SUCCESSFUL USE OF NATIVE SEED

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E. “Kika” de la Garza
Plant Materials Center

- A Division of the Natural Resources Conservation Service
  - 27 centers across the US
  - Develop plant releases and technology to meet conservation needs
  - Work mainly with native plants
E. “Kika” de la Garza
Plant Materials Center

Our Program Emphasis

- Rangeland Habitat Restoration & Enhancement
- Coastal Habitat Restoration & Enhancement
- Coastal Shoreline Stability
- Erosion Control & Water Quality Improvement
- Biofuels
South Texas Natives

A Mutually Beneficial Partnership

- Part of the Caesar Kleberg Wildlife Research Institute at TAMUK
- Formed due to the lack of commercially available native materials adapted to South Texas
- Brought in 1,728 collections since 2001
- Numerous off-site evaluations & plantings
Goals and Objectives

- Ecotypic Seed Mixes
- Effective Planting Strategies
- Education Program
Eco-regions of Texas

- EDWARDS PLATEAU
- BLACKLAND PRAIRIE
- SOUTH TEXAS PLAINS
- COASTAL SAND PLAINS
- OAK WOODS AND PRAIRIES
- GULF COAST PRAIRIES AND MARSHES
- TRANS-PECOS, MOUNTAINS AND BASINS
History of Native Seed in South Texas

- Prior to 2006 there was very little adapted, native seed commercially available in South Texas.
- Now there are 24 native, ecotype seed releases for South Texas.
- Results from over 30 plantings show an overall success rate of at least 70% when using a diverse mixture of 11 species or more.
Successful Use of Native Seed

- Commercial Availability of Ecotypic Seed
- Site and Seedbed Preparation
Types of Available Seed

- Single Species Cultivar
- Single Species Ecotype
- Wild Multiple Species Bulk Harvest
Cultivar Release

- Cultivar
  - Usually bred and “improved” by selection
  - May be better for increased forage production or in highly disturbed sites with competition from numerous exotic species
  - But may not be locally adapted to your site
Ecotype Release

- Ecotype Concept
  - A mix of numerous collections of a species
  - A broad spectrum of the genetic makeup adapted to a specific ecoregion
  - Used to restore local habitat
  - Not an exact match, but closer than seed from out-of-region origins
  - Tested to be sure of adaptation and performance
  - Sold on a PLS basis
Ecotype Release

Process

- Collect seed from natural populations within an ecoregion
- Intention is to capture locally adapted genetics
- Collections are compared for critical traits, and selections are made for a release
- No breeding is done for “Natural Track” releases
Ecotype Seed

- Higher genetic variation compared to single site
  - Increases likelihood that genes for adaptation will be present (over 1 accession)
  - Natural selection will operate more easily on genetic material possessing greater diversity
  - Especially appropriate for a species that exhibits continuous genetic variation
    - Long-lived, wind pollinated, cross pollinating, perennials
Wild Bulk Harvest Seed

- Native, locally adapted seed
  - Atwater Prairie Preserve/Pierce Ranch
  - Generally harvested 1 time during the season
  - Harvested at 1 height
    - Some plants are not harvested at maturity
    - Some plants are not harvested because too low or too high
    - Generally no PLS test – so unsure of actual species and germination
    - However, good compliment to ecotypic seed (if weed free)
      - Adds additional species for diversity
Restoration Seed Mixes

- Focus on plant functional groups from a concise regional area.
- Select for genetic and environmental adaptation.
- Provide grower and user-friendly material.
- Release after proven success only!
Seed Mixtures Using 6 Functional Groups

- Early successional grasses, legumes and annual forbs (50% of mix)
- Mid successional grasses (25% of mix)
- Late successional species rarely establish without other species present (25% of mix)
  - Include cool-season and warm season species.
Ideal Seed Mix for the Texas Coast

- Early Successional Species:
  - Knotroot bristlegrass
  - Silver bluestem
  - Fall panicum
  - Red lovegrass
  - Purpletop
  - Virginia wildrye
  - Texas wintergrass
  - Meadow dropseed
  - Brownseed paspalum
Ideal Seed Mix for the Texas Coast

- Late Successional Species:
  - Little bluestem
  - Indiangrass
  - Switchgrass
  - Eastern gamagrass
  - Florida paspalum
  - Beaked panicum
  - Longspike Tridens
Available Seed Mix for the Texas Coast

**Early Successional Species:**
- Texas grama            5%
- Hairy grama            5%
- Hooded windmillgrass   10%
- Shortspike windmillgrass 10%
- Hall’s panicum         5%
- Purpletop              5%
- Sideoats grama         5%
- Canada/Virginia wildrye 10%
- Tallow weed blend      10%
- Partridge pea          5%
Available Seed Mix for the Texas Coast

- Late Successional Species:
  - Indiangrass 5%
  - Switchgrass 5%
  - Eastern gamagrass 5%
  - Florida paspalum 5%
  - Illinois bundleflower 5%
  - Maximilian sunflower 2%
  - Engelmann daisy 3%
Critical Concerns for Seeding Projects

- Land use history
- Site attributes
- Site preparation and resulting seedbed
- Planting method, date, and seed mixture
- Post planting precipitation
- Post planting management
Double disking only was the site preparation method for most failed plantings.

Site preparation methods that resulted in the best establishment:

- Deep plowing + multiple disking
- Herbicide (glyphosate) – (tebithiuron) only (no till drill)
- Sorghum cover crop + disking
Site Preparation Methods

- Conduct treatments over more than 1 growing season.
- Control of the seedbank of unwanted plants is very important.
- Fire, herbicides, and soil disturbance all have their place, in combination.
- Deep tillage, followed by repeated, shallow cultivation over long, wet intervals is the most successful control of exotics.
- Repeated, low rate applications of glyphosate or a single application of tebuthiuron are also effective, especially if no-till drilling is a planting option.
Seedbed Conditions

- 100% success in firm, aggregated seedbeds
- Failed seedings were in:
  - Cloddy, uneven seedbeds
  - Loose, fluffy seedbeds
Seedbed Conditions
Planting Methods

- Most plantings done with a Truax® Flex II drill
- Drilling: 76% successful
- No-till drilling:
  - 100% successful
- Broadcast seeding is not as effective as drill seeding in our assessment
Recommendations:

1. Use multiple seedbed preparation treatments to create an ideal seedbed and control the seed banks of undesirable plants before planting.

2. Maximize diversity in your seed mix by selecting from the various plant functional groups—but be sure to include large percentages of early successional species.
The Continuing Challenge

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