Incorporating Native Grasses and Flowers into the Roadside

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History of Revegetation on Roadsides

- 1950's Forage Research
 - Agronomic slant
 - Fescues, crown vetch, flat pea, weeping lovegrass
 - Plants commercially available
 - Natives were the weeds

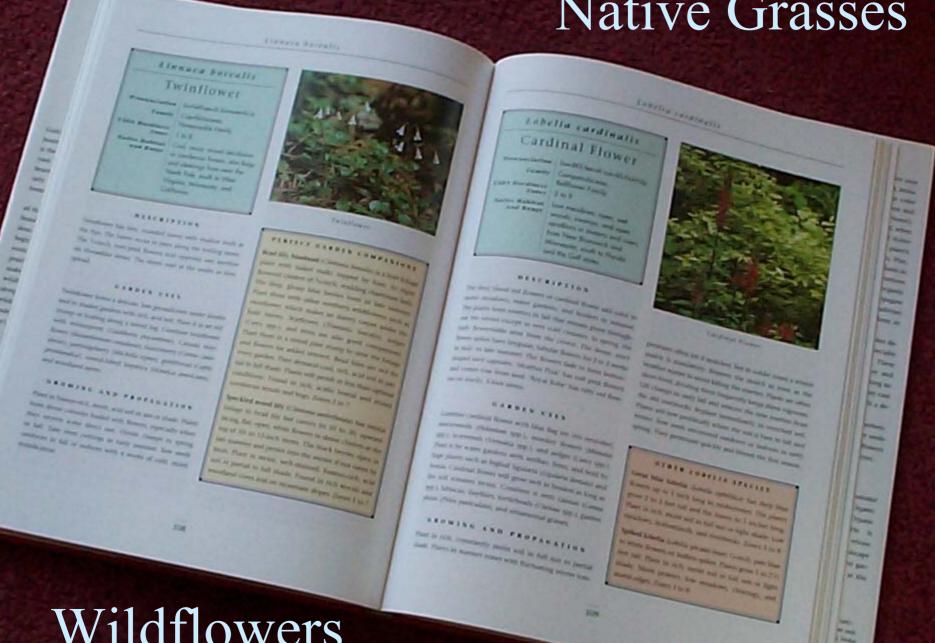
Use of Native Grasses

- 1960's natives acknowledged
- Recent History
 - ◆ 1970&80's Prairie Restoration
 - ◆ 1980's Diversity on Public Lands
 - ◆ 1990's Alien Invasive Plant Species
 - Clinton Directive 1999
- New Direction and Current Status
 - Agencies encouraged to show intention

Our Roadside Research at VT

- Re-Vegetation Research 1960's
- Turf Research –1970 to present
- 1993 Search for <u>adapted species</u>
- 1996 Demonstrations with native plants
- 1997 NG Roadside work for VDOT
- 2001 NG Mine Lands

Native Grasses



Wildflowers

Warm vs Cool Season Grass Culture

Warrn-Season

- C₄ Plants
 - Seed in Spring
 - ◆ Thrive in Summer
- Many are <u>very</u> tolerant of acid & low P soils
- Fertilize in Summer

Cool-Season

- C₃ Plants
 - Seed in Fall
 - Thrive in Fall/Sp
- A few are tolerant of acid and low P soils
- Fertilize in Fall

Examples of Native Grasses

- Warm-Season
 - Big bluestem 6-7'
 - Switchgrass
 - Indiangrass
 - Eastern Gama
 - Little Bluestem
 - Sideoats grama
 - Virginia Broomsedge
 - Beardgrass
 - Bluegrama
 - ◆ Buffalograss 6-8"

- Cool-Season
 - Canada wildrye 4-5'
 - Virginia wildrye
 - Western wheatgrass
 - Creeping red fescue
 - Danthonia
 - Junegrass 4-6"





Growing Switchgrass in Water



Big Bluestem

Andropogon gerardii

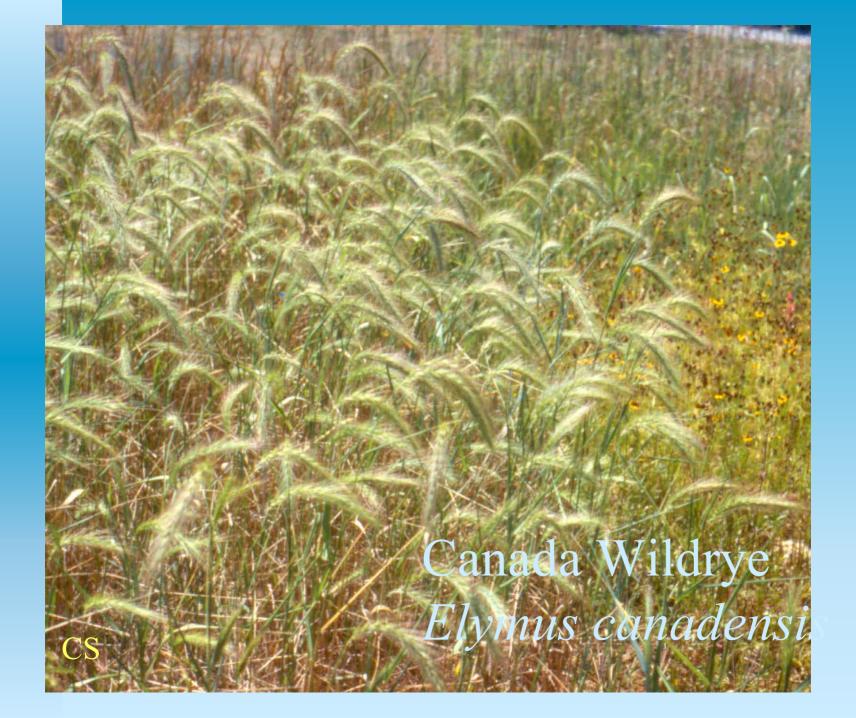


Sorghastrum nutans















DOT Roadside Flowers History

- **Operation Wildflower Program**
 - Lady Bird Johnson -1976
- In Va, 490 A and 30 A Bulbs
- Meadows > Annual Mono-stands
 - > Meadows

Direction of Our Research Since 1998

- Diversity
- **Sustainable Stands of Perennials**
- **■** Native Grasses
- Relaxed Meadow Plantings
- No-Till Planting System Development





Bearded beggarticks

Bidens aristosa

Va Native - Annual





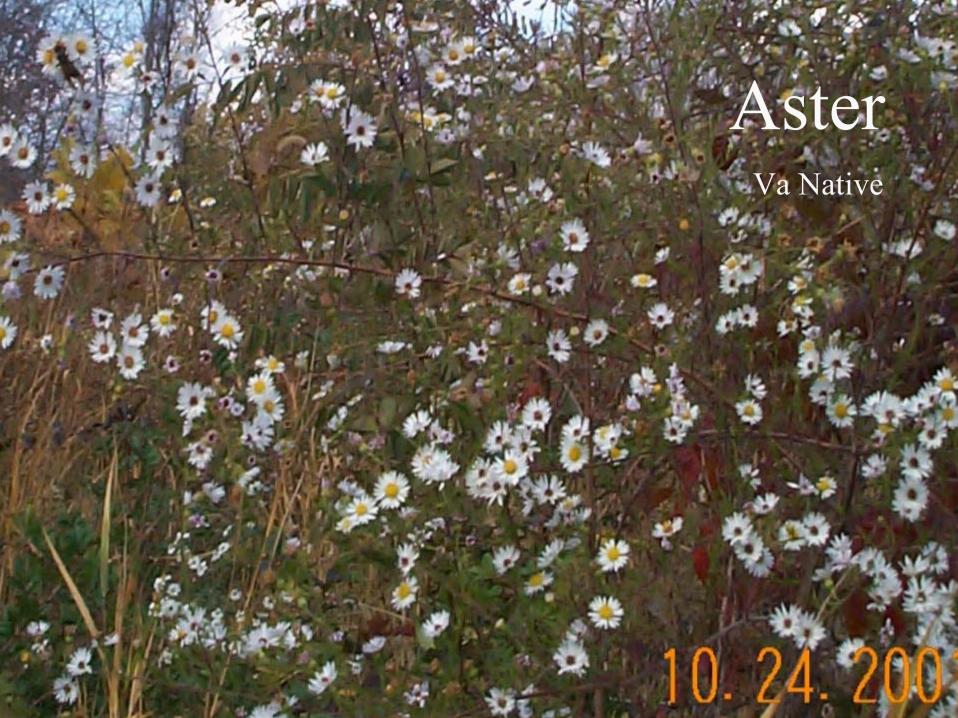






Purple Coneflower

Echinacea purpurea





Swamp Sunflower Helianthus angustifolia

Plants In Review

- Maximillian Sunflower
- Ashey Sunflower
- Sawtooth Sunflower
- Ox-eye Sunflower
- Grey Goldenrod
- Showy Goldenrod
- Lupine

Foxtail
Teasel
Thistle
Prickly lettuce

Roadside Challenges

Soil

Weeds

Weather
Ill-boding Forces

WF/NG Site Preparation

- Soil Compaction Rip
- Adjust pH to 5.5 to 6.5
- \blacksquare P 200 lb/A of 0-46-0 (test soil)
- N/K -Slowly available N is best
 - •0.5 to 1 lb / 1000 ft sq
- Use composts to improve H₂O holding capacity

WF/NG Seeding Recommendations

- Total amount should approach 25-35 lb/A pure live seeds (PLS)
- Rate should be adjusted to site pressure and seeding method
- Keep mixes simple
- Use companion plants
 - Plains Coreopsis (2-4 lb/A)
 - Creeping red fescue (5-10 lb/A)

Planting Natives

- Choice of 3 Methods
 - Broadcast & Roll 5 steps
 - Slit-Seed 3 steps
 - No-Till 3 steps

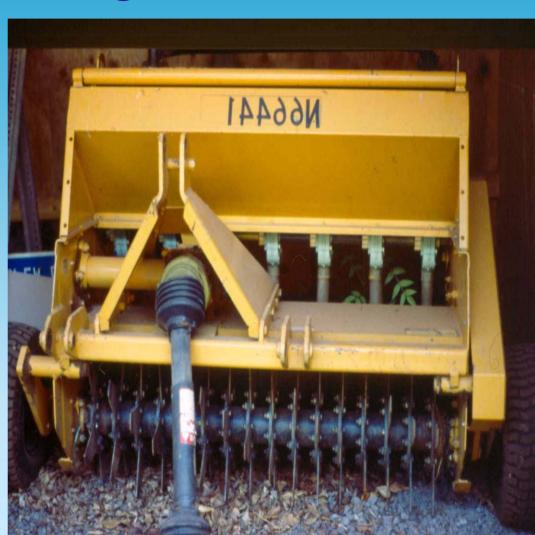
Broadcast Method

- Glyphosate 2x
- Mow
- Till
- Broadcast
- Roll



Slit-Seeding Methods

- Glyphosate 2x
- Mow
- Slit-Seeder



No-Till Method Glyphosate 2x

Mow



Seeding Tricks

- Breaking Dormancy (moist-chill or winter seeding)
- Fluffy Seed Soak and Coat (vermiculite) or spray with hair-gel
- Moist Sand / Cat litter / soybean meal
- Graphite Powder

Maintenance of Established Site

- Fertilization Apply N-P-K @ 0.5 lb/1000 ft² in summer for WS grass and fall for CS and WF
- Weed Control Choices
 - Mow 6-8" high
 - Pre-plant > pre-emergent herbicides
 - Post-plant > post-emergent herbicides
 - Burn in winter
- Clipping to reduce height

Convincing Agencies to Use Native Plants

- **Erosion Control Issue**
- Long-term Persistent Cover (5 years +)
- **■**Cost
- Public Perception



October 2001 Abandoned Coal Mine Refuse Pile Data (DMME) (% Ground Coverage)

Switchgrass + Mix* 75%

Eastern Gama + Mix 68

Big Bluestem + Mix 88

TF+Birdsfoot Trefoil+White Clover+German Millet 97

*Mix = LB-Indiangrass-CRF-Tickseed

Promoting Native Plants

- Erosion Control & Persistence
 - Support research
 - Time will provide experience
- Reduce Seed Cost
 - Court Seed Producers
 - Work with Va Seed Certification Program
 - Support Seed Development

Promoting Native Plants

Public Perception

- Education
 - Elementary Schools
 - Cooperative Extension Network
 - Elder Hostels
- Auto Tag Program
- Collaborate with Agencies
- Acknowledge plantings that are favorable positive reinforcement works!

