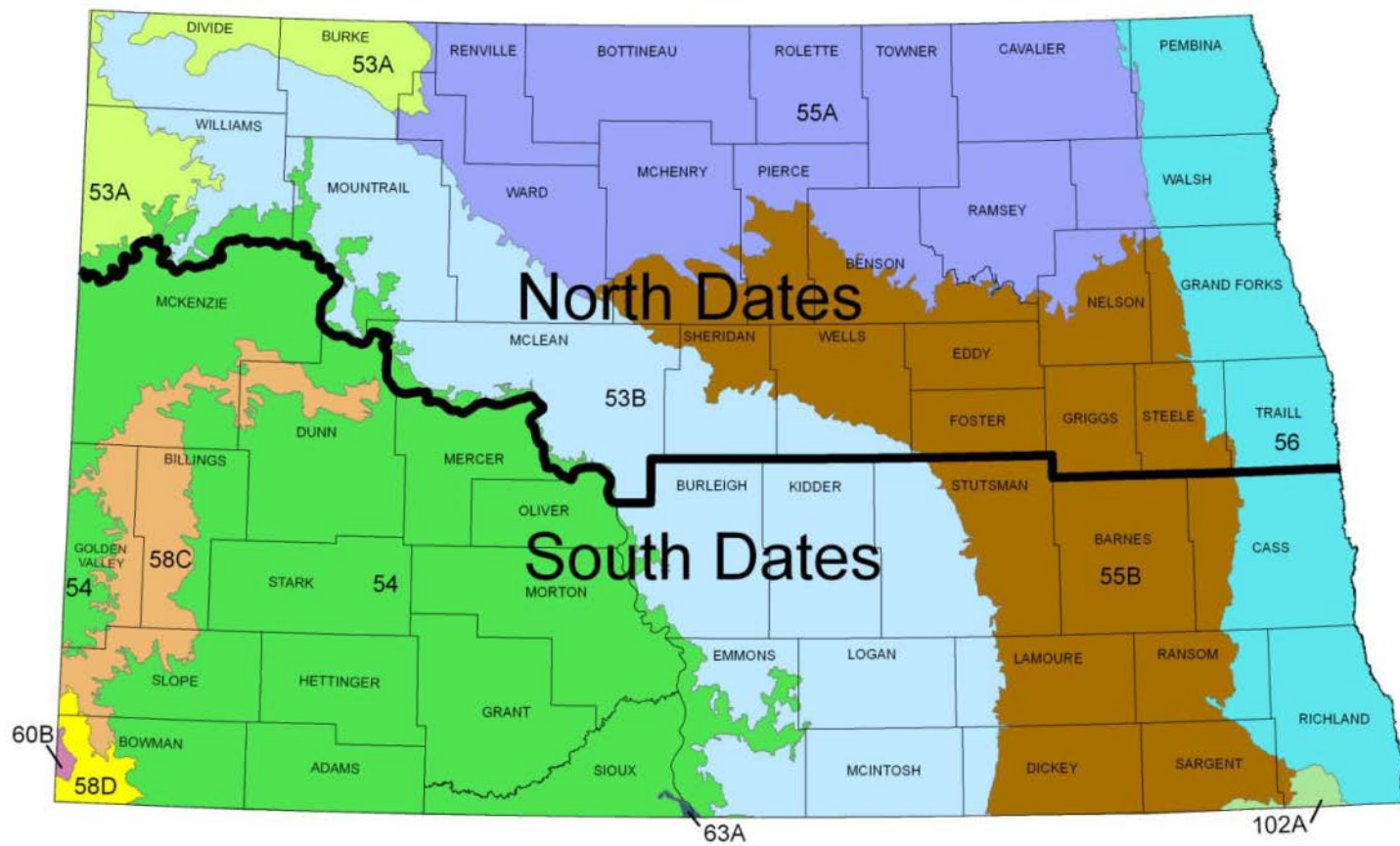


1. Seeding Dates

Seeding Dates		
Species Type and Season of Planting	NORTH (53A, N. 1/2 53B, 55A, N. 1/2 56, N. 1/3 55B)	SOUTH (58C, 58D, 54, S. 1/2 53B, S. 2/3 55B, S. 56)
<u>Cool Season Species</u> Spring Late summer ¹ Late fall (dormant) ²	Prior to May 20 August 10 to September 1 See footnote ²	Prior to May 10 August 10 to September 15 See footnote ²
<u>Warm Season Species</u> Spring	May 10 to June 25	May 10 to June 25
<u>Warm/Cool Season Mix</u> Spring	May 1 to June 15	April 20 to June 1

¹ If legumes are part of a mixture, seed by August 25th. It is essential that alfalfa plants reach the 6-leaf stage prior to fall dormancy, for winter survival. Alfalfa requires 6-8 weeks growth after emergence to develop the 6-leaf stage.

² Seeding may occur once soil temperatures drop to 40° Fahrenheit for a minimum of 5 consecutive days (usually after November 1) based upon North Dakota Agriculture Weather Network <http://ndawn.ndsu.nodak.edu/index.html> or actual field measurements at a depth of 2 inches.



Why are seeding dates important

- Maximize available soil moisture.
- Provide proper climate for seed germination.
 - soil temperatures for quick emergence.
 - 40-50 degree soil temps for cool-season
 - 50-60 degree soil temps for warm-season
- Avoid killing frosts on new seedlings
 - Early spring germination of warm-season species
 - Warm-season grasses usually have elevated growing points more susceptible to frost
 - Fall warm-up after late dormant seedings
- Allow seed stratification if needed
 - May need to break seed dormancy
 - Green-needle grass known for seed dormancy
- Allow sufficient time for plant growth to establish and maintain enough vigor to over-winter. (Alfalfa 6-leaf stage prior to fall dormancy, for winter survival, 6-8 weeks).



2. Landuse

- Use the same species that match the adjacent landuse.
 - Reclamation VS. Production
 - May need to plan for different seed mixes if disturbance goes through multiple land uses.
 - Erosion control should always be considered.



It is critical to use quick establishing species that are adapted to the site

- Use native species when seeding adjacent and through native rangeland
 - Similar forage use and management of the adjacent area.
 - Would crested wheatgrass be the right species to select for revegetating this pipeline?



Photo courtesy of the Watford City NRCS Office

- Topsoil stripped and respread if possible
- Contains organic matter and other soil components needed for plant growth.
- Capitalize on existing seedbank.



Photo courtesy of Mike Brand ND State Land Department

3. Seed Placement

- One of the major reasons of grass seeding failures is seeding too deep.
- The smaller the seed generally means the shallower it needs to be seeded.
- Most grasses should be seeded at a depth of $\frac{1}{4}$ to 1 inch depending on the species being seeded. A depth of $\frac{1}{2}$ inch is generally desirable for most species.
- Dig up seed and measure planted depth. Adjust equipment accordingly

Average Percent Emergence from Same Number of Viable Seed on Loam Soil							
Species	Depth of Planting (inches)						Optimum Depth
	1/2	1	1 1/2	2	2 1/2	3	
bromegrass	94	94	83	62	40	8	1/2 - 1
intermediate wheatgrass	92	98	90	77	38	6	1/2 - 1
tall wheatgrass	93	90	83	61	27	3	1/2 - 1
reed canarygrass	76	73	67	54	37	9	1/2 - 1
crested wheatgrass	87	79	44	6	0	0	1/2 - 1
western wheatgrass	71	72	54	0	0	0	1/2 -1
switchgrass	75	65	45	0	0	0	1/2 - 1
big bluestem	65	59	38	0	0	0	1/2 -1
sideoats grama	62	39	0	0	0	0	1/2
blue grama	61	33	0	0	0	0	1/2
alfalfa	74	40	no data	7	no data	0	1/2
sweet clover	62	30	no data	4	no data	1	1/2

Note: Data on introduced grasses from Canada, Scientific Ag., 26:9 September 1946. Data on native grasses from SCS Nursery, Mandan, ND, June 1949. Data on legumes from University of Minnesota reproduced in the Journal of American Society of Agronomy.

Seed size and seeding rates

- Western wheatgrass
 - 112,000 seeds per pound.
 - 20 seeds per square foot
 - 8 PLS pounds per acre
- Blue grama
 - 750,000 seeds per pound
 - 30 seeds per square foot
 - 2 PLS pounds per acre

Seeding rates are calculated for each species and are dependant on factors such as seedling vigor, seed size, ease of establishment, longevity and aggressiveness.



4. Seed Quality

- Current germination and purity tests (12 months)
- Have good germination
- Are clean and have high purities
- Processed (debearded) so seed is flowable if using a drill
- Use varieties or local sources that are adapted to your region and offer the characteristics that you want.
- Buy seed on PLS basis



Lodorm green needlegrass (left)
compared to a native harvest (right).

Adapted to the Site



Species characteristics

- High seed dormancy (needlegrasses)
- Some species have poor seedling vigor and are slow to establish. (prairie dropseed, bluebunch wheatgrass)
- Quick germination (Bad River blue grama, slender wheatgrass)
- A shorter lifespan but high seedling vigor (slender wheatgrass and Canada wildrye)
- Awned and fluffy seed



Green needlegrass seedlings (July 2009) two growing seasons after a fall dormant seeding (Nov 2007).

Debearded vs. Fluffy Seed



Easy check for seed flow



Is This Porcupine Grass Flowable?



There is no seed trade standard for the degree of debearding. Be careful when purchasing fluffy or awned seed!

Seed Sources/Origins



ORIGIN



Tomahawk indiangrass
ND origin matures 33
days earlier

Holt indiangrass
Nebraska origin

Use adapted species and northern sources for your area!!

Sideoats grama



Green needlegrass



25 days after seeding

Table 2. Approved Named Varieties 1

Species		Recommended Varieties for North Dakota
		Origin of non-varietal ('common') grass seed of both native and introduced is limited to ND, SD, NE, MT, WY, MN, and Canada
Native Warm and Cool-Season Grasses (cont.)		
Bluestem	Big	Sunnyview, Bison, Bonilla, Bounty
	Little	Badlands, Itasca
	Sand	Goldstrike, Garden
Buffalograss		Bowie, Cody
Grama	Blue	Bad River
	Sideoats	Killdeer, Pierre, Butte
Indian ricegrass		Rimrock, Nezpar
Indiangrass		Tomahawk
Prairie cordgrass		Red River
Prairie sandreed		Goshen, Bowman, Koch
Prairie dropseed		Common
Sand dropseed		Common
Switchgrass		Dacotah, Forestburg, Sunburst, Summer
Native Grass-likes:		
Fox sedge (<i>Carex vulpinoidea</i>)		Common
Slough sedge (<i>Carex atherodes</i>)		Common
		Non-varietal ('common') native forbs & legumes will originate or be grown in ND, SD, NE, MT, WY, ID, WA,

What is wrong with the maximilian sunflower?



5. Species

- Two basic planting types
 - Native species (naturally occurring)
 - Important to know site/soils
 - Introduced species
 - Hayland
 - Tame pasture

Classified by Growth Characteristics

- Cool-season
 - Western wheatgrass
 - Green needlegrass
 - Slender wheatgrass
 - Canada wildrye
- Warm-season
 - Sideoats grama
 - Prairie sandreed
 - Little bluestem
 - Blue grama

Most Introduced grasses
are cool-season

Bunchgrass or Rhizomatous

Green needlegrass

Slender wheatgrass

Canada wildrye

Little bluestem

Blue grama

Western wheatgrass

Prairie sandreed

Sideoats grama

Putting a seed mix together

- Site survey
 - Soil inclusions including saline areas, sandy, wetlands etc..
 - Weeds needing control?
- What are the soils and ecological sites?
 - NRCS Web Soil Survey (soil maps)
 - Match species from adjacent native sites (providing the soils are similar).
- What are the primary use of the planting? (native rangeland, tame pasture, hayland, wildlife)
- What equipment do I have available for seeding?

Putting a seeding mix together (cont)

- How many species do I use?
 - Most native mixes have 5-10 species but some use as many as 25 species
 - Can be dependent on size of disturbance
- Diverse mixture of both cool-season and warm-season grass species
- Mixture of bunchgrasses and rhizomatous grass species
- Include forbs and shrubs?
 - Use forbs that enhance your seeding objective
 - What is your weed control plan?

Native species found on Many Western Ecological Sites

- Western wheatgrass
- Green needlegrass
- Slender wheatgrass
- Canada wildrye
- Blue grama
- Little bluestem ?
- Sideoats grama

Commonly used Introduced Species

- Intermediate wheatgrass
- Meadow brome
- Crested wheatgrass
- Alfalfa

Helpful References

- Each County has an NRCS/SCD office familiar with local soils and adapted species and sources.
- Herbaceous Vegetation Establishment Guide
(HANDOUT)
NRCS Field Office Technical Guide - Section I
Page 1 of 26
USDA-NRCS - North Dakota
January 2013
Easiest to find by a web search.
- Grass Varieties For North Dakota
NDSU Extension Service R-794

References

- **Design and Installation Guide (Handout)**

Range planting -550

FOTG- Section IV – Conservation Practices

Page 1-10

USDA-NRCS- North Dakota

Good reference for matching species and percentages to Ecological Sites

Where should I buy?

- Reputable local vendors
- Conservation Seed/Plant Vendors List (Minnesota, North Dakota, and South Dakota (Download from web)).
- Buy on a PLS basis (Purity X Germination)

Rewards of a Properly Planned Seeding



**Uniform germination
and quick emergence**



**Quick establishment is critical in
establishing stands as it provides a
competitive cover against erosion
and existing weed pressure.**

Any Questions?