

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

And

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

And

TEXAS AGRILIFE RESEARCH STATION
BEEVILLE, TEXAS

NOTICE OF RELEASE OF WEBB GERMPLASM WHIPLASH PAPPUSGRASS
SELECTED PLANT MATERIAL

Texas A&M University-Kingsville, Caesar Kleberg Wildlife Research Institute, *South Texas Natives*, U.S. Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS), E. “Kika” de la Garza Plant Materials Center, and Texas AgriLife Research Station at Beeville, Texas announce the release of a selected plant material of whiplash pappusgrass (*Pappophorum vaginatum* Buckley) for the South Texas Ecoregion.

This plant will be referred to as Webb Germplasm whiplash pappusgrass, and is released as a selected plant material class of certified seed (natural track). Webb Germplasm was tested under the accession numbers 9088622, 9088715, and 9091841. Seed of the Webb Germplasm whiplash pappusgrass release will be identified by USDA NRCS accession number 9093443.

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

A. Proposed Variety Name and Temporary Designation:

WEBB GERMPLASM WHIPLASH PAPPUSGRASS

B. Family, kind, genus and species:

Family: Poaceae

Tribe: Pappophoreae

Kind: whiplash pappusgrass

Genus and species: *Pappophorum vaginatum* Buckley

C. Origin and breeding history of the variety:

Collection Site Information: Accession 9088662 was collected by Forrest Smith, Cody Lawson, and Jimmy Rutledge on May 15, 2002 from native plants located at the Dos Amigos Ranch in Dimmit County, Texas at 28° 26' 24" N. latitude and 99° 51' 32" W. longitude (MLRA 83). Soil type of the collection site is Brundage fine sandy loam (USDA NRCS 2009).

Accession 9088715 was collected by Forrest Smith and Cody Lawson on June 12, 2002 from native plants located at the Cerrito Prieto Ranch in Webb County, Texas at 27° 57' 10" N. latitude and 99° 26' 25" W. longitude (MLRA 83). Soil type of the collection site is Copita fine sandy loam (USDA NRCS 2009)

Accession 9091841 was collected by Charity Lawson and Cody Lawson on December 8, 2003 from native plants located at the Arroyo Velano Ranch in Zapata County, Texas at 26° 56' 50" N. latitude and 99° 07' 55" W. longitude (MLRA 83). Soil type of the collection site is Catarina clay (USDA NRCS 2009).

Breeding history: Plants evaluated in all trials were grown from the original seed collection. Breeder seed of each of the three accessions was also grown from isolated increase plots of the original seed collection. All seed increase plots were grown in isolation from other *Pappophorum* accessions, and wild populations of *Pappophorum*. No intentional breeding, selection or genetic manipulation has been carried out on these accessions. Combination of accessions should have no effect on the genetic makeup of the release, as whiplash pappusgrass is thought to be an apomictic or self-pollinated species. Each accession in the release should maintain the genetic integrity of the parent population. Plant stature, flowering time, and seed maturation are similar among the selected accessions.

D. Objective description of the variety:

Description:

Whiplash pappusgrass is perennial bunchgrass, similar in vegetative characters to *P. bicolor*. Culms are 30-80 (-100) cm. tall, stiffly erect, or somewhat geniculate below and glabrous. Sheaths have a tuft of long hairs on either side of collar, and the hairs deciduous in age. Ligule is a ring of short hairs, the base of blade immediately above the ligule has hairs 2-4 mm long. Blades are flat or involute, scabrous on the adaxial surface, 10-20 (-30) cm. long and 1.5-5 mm. broad. Panicles are narrow, tightly contracted, whitish or tawny, only rarely with a slight purple tinge, mostly 12-25 cm. long and

averaging longer than in *P. bicolor*. Spikelets with 1, rarely 2, perfect florets and 2 reduced florets above. The lemma of lower floret has a body 2-3 mm. long and awns to 5 mm. long. Chromosome number is $2n=40$, or 60 (Reeder and Toolin 1989). Whiplash pappusgrass flowers from April through November. (Gould 1975). Cleaned seed of whiplash pappusgrass contains approximately 436,250 seeds per pound.

Whiplash pappusgrass exhibits a self-pollinated mode of reproduction. We have not observed off types or characteristics deviant from the parent population in 3 generations of propagation. A release of *Pappophorum vaginatum* from Arizona, Pima Germplasm Pima pappusgrass, is also assumed to be self-pollinated or apomictic (Garner et al. 2006). Within accessions, plant morphology and phenology are identical.

Potential Uses: Webb germplasm whiplash pappusgrass 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 *South Texas Natives* obtained seed of pink and whiplash pappusgrass from 70 field locations in South Texas from 2001-2004. These species of *Pappophorum* were selected for evaluation of potential use in revegetation plantings on rangelands and highway rights of way, and for use in upland wildlife habitat plantings. Pink and whiplash pappusgrass have considerable overlap in range and habit, and often grow together (Reeder 2008). Of the 70 collections, 55 were determined to be pink pappusgrass, 6 whiplash pappusgrass, and 9 a mixture of the two species. A decision was made to evaluate all 70 accessions collectively, because of the similarity of growth habits, habitat of origin, range of occurrence, and breeding biology (assumed apomictic), despite the 2 species being heterospecific. (Table 1)

In December 2004, all 70 collections were seeded in greenhouse flats to produce transplants for evaluation. Two accessions had 0% germination in this planting, and were eliminated from consideration. In 2005, transplants of the 68 remaining accessions were planted in a randomized, complete block design with 2-10 plant replications of each accession at 3 separate locations (Texas Agrilife Research Station Uvalde (Uvalde County), Rio Farms (Hidalgo County), and Rancho Blanco (Webb County)). An additional replication was also planted at the E. Kika De La Garza Plant Materials Center (Kleberg County); this planting consisted of paired row planting of 50 plants of each accession in a complete block design.

Accessions at each location were evaluated monthly throughout the growing season in 2005 under fully irrigated conditions and bi-monthly under rain-fed conditions in 2006. Data was collected on important traits for commercial production and ecological function including: survival, plant vigor, foliage density, uniformity, forage (biomass) production, seed production, and plant height. Each replication of each accession was

given a rank of 1 to 9 (1 best, 9 worst) based on visual observation of each characteristic at the given evaluation. Data from each evaluation year was pooled, and mean performance in each category by year used for selection of superior accessions. In 2005, under fully irrigated conditions, seed was collected from each accession at each location for testing of percent active seed germination under favorable production conditions. Accessions were not evaluated in 2006 at TAES-Uvalde because of severe drought conditions, as no appreciable plant growth occurred.

Advanced Evaluation

Following evaluation in 2005 and 2006, 10 accessions were selected for advanced evaluation and initial seed increase. Of these 10 accessions, 3 were whiplash pappusgrass, and 7 pink pappusgrass. Selection was made using a combination of data collected from each site and active seed germination. Accessions that showed greater than mean performance in the greatest number of evaluation categories at all locations were selected. Transplants of these 10 accessions were grown from the original seed collections for isolated seed increase and evaluation of harvest characteristics, seed set and timing, and adaptability to agronomic production in 2007 at Rio Farms. Additional advanced evaluation plots containing 250 plants per accession were planted at the STN Farm, near Kingsville, Texas in the spring of 2008. All accessions performed well in this evaluation, and similar growth rates and seed maturity dates observed. Similar seed maturation dates and seedhead stature of the selected accessions have been confirmed at 4 growing locations.

Selection

All 10 accessions planted for advanced evaluation showed similar phenology in the onset of flowering, set seed, and seed maturity. Each accession was harvested successfully using a Flail-Vac seed harvester, and had excellent survival in a rowed, fully irrigated setting under intense cultivation and herbicide exposure. The 3 whiplash pappusgrass accessions were subsequently designated for release as Webb Germplasm whiplash pappusgrass, and the 7 pink pappusgrass accessions as Maverick Germplasm pink pappusgrass.

Seed Increase

Seed harvested from the 2007 isolated advanced evaluation plantings was used to establish breeder seed increase fields of the accessions selected for release in 2008. Seed harvested from these planting will be blended by equal amounts of pure live seed (PLS) and distributed to interested commercial seed producers.

Seeding trials

Numerous seeding trials have documented good establishment of pappusgrasses from seed in south Texas. Plantings at the Welder Wildlife Refuge near Sinton, Texas had good establishment from seed >1 year after planting, following a severe drought. These

plantings indicated good soil seed life and persistence, an important characteristic for range seed mix components in south Texas. A blend of pink and whiplash pappusgrass seed was also planted as part of a highway right of way seeding demonstration in Kleberg County, Texas. Emergence and persistence of pappusgrass in this planting was also documented following a severe drought.

A composite harvest of seed of pink and whiplash pappusgrass seed from evaluation plots was planted in a native grass seeding trial in 2006 at Rancho Blanco, near Laredo, Texas. Three seeding rates (10, 20, and 30 pure live seeds/ft²) were sown in replicated plots at three times throughout the year (May-spring, August-summer, and November-fall) in areas dominated by the exotic grass buffelgrass. All plantings were fully irrigated. These plantings showed that fall seeding was the superior season for establishment of pappusgrass from seed in south Texas. One year after planting, spring plots had 6% cover, summer plots 16% cover, and fall plots 37% cover. By two years following plantings, spring seeded plots had 1% cover, summer plots 0% cover, and fall plots 22% cover. Seeding rates had no significant effect on cover of pappusgrass in these plantings. Of 12 native grass species planted in these trials, pappusgrass was the 4th most competitive species with buffelgrass.

A blend of the selected accessions of pappusgrass was planted in a research project in the lower Rio Grande Valley of Texas in March 2008. Pappusgrass seedlings did not emerge until October, despite above average rainfall and soil moisture by mid-June of the planting year. These results concur with observations in our evaluations plots at various locations, and the Rancho Blanco plantings where we have also noted a dramatic increase of volunteer pappusgrass seedlings in the fall.

The recommended seeding rate for pure stands of Maverick Germplasm pink pappusgrass is 3 lbs. pure live seed per acre. Seed coatings (talc based) increase the flowability of seed through standard seed drills. Successful establishment has been obtained in both drill and broadcast plantings.

Seed Production, Harvest, and Cleaning

Seed increase plots have been planted on 36" bedded rows, however flat plantings may be possible with frequent weeding. Whiplash pappusgrass produces seed throughout the growing season, whenever adequate soil moisture is present. Seed is harvested with a Flail-Vac or similar brush-type harvester. The use of slow travel and RPM speeds while harvesting results in relatively clean seed, needing little cleaning or processing. Seed harvested in this manner averages 54% pure live seed. To clean stems and chaff from harvests when needed, a clipper seed cleaner has been used. No attempt has been made to clean caryopsis from the bur or glumes, as seed damage or reductions in seed life are likely to occur.

Common pests of pappusgrass seed include fall armyworms (*Spodoptera* spp.), thrips (*Thrips* spp.), and rice stink bugs (*Oebalus pugnax*). Control of the pests may be necessary in order to produce seed crops in dry years under irrigation. Pappusgrass seed fields should be mowed, or burned annually to promote vigorous growth. Deep soil tillage or frequent close cultivation is also recommended to promote seed production. Herbicides containing 2, 4-D, Pendamethelin, Atrazine, and Halosulfuron-methyl are safe for weed control once plants are beyond the seedling growth stage. Established plants

(>1 yr. age) have shown excellent tolerance to Glyphosate herbicides; discretion should be used to avoid applications during times of vigorous active growth of pappusgrass stands.

Plantings of pink pappusgrass in north central Texas at 2 locations have had good winter survival < 2 years after seeding. However, persistence of this species for seed production in these areas is unknown.

F. Area of adaptation

Based on the distribution of *Pappophorum vaginatum*, best performance of Webb Germplasm will be in the Gulf Prairies and Marshes, Rio Grande Plain, and sand plains. Good performance in the southern portions of the Edwards Plateau and Blackland prairie, and the eastern portions of the Trans Pecos Mountains and Basins and adjacent portions of northern Mexico is possible but this use has not been tested.

G. Procedure for maintaining stock classes of seed

Breeder seed will be produced and maintained by *South Texas Natives* in conjunction with the Texas Foundation Seed Service.

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

Webb Germplasm whiplash pappusgrass is released as Selected Texas Native Ecotype by *South Texas Natives*. Breeder seed will be made up of equal amounts (by % PLS, +/- 10%) of each of the 3 accession. Breeder seed may contain a maximum of 49% PLS of any one accession and a minimum of 16% PLS of any one accession. Foundation seed is that which is grown from harvest of plantings of the Breeder seed blend. Certified seed is that which is grown from plantings of the Foundation seed. Increase using certified seed is prohibited.

I. Additional restrictions, etc.

Foundation and certified seed fields have a 7 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 per pound of Certified Pure Live Seed sold will be collected by the Texas Foundation Seed Service, and placed in a project account with discretionary spending authority, requiring approval for expenditures by the *South Texas Natives Coordinator* 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 Webb Germplasm whiplash pappusgrass was suitable for release based on the criterion contained in this document. This conclusion is mainly due to the fact that whiplash pappusgrass 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: Webb whiplash pappusgrass will provide a native plant species for rangeland planting and wildlife habitat improvement.

Availability of Plant Materials: Breeder Seed will be maintained by *South Texas Natives*, Kingsville, Texas. At this time release of the germplasm will be limited to a single commercial grower.

References:

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

Reeder, J.R. 2008. 18.01 PAPPOPHORUM Schreb *in* Manual of Grasses for North America. Utah State University, Logan, Utah.

Reeder J.R. and L.J. Toolin. 1989. Notes on *Pappophorum* (Gramineae: Pappophoreae). *Systematic Botany* 14:3, 349-358.

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

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TABLES AN FIGURES

Table 1. *Pappophorum* collections evaluated in the development of Webb and Maverick Germplasms.

| Accession | Species | County | Location | Soil type |
|-----------|---------------------|-----------|----------------------|-----------------|
| PMT 2593 | <i>P. bicolor</i> | Webb | Laredo, TX | |
| PMT 3033 | <i>P. bicolor</i> | Dimmit | Carrizo Springs, TX | |
| 9076944 | <i>P. bicolor</i> | Jim Wells | Hwy 44 | sandy loam |
| 9085241 | <i>P. bicolor</i> | Dimmit | Carrizo Springs, TX | Poteet FSL |
| 9085252 | <i>P. bicolor</i> | Dewitt | Hwy 87 R.O.W. | loamy sand |
| 9085257 | <i>P. bicolor</i> | Starr | | Catarina clay |
| 9085302 | <i>P. bicolor</i> | Duval | JD Lopez ranch | |
| 9085324 | <i>P. bicolor</i> | Uvalde | Stichler's house | silty clay loam |
| 9086195 | <i>P. bicolor</i> | Zavala | Westwind ranch | |
| 9086196 | <i>P. bicolor</i> | Zavala | Westwind ranch | |
| 9086272 | <i>P. vaginatum</i> | Atascosa | 74 ranch | sandy loam |
| 9086276 | <i>P. vaginatum</i> | Atascosa | Peeler ranch | Loam |
| 9088534 | <i>P. bicolor</i> | Zavala | | sandy loam |
| 9088540 | <i>P. bicolor</i> | Frio | | Loam |
| 9088567 | <i>P. bicolor</i> | Zavala | Westwind ranch | sandy loam |
| 9088620 | <i>P. bicolor</i> | Dimmit | Dos Amigos ranch | Loam |
| 9088622 | <i>P. vaginatum</i> | Dimmit | Dos Amigos ranch | Loamy |
| 9088627 | Mix | Dimmit | Dos Amigos ranch | Loam |
| 9088639 | <i>P. bicolor</i> | Dimmit | Dos Amigos ranch | Loam |
| 9088710 | <i>P. bicolor</i> | Webb | Old Mines rd | gravel loam |
| 9088715 | <i>P. vaginatum</i> | Webb | Cerrito Prieto ranch | sandy loam |
| 9088738 | <i>P. bicolor</i> | Jim Hogg | | caliche loam |
| 9088785 | <i>P. bicolor</i> | Webb | Cerrito Prieto ranch | sandy loam |
| 9088792 | <i>P. bicolor</i> | Webb | Cerrito Prieto ranch | sandy loam |
| 9088793 | <i>P. bicolor</i> | Webb | | sandy loam |
| 9088855 | Mix | Webb | 7 C's ranch | Loam |
| 9088856 | Mix | Webb | 7 C's ranch | Loam |
| 9088858 | Mix | Webb | 7 C's ranch | Loam |
| 9088904 | <i>P. bicolor</i> | Dimmit | Piloncillo ranch | Loam |
| 9088912 | <i>P. bicolor</i> | Dimmit | Piloncillo ranch | sandy loam |
| 9088954 | <i>P. bicolor</i> | Frio | Shiner ranch | sandy loam |
| 9088970 | <i>P. bicolor</i> | Frio | Shiner ranch | sandy loam |
| 9088982 | <i>P. bicolor</i> | Uvalde | FM 1022 | Loam |
| 9088995 | <i>P. bicolor</i> | Dimmit | Piloncillo ranch | clay loam |
| 9088999 | <i>P. bicolor</i> | LaSalle | 7 C's ranch | clay loam |
| 9089000 | <i>P. bicolor</i> | LaSalle | Chaparral WMA | sandy clay loam |
| 9089079 | <i>P. bicolor</i> | Webb | Cerrito Prieto ranch | sandy loam |
| 9089171 | <i>P. bicolor</i> | Medina | Co. Rd 5232 | Loam |
| 9089176 | <i>P. bicolor</i> | Medina | CR 742 | sandy loam |
| 9089239 | Mix | LaSalle | Hwy 624 | Loam |
| 9090329 | <i>P. vaginatum</i> | LaSalle | Herradura ranch | Loam |
| 9090405 | <i>P. bicolor</i> | Kinney | Anaconcho ranch | clay loam |
| 9090407 | <i>P. bicolor</i> | Kinney | Anaconcho ranch | Loam |
| 9090416 | <i>P. bicolor</i> | Kinney | Anaconcho ranch | gravel-loam |
| 9090469 | Mix | McMullen | NE of Tilden | Clay |
| 9090481 | <i>P. bicolor</i> | Starr | Benison ranch | sandy loam |
| 9090500 | Mix | Frio | CR 189 | sandy loam |
| 9090518 | <i>P. bicolor</i> | Frio | FM 3176 | Loam |
| 9090519 | <i>P. bicolor</i> | Medina | FM 1343 | red sandy loam |
| 9090520 | <i>P. bicolor</i> | Duval | Temple ranch | loamy sand |

| Accession | Species | County | Location | Soil type |
|------------------|---------------------|---------------|---------------------|------------------|
| 9090583 | <i>P. bicolor</i> | Frio | Half ranch | sandy loam |
| 9090612 | <i>P. bicolor</i> | Maverick | Faith ranch | Loam |
| 9090627 | <i>P. bicolor</i> | Dimmit | San Pedro ranch | sandy loam |
| 9090635 | <i>P. bicolor</i> | Kinney | Hwy 90 | Clay |
| 9090637 | <i>P. bicolor</i> | Kinney | Dolan falls | Clay |
| 9090646 | <i>P. bicolor</i> | Kinney | Seminole Can. SP | Loam |
| 9090660 | <i>P. bicolor</i> | Maverick | Faith ranch | Loam |
| 9090674 | <i>P. bicolor</i> | Dimmit | San Pedro ranch | sandy loam |
| 9090676 | <i>P. bicolor</i> | Maverick | San Pedro ranch | Loam |
| 9090700 | <i>P. bicolor</i> | Frio | Calvert ranch | sandy clay |
| 9090755 | <i>P. bicolor</i> | Frio | Calvert ranch | sandy loam |
| 9091841 | <i>P. vaginatum</i> | Zapata | Arroyo Velano | sandy clay loam |
| 9091859 | <i>P. bicolor</i> | Zapata | Arroyo Velano | gravelly loam |
| 9091869 | <i>P. bicolor</i> | Zapata | Noser ranch | clay loam |
| 9091882 | <i>P. bicolor</i> | Dimmit | La Bandera | silty clay |
| 9091885 | <i>P. bicolor</i> | Zavala | Chaparrosa ranch | Clay |
| 9091895 | <i>P. bicolor</i> | Maverick | Comanche Ranch | gravelly clay |
| 9093175 | <i>P. bicolor</i> | Duval | Duval co. ranch | sandy clay loam |
| 9093185 | <i>P. bicolor</i> | Zapata | Rafael Flores ranch | loamy sand |
| 9093208 | <i>P. bicolor</i> | Zavala | Chaparrosa Ranch | Sandy loam |

Table 2. Field plantings of *Pappophorum* collections, 2005-2009 during the development of Maverick and Webb Germplasms.

| Date | Location | County | Planting type | # accessions |
|-------------|-------------------|---------------|----------------------|---------------------|
| 3/2005-2009 | Rancho Blanco | Webb | Transplant (2 x10) | 68 |
| 4/2005-2008 | TAR Uvalde | Uvalde | Transplant (2x10) | 68 |
| 3/2005-2009 | Rio Farms | Hidalgo | Transplant (2x10) | 68 |
| 2005-2007 | PMC | Kleberg | Transplant (1x50) | 52 |
| 2007-2008 | Bladerunner Farms | Atascosa | Seed (irrigated) | 68 |
| 2006-2009 | Rancho Blanco | Webb | Seed (irrigated) | 68 |
| 2007 | US HWY 77 | Kleberg | Seed | 68 |
| 2006 | Welder Refuge | San Patricio | Seed | 68 |
| 2007 | Rio Farms | Hidalgo | Transplant (1x20) | 10 |
| 2008-2009 | Rio Farms | Hidalgo | Seed increase | 10 |
| 2008 | Taormina WMA | Hidalgo | Seed | 10 |
| 2008 | Turner Seed Co. | Stephens | Seed | 10 |
| 2008 | Pogue Seed Co. | Karnes | Seed | 10 |
| 2007 | TAR Stephenville | Erath | Seed | 10 |

Table 3. Seeding trial data on plantings of *Pappophorum* selections 2006-2009.

| Planting | % seed mix | % cover 1 year from seeding | % cover 2 years from seeding |
|---------------------------|-------------------|------------------------------------|-------------------------------------|
| Welder Refuge-Summer 2006 | 100 | – | – |
| US HWY 77-Summer 2007 | 1.60 | 0.001 | 0.05 |
| Rancho Blanco-Spring 2007 | 100 | 6.26 | 1.25 |
| Rancho Blanco-Summer 2007 | 100 | 15.42 | 0.00 |
| Rancho Blanco-Fall 2007 | 100 | 37.08 | 22.08 |
| TPWD Spring 2008 | 7.31 | 0.62 | 2.17 |

Table 4. Comparative difference in evaluation scores of selected and non-selected accessions of whiplash pappusgrass, across all planting sites and evaluation years.

| Category | Selected Accessions | Non Selected Accessions | Difference (%) |
|---------------------------|----------------------------|--------------------------------|-----------------------|
| % survival | 98.47 | 91.16 | 7.42 |
| plant vigor* | 2.88 | 3.48 | 20.92 |
| foliage density* | 2.79 | 3.49 | 25.25 |
| uniformity* | 2.21 | 2.26 | 2.49 |
| development stage* | 1.10 | 1.09 | 0.92 |
| seed production* | 2.65 | 3.31 | 24.98 |
| forage production* | 2.77 | 3.71 | 33.81 |
| plant height* | 2.58 | 3.31 | 28.19 |
| % active seed germ | 47.04 | 41.04 | 12.76 |

*Ocular estimates with 1 being the best and 9 being the poorest.

Figure 1. Collection, evaluation, and experimental planting sites used in the development of Webb Germplasm whiplash pappusgrass.

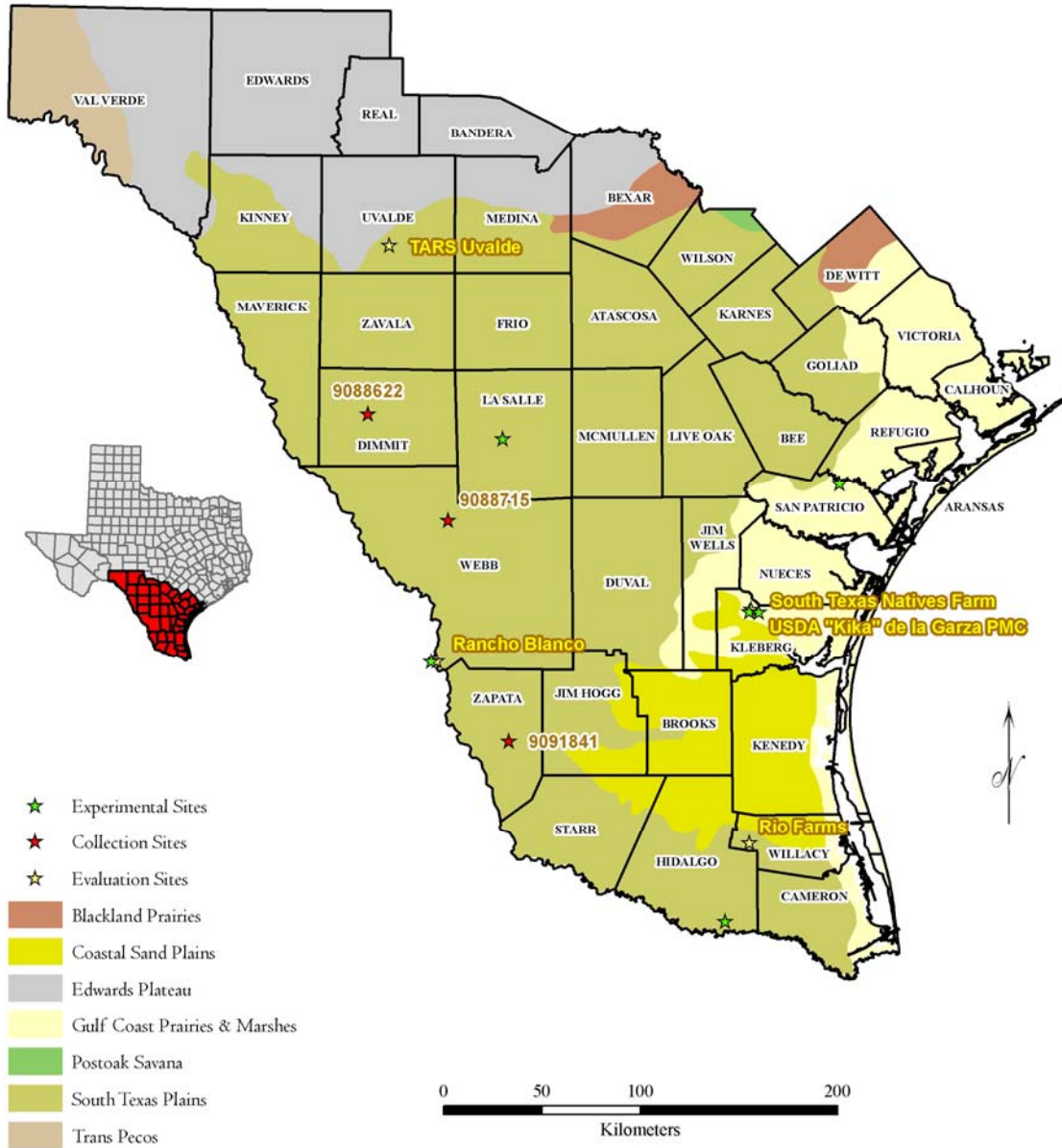


Figure 2. Seed increase field of accession 9091841 whiplash pappusgrass, a component of Webb Germplasm, 2009 at Rio Farms.



Figure 3. Representative plant of Webb Germplasm whiplash pappusgrass.



MARKETING PLAN

WEBB GERMPLASM WHIPLASH PAPPUSGRASS

January 2010

Distribute breeder seed to commercial grower

January 2010

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

Spring/Summer 2010

Draft press release and host celebration of release once seed is commercially available to consumers.

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

Winter 2011

Present results and overview of development process at International Meeting of the Society for Range Management

Publish “notice of release” article in Native Plant Journal

SEED AVAILABILITY

WEBB GERMPLASM WHIPLASH PAPPUSGRASS

As of January 1, 2010, 25 lbs. of pure live seed of Webb Germplasm is available for distribution to a commercial grower. This will plant approximately 5 acres of commercial production fields by direct seeding. Additional seed for establishment of transplants and renovation of breeder lines comprising the blend is in cold storage at the E. "Kika" de la Garza Plant Materials Center.

SEED PRODUCTION ESTIMATE/PLAN

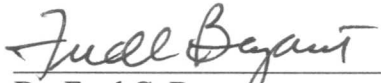
WEBB GERmplasm WHIPLASH PAPPUSGRASS

As of August 1, 2009, 0.34 acre (5,000 transplants) isolated seed increase fields of each of the 3 accessions that comprise the blend are established at Rio Farms, Inc. near Monte Alto, Texas. Total production acreage for the blend components is 1.02 acres, which if harvested 3x annually yields an average of 60 pounds pure live seed/year. This production level will be sustained until November 2011, when fields will be reduced to 0.10 acres each, or removed if commercial production has reached an acceptable level, and seed for establishment of at least 50 acres of commercial seed fields is in cold storage. An additional nursery plot containing 250 plants of each of the 3 selected accessions planted in concurrent rows is established at the *South Texas Natives* Irrigated Farm near Kingsville, Texas. This plot is used to produce seed for research and demonstration plantings, and seed harvested. Hand 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 fields are lost.

Signatures for release of:

Webb Germplasm whiplash pappusgrass

Pappophorum vaginatum Buckley



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

2/24/10
Date



Dr. George Allen Rasmussen
Dean
Dick and Mary Lewis Kleberg College of
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3-8-10
Date

Dr. William A. Dugas
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Date

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Date

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Date