



Year 2001 Progress Report of Activities



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The Kika de la Garza Plant Materials Center (PMC) is an 80-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 26 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 and Water Conservation Districts, and the Gulf Coast Association of Soil and 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 selections 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.

Current program emphasis at the PMC is in the following areas:

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

Following are highlights of some of the activities of the PMC for 2001. Please contact the PMC for more detailed information.

Rangeland Habitat Restoration and Enhancement



An initiative was developed in August of 2000 and spearheaded by the CKWRI to develop and promote native plants for the restoration and reclamation of habitat on private and public lands in South Texas. The goal of the initiative, called the South Texas Natives Project, is to provide economically viable sources of plants and seeds, and to develop effective planting strategies for the restoration of South Texas plant communities. As a partner in this initiative, the PMC will establish a seed nursery of South Texas ecotypes of

a variety of grasses, forbs, and legumes. Ecotypes will be developed for three basic regions: the Gulf Coast Prairie, the South Texas Plains and the Coastal Sand Plains. The ecotype regions were established to be large enough to retain regional integrity and genetic adaptability. The seed nurseries will consist of approximately 20 collections of each species per ecoregion. The nurseries will consist of transplants that are isolated as necessary to maintain species integrity and diversity. The seed nurseries will be hand harvested to ensure a complete spectrum of seed is harvested from each species. The nursery seed will be planted in production fields where it will then be harvested and bulked per species within each ecoregion. The ecoregion seed will then be made available to commercial seed growers.

We received in 2001 sixty-six collections representing seven species for the South Texas Plains Ecoregion and 24 collections representing five species for the Coastal Sand Plains Ecoregion. We established a small seed nursery consisting of over 3,770 plants and harvested a little over 23 pounds of seed.

Coastal Habitat Restoration and Enhancement



Constructed Wetlands:

Texas wetlands provide critical habitat for migratory waterfowl as well as neotropical birds. Texas has seen an estimated 52 percent loss (eight million acres) in wetland acreage over the past 200 years. Therefore, it is important to construct wetland types that will provide high value habitat for birds and other wildlife.

The PMC with funding from the U.S. Fish and Wildlife Service has evaluated over 30 different plant species for

wetland restoration. Currently, the PMC is evaluating four Texas native plants that are very promising species for waterfowl. *Eleocharis cellulosa* (Gulfcoast spikerush), *Eleocharis quadrangulata* (Squarestem spikerush), *Scirpus robustus* (Saltmarsh bulrush) and *Echinochloa polystachya* (Creeping rivergrass) produce an abundance of seed that are consumed by ducks. Furthermore, gulfcoast spikerush, squarestem spikerush, and saltmarsh bulrush all produce rhizomes and tubers that are relished by ducks, geese, nutria, and muskrats. The PMC is evaluating both vegetative propagation methods as well as seed production and seed quality characteristics. It is hoped that research evaluations will provide the information needed for low-cost seedlings for waterfowl enhancement of constructed wetlands.

Waterbird Nesting Habitat:



Dredge spoil islands and other coastal sites are in need of native plant species and establishment techniques for improving waterbird nesting along the Texas Gulf Coast. Sundown Island, an island constructed by the Army Corp of Engineers in the dredging of the Gulf Intracoastal Waterway in Lavaca Bay, is such an island. The island has become a valuable nesting site for waterbirds along the Texas Gulf Coast. This man-made island has either bare-ground or is vegetated primarily with short herbaceous grasses and forbs. While many waterbirds such as terns prefer nesting on bare-ground, other birds such as herons and egrets prefer to nest in trees or tall shrubs. The Audubon Society that manages the island, partnered with the U.S. Fish and Wildlife Service and the PMC to establish a test demonstration site for waterbird enhancement on the island. The PMC installed four demonstration plots with seven different native trees and shrubs as well as several different planting techniques. Test results should help answer

questions about how to improve waterbird nesting with shrubs and trees on dredge spoil islands and other sites along the Texas Gulf Coast.

Coastal Shoreline Stabilization



Bioengineering Methods:

The PMC along with the San Patricio Soil and Water Conservation District has been investigating innovative methods for coastal shoreline stabilization over the last 10 years. Recently, the District with funding from the Coastal Erosion Planning and Response Act (CEPRA) administered by the Texas General Land Office and with additional support from the Coastal Bend Bays and Estuaries Program teamed up with the PMC to install a unique bluff shaping and stabilization project. An historic structure made from oyster shell located near Rockport, Texas on Copano Bay was threatened by coastal wave erosion. In August 2001, the PMC developed a bioengineering design to safeguard the structure utilizing fabric encapsulated soil and native salt-tolerant plants. Seven encapsulated soil lifts were constructed at a 2:1 gradient. Twenty-four inch long containerized plants were placed horizontally every two feet between the soil lifts. Six-inch containerized material was planted vertically every one foot into the bench of the soil lifts. Marshhay cordgrass, gulf cordgrass, and marsh elder were the principal plants used in the construction. Project results should provide guidance on nonstructural, shoreline erosion practices for embankments and dunes along the Texas Gulf Coast.

Coastal Salt-tolerant Plants:



There are over 3,000 miles of coastal shoreline along the Texas Gulf Coast. Many of these miles have eroding bluffs that need adapted plant material for stabilization. These bluffs along with coastal wetland berms and dredge spoil islands are all in need of low-cost planting techniques to provide an economical method of vegetatively stabilizing and enhancing these sites.

Most coastal revegetation projects are established with expensive transplants. If a seeded variety of a salt-tolerant grass could be developed, it would provide a low-cost technique for stabilization and enhancement of Texas coastal shorelines. Seeded plants along with turf-reinforcement matting may provide a low-cost environmentally friendly stabilizing system for miles of eroding shorelines. The PMC with funding from the U.S. Fish and Wildlife Service has begun to collect and evaluate five species of coastal salt-tolerant grasses for seed production and seed quality characteristics. Under current evaluation are 14 collections of gulf cordgrass (*Spartina spartinae*), 15 collections of marshhay cordgrass (*Spartina patens*), 5 collections of saltgrass (*Distichlis spicata*), 6 collections of seashore dropseed (*Sporobolus virginicus*), and 7 collections of seashore paspalum (*Paspalum vaginatum*).

Conservation Across America

Erosion Control/Water Quality Improvement on Agricultural Land

Agroforestry:



Vegetative Barriers:

The PMC has worked over the last several years in the development of guidelines for the use of vegetative barriers for gully erosion control. Recommendations are available for engineering design as well as the use of vetiver grass and switchgrass.

More recently the PMC has been evaluating the potential of seeding vegetative barriers as a low-cost method for erosion control on Texas cropland. Evaluations of both switchgrass and eastern gamagrass have been done over the last two years. Results from a study conducted during 2001 with “Iuka” eastern gamagrass indicate that a double row seeding of eastern gamagrass can provide effective erosion control on heavy clay soils.

The Luling Foundation with funding from the USDA NRCS – National Agroforestry Center has recently established a test demonstration site of alley cropping with its partners the Caldwell-Travis Soil and Water Conservation District and the PMC. Alley cropping is one of several practices that are considered under agroforestry. Alley cropping is the planting of trees with agronomic or forage crops planted in the alleys or rows between the trees. This project will evaluate the use of cool-season grasses incorporated with a pecan operation. Currently no forage other than volunteer weeds is utilized within the pecan grove. The incorporation of a perennial cool-season forage grass could enhance the economic productivity of this agriculture enterprise by allowing grazing during the winter months when the pecans are dormant. With the use of cool-season grasses this system would not compete for nutrients or soil moisture during the pecans summer growing period. Furthermore, not only might this alley cropping system provide economic benefits but also it will provide additional erosion control, water quality and wildlife enhancement.

The PMC installed the demonstration site on September 19, 2001. Results from this demonstration project should give us valuable information on the economic feasibility of utilizing alley cropping within a pecan operation in Texas. It should also provide valuable information for other alley cropping systems such as land-use conversion from cropland to hardwood tree-forage systems.

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