USDA
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Natural Resources Conservation Service

2016 Progress Report of Activities
E. "Kika" de la Garza Plant Materials Center
Kingsville, Texas

Following are highlights of some of the activities of the PMC for 2016. Please contact the PMC for more detailed information.

New Seed Releases with South Texas Natives

In 2016, South Texas Natives and the USDA-NRCS E. "Kika" de la Garza Plant Materials Center completed two cooperative releases. Both are a selected plant material class of certified seed (natural track). No intentional breeding, selection or genetic manipulation was carried out within these populations.

Nueces Germplasm sand dropseed, photo by South Texas Natives

Nueces Germplasm sand dropseed [*Sporobolus cryptandrus* (Torr.) A. Gray.] is a perennial, early successional, bunch grass. This selection is made up of 5 different accessions originating from the Rio Grande Plains, Gulf Coast Prairies and Marshes, and Coastal Sand Plain. These five accessions were chosen from 26 accessions evaluated at three locations in South Texas.

Nueces Germplasm sand dropseed should be useful for critical site revegetation, right-of-way plantings and for inclusion in range seeding mixes. Sand dropseed is a warm season bunchgrass that is adapted to a wide variety of soils and climates. This species forms extensive fibrous root systems which assist in the stabilization of sandy soils. Seed of sand dropseed is eaten by a variety of game birds, and the plant provides fair forage for cattle. Nueces Germplasm has high germination rates and is able to provide quick cover following seeding. The area of known adaptation of Nueces Germplasm includes the Rio Grande Plains (MLRA 83A, B, C and D), Coastal Sand Plain (MLRA 83E) and Gulf Coast Prairies and Marshes of Texas (MLRA 150A and B).

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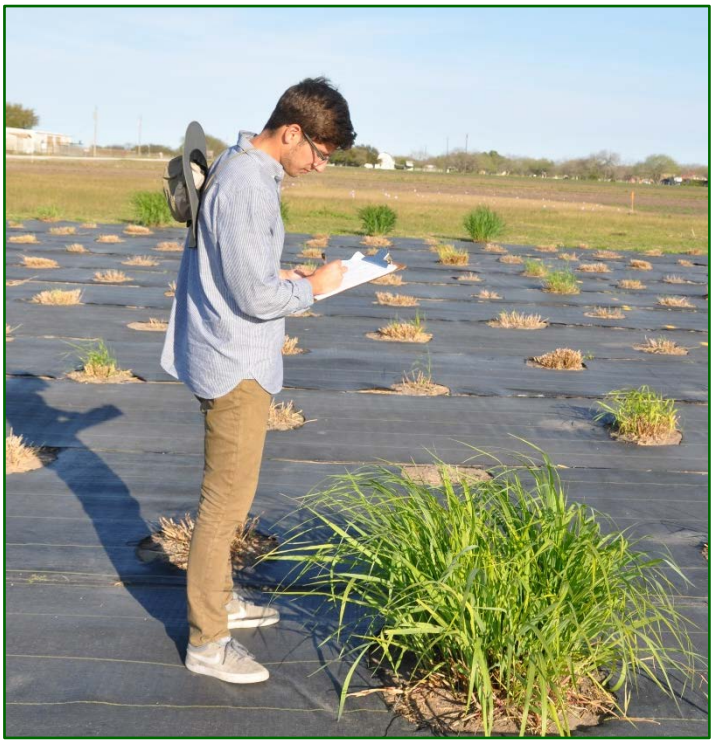
Duval Germplasm red lovegrass, photo by South Texas Natives

Duval Germplasm red lovegrass [*Eragrostis secundiflora* (J.) Presl spp. *oxylepis* (Torr.) S.D. Koch] is a low growing, early successional bunchgrass, and is easily identified by the pink to reddish color of the seed heads. It flowers throughout the summer and fall in South Texas. This selection is made up of 4 different accessions originating from the Rio Grande Plains, Coastal Sand Plain, and Gulf Coast Prairies and Marshes regions of Texas. These four accessions were chosen from nineteen accessions evaluated at three locations in South Texas.

Red lovegrass is a warm season perennial that provides quick cover in sandy and sandy loam soils that are prone to erosion. Duval Germplasm red lovegrass is recommended for use in critical site revegetation, roadside plantings, and for inclusion in range seeding mixes. Duval Germplasm has shown excellent seed quality and active germination. Best performance of this seed source has been observed on medium to course textured soils in the region. The area of known adaptation of Duval Germplasm includes the Rio Grande Plains (MLRA 83A, B, C and D), Coastal Sand Plain (MLRA 83E) and Gulf Coast Prairies and Marshes of Texas (MLRA 150A and B).

Exploring Switchgrass Responses to Climate Change

In March of 2014, we were contacted by Dr. Tom Juenger, professor at the University of Texas in Austin, to help collaborate on his work with switchgrass and Hall's panicum. Juenger has been funded by the Plant Genome Research Program of the National Science Foundation (NSF) to explore the genetic basis of physiological responses to climate change in the two C4 perennial grasses, switchgrass and Hall's panicum. The research includes physiological genomic studies of upland/lowland switchgrass, drought responses, common garden studies of switchgrass performance across geographical variation, genetic mapping of diverse traits and modeling studies of switchgrass yield under climate change.



Sam Lutfy in the Switchgrass Plot, photo by Shelly Maher

Genome enabled research has characterized the myriad expression and metabolite responses of many species to common stresses such as drought, temperature extremes, light stress and salinity. A promising avenue is the use of locally adapted natural variation to winnow out the beneficial responses from the maladaptive consequences of stress. One largely unexplored phenomenon is the role of priming, hardening or stress memory to abiotic stress responses. In this scenario prior exposures to

an environmental challenge improve plant performance by facilitating more appropriate, rapid or sustained responses to future challenges when they occur. Most likely adaptive stress memory exists in long-lived, clonally reproducing (tillering), perennial species with widespread geographical distributions and that exhibit legacy effects from stressful situations. Adaptive phenotypic plasticity and stress memory may be important features under the context of climate shifts.

In the spring of 2016, Dr. Juenger detailed Sam Lutfy to assist us in our collaborative work with him. Sam is a graduate of Pennsylvania State University. He has experience in agricultural research studies, greenhouse management and landscaping. He is hard-working, reliable, and diligent. He has helped us with Dr. Juenger's studies as well as PMC specific work. We are happy to have Sam as a member of the PMC team.

Seed Collections Needed

The PMC is seeking seed collections in 2017 including: Virginia wildrye (*Elymus virginicus*), partridge pea (*Chaemaecrista fasciculata*), Engelmann's daisy (*Engelmannia peristenia*), and swamp sunflower (*Helianthus angustifolius*). Species description sheets as well as seed collecting protocols can be found on the Texas Plant Materials Program website or contact the PMC for more information.

Engelmann's Daisy, photo by Shelly Maher

About the PMC

The E. "Kika" de la Garza Plant Materials Center (PMC) is a 91-acre facility established to provide cost-effective vegetative solutions for soil and water conservation problems. This means identifying plants and developing techniques for successful conservation use. It also means assisting in the commercial development of these plants and promoting their use in natural resource conservation and other environmental programs.

The PMC was established in 1981. It is one of 25 centers located throughout the United States. The PMC is operated by the United States Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS), in cooperation with Texas A&M University-Kingsville, the Caesar Kleberg Wildlife Research Institute (CKWRI), South Texas Association of Soil & Water Conservation Districts, and the Gulf Coast Association of Soil & Water Conservation Districts. The Kika de la Garza PMC serves approximately 27 million acres of the southern portion of Texas.

Program Emphasis

The mission of the E. "Kika" de la Garza PMC is to develop and transfer plant science technology to solve natural resource problems in the South Texas area. Plant testing and plant selection as well as the development of new plant science technologies are the primary products of our program. The PMC conducts plantings and studies at the Center and off-Center with cooperating partners. The PMC works with NRCS Field Offices and Resource Conservation and Development (RC&D) groups, Conservation Districts, federal and state agencies, and private landowners.
Our current program emphasis at the PMC is in the following areas:

- Rangeland Habitat Restoration and Enhancement
- Pollinator Habitat
- Coastal Shoreline Stabilization
- Coastal Habitat Restoration and Enhancement
- Erosion Control/Water Quality Improvement on Agricultural Land
- Biofuels

Publications for FY 2016

D. Lowry, J. Bonnette, J. Lovell, E. Milano, F. Fritschi, J. Reilley, et al. QTL x Environment Interactions in Switchgrass (*Panicum virgatum*). NSF Plant Genome Conference. (Poster)

Falk, A, S. Maher, and J. Reilley. Duval Germplasm red lovegrass Release Brochure. South Texas Natives and STPMC.

Falk, A., F. Smith, J. Reilley, and S. Maher. Duval Germplasm red lovegrass Release Notice. South Texas Natives and STPMC.

Falk, A., F. Smith, J. Reilley, and S. Maher. Nueces Germplasm sand dropseed Release Notice. South Texas Natives and STPMC.

Falk, A., S. Maher, and J. Reilley. Nueces Germplasm sand dropseed Release Brochure. South Texas Natives and STPMC.

Maher, S. and J. Reilley 2016. Red Lovegras Plant Guide.

Reilley, J. and S. Maher 2016. Year 2015 Progress Report of Activities.

Tilley, D., L. St. John, and D. Ogle 2016. Sand Dropseed Plant Guide. Idaho PMC & edited by STPMC.

Presentations for FY 2016

Maher, S. The E. "Kika" de la Garza Plant Materials Center. Master Naturalists Meeting. South Texas Botanical Gardens and Nature Center, Corpus Christi, TX.

Reilley, J. The South Texas Ecotype Approach to Rangeland Restoration. Society of Range Management Meeting. Corpus Christi, TX.

Reilley, J. The Science Behind Plant Material Releases and Why They Are Used in Conservation Planning. Presentation and Tour to NRCS Range Conservationists National Workshop. STPMC Kingsville, TX.

Reilley, J. Developing & Implementing a Strategic Plan for a Plant Materials Center. Training at the PMC Fallon, NV.

Maher, S. Pollinator Habitat. Training session as part of a CRP & Pollinators Workshop. National Butterfly Center, Mission, TX.

Reilley, J. STPMC 2016 Expectations. SWCD Meeting. Sarita, TX.

Current Availability of South Texas Ecotype Releases			
Common Name	**Scientific Name**	**Available From**	**Available**
Lavaca Germplasm Canada Wildrye	*Elymus canadensis*	Turner, Douglass King, Bamert and Pogue	Now
Falfurrias Germplasm Big Sacaton	*Sporobolus wrightii*	Douglass King, Bamert and Pogue	Now
Kinney Germplasm False Rhodes Grass	*Trichloris crinita*	Douglass King, Bamert and Pogue	Now
Catarina Blend Bristlegrass	*Setaria leucopila* & *Setaria vulpiseta*	Douglass King, Bamert, Pogue, and Turner	Now
Mariah Germplasm Hooded Windmillgrass	*Chloris cucullata*	Douglass King Seed Pogue Agri Partners Bamert Seed	Now
Welder Germplasm Shortspike Windmillgrass	*Chloris subdolichostachya*	Douglass King, Pogue, and Bamert	Now
Dilley Germplasm Slender Grama	*Bouteloua repens*	Douglass King, Pogue, and Bamert	Now
Chaparral Germplasm Hairy Grama	*Bouteloua hirsuta*	Douglass King, Pogue, and Bamert	Now
Atascosa Germplasm Texas Grama	*Bouteloua rigidiseta*	Douglass King, Pogue, and Bamert	Now
La Salle Germplasm Arizona Cottontop	*Digitaria californica*	Douglass King, Bamert, Pogue, and Turner	Now
Zapata Germplasm Rio Grande Clammyweed	*Polanisia dodecandra* ssp. *riograndensis*	Douglass King, Pogue, and Bamert	Now, limited
Maverick Germplasm Pink Pappusgrass	*Pappophorum bicolor*	Douglass King, Pogue, and Bamert	Now
Webb Germplasm Whiplash Pappusgrass	*Pappophorum vaginatum*	Douglass King, Pogue, and Bamert	Now
Hidalgo Germplasm Multiflower False Rhodes Grass	*Trichloris pluriflora*	Douglass King, Pogue, and Bamert	Now
Oso Germplasm Hall's Panicum	*Panicum hallii* var. *filipes*	Douglass King, Pogue, and Bamert	Now
South Texas Germplasm Sideoats Grama	*Bouteloua curtipendula* var. *caespitosa*	Douglass King, Pogue, and Bamert	Now
Rio Grande Germplasm Prairie Acacia	*Acacia angustissima* var. *hirta*	Douglass King	Now, limited
Venado Germplasm Awnless Bushsunflower	*Simsia calva*	Douglass King, Pogue, and Bamert	Now
Balli Germplasm Prostrate Bundleflower	*Desmanthus virgatus* var. *depressus*	Douglass King, Pogue, and Bamert	Now
Goliad Germplasm Orange Zexmenia	*Wedelia texana*	Douglass King, Pogue, and Bamert	Now
Duval Germplasm Red Lovegrass	*Eragrostis secundiflora* ssp. *oxylepis*	Douglass King, Pogue, and Bamert	Now
Ramadero Germplasm Spike Lovegrass	*Eragrostis spicata*	Douglass King, Pogue, and Bamert	Now
Nueces Germplasm Sand Dropseed	*Sporobolus cryptandrus*	Douglass King, Pogue, and Bamert	Now
Carrizo Blend Little Bluestem	*Schizachyrium scoparium* var. *scoparium*	Douglass King, Pogue, and Bamert	Now, limited

Seed companies abbreviated above are: Douglass King Seed Company, Pogue Agri Partners, Bamert Seed Company, and Turner Seed Company