



United States Department of Agriculture

Natural Resources Conservation Service

Things to Consider when Revegetating Disturbed Sites

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Preconstruction Planning

- Plan for the least amount of site disturbance as possible.
- Leave existing vegetation on as much of the constructed site as possible.
- Less area affected by compaction.
- Limit area for erosion
- Less area to be reclaimed.





Minimize the area and or time soils are unprotected

**Both wind and water erosion
need to be considered**



07

NOTICE

WARNING



Preconstruction

If possible strip topsoil from impacted area.



Reclaiming after Construction

- Hopefully topsoil is available to be respread
- May have to rip thru compacted layer
- Prepare site so not to restrict plant roots
- Water infiltration instead of water runoff.





Soil Considerations

- Compaction
- Salinity
- Texture
- Onsite soil investigation

- NRCS WEB SOIL SURVEY
 - Soil surveys were designed for general conservation planning, not site specific interpretations.

Soil Compaction



No root restriction,
optimum plant
growth potential

Root restriction due
to compaction layer

Salinity



- Leave as much vegetation as possible.
- Less vegetation equals increased evaporation.
- Evaporation will cause salts to move up and laterally.
- Potential to affect additional area is great.





Soil Texture

- Sand
- Silt
- Clay



Ecological Sites

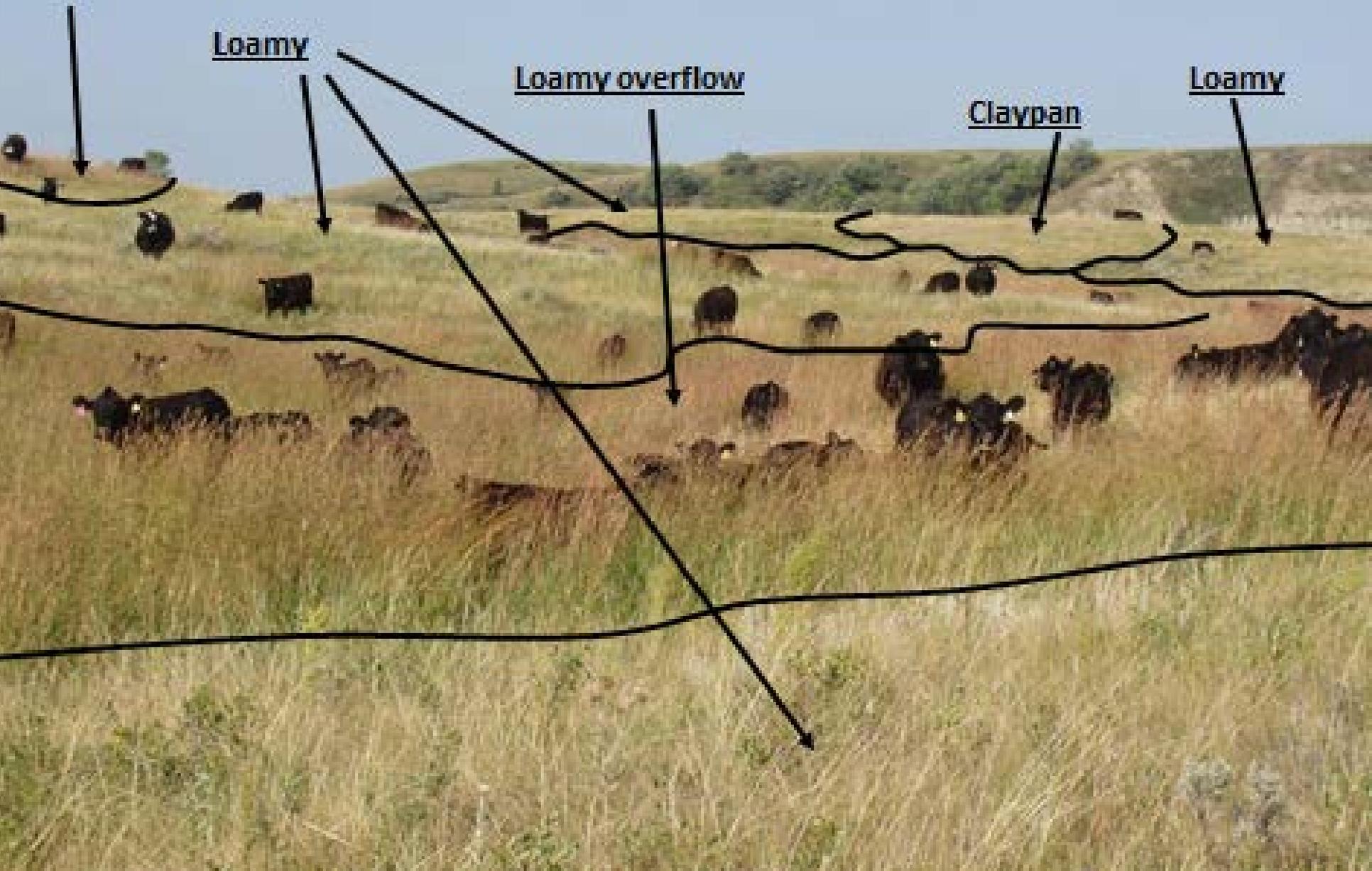
Shallow loamy

Loamy

Loamy overflow

Claypan

Loamy



Plant/Vegetation Considerations

- Species Selection
- Seedbed
- Equipment
- Seeding
- Post management

Species Selection

- What is the final product

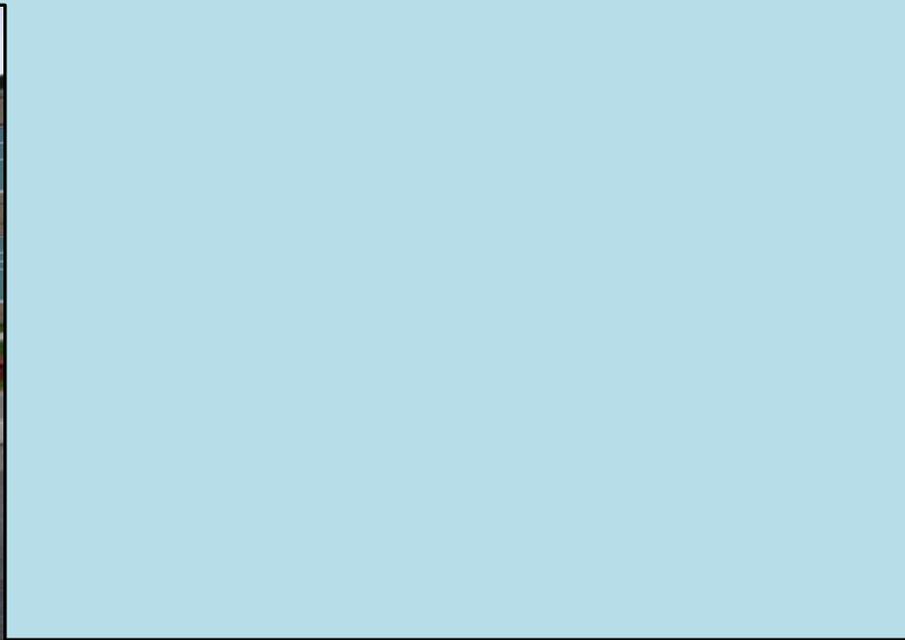
Groomed lawn

Low maintenance planting

Multi species mix or single species?



What is the final goal for landscaping







No water and one mowing per year

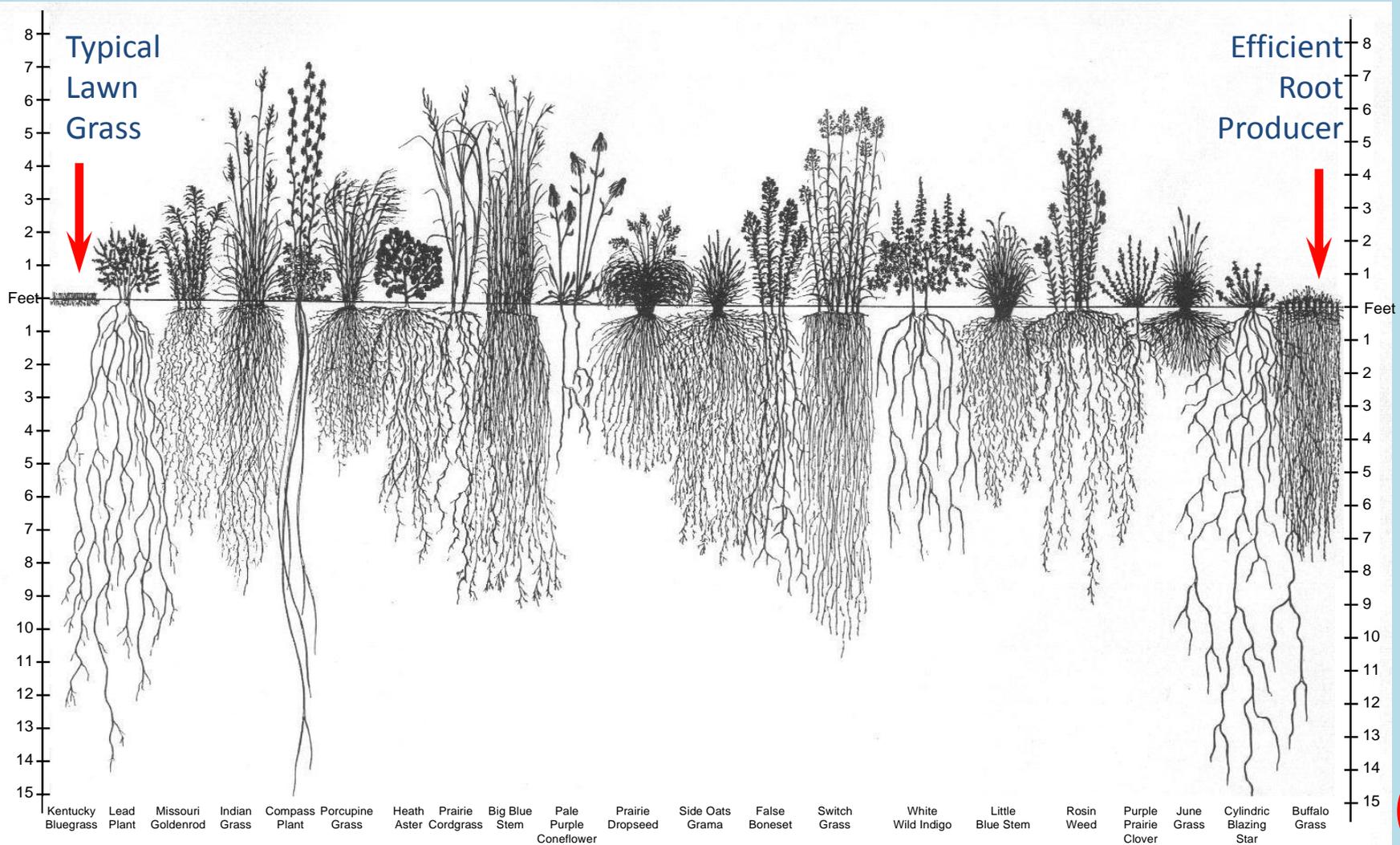


Not All Grasses are the Same

- Cool-season grasses
- Warm-season grasses
- Bunchgrass
- Rhizomatous grass
- Native grass
- Introduced grass

Deep-Rooted Species

ACCORDING TO: www.epa.gov/greenacres/



15 ft

Root Systems of Prairie Plants - From the U.S. EPA Handbook on Natural Landscapes



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).

Debearded vs. Fluffy Seed



Use adapted species and northern sources for your area!!

Sideoats grama

Green needlegrass



25 days after seeding

Equipment

Drill



Broadcasting



Seedbed Preparation

- Weed free
- Be aware of any herbicide carry over in the soil.
- Firm ground for proper seeding depth
- What equipment is available to pack and seed the area
- Broadcast or Drill

Important to have a firm packed seedbed

Clean tilled, weed free and ready to seed?



No!!, not firm enough. Results will be poor depth control. Generally if the soil is worked it will need to be packed before seeding.



Properly Packed Clean-Tilled Seedbed



Barely visible
adult human footprint

Potential for wind
and water erosion

Herbicide burndown

- Provides a firm seedbed without tillage.
- Usually need multiple herbicide applications.
 - Residual carryover
- Reduces both wind and water erosion potential.



Seedbed of clean grain stubble

- Seeded into stubble can mean many things.
- Moisture conservation
- Erosion control
- Firm seedbed
- Weeds controlled?

Is your seeding equipment capable of seeding into this and placing seed at proper depth?

Residue must be uniformly spread across field.



Seeding

- Drill or Broadcast
- Generally recommended to increase the seeding rate 1.5X if broadcasting.
- Turf seeding rates are generally higher than conservation critical area seedings.
 - lawn vs pipeline or road ditch
- Good seed to soil contact is critical.
- Be aware of your seeding depth.



Soil Crusting



Why is Seeding Depth Important?

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.

Sometimes it is Best to Wait

- Consider planting a covercrop for erosion control.
 - Site not properly prepared.
 - Weeds a problem.
 - Improper seeding date for your location.
- What are those dates for North Dakota?



Recommended 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	Prior to May 20	Prior to May 10
Late summer ¹	August 10 to September 1	August 10 to September 15
Late fall (dormant) ²	See footnote ²	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 Seedlings Fail

Germination Through Emergence

- Poor quality seed
- Improper timing
- Temperature (too hot!)
- Improper planting depth
- Seed dries out
- Crusted soil surface
- Toxicity
 - allelopathic effects
 - herbicide carryover



Why Seedlings Fail

After Emergence

- Undesirable pH
- Saline/Sodic
- Low fertility
- Poor drainage
- Drought
- Insects
- Excessive grazing by wildlife and livestock
- Diseases
- Winterkill
- Competition from weeds/companion crops





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Questions

Thank You