

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

NOTICE OF RELEASE OF OSO GERMPLASM HALL'S PANICUM
SELECTED PLANT MATERIAL

U.S. Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS), E."Kika" de la Garza Plant Materials Center and Texas A&M University-Kingsville, Caesar Kleberg Wildlife Research Institute, *South Texas Natives* announce the release of a selected plant material of Hall's panicum [*Panicum hallii* Vasey var. *filipes* (Scribn.) Waller] for the South Texas Ecoregion.

This plant will be referred to as Oso Germplasm Hall's panicum, and is released as a selected plant material class of certified seed (natural track). Oso Germplasm was tested under the USDA NRCS accession numbers 9085421 and 9089159. Seed of the Oso Germplasm Hall's panicum release will be identified by USDA NRCS accession number 9093601.

This alternative release procedure is justified because there are no existing Texas commercial sources of tested and adapted Hall's panicum. The potential for immediate use is high, especially for upland wildlife plantings, highway rights of way revegetation, and for inclusion in range seeding mixes.

A. Proposed Variety Name and Temporary Designation:

OSO GERMPLASM HALL'S PANICUM

B. Family, kind, genus and species:

Family: Poaceae

Tribe: Paniceae

Kind: Hall's panicum

Genus and species: *Panicum hallii* Vasey var. *filipes* (Scribn.) Waller

C. Origin and breeding history of the variety:

Collection Site Information: Accession 9085421 was collected by John Lloyd-Reilley on June 12, 2001 from native plants located along a trail of the old Corpus Christi Botanical Gardens along Oso creek in Nueces County, Texas at 27° 38.982' N. latitude and 97° 24.297' W. longitude (MLRA 150B). Soil type of the collection site is a gullied, clay soil (USDA NRCS 2009).

Accession 9089159 was collected by Shelly Maher and Chris Best on October 23, 2002 from native plants located at the Loma Portero Cercado in Cameron County, Texas at 26° 00' 042" N. latitude and 97° 16' 143" W. longitude (MLRA 83). Soil type of the collection site is a Point Isabel clay loam (USDA NRCS 2009).

Breeding history: Plants evaluated in all trials were grown from the original seed collections. Breeder seed of each of the accessions was also grown from isolated increase plots established using the original seed collection of each accession. All seed increase plots were grown in isolation from other *Panicum hallii* 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:

Hall's panicum is a short-lived, native, perennial bunch grass with stiffly erect stems. Mature foliage height ranges from 20 to 80 centimeters (.5 to 2.5 feet) tall. It has a ligule with a membrane about 0.2 mm long with ciliate hairs to 1.3 mm long. Leaves are mostly in a basal clump, curling with drying and age. The leaf blades are flat, 2-10 mm broad and 4-30 centimeters (2 to 12 inches) long. The inflorescence is an open panicle 6 to 20 centimeters long. Primary panicle branches are mostly less than 15, few-flowered, with spikelets appressed near the ends of stiffly ascending branches. Sheaths are mostly hairy. Spikelets are smooth, acute and 2.2-3.7 mm long and 1-1.5 mm wide. The lemma is usually dark brown and shiny. Chromosome number is $2n=18$ (Gould 1975). The plants produce seed from April through November. Hall's panicum has an average of 855,566 seeds per pound.

Potential Uses: Oso Germplasm Hall's panicum is recommended for upland wildlife, highway rights-of-way, and range plantings.

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 South Texas Natives obtained seed of Hall's panicum from 29 field locations in South Texas. Initial evaluations began in 2001 at the USDA/NRCS E. "Kika" de la Garza Plant Materials Center (PMC), Kingsville, Texas. In December of 2002, 19 accessions of Hall's panicum were seeded in the greenhouse. Due to poor seed-fill and germination, only four accessions produced enough plants for field evaluation at the PMC on a Cranell sandy clay loam. These four collections were evaluated and harvested from May to October of 2003 (Table 1).

Table 1. Grams harvested and percent germination of Hall's panicum accessions from the initial evaluation in 2003.

Accession Number	Origin (County)	Grams Harvested	3 Days %	14 Days %	28 Days %
9085331	Atascosa	1.5	50.7	62.7	63.3
9229051	Maverick	0.7	39.3	54.0	54.0
9229052	Mexico	1.0	49.3	55.3	56.0
9089159	Cameron	8.0	54.7	63.3	64.0

*12 hours dark 20°C (68°F) / 12 hours light 30°C (86°F).

In December of 2003, 17 accessions were seeded in the greenhouse. Only three accessions produced enough plants to be field planted. These three accessions were added to the evaluation plot that by this time consisted of just one surviving accession (9089159) from Cameron County. This plot was evaluated for field performance in July of 2004 (Table 2). 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, and tolerance to cold, heat and drought, uniformity in timing and height of plant vegetation and inflorescence development, and the amount of seed produced per harvest.

Table 2. Field performance of Hall's panicum from the initial field evaluations in 2004.

PMC (Cranell sandy clay loam)

Accession Number	Source (County)	% Survival	% Regrowth	Plant Vigor*	Foliage Density*	Resistance*	Uniformity*	Seed Production*
9089200	Uvalde	90	-	6.0	6.0	6.0	5.0	6.0
9090512	Bexar	100	-	5.0	5.0	5.0	5.0	5.0
9085327	Uvalde	100	-	6.0	6.0	5.0	5.0	6.0
9089159	Cameron	100	100	5.0	4.0	5.0	5.0	4.0

*Ocular estimate (1= Best)

Four accessions of Hall's panicum had survived in the initial evaluation plot by the end of 2004. Seed was collected in June, August, and November 2004 from this plot and was germination tested in March of 2005 (Table 3). One accession (9089159-Cameron) had the best germination for all three harvests and the highest seed production.

All accessions, even the accession from Cameron County, continued to exhibit poor over-winter survival, poor regrowth, and little or no seed production during the second year after planting. Four accessions were added to the evaluation plot and 2 replanted in May of 2005. These accessions were evaluated for field performance in 2005 (Table 4).

Table 3. Grams harvested and percent germination of Hall's panicum accessions from the initial evaluation in 2004.

Accession Number	Origin (County)	Harvest Date	Grams Harvested	5 Days %	14 Days %	28 Days %
9089159	Cameron	6-7-04	63	20.7	30.0	30.7
9090512	Bexar	8-9-04	2.8	6.0	7.3	7.3
9085327	Uvalde	8-9-04	2.0	0	1.3	1.3
9089159	Cameron	8-9-04	3.4	17.7	24.0	24.0
9089200	Uvalde	11-12-04	0.5	10.0	14.7	14.7
9090512	Bexar	11-12-04	2.5	4.0	6.0	6.0
9085327	Uvalde	11-12-04	1.2	0.7	0.7	0.7
9089159	Cameron	11-12-04	13.7	11.3	16.0	16.0

*12 hours dark 20°C (68°F) / 12 hours light 30°C (86°F).

Table 4. Field performance of Hall's panicum from the initial field evaluations in 2005.

PMC (Cranell sandy clay loam)

Accession Number	Source (County)	% Survival	% Regrowth	Plant Vigor*	Foliage Density*	Resistance*	Uniformity*	Seed Production*
9093179	Bexar	68	new	7.0	7.0	7.0	5.0	8.0
9089200	Uvalde	0	-	-	-	-	-	-
9090512	Bexar	10	25	7.3	7.3	7.3	5.0	7.0
9085327	Uvalde	75	25	7.3	7.3	7.3	5.0	7.5
9089159	Cameron	0	-	-	-	-	-	-
9090675	Maverick	89	new	6.0	6.0	6.0	5.0	7.0
9090713	Frio	89	new	8.5	8.5	8.5	5.0	none
9091840	Zapata	100	new	2.0	2.0	2.0	5.0	3.7

*Ocular estimate (1= Best)

Due to superior field performance and harvest germination numbers in 2003, an isolated seed increase plot of accession 9089159-Cameron was started from original seed. Three hundred plants were transplanted in May of 2005. Seed was harvested in the fall of 2005.

In December 2005, eleven accessions of Hall's panicum (all accessions that still had original seed left) were seeded in the greenhouse (Table 5). Three had germination at 74% or higher (9091840-Zapata, 9085421-Nueces, & 9089159-Cameron) and the rest were reseeded in an attempt to get enough seedlings for a field planting at the PMC Annex on a Delfina fine sandy loam soil (USDA NRCS 2009).

Table 5. Greenhouse germination of Hall's panicum in the winter 2005.

Accession Number	Origin (County)	15 Days %	30 Days %	45 Days %	60 Days %
9090512	Bexar	0	0	0	0
9091840	Zapata	96.0	96.5	75.0	76.0
9091890	Webb	0.5	0.5	0.5	0.5
9085421	Nueces	72.0	76.5	75.5	74.0
9093195	Webb	0.8	0.8	0.8	0.8
9089159	Cameron	86.7	86.7	87.2	too thick
9090675	Maverick	0.6	0.6	0.6	0.6
9091887	Maverick	0.2	0.2	0.4	0.4
9091807	Bee	1.9	1.9	1.9	1.9
9085327	Uvalde	0	0	0.1	0.1
9093171	Duval	0.7	0.8	0.8	0.8

Four accessions were planted at the Annex in July of 2006. These accessions were evaluated for field performance in November of 2006 (Table 6). Accession 9089159-Cameron had the most dense growth and overall vigor.

Table 6. Field performance of Hall’s panicum from the initial field evaluations in 2006.

Annex Plot (Delfina fine sandy loam soil)

Accession Number	Source (County)	% Survival	% Regrowth	Plant Vigor*	Foliage Density*	Resistance *	Uniformity *	Seed Production*
9091840	Zapata	92	new	7.0	7.0	7.0	5.0	5.0
9085421	Nueces	98	new	5.0	5.0	5.0	5.0	6.0
9091807	Bee	88	new	5.0	4.0	5.0	5.0	5.0
9089159	Cameron	90	new	3.0	3.0	4.0	5.0	3.0

*Ocular estimate (1= Best)

The accessions in the clay soil were evaluated one last time in November of 2006. None of the original plants had survived, but four accessions had numerous volunteer seedlings (9089159-Cameron, 9090675-Maverick, 9090713-Frio, and 9091840-Zapata). This plot was plowed out in December of 2006.

The plot at the Annex was evaluated again in November of 2007 (Table 7). Only two of the four accessions survived (9089159-Cameron and 9085421- Nueces). Accession 9085421 from Nueces County had the best survival, density, and vigor.

Table 7. Field performance of Hall’s panicum from the initial field evaluations in 2007.

Annex Plot (Delfina fine sandy loam soil)

Accession Number	Source (County)	% Survival	% Regrowth	Plant Vigor*	Foliage Density*	Resistance *	Uniformity *	Seed Production*
9091840	Zapata	0	-	-	-	-	-	-
9085421	Nueces	96	100	4.0	4.0	5.0	5.0	5.0
9091807	Bee	0	-	-	-	-	-	-
9089159	Cameron	48	100	5.0	5.0	5.0	5.0	5.0

*Ocular estimate (1= Best)

Advanced Evaluation

In November 2007, we initiated a seed increase of the two best performing Hall’s panicum accessions (9089159-Cameron and 9085421- Nueces). Transplants of these 2 accessions were grown from the original seed collections and planted in 2008 for isolated seed increase and

evaluation of harvest characteristics, seed set and timing, and adaptability to agronomic production. Both accessions performed well in this evaluation, with similar growth rates and seed maturity dates.

Selection

Seeding trials

Hall's panicum was planted as part of a mix of 29 native species at the Taormina Unit of the Texas Parks and Wildlife, Las Palomas Wildlife Management Area. Soil type of the study area was Harlingen clay. Site preparation consisted of mowing, moldboard plowing, double disking and leveling. Eight hectares were planted using a combination of drilling and broadcast seeding. Hall's panicum was 0.25% of the seed mix planted. Mean canopy cover contribution of Hall's panicum during the 2.5 year study was 0.40% of the total native cover of seeded plants. Hall's panicum was the ninth best performing species of the 29 native species planted in this experiment for canopy cover percentage.

Seed Increase

Both accessions were harvested four times (May, July, September and October) in 2008. The May harvest for accession 9089159 yielded 56 pure live seed (PLS) pounds per acre (lb/A) and accession 9085421 yielded 29 PLS lb/A. The July harvest plummeted with accession 9089159 yielding just 3 PLS lb/A and accession 9085421 yielding 2 PLS lb/A. The harvest yield picked up again in September with accession 9089159 yielding 15 PLS lb/A and accession 9085421 yielding 17 PLS lb/A. The October harvest for accession 9089159 continued to be good yielding 18 PLS lb/A. However, the yield for accession 9085421 was only 3 PLS lb/A.

In 2009, accession 9085421 was harvested three times (May, August and October) and accession 9089159 was harvested just twice (July and October). The May harvest of accession 9085421 yielded only 1 PLS lb/A. The July harvest of accession 9089159 was only 8 PLS lb/A, while the August yield for accession 9085421 was 12 PLS lb/A. However, the seed yields improved significantly in October with accession 9089159 yielding 40 PLS lb/A and accession 9085421 yielding 49 PLS lb/A.

The early spring harvest of accession 9089159 yielded 30 lbs of bulk seed per acre but with a germination of only 12%, it left us with just 2 PLS lb/A. We yielded 104 lbs of bulk seed per acre from the June harvest of accession 9085421 following 7.4 inches of rainfall that preceded the harvest. With germination of 32%, it left us with 20 PLS lb/A.

The trend in seed production is for both better seed yields and germination during the cooler temperatures of spring and fall provided there is good soil moisture. The May harvest of 2008 produced a good PLS yield from the 2.5 inches of rainfall that preceded the harvest. However the May harvest in both 2009 and 2010 was negligible following 1.3 inches and 1.1 inches of rainfall respectively. July and August seed harvests tend to be low in PLS seed yields. However, September and October can produce good seed yields provided there is adequate soil moisture.

The September harvest in 2008 had good yields following 7.5 inches of rainfall and the October harvest of 2009 had very good yields following 2.97 inches of rainfall.

Seed harvested from this planting will be blended by equal amounts of pure live seed (PLS)/accession, and distributed to interested commercial seed producers.

Seed Production, Harvest, and Cleaning

Irrigated seed fields of the two selected accessions of Hall's panicum were evaluated at Rio Farms, Hidalgo County, TX in 2010. Plantings were established using transplants spaced 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 114 pounds of pure live seed (PLS)/acre/harvest.

F. Area of adaptation

The best performance of Oso Germplasm will be predominantly in the Gulf Prairies and Marshes. However, based on the distribution of *Panicum hallii*, it is expected that it will likely do well also in the Rio Grande Plain eco-region of Texas.

G. Procedure for maintaining stock classes of seed

Generation 1 seed will be produced and maintained by the USDA-NRCS E. "Kika" de la Garza Plant Materials Center, Kingsville, Texas. Seed will be released to a single commercial producer for 5 years following release, and thereafter according to any subsequently negotiated licensing agreement. Interested producers are asked to submit detailed production proposals regarding the release to the releasing agency for consideration of selection for production rights.

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

Oso Germplasm Hall's panicum is released as a Selected Texas Native Ecotype. Generation 1 seed will be made up of equal amounts (by percent PLS, +/-10%) of each of the two accessions. Generation 2 seed is that which is grown from plantings of the Generation 1 seed blend. Generation 3 seed is that which is grown from plantings of the Generation 2 seed. Increase using Generation 3 seed is prohibited.

I. Additional restrictions, etc.

Generation 2 and Generation 3 seed fields have a 5 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__

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 Oso Germplasm Hall's panicum was suitable for release based on the criterion contained in this document. This conclusion is mainly because Hall's panicum 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 seed source to upland avian wildlife species and provide unknown benefits by maintaining and contributing habitat that harbors beneficial insects and butterflies.

Conservation Use: Oso Germplasm Hall's panicum will provide a native plant species for rangeland planting and wildlife habitat improvement.

Availability of Plant Materials: Generation 1 Seed will be maintained by USDA-NRCS E. "Kika" de la Garza Plant Materials Center, Kingsville, Texas. Generation 1 seed will be available by September 2011. At this time release of the germplasm will be limited to a single commercial grower, who must grow the seed within the Rio Grande Plain Ecoregion.

References:

Gould, F.W. 1975. The Grasses of Texas. Texas A&M University Press. College Station, Texas.

USDA NRCS. 2009. Web soil survey. <http://websoilsurvey.nrcs.usda.gov>.

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 7841

Figure 1. Collection, evaluation, and experimental planting sites used in development of Oso Germplasm Hall's panicum.

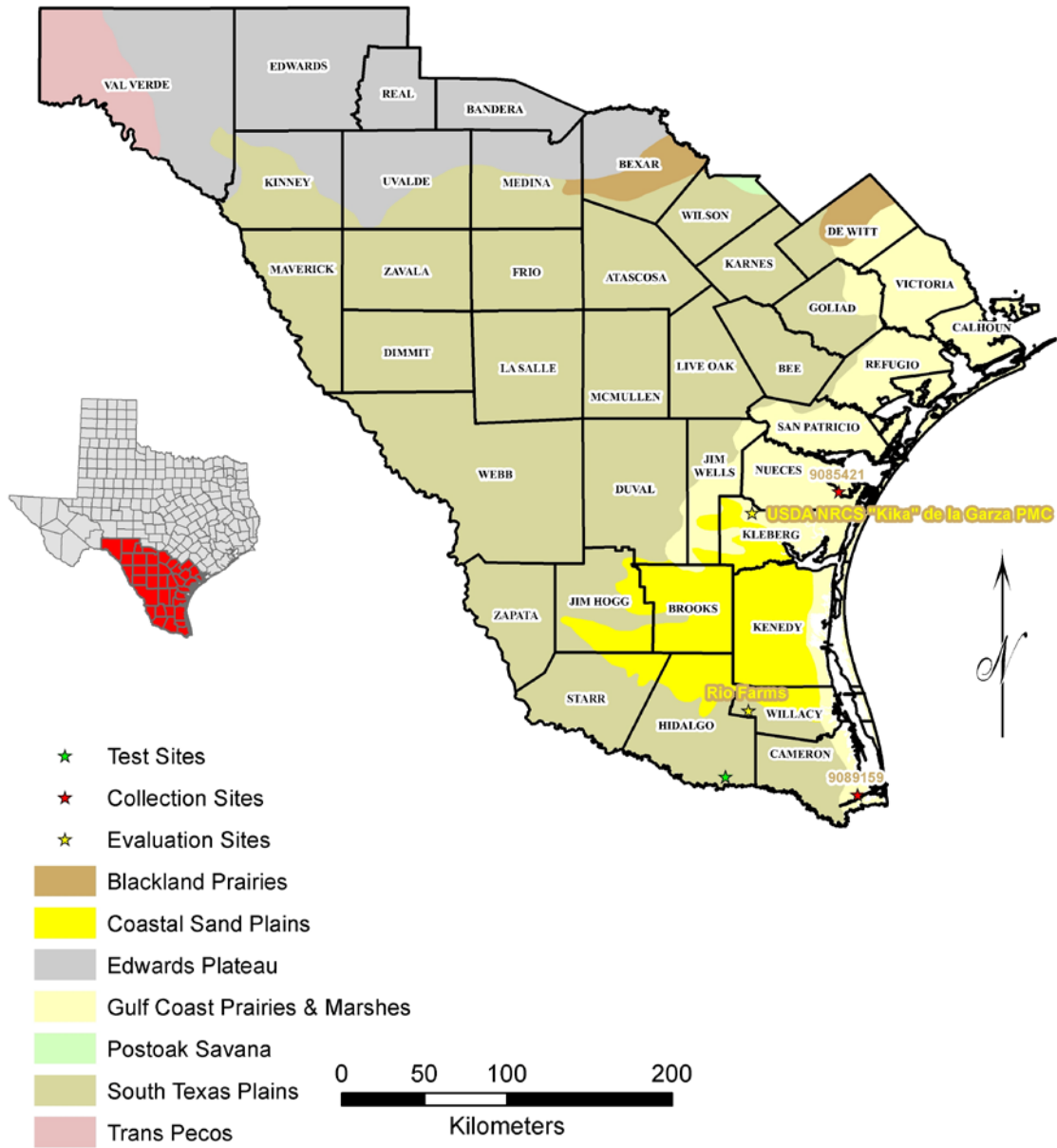


Figure 2. Seed increase field of Accession 9085421 Hall's panicum.



Figure 3. Representative plant of Oso Germplasm Hall's panicum.



MARKETING PLAN

OSO GERMPLASM HALL'S PANICUM

January 2010

Distribute breeder seed to *South Texas Natives* for Foundation seed increase.

May 2011

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

Spring/Summer 2011

Draft press release once seed is available to seed dealers.

Winter 2011

Publish "notice of release" article in *Native Plant Journal*.

Spring/Summer 2012

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

OSO GERMPLASM HALL'S PANICUM

As of April, 2011 there is 35 lbs. of bulk seed at the E. "Kika" de la Garza Plant Materials Center which converts to approximately 10 lbs. of pure live seed of Oso Germplasm that is available for distribution to a commercial grower. This will seed approximately 20 acres of commercial row production. South Texas Natives (STN) has another 20 lbs. of bulk seed that is approximately 15 lbs. of pure live seed. Based on its active germination levels of 25 %, it should seed another 5 acres.

SEED PRODUCTION ESTIMATE/PLAN

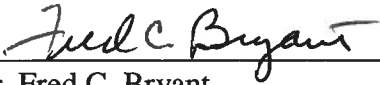
OSO GERMPLASM HALL'S PANICUM

As of April, 2011, 0.26 acres of isolated seed increase fields of each of the 2 accessions that comprise the blend are established at Rio Farms, Inc. near Monte Alto, Texas. Total production acreage for the blend components is 0.52 acres, which if harvested twice annually yields an average of 80 lbs of 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 if needed.

Signatures for release of:

Oso Germplasm Hall's Panicum

Panicum hallii Vasey var. *filipes* (Scribn.) Waller



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

8/17/11

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

8/18/11

Date



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

8/24/11

Date



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

9-27-2011

Date