Year 2007 Progress Report of Activities

Issued March 2008

E. "Kika" de la Garza Plant Materials Center

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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

Following are highlights of some of the activities of the PMC for 2007. Please contact the PMC for more detailed information.

Rangeland Habitat Restoration and Enhancement

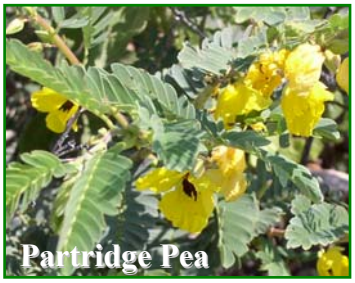
South Texas Natives Project

The PMC continues to have a productive partnership with the South Texas Natives Project (STN). By the spring of 2008 seven native ecotypes will be available for purchase from seed dealers. Within the next three years, joint releases of orange zexmenia (*Wedelia texana*), redwhisker clammyweed (*Polanisia dodecandra*), awnless bushsunflower (*Simsia calva*), prairie acacia (*Acacia angustissima*), pink pappusgrass (*Pappophorum bicolor*), and whiplash pappusgrass (*Pappophorum vaginatum*) are planned.

Current Availability of Ecotype Releases

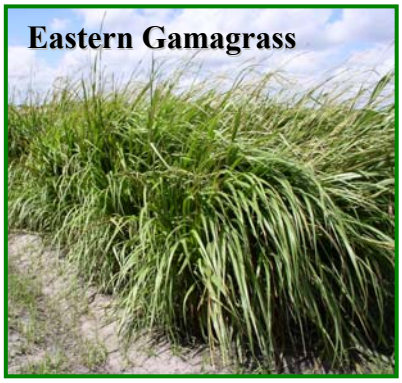
Common Name	Scientific Name	Available From	Date Available
Catarina Blend Bristlegrass	*Setaria leucopila* & *Setaria vulpiseta*	Pogue Agri Partners, Douglass W. King Co., Bamert Seed Co. Turner Seed Company	Now
Dilley Germplasm Slender Grama	*Bouteloua repens*	Bladerunner Farms	Spring 2008
La Salle Germplasm Arizona Cottontop	*Digitaria californica*	Pogue Agri Partners	Now
Kinney Germplasm Two-flower Trichloris	*Chloris crinita*	Douglass W. King Co.	Now
Lavaca Germplasm Canada Wildrye	*Elymus canadensis*	Turner Seed Company	Now
Mariah Germplasm Hooded Windmillgrass	*Chloris cucullata*	Watley Seed Company	Late Spring 2008
Welder Germplasm Shortspike Windmillgrass	*Chloris subdolichostachya*	Turner Seed Company	Spring 2008

New Collections



The PMC is still seeking new collections of several species including: gayfeather (*Liatris* spp.), frostweed (*Verbesina microptera*), green sprangletop (*Leptochloa dubia*), Virginia wildrye (*Elymus virginicus*), seashore dropseed (*Sporobolus virginicus*), eastern gamagrass (*Tripsacum dactyloides*), partridge pea (*Chaemaecrista fasciculata*), and plains lovegrass (*Eragrostis intermedia*). 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.

The Gulf Coast Ecotype Project



In 2001, an initiative was begun between the U.S. Fish and Wildlife Service, CKWRI, the Gulf Coast Association of Soil and Water Conservation Districts, the STN Project, and the Kika de la Garza PMC to produce native, eco-typic plant material to displace invasive species on pastures and agricultural fields along the Texas Gulf Coast. Thirteen species including 4 forbs, 1 cool season grass, and 8 warm season grasses were selected for initial collecting and evaluation.

Since 2001, 123 collections have been received, representing all thirteen species. The field nursery now consists of 80 accessions representing 12 of the 13 species. In 2007, 13 new collections were received of the selected species. In December 2007, 12 new collections were seeded in the greenhouse. Those exhibiting good germination will be transplanted into the field beginning in the spring.

The largest obstacle to releasing several of these species has been poor seed fill. In 2007, plots were started in two more northern locations to see if this improved seed fill. Seedlings of sideoats grama, little bluestem, Florida paspalum, Indiangrass, big bluestem, and switchgrass were planted at the Katy Prairie. Seedlings of sideoats grama, big bluestem, and switchgrass were also planted at the Texas AgriLife Research Station in Stephenville, TX. Seed collected in the fall of 2007 and 2008 will be analyzed for fill.

Small Plot Seeder

There are vast areas of unimproved, low producing pasture in the United States. Much of the range pasture land could benefit from interseeding to achieve a diversity of species. Introducing species into pastures has been recognized as beneficial for increasing forage production and quality, seasonal distribution of forage production, and wildlife habitat. Many of these pasture areas can not be planted by conventional tillage methods. The soils are often rocky and shallow and / or the topography is sloping, irregular, and uneven. Equipment used for pasture planting must meet some technical demands that typical row crop equipment does not. However, the scale and economics involved cannot usually support costs of seeding even at row crop rates.

Many pasture seeders are available, but these are ineffective on rocky and uneven land, unable to seed at a row spacing of less than 44 cm, are too expensive for the typical renovation system, and require a tractor for operation. The objective of this study is to investigate the development of an ATV drill that will be an economical seeder capable of effectively seeding into established pasture.

The measure of success of this type of planting is the establishment of the planted species. In Texas, surface seeding without soil or mulch cover is not consistently successful. Yearly variations in climate may contribute to this lack of success. Surface seedlings may fail due to extreme temperature and moisture fluxes at the surface.

Our seeder was designed specifically for interseeding into pastures and allows for a maximum furrow-opening depth of 2.5 cm. To increase the uniformity of seeding in rocky soil and uneven pastures, an individual unit suspension system was used. This seeder has a 22.5 cm row spacing with 4 units mounted to the chassis.

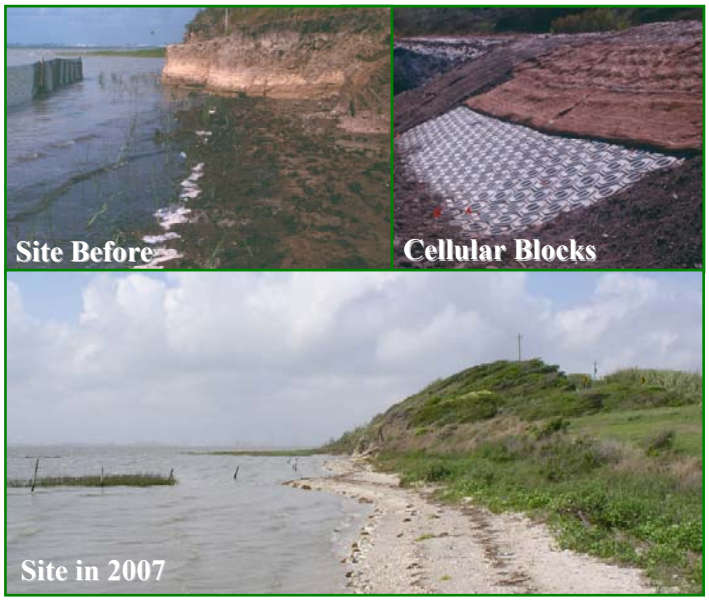
Plantings were done in Kingsville, Odessa, and Seymour, Texas in 2006. Results of these trials should provide us information on the ultimate performance and utility of this seed drill. We feel the cost and simplicity of this unit will appeal to farmers and ranchers that wish to interseed small areas. Unlike most commercially seeders, ours is towed with an ATV. This will conserve energy and allow use by those who do not have a tractor available.

Coastal Shoreline Stabilization & Coastal Habitat Restoration and Enhancement

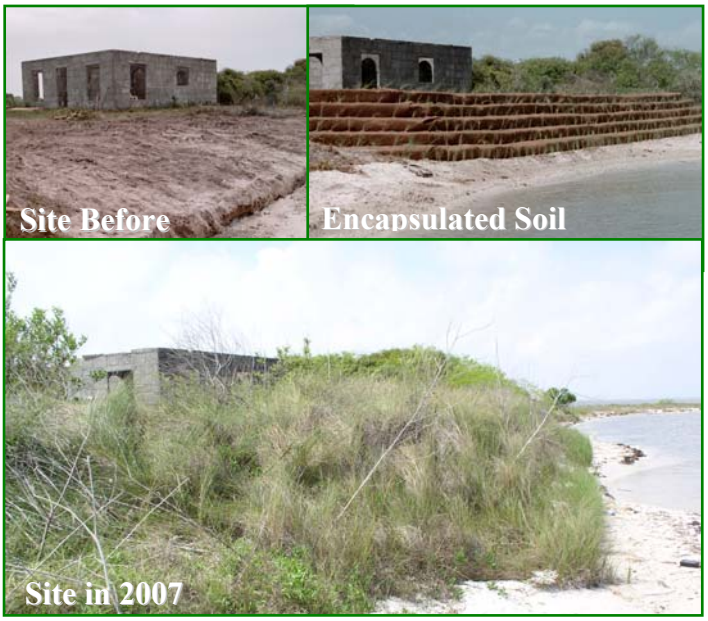
Coastal Projects Revisited

In March 2007, most of the coastal projects that have been installed by the PMC were revisited. This provided an opportunity to view the projects' long term success several years after completion. Coastal erosion is part of the purpose of the 342 conservation practice standard (critical area). The results of this work will provide additional technology to strengthen the 342 practice standard.

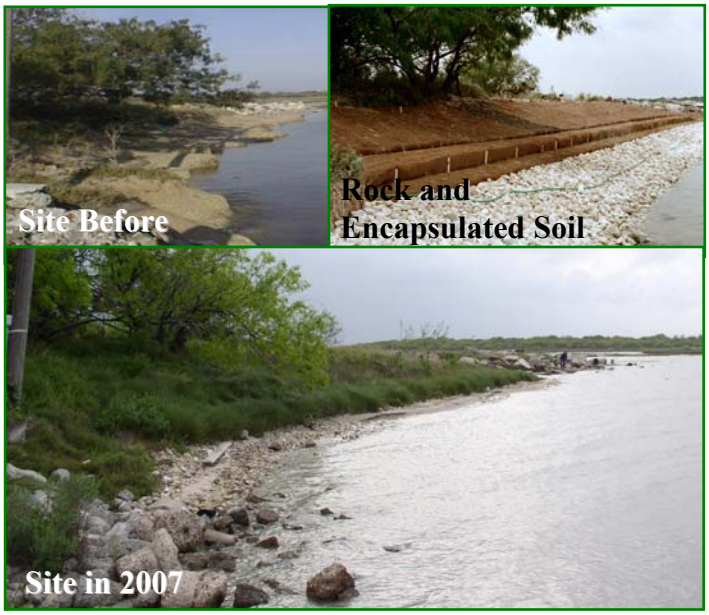
Portland, TX 1997: Cellular blocks planted with gulf cordgrass and marshhay cordgrass.



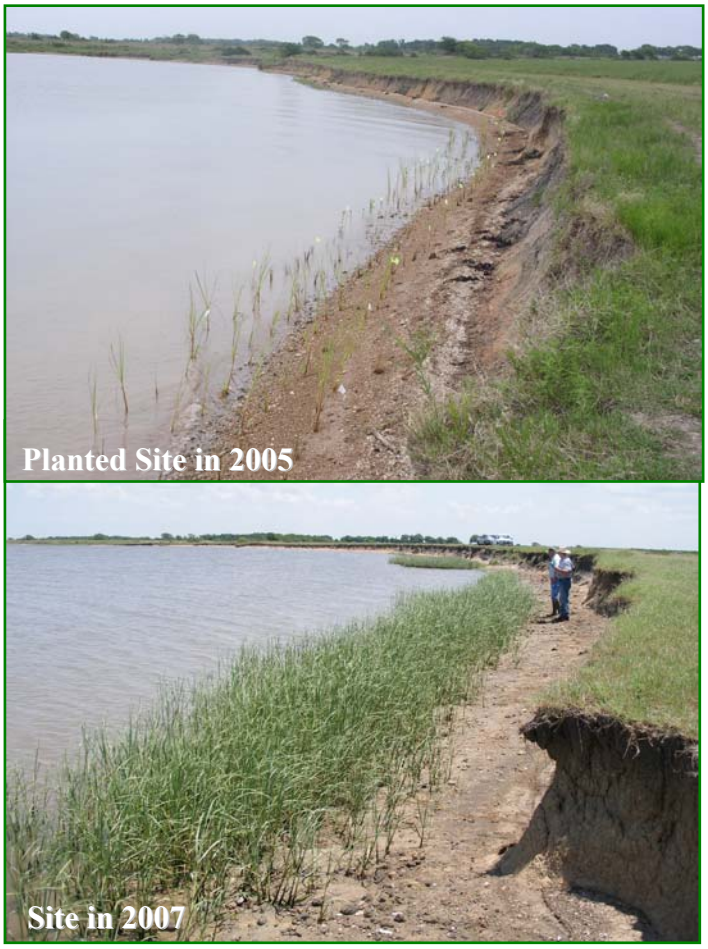
Fulton, TX 2002: Historic building protected by fiber encapsulated soil planted with gulf cordgrass and marshhay cordgrass.



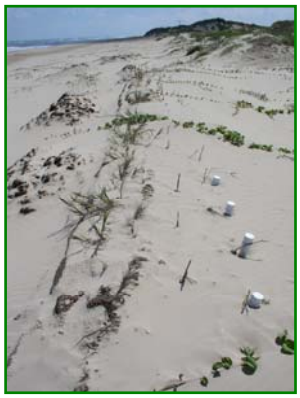
Kaufer-Hubert Park in Kleberg Co., TX 2003: Coastline protected by rock and fiber encapsulated soil planted with seashore dropseed, gulf cordgrass and marshhay cordgrass.



Palacios, TX 2005: Erosion site planted with smooth cordgrass, black mangrove, saltmarsh bulrush, and black needlerush.



Sand Dune Construction – 2 Year Evaluation



In January 2005, the PMC coordinated with The Nature Conservancy (TNC), the South Padre Island Parks Department (SPIPD), and the U.S. Fish and Wildlife Service to construct and vegetate a sand dune. After this dune was destroyed by Hurricanes Emily and Rita, the PMC reconstructed a dune on the same site. The new dune included the use of coconut fiber bales, coconut fiber blocks with matting, and "concertainers," metal cages filled with sand and covered with coconut fiber.

The dune was also used to compare plant material from a population near Corpus Christi and from near the dune. Watering and hydrogel techniques were installed in April to evaluate their effect on plant survival. A second watering was applied in May. Plant evaluations occurred in May and November of 2006. A final topographic and plant evaluation occurred in February 2008.

Over the course of 23 months, there was an average accumulation of 1.6 feet of sand at all locations on the constructed dune. There was a loss of sand only at the top of the dune, which was a recorded loss of 0.15 feet. The greatest accumulation was an increase of 2.38 feet. All of the dune construction methods worked very well. The "concertainers" were particularly quick and easy to use.

Two months after planting survival rates of bitter panicum ranged from 0-50%. By February of 2008, there was about a 10% overall survival rate with ranges from 0-40%. No treatment was significantly better than another treatment due to the high variation between replications. Drought conditions were too severe for the plants to survive with out monthly irrigation. Even the hydrogel treatments were inadequate. From January through August of 2005 the site only received 8.25"rainfall and only 5.5" from January through August 2006.

Because of the unreliability of rainfall encountered, it is recommend that any additional plantings at this site should have an irrigation system established in order to assure planting will have adequate monthly watering the first year to ensure survival

Erosion Control/Water Quality Improvement on Agricultural Land

Vegetative Barriers in Zapata County

Over 243,000 hectares of South Texas land is affected by saline soil conditions. Land with sparse vegetation and severe erosion are often found to have accumulated salts within the soil. Weathering of parent material releases soluble salt ions that contribute to soil salinity. Elevated levels of these soluble salts restrict plant establishment, and leave the ground bare and susceptible to soil erosion.

Elevated salt levels have been a problem at the Eric Gonzales property in Zapata County. Landshaping was performed in the spring of 2007 to address gully erosion on the ranch. In the fall of 2007, the PMC planted five vegetative barriers (conservation practice standard 601) to evaluate their capability for survival and to protect the site from erosion. Each barrier was spaced on the downhill gradient at a 2 feet height interval. Three barriers were established down the center gully. The side gullies were addressed with two barriers. A trencher was used to install the barriers and slow release fertilizer was sprinkled in the trench before installing the plants. We planted one gallon containers of saline tolerant Falfurrias Germplasm big sacaton (*Sporobolus wrightii*) at 1 foot spacing. Falfurrias Germplasm was released by the PMC in 1989. We put six and a half feet wide turf reinforcement mat down the centerline of the concentrated flow sites extending 15 feet downslope. Soil conditions were moist at planting and no irrigation was supplied to the planting.

In February of 2008, evaluation of the site revealed that there was over 90% survival of the big sacaton plants. We will continue to monitor the site for summer survival and soil erosion protection using the vegetative barrier practice.