



Photo by Forrest Smith

Carrizo Germplasm little bluestem in a sandy soil restoration planting in the South Texas Sandsheet

Native seed releases for sandy soil restoration in South Texas

By *Forrest S. Smith*

Savvy quail hunters know that good quail country in South Texas is often characterized by gopher mounds, native bluestem grasslands, and sandy soil. Many of these areas represent the premier wildlife habitat in the region, especially for bobwhite quail. In large part, these sand, sandy loam, and loamy sand soil wildlife meccas exist today because most of these areas were unsuitable for cultivation, lacked surface water and soil nutrients allowing for habitual overgrazing, and would not grow exotic grasses available for use in past decades. As a whole, much of the sandy land in

South Texas has, and will continue to be used primarily for grazing, and increasingly such country's primary value is for quail hunting.

Although many sandy rangelands in South Texas have been relatively insulated from disturbances that negatively impacted the native plant communities in the past, times are changing. Man-caused disturbances are today widely impacting these "sweet spots" as commonly as other sites in the region. For example, in just the last decade in the South Texas Sandsheet, large scale disturbances from wind farms, oil and gas pipelines, uranium exploration, electric transmission lines, and transportation infrastructure improvements have occurred. More of each is ahead in all likelihood. These activities have created substantial need and demand for native seed sources for use on

sandy rangelands in South Texas. For the past 5 years, one of South Texas Natives' priorities has been developing seed sources for use on sandy soils, in hopes of helping landowners maintain these wildlife-critical rangelands that increasingly face impactful disturbances.

Most native plant communities on sandy soils in South Texas are grass dominated in undisturbed states, and have extensive seedbanks of forbs and legumes. We have long worked with many of the dominant grasses found on these sites, including little, seacoast, and big bluestems, switchgrass, and Yellow Indiangrass. But along with these late seral grasses, we have also spent considerable time developing seed sources of early seral grasses, many of which are the true keys to successful reclamation of sandy sites after disturbance.

Early seral grasses for sandy soils we have or are working with include hooded windmillgrass, slender and hairy grammas, red lovegrass, southern witchgrass, and sand dropseed. Our focus on native grasses, instead of forbs or legumes for sandy sites has been guided by patterns of degradation observed on sandy soils in the past decade and a half. Many observations suggest that without the reestablishment of competitive native grass cover (which is typically lost in most man-caused disturbances), and despite naturally strong forb and legume communities in seedbanks, disturbed sandy soils are especially prone to invasion by guineagrass. As a result, most all native plants

are often eliminated from these disturbed sites. Wind erosion, and subsequently loss of the ability of sandy sites to grow adapted native vegetation is another serious concern.

We are pleased to report that beginning in 2015 and over the next few years, STN and the “Kika” de la Garza Plant Materials Center will be helping commercialize a considerable number of new seed releases that should tremendously improve the ability to restore native grass communities on sandy rangelands in South Texas. The first of these releases, which should be available to consumers in late fall 2015, is Carrizo Germplasm little bluestem. Little bluestem is perhaps the most charismatic sandy soil-plant species in many areas, and this release has been extensively tested and proven successful in a variety of planting trials. In 2016, releases of switchgrass, red lovegrass and sand dropseed will follow. Also, final seed increases allowing release of big bluestem and Yellow Indiangrass selections originating from South Texas are being planted this spring, and releases of these two species should be available by 2016. These 6 releases, in addition to the successful commercialized releases of slender grama, hairy grama, and hooded windmillgrass, should be game changers for restoration of sandy soils in the region, and help conserve and enhance these sandy soil oases for generations of hunters and wildlife to come. 🌿

Forrest Smith is the Dan L Duncan Endowed Director of South Texas Natives and Texas Native Seeds. He has worked for the program since 2001.

News from South Texas Natives

- In November, the **Texas Transportation Commission** approved new seeding specifications for roadside seeding in rural areas of South Texas. The new seed mixes specified are 100% native, with the majority of the species included made available through the work of STN and its partners. TxDOT also made sweeping changes to all rural seeding specifications in their Central and West Texas districts. Based on findings from our *Texas Native Seeds (TNS)* Project sponsored by TxDOT, all exotic grasses were removed from rural seeding mixtures in these regions as well. The new specifications are available online at <http://www.txdot.gov/business/resources/txdot-specifications.html>
- Last fall, a **124 mile long natural gas pipeline** was installed from Agua Dulce to near Rio Grande City. STN personnel provided native seed mix recommendations to 13 private ranches impacted by this

pipeline right of way, as well as to the revegetation contractors completing the reseeding work on other portions. Results of these extensive restoration seedings will be monitored by STN for the next few years on several of the ranches we assisted.

- STN personnel and our collaborators were authors of 2 articles published in **Native Plants Journal** in 2014. STN has authored or co-authored the 2nd most articles in this national level scientific journal since it was established in 2000, with 15 papers. The top contributing program was the USDA Forest Service Rocky Mountain Research Station. Other top contributors to the journal include scientists from the USDA Agricultural Research Service in Utah, USDA National Reforestation, Nurseries and Genetics Resources Program, and the University of Idaho. We are proud of the stature of STN both nationally, and internationally, among native plant programs.
- STN and Texas AgriLife Extension Range Specialist and STN Technical Committee Member Dr. Megan Clayton recently published a



Photo by Forrest Smith

Native grass seed mixes for rural areas of South Texas were approved for use by TxDOT in late 2014

6 part extension publication series titled “Reseeding Natives in South Texas”. Each publication provides detailed information on native plant restoration topics, including site preparation, seed mix selection, planting techniques and equipment, post-planting management, noxious plant control, and mistakes to avoid. These publications can be downloaded for free from the Texas AgriLife Extension Bookstore (<http://www.agrilifebookstore.org>) or the STN Website.



Photo by Dusty Crowe/USDA NRCS

Large scale restoration seedings like this one in Dimmit County are being conducted by private landowners using STN developed seeds.



Reseeding Natives in South Texas:
Selecting the Seed Mix

The success of a native planting can depend on choosing the right seed mix (Fig. 1). Buying seeds for a vegetable garden is easy—they are readily available, almost guaranteed to grow in most soil types, and can be grown under many conditions.

However, native seeds must be selected according to their ability to grow in a specific soil type and under certain weather conditions. How will you know which seeds to buy? These resources can help you determine which plants may do well at your South Texas site:

- Nearby native remnant fields
- Ecological site descriptions (ESDs) produced by the U.S. Department of Agriculture's Natural Resource Conservation Service (USDA-NRCS)
- The South Texas Natives website at <http://kwr.tamuk.edu/research-program/south-texas-natives/>

Nearby native remnant fields

Areas that have the same soil type as yours may offer clues about which native plant species to reseed. Take some plant field guides to a nearby area where native plants grow, and identify some of the dominant plants.

It is helpful to know some history about the property, such as whether livestock overgrazing may have eliminated many of the desirable forage grasses. Nevertheless, exploring nearby areas can give you some hints as to what plants could do well at your reseeded site.

Ecological Site Descriptions

Ecological site descriptions are the product of a land classification system used by the USDA-NRCS. These classifications are based on soils, location, and annual precipitation.

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An ESD lists the plant species typically found on a specific soil type or location. ESDs are available via:

- The Web Soil Survey site (<http://websoilsurvey.sc.egov.usda.gov/App/HomePage.html>) by the U.S. Department of Agriculture's Natural Resource Conservation Service (USDA-NRCS). On this site, first define your "Area of Interest" and then access the ESD from the "Soil Data Explorer" and "Ecological Site Assessment" tabs.
- The SoilWeb application (<http://soilwebresource.laer.ucdavis.edu/etools/index02/>), which was developed by the California Soil Resource Lab of the University of California-Davis. Your location will be determined using your phone's internal GPS. This application can also be downloaded for use with Google Earth on a computer.

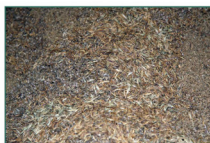


Figure 1. A seed mix that includes more than a dozen plant species.

is “**Converting bermudagrass to native warm-season grasses in the Cross Timbers, Blackland Prairie, Post Oak Savannah, and Coastal Prairies Ecoregions of Texas**”. STN and TNS cooperators Dr. Jim Muir of Texas AgriLife Research and Tarleton State University is the lead investigator. A key component of the project will be evaluating seed releases developed by STN and TNS for this need, as well as refining control techniques for bermudagrass. 🌿

available. Thus, many landowners are interested in a low input, native option for game bird food plots.

In order to see if any of the seed sources released by the *South Texas Natives* program would fill this role, we planted Oso Germplasm Hall’s panicum, Venado Germplasm awnless bushsunflower, Zapata Germplasm Rio Grande clammyweed, Balli Germplasm prostrate bundleflower, Rio Grande Germplasm prairie acacia, and Catarina Blend bristlegrass in food plots on 6 ranches last summer. Each species was established in a monoculture plot within a larger food plot in an attempt to determine if there were any preferences between species planted, and adjacent traditional food plot crops at some sites. The planting sites were spread throughout South Texas. Three of the 6 planting sites were irrigated. We sampled each plot in fall 2014 to determine performance.

Unfortunately, by most standards these food plots were a failure and provided little benefit for attracting or providing food sources for game birds. There were seeded plants that did establish at

Native Seed Sources for Game Bird Food Plots

By Tony Falk

The practice of planting agriculture crops such as milo, sunflowers, and sesame to attract and provide food for doves and quail is a common practice throughout South Texas. Many of these crops require irrigation, fertilization, and specialized equipment to be successful. Even when these agriculture crops are a success, doves and quail are often found consuming native foods instead when they are

A new publication series was completed with Texas AgriLife Extension

- Large scale restoration seedings are increasingly being conducted by private landowners in South Texas because of the commercial availability of native seeds. In 2014, we learned of at least 5 private land seeding projects that have been completed that exceeded 200 acres in size. STN personnel have worked closely with most of these landowners on seed mixture composition and planting techniques.
- STN personnel will be assisting with a 4 year research project funded by Texas Parks and Wildlife Department beginning in early 2015. The title of the project



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Photo by Forrest Smith

Rio Grande clammyweed shows promise for dryland gamebird food plots in South Texas

each location to varying degrees depending on location and species. The most successful species were Zapata Germplasm Rio Grande clammyweed, Balli Germplasm prostrate bundleflower, and Oso Germplasm hall's panicum. In addition to drought, the major problem in all of the food plots was the competition with annual grasses such as crabgrass. This

problem may have been caused by low seeded plant density which we suspect was product of utilizing reduced planting rates for each species in an effort to ensure bare ground for doves to feed on, and to decrease costs. Another issue observed is that the majority of the seed set occurred during the split between the first and second hunting seasons for

doves, resulting in a low amount of seed available for birds to forage on during typical hunting periods.

Overall, we learned from this pilot project. We plan to implement a second trial in 2015 with a few minor changes. Based on the first plantings, we will plant only the 3 species that performed best. We plan to seed each species at the full planting rate to hopefully help reduce the amount of annual grass competition. Finally, we will plant earlier in the year to take advantage of available soil moisture and hopefully better match seed maturity to hunting season dates. ♣

Tony Falk is the research coordinator for South Texas Natives and Texas Natives Seeds.

