Year 2013 Progress Report of Activities
E. “Kika” de la Garza Plant Materials Center

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Following are highlights of some of the activities of the PMC for 2013. Please contact the PMC for more detailed information.

New Seed Releases with STN

In 2013, the USDA-NRCS E. “Kika” de la Garza Plant Materials Center and partners completed two cooperative releases. Both are selected plant material class of certified seed (natural track). No intentional breeding, selection or genetic manipulation was carried out within these populations.

Balli Germplasm Prostrate Bundleflower

Balli Germplasm prostrate bundleflower (*Desmanthus virgatus* (L.) Willd. var. *depressus* (willd.) B.L. Turner) was cooperatively released by the USDA NRCS E. “Kika” de la Garza Plant Materials Center, *South Texas Natives* Project of the Caesar Kleberg Wildlife Research Institute at Texas A&M University-Kingsville, and Texas AgriLife Research Station Beeville.

Prostrate bundleflower is a low growing, warm season perennial legume. It has small white flowers during the summer and seed ripens at the beginning of July in South Texas. Balli Germplasm originated from a sandy loam soil in Hidalgo County in South Texas. Balli Germplasm has superior growth, plant density, and seed production when compared to other prostrate bundleflower collections made in south Texas.
Prostrate bundleflower is recommended for upland wildlife plantings, critical site revegetation, roadside plantings, and for inclusion in range seeding mixes. It provides forage and seeds utilized by bobwhite quail, Rio Grande turkey, white-tailed deer, and livestock. Balli Germplasm has shown excellent competitive ability with many introduced exotic grasses. Best performance of this seed source has been observed on medium to fine textured soils. Prostrate bundleflower does not naturally occur on coarse sands or loamy sand soils in south Texas. The area of known adaptation of Balli Germplasm includes the Rio Grande Plain, Gulf Coast Prairies and Marshes, and Sand Sheet Ecoregions of Texas.

Venado Germplasm Awnless Bushsunflower

Venado Germplasm awnless bushsunflower (*Simsia calva* (Engelm. & A. Gray) A. Gray) was released by the *South Texas Natives* Project of the Caesar Kleberg Wildlife Research Institute at Texas A&M University-Kingsville and the USDA NRCS E. “Kika” de la Garza Plant Materials Center. Awnless bushsunflower is a perennial forb or sub-shrub that has orange-yellow disk shaped flowers. Mature foliage height ranges from 30-90 cm (1-3 ft). Mature plants form mounds in open settings, or vines through brush or thick vegetation. Awnless bushsunflower begins flowering in April and will continue to produce flowers through the fall with adequate precipitation.

Venado Germplasm is made up of 4 collections made in the Rio Grande Plain of South Texas from clay loam, loam and very fine sandy loam soil types. These four collections were made from native stands in Medina, Bee, Webb, and La Salle County, Texas. The components that comprise Venado Germplasm were chosen based on indications of superior plant vigor, survival, seed production, and seed quality.

Venado Germplasm awnless bushsunflower is recommended for upland wildlife plantings, critical site revegetation, roadside plantings, and for inclusion in range seeding mixes. Awnless bushsunflower is an excellent pollinator plant, and is a host plant for the bordered patch butterfly (*Chlosyne lacinia*). It produces seeds eaten by bobwhite quail and Rio Grande turkey. Awnless bush sunflower is a highly sought after forage for white-tailed deer, and it is also frequently grazed by cattle. Mean crude protein value of awnless bushsunflower is reported to be 16%, and the species may have high potential for use as adequate supplemental forage (e.g. food plot plant species) for deer from summer to fall. Awnless bushsunflower is considered a preferred food of deer, sheep, and goats. Recent work by at the Caesar Kleberg Wildlife Research Institute suggests awnless bushsunflower is one of the most preferred food plants of white-tailed deer in western south Texas.

In field plantings, Venado Germplasm has shown excellent competitive ability with many introduced exotic grasses. Best performance of this seed source has been documented on medium to fine textured soils, and naturally awnless bushsunflower generally occurs on sandy loam and caliche soils in the region. Venado Germplasm is recommended for use in the Rio Grande Plains, Gulf Coast Prairies and Marshes, and Coastal Sand Plains Ecoregions of Texas. Good performance is possible in adjacent areas of northern Mexico, the southern Edwards Plateau, and eastern Trans Pecos Ecoregions of Texas. However this use has not been extensively tested. Acceptable performance has also been documented in north central Texas in the Cross Timbers and Prairies and Rolling Plains Ecoregions.

Native Grass Response to Herbicides and Carbon Bands

Greenhouse and field studies were conducted to evaluate the use of a carbon band to provide a 'safe zone' for the establishment of 3 native grass species (bristlegrass, switchgrass, and windmillgrass) when used in combination with several pre- and post herbicides. Five herbicides at both full and half strength were used in this study. Based on the greenhouse experiment and the field studies of 2008 and 2009, grass stand establishment was improved with carbon banding. Furthermore, switchgrass appeared to be tolerant of flumioxazin at the 1.5 oz/ac rate and windmillgrass appeared to be tolerant of imazethapyr at the 2 oz/ac rate whether with or without protective carbon band. Further research into these tolerance characteristics should be investigated. These tolerance characteristics could allow for broader application of these herbicides in the establishment of these 2 grasses.

- Switchgrass stands were improved with carbon banding along with the application of imazethapyr at the 2 oz and 4 oz/ac rates.
- Windmillgrass and bristlegrass had improved stand establishment from carbon banding with the application of flumioxazin at 1.5 oz/ac rate.

This study was published in Weed Technology, Issue 26 of 2012.

A Tray from the Greenhouse Study Showing Seedling Emergence With and Without Carbon Bands

Design, Implementation and Five Year Assessment of an Ecological Engineering Approach to Coastal Restoration at Loyola Beach, Kleberg County, Texas

It has been reported that states bordering the Gulf of Mexico have the nation's highest average annual erosion rates of around 6 ft/year. It has been estimated that in the Gulf of Mexico alone, erosion is responsible for approximately $130 million per year in property losses due to continuous erosion and damage to structures. Historical engineering solutions that have been employed are seawalls, jetties and breakwaters, as well as beach nourishment and geotubes. Unfortunate consequences to these approaches have been backside erosion, undermining, detioration and loss of the beach.

Loyala Beach Site 2003 Before (top), 2003 After Construction (middle), and in March 2007 (bottom)

In 2003, ecological, coastal and civil engineering techniques were integrated to obtain a structurally sound, ecologically beneficial engineering restoration method for preserving the shoreline at Loyola Beach, Kleberg County, Texas. The shoreline protection strategy was based on a plan to integrate the natural landscape, with the use of riprap rock and local fill material along with native salt-tolerant vegetation. Geotechnical parameters including soil moisture, shear strength, plasticity and grain size were measured for pre-construction site characterization and then compared to measurements for the restored, after-construction site. A detailed evaluation of this project five years after construction was completed on several scales including the landscape, civil engineering design, environmental and ecological considerations and social and economic factors. The findings indicated that the vegetation and its underlying geotechnical integrity have played an important role in erosion mitigation. Overall the project was successful in the protection of the shoreline and was shown to be more ecologically beneficial than other hard structures. This alternative to conventional coastline restoration cost one-third of a typical seawall in addition to preserving the natural beach ecosystem.

This study was published in Ecological Engineering, Volume 22 Issue 4 of July 2004 and titled “Design and implementation of an ecological engineering approach to coastal restoration at Loyola Beach, Kleberg County, Texas.” The follow-up study titled “Multi-level assessment of ecological coastal restoration in South Texas” was published in Ecological Engineering, Volume 36 Issue 4 In April 2010.

Seed Collections Needed

The PMC will be seeking new collections of several species in 2014 including: Virginia wildrye (*Elymus virginicus*), partridge pea (*Chaemaecrista fasciculata*), and Engelmann's daisy (*Engelmannia peristenia*). Species description sheets as well as seed collecting protocols can be found on the Texas Plant Materials Program website (http://www.tx.nrcs.usda.gov/technical/pmc/) or contact the PMC for more information.

About the PMC

The 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 27 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 an Advisory Board from 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 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
- Coastal Shoreline Stabilization
- Coastal Habitat Restoration and Enhancement
- Erosion Control/Water Quality Improvement on Agricultural Land
- Biofuels

Current Availability of South Texas Ecotype Releases

Common Name	Scientific Name	Available From	Date Available
Lavaca Germplasm Canada Wildrye	*Elymus canadensis*	Turner Seed Company Douglass W. King Co.	Now
Falfurrias Germplasm Big Sacaton	*Sporobolus wrightii*	Douglass W. King Co.	Now
Kinney Germplasm False Rhodes Grass	*Trichloris crinita*	Douglass W. King Co.	Now
Catarina Blend Bristlegrass	*Setaria leucopila* & *Setaria vulpiseta*	Pogue Agri Partners Douglass W. King Co. Bamert Seed Co. Turner Seed Company	Now
Mariah Germplasm Hooded Windmillgrass	*Chloris cucullata*	Douglass W. King Co. Pogue Agri Partners	Now
Welder Germplasm Shortspike Windmillgrass	*Chloris subdolichostachya*	Douglas King Seed Co. Pogue Agri Partners	Now
Dilley Germplasm Slender Grama	*Bouteloua repens*	Douglass W. King Co. Pogue Agri Partners	Now
Chaparral Germplasm Hairy Grama	*Bouteloua hirsuta*	Douglass W. King Co. Pogue Agri Partners	Now
Atascosa Germplasm Texas Grama	*Bouteloua rigidiseta*	Douglass W. King Co. Pogue Agri Partners	Now
La Salle Germplasm Arizona Cottontop	*Digitaria californica*	Pogue Agri Partners Douglas King Seed Co. Turner Seed Company	Now
Zapata Germplasm Rio Grande Clammyweed	*Polanisia dodecandra* ssp. *riograndensis*	Douglas King Seed Co.	Now, limited
Divot Talloweed Blend	*Plantago hookeriana* & *Plantago rhodosperma*	Pogue Agri Partners	expected in Fall 2014
Maverick Germplasm Pink Pappusgrass	*Pappophorum bicolor*	Douglas King Seed Co. Pogue Agri Partners	Now
Webb Germplasm Whiplash Pappusgrass	*Pappophorum vaginatum*	Douglass W. King Co.	Now
Hidalgo Germplasm Multiflower False Rhodes Grass	*Trichloris pluriflora*	Douglas King Seed Co.	Now, limited
Oso Germplasm Hall's Panicum	*Panicum hallii* var. *filipes*	Douglas King Seed Co.	Now
South Texas Germplasm Sideoats Grama	*Bouteloua curtipendula* var. *caespitosa*	Douglas King Seed Co.	Now
Rio Grande Germplasm Prairie Acacia	*Acacia angustissima* var. *hirta*	Douglas King Seed Co.	Now, limited
Hoverson Germplasm Deer Pea Vetch	*Vicia ludoviciana*	Douglas King Seed Co.	expected in Fall 2014
Venado Germplasm Awnless Bushsunflower	*Simsia calva*	Douglas King Seed Co.	expected in Fall 2014
Balli Germplasm Prostrate Bundleflower	*Desmanthus virgatus* var. *depressus*	Douglas King Seed Co.	expected in Fall 2014

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