

UNITED STATES DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE
E. "KIKI" DE LA GARZA PLANT MATERIALS CENTER
KINGSVILLE, TEXAS

And

TEXAS A&M UNIVERSITY-KINGSVILLE
CAESAR KLEBERG WILDLIFE RESEARCH INSTITUTE
SOUTH TEXAS NATIVES
KINGSVILLE, TEXAS

And

TEXAS AGRILIFE RESEARCH STATION
BEEVILLE, TEXAS

NOTICE OF RELEASE OF RIO GRANDE GERMPLASM PRAIRIE ACACIA
SELECTED PLANT MATERIAL

The U.S. Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS), E."Kika" de la Garza Plant Materials Center, Texas A&M University-Kingsville, Caesar Kleberg Wildlife Research Institute, *South Texas Natives* and the Texas AgriLife Research Station at Beeville announce the release of a selected plant material of prairie acacia (*Acacia angustissima* (Mill.) Kuntze var. *hirta* (Nutt.) B.L. Rob.) for the south Texas Ecoregion.

This plant will be referred to as Rio Grande Germplasm prairie acacia, and is released as a selected plant material class of certified seed (natural track). Rio Grande Germplasm was tested under the USDA NRCS accession numbers 9089174, 9090706 and 9090685. Seed of the Rio Grande Germplasm prairie acacia release will be identified by USDA NRCS accession number 9093599.

This alternative release procedure is justified because there are no existing Texas commercial sources of tested and adapted prairie acacia for the south Texas ecoregion. The potential for immediate use is high, especially for upland wildlife plantings, native landscaping and for inclusion in range seeding mixes.

A. Proposed Variety Name and Temporary Designation:

RIO GRANDE GERMPLASM PRAIRIE ACACIA

B. Family, kind, genus and species:

Family: Fabaceae

Kind: prairie acacia

Genus and species: *Acacia angustissima* (Mill.) Kuntze var. *hirta* (Nutt.) B.L. Rob.

C. Origin and breeding history of the variety:

Collection Site Information: Accession 9089174 was collected by Jimmy Rutledge in October 2002 behind a rest stop in McMullen County, Texas.

Accession 9090706 was collected by Forrest Smith and the *South Texas Natives* crew on August 20, 2003 from native plants located near interstate highway (IH) 35 in Webb County, Texas at 27° 48' 50.5" N. latitude and 99° 24' 58.1" W. longitude (MLRA 83). Soil type of the collection site is a Brundage fine sandy loam (USDA NRCS 2009).

Accession 9090685 was collected by Forrest Smith and Cody Lawson on June 26, 2003 from native plants located on the San Pedro Ranch in Dimmitt County, Texas at 28° 16' 17.7" N. latitude and 100° 03' 99.0" W. longitude (MLRA 83). Soil type of the collection site is a Dilley fine sandy loam (USDA NRCS 2009).

Breeding history: Plants evaluated in all trials were grown from the original seed collection. Breeder seed of each of the accessions was also grown from isolated increase plots that were derived from the rootstock of the original seed collection. All seed increase plots were grown in isolation from other *Acacia angustissima* accessions and from wild populations of the species. No intentional breeding, selection or genetic manipulation has been carried out on these accessions.

D. Objective description of the variety:

Description:

Prairie acacia, also known as fern acacia, is a native, perennial member of the legume family. It is a semi-woody sub-shrub in south Texas often forming colonies from its rhizomes. Mature foliage height ranges from 75 to 120 centimeters (3 to 4 feet) tall. Leaves are bipinnate with leaflets 3-6 mm long with numerous pairs often 24 to 30 per pinna. Prairie acacia's white to cream flowers occur in 1-2 cm wide heads and those are formed into terminal clusters. Fruit is a

brownish flat seedpod 4-7cm long and 6-8 mm wide. It blooms from May to November. Prairie acacia has about 31,000 seeds per pound.

Potential Uses: Rio Grande Germplasm prairie acacia is recommended for upland wildlife, erosion control, alley cropping, biofuels, native landscaping, and range plantings in south Texas.

E. Evidence

Method of Breeding and Selection:

Initial Evaluation

As part of an effort to collect, evaluate, and release germplasms of a variety of plants native to south Texas, personnel from E."Kika" de la Garza Plant Materials Center and the *South Texas Natives* project obtained seed of prairie acacia from 15 field locations in South Texas. Initial evaluations began in 2000 at the USDA/NRCS E. "Kika" de la Garza Plant Materials Center (PMC), Kingsville, Texas. Nine accessions represented by 50 plants of each accession and spaced 1 foot apart were in the initial evaluation plot in 2004. Evaluations were based on percent of plants that survived, the amount of regrowth after dormancy, vigor based on leaf color as well as height and width of plant and the abundance of leaves, density of leaves per height of plant, resistance to diseases and insects, tolerance to cold, heat and drought, uniformity in timing and height of plant vegetation and inflorescence development, and the developmental stage of the plants. This plot was evaluated for field performance in July 2004 (Table 1). All accessions except 9085672 from Knox City performed well. Seed was collected from all accessions in 2004 and was germination tested in 2005 as scarified (1 second of scarification) and unscarified seed (Table 2). Seed was scarified in a Forsberg tabletop caborundum sandpaper scarifier. Scarification is necessary to assess germination on prairie acacia and most other legumes from the south Texas region because of the amount of hard seed. Hard seed provides the plant a safety mechanism to prevent all the seed from germinating and assure that some seed will be viable over an extended time. This is a very effective strategy for a plant trying to survive in a highly unpredictable rainfall region.

Table 1. Field performance of prairie acacia from the initial field evaluation plot transplanted in May 2000 and evaluated in July 2004.

Accession Number	Source (County)	% Survival	Plant Vigor*	Foliage Density*	Resistance*	Uniformity*	Seed Production*
9029653	Motley	86	5.0	5.0	5.0	5.0	n/a
9076907	LaSalle	84	5.0	5.0	5.0	5.0	n/a
9076909	Frio	98	4.0	4.0	4.0	5.0	5.0
9085305	Burleson	96	4.0	5.0	5.0	5.0	n/a
9085672	Knox City	100	7.0	6.0	6.0	5.0	n/a
9088941	Frio	100	5.0	5.0	5.5	6.0	n/a
9089174	McMullen	100	4.0	4.0	4.0	5.0	n/a
9090706	Webb	96	4.0	4.0	5.0	5.0	n/a
9090685	Dimmit	96	5.0	5.0	5.0	5.0	n/a

*Ocular estimate (1= Best)

Table 2. Grams harvested in 2004 from the initial evaluation plot of prairie acacia accessions and percent germination results from the seed tested in August of 2005.

Accession Number	Grams Harvested	Scarification Treatment Time	3 Days %	7 Days %	28 Days %
9029653	39	0	4.7	7.3	18.7
		1 sec	36.7	45.3	49.3
9076907	194	0	2.7	4.7	8.7
		1 sec	31.3	42.7	45.3
9076909	154	0	0	4.0	6.7
		1 sec	14.7	20.7	21.3
9085305	68	0	1.3	4.0	6.7
		1 sec	31.3	39.3	42.7
9085672 (Knox City)	7	0	6.0	16.0	32.0
		1 sec	51.3	63.3	70.0
90888941	39	0	4.0	4.0	6.0
		1 sec	46.0	50.0	50.7
9089174	106	0	2.0	4.7	6.7
		1 sec	26.0	41.3	47.3
9090706	42	0	3.3	6.0	10.7
		1 sec	58.7	79.3	81.3
9090685	26	0	6.7	9.3	14.7
		1 sec	28.0	47.3	50.0

***12 hours dark 16°C (60°F) / 12 hours light 30°C (86°F)

South Texas Natives (STN) made rootstock collections of prairie acacia in 2004. Five accessions were added to the initial evaluation plot at the PMC. This plot was evaluated for field performance in July 2005 (Table 3). All of the older accessions except 9085672-Knox City performed well. Fourteen accessions were in the initial evaluation plot at the end of 2005. Seed was collected in December of 2005 and was germination tested in January of 2007 as scarified (1 second of scarification) and unscarified seed (Table 4). With scarification, all accessions had germination that exceeded 70%.

Four accessions were added to the initial observation plot in June of 2006. This plot was evaluated for field performance in April and November of 2006 (Table 5).

Table 3. Field performance of prairie acacia from the initial field evaluation plot transplanted in May 2000 and evaluated in July 2005.

Accession Number	Source (County)	% Survival	% Regrowth	Plant Vigor*	Foliage Density*	Resistance *	Uniformity *	Seed Production*
9029653	Motley	98	50	6.3	6.0	6.3	5.0	5.5
9076907	LaSalle	90	50	5.7	5.7	5.0	5.0	5.0
9076909	Frio	98	50	4.3	4.3	5.0	5.0	5.0
9085305	Burleson	98	75	5.3	5.0	5.3	5.0	4.3
9085672	Knox City	100	10	7.0	7.3	7.0	5.0	6.0
9088941	Frio	84	50	6.0	5.3	5.6	5.6	6.0
9089174	McMullen	98	100	4.0	3.0	4.0	5.0	4.5
9090706	Webb	98	100	4.3	4.3	4.3	5.0	4.5
9090685	Dimmit	90	100	4.7	4.3	4.7	5.0	5.0
9093283	La Salle	78	1 st yr.	6.0	6.0	6.0	5.0	7.0
9093278	Webb	100	1 st yr.	6.0	6.0	6.0	5.0	5.0
9093279	Bee	100	1 st yr.	6.0	6.0	6.0	5.0	6.0
9093277	Jim Hogg	100	1 st yr.	6.0	6.0	6.0	5.0	veg. only
9093284	Atascosa	0	1 st yr.	-	-	-	-	-

*Ocular estimate (1= Best)

Table 4. Grams harvested in 2005 from the initial evaluation plot of prairie acacia accessions and percent germination results from the seed tested in January of 2007.

Accession Number	Grams Harvested	Scarification Treatment Time	3 Days %	14 Days %	28 Days %
9029653	16	0	3.3	10.7	21.3
		1 sec	60.0	83.3	84.7
9076907	37	0	2.7	6.0	6.7
		1 sec	53.3	69.3	70.0
9076909	71	0	1.3	4.7	6.7
		1 sec	68.0	84.7	85.3
9085305	40	0	0.7	3.3	8.0
		1 sec	48.7	77.3	78.7
9085672 (Knox City)	5	0	4.0	29.0	62.0
		1 sec	61.3	88.5	88.5
90888941	27	0	0.7	6.0	8.0
		1 sec	52.0	88.7	89.3
9089174	241	0	1.3	6.7	10.7
		1 sec	23.3	80.7	81.3
9090706	183	0	3.3	10.0	10.7
		1 sec	47.3	85.3	87.3
9090685	48	0	2.7	16.7	22.7
		1 sec	51.3	77.3	78.0
9093283	2	0	11.4	62.9	74.3
		1 sec	28.6	91.0	91.0
9093278	5	0	0.0	7.3	12.0
		1 sec	64.4	80.0	80.0
9093279	2	0	14.0	26.0	30.0
		1 sec	37.5	80.0	80.0

***12 hours dark 16°C (60°F) / 12 hours light 30°C (86°F)

**Accessions 9093277 & 9093284 had no seed production in 2005.

Table 5. Field performance of prairie acacia from the initial field evaluation plot transplanted in May 2000 and evaluated in 2006.

Accession Number	Source (County)	% Survival	% Regrowth	Plant Vigor*	Foliage Density*	Resistance *	Uniformity *	Seed Production*
9029653	Motley	98	100	5.0	5.5	5.0	5.0	5.0
9076907	LaSalle	82	100	6.0	6.0	5.0	7.0	6.0
9076909	Frio	98	100	5.0	4.0	5.0	5.0	5.5
9085305	Burleson	96	100	5.0	5.0	5.0	6.0	5.0
9085672	Knox City	90	50	9.0	9.0	9.0	5.0	7.0
9088941	Frio	100	100	6.5	6.5	6.0	6.0	6.5
9089174	McMullen	98	100	4.0	3.0	4.0	5.0	4.5
9090706	Webb	98	100	4.0	4.0	4.0	5.0	4.5
9090685	Dimmit	90	100	5.0	4.0	5.0	5.0	5.0
9093283	La Salle	89	100	5.5	6.0	5.0	5.0	veg. only
9093278	Webb	100	100	5.0	5.0	5.0	5.0	5.0
9093279	Bee	100	10	5.0	5.5	5.0	5.0	4.0
9093277	Jim Hogg	100	100	5.0	5.5	5.0	5.0	veg. only
9093284	Atascosa	0	-	-	-	-	-	-
9064952	DeWitt	68	new	6.0	6.0	6.0	5.0	veg. only
9064962	Austin	44	new	7.0	7.0	7.0	5.0	veg. only
PMT-2466	Frio	78	new	6.0	6.00	5.0	5.0	veg. only
PMT-3131	Frio	100	new	7.0	7.0	7.0	5.0	veg. only

*Ocular estimate (1= Best)

Advanced Evaluation

Three accessions (9089174-McMullen Co., 9090706-Webb Co. and 9090685-Dimmit Co.) had consistently performed well since 2004 with the tallest and widest growth form, best foliage production and good seed production and germination. Hence these three accessions were selected for a seed release. No original seed was left of these accessions, so rhizomes were rooted and planted in small isolated seed increase rows in 2007.

Evaluation of harvest characteristics, seed set and timing, and adaptability to agronomic production was initiated in 2007 at the PMC. All three accessions performed well in this evaluation, and similar growth rates and seed maturity dates were observed.

Seed Increase

Seed was harvested from the seed increase plot in 2009 for accession 9089174. In 2010, seed was harvested from all three accessions. In 2009, accession 9089174 yielded 229 pounds per acre (lb/A) and in 2010 it yielded 531 lb/A. In 2010, accession 9090706 yielded 426 lb/A and accession 9090685 yielded 312 lb/A.

Seed harvested from the seed increase plot at the PMC will be blended by equal amounts of pure live seed (PLS)/accession (+/-10%), and distributed to interested commercial seed producers.

Seed Production, Harvest, and Cleaning

Irrigated seed fields of the three selected accessions of prairie acacia were evaluated at the PMC in Kingsville, TX. No original seed was left of these accessions, so rhizomes were rooted and planted in small isolated seed increase rows in 2007 at one foot apart on 36 inch bedded rows. Fields were harvested with a plot combine. Two harvests were made in 2010 and yielded an average of 211 lbs. of pure live seed (PLS)/acre/harvest.

F. Inoculum Development

Root nodules were obtained from populations where accessions 9090706-Webb and 9090685-Dimmit were collected. Separate types of rhizobia were isolated from each population by Tom Wacek of Plant Probiotics. Each strain of rhizobia was increased and provided as a peat-based inoculant for testing by Dr. Larry Zibilske of the USDA ARS in Weslaco. The inoculant from the parent population of accession 9090685 resulted in slightly greater nitrogen fixation in comparison to 9090706 population inoculants when tested on the same source of prairie acacia seed provided by the PMC. The commercial grower of Rio Grande Germplasm prairie acacia will be able to obtain the needed inoculant for seed produced and made available to consumers through Plant Probiotics.

G. Area of Adaptation

Rio Grande Germplasm will likely perform best in the Rio Grande Plain. However, based on the natural distribution of *Acacia angustissima*, it will likely do well in the Gulf Coast Prairies and Marshes, the Edwards Plateau, the Trans Pecos eco-regions of Texas, and adjacent portions of northern Mexico.

H. Procedure for maintaining stock classes of seed

G0 seed will be produced and maintained by the USDA-NRCS E. "Kika" de la Garza Plant Materials Center, Kingsville, Texas.

I. Description of how variety is to be constituted, etc.

Rio Grande Germplasm prairie acacia is released as a Selected Texas Native Ecotype. G0 seed will be made up of equal amounts (by percent PLS, +/-10%) of each of the three accessions. G1 is that which is grown from plantings of the G0 seed blend. G2 seed is that which is grown from plantings of the G1. Increase or seed production using G2 seed is prohibited.

J. Additional restrictions, etc.

Foundation and certified seed fields have a 10 year production limit.

Will application be made to the Plant Variety Protection Office? YES__ NO X

If yes will the application specify that the variety is to be sold by variety name only as a class of certified seed? YES__ NO__

Royalty distribution: A royalty will be collected based on a negotiated percent of sales and will be collected by the Texas Foundation Seed Service in accordance with a licensing agreement negotiated between the selected seed producer and the Texas A&M System Office of Technology Commercialization, and placed in a project account with discretionary spending authority, requiring approval for expenditures by the *South Texas Natives Project Director* and Manager of the USDA NRCS E. “Kika” de la Garza Plant Materials Center, for the benefit of native seed development for south Texas.

Ecological Considerations and Evaluation: An Environmental Evaluation of Plant Materials Releases was completed using guidelines established by NRCS, and the best available information for this species. Results of this evaluation determined that Rio Grande Germplasm prairie acacia was suitable for release based on the criterion contained in this document. This conclusion is mainly because prairie acacia is a naturally occurring species in Texas and planting it would therefore not constitute an introduction of an exotic species into local ecosystems. Any negative impacts on other native plant species would likely be minimal to non-existent. Also, release of this species will make available an additional native species for rangeland planting, will provide a good source of forage for deer, a seed source to upland avian wildlife species and provide unknown benefits by maintaining and contributing habitat that harbors beneficial insects and butterflies.

Conservation Use: Rio Grande Germplasm prairie acacia will provide a native plant species for rangeland planting, native plant landscaping and wildlife habitat improvement.

Availability of Plant Materials: G0 seed will be maintained by USDA-NRCS E. “Kika” de la Garza Plant Materials Center, Kingsville, Texas. At this time, release of the germplasm will be limited to a single commercial grower. Limited quantities of seed for research or evaluation purposes can be obtained by request to John Lloyd-Reilley, PMC Manager (John.Reilley@tx.usda.gov).

References:

Correll, D.V., and M.S. Johnston. 1996. Manual of the Vascular Plants of Texas. The University of Texas at Dallas. Dallas, Texas. Fourth Printing.

Diggs, Jr., G.M., B.L. Lipscomb, and R.J. O'Kennon. 1999. Shinnery and Mahler's illustrated flora of North Central Texas. Botanical Research Institute of Texas, Fort Worth, TX.

Everitt, J.H., and D.L. Drawe. 1993. Trees, Shrubs & Cacti of South Texas. Texas Tech University Press, Lubbock, TX.

Turner, B. L. 1959. The legumes of Texas. University of Texas Press, Austin, TX.

[USDA NRCS] USDA Natural Resources Conservation Service. 2012a. The PLANTS database, version 3.5. URL: <http://www.plants.usda.gov> (accessed 22 March 2012). Baton Rouge (LA): National Plant Data Center.

[USDA NRCS] USDA Natural Resources Conservation Service. 2012b. Conservation plant releases sorted by scientific name. URL: <http://plant-materials.nrcs.usda.gov/releases/releasesallbysci.html> (accessed 22 March 2012).

[USDA NRCS] USDA Natural Resources Conservation Service. 2008. Plant Fact Sheet prairie acacia. URL: http://plants.usda.gov/plantfactsheet/pdf/pg_acan.pdf (accessed 22 March 2012).

[USDA NRCS] USDA Natural Resources Conservation Service. 2012e. Web Soil Survey. URL: <http://www.websoilsurvey.nrcs.gov> (accessed 22 March 2012). Lincoln (NE): National Soil Survey Center.

Prepared by:

John Lloyd-Reilley
USDA-NRCS E."Kika" de la Garza Plant Materials Center
3409 N. FM 1355
Kingsville, TX 78413

Shelly Maher
USDA-NRCS E."Kika" de la Garza Plant Materials Center
3409 N. FM 1355
Kingsville, TX 78413

Figure 1. Collection, evaluation, and experimental planting sites used in development of prairie acacia.

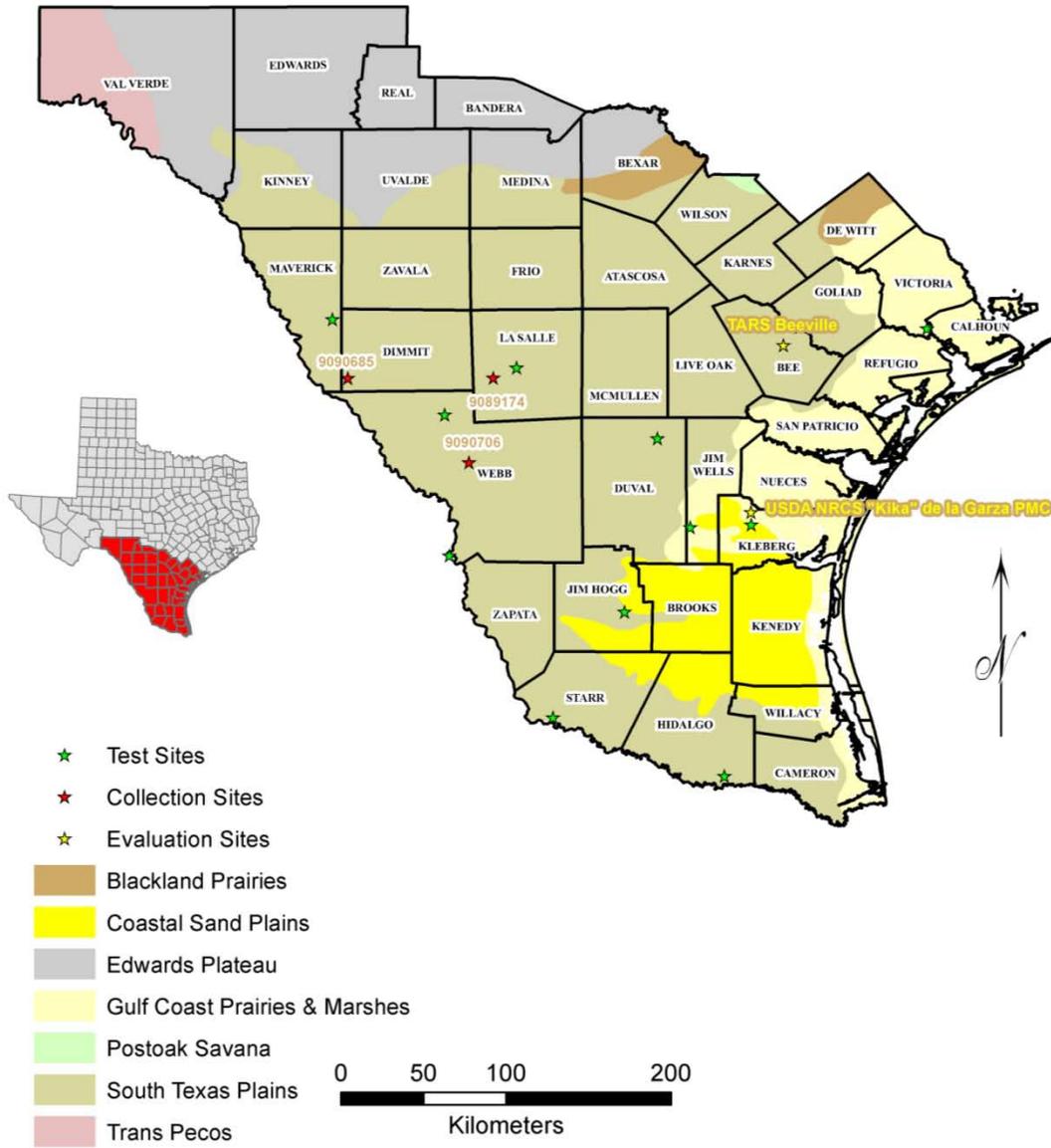


Figure 2. Seed increase field of prairie acacia accession 9089174.



Figure 3. Representative plant of Rio Grande Germplasm prairie acacia.



MARKETING PLAN

RIO GRANDE GERMLASM PRAIRIE ACACIA

July 2012

Finalize and obtain approval for release, and print supporting documents (fact sheet & brochure).

Winter 2012

Draft press release once seed is commercially available to seed dealers.

Publish “notice of release” article in Native Plant Journal.

Spring/Summer 2013

Draft press release once seed is commercially available to consumers.

Staff information booths at 2 landowner and consumer oriented symposiums or conferences in south Texas.

SEED AVAILABILITY

RIO GRANDE GERMLASM PRAIRIE ACACIA

As of April 2011 there was at the E. “Kika” de la Garza Plant Materials Center 42 LBS. (bulk) of Rio Grande Germplasm which converts to approximately 30 lbs. of pure live seed available for distribution to a commercial grower. This will seed approximately 10 acres of commercial row production.

SEED PRODUCTION ESTIMATE/PLAN

RIO GRANDE GERMPLASM PRAIRIE ACACIA

As of April 2011, 0.06 acres (660 transplants) of isolated seed increase fields of each of the 3 accessions that comprise the blend are established at the E. “Kika” de la Garza Plant Materials Center near Kingsville, TX. Total production acreage for the blend components is 0.2 acres, which if harvested 2 times annually should yield an average of 30 lbs pure live seed/year. This production level will be sustained until commercial production has reached an acceptable level, and seed for establishment of at least 50 acres of commercial seed fields is in cold storage. Seed harvests of the isolated fields will be obtained annually and stored at the E. “Kika” de la Garza Plant Materials Center in Kingsville to provide material for re-establishment of the germplasm as needed.

Signatures for release of:
RIO GRANDE GERMLASM PRAIRIE ACACIA
Acacia angustissima (Mill.) Kuntze var. *hirta* (Nutt.) B.L. Rob.

Dr. Fred C. Bryant
Leroy Denman, Jr. Director of Wildlife Research
Caesar Kleberg Wildlife Research Institute
Texas A&M University-Kingsville
Kingsville, TX

Date

Dr. George Allen Rasmussen
Dean
Dick and Mary Lewis Kleberg College of
Agriculture, Natural Resources and Human Sciences
Texas A&M University-Kingsville
Kingsville, TX

Date

Dr. Craig L. Nessler
Director
Texas Agrilife Research
College Station, TX

Date

Salvador Salinas
Texas State Conservationist
United States Department of Agriculture
Natural Resources Conservation Service
Temple, TX

Date

Terrell Erickson
Director
Ecological Sciences Division
United States Department of Agriculture
Natural Resources Conservation Service
Washington, D.C.

Date