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CAESAR KLEBERG WILDLIFE RESEARCH INSTITUTE
SOUTH TEXAS NATIVES
KINGSVILLE, TEXAS

And

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

NOTICE OF RELEASE OF NUECES GERMPLASM SAND DROPSEED
SELECTED PLANT MATERIAL

Texas A&M University-Kingsville, Caesar Kleberg Wildlife Research Institute, *South Texas Natives*, and the U.S. Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS), E. "Kika" de la Garza Plant Materials Center announce the release of a selected plant material of sand dropseed [*Sporobolus cryptandrus* (Torr.) A. Gray] for the South Texas region.

This plant will be referred to as Nueces Germplasm sand dropseed, and is released as a selected plant material class of certified seed (natural track). Nueces Germplasm was tested under the accession numbers 9093511, 9088909, 9093451, 9093458, and 9088993. Seed of Nueces Germplasm sand dropseed will be identified by USDA NRCS accession number 9112621.

This alternative release procedure is justified because there are no existing commercial sources of tested and adapted sand dropseed for the south Texas ecoregion. The potential for immediate use is high, especially for wildlife plantings, critical site revegetation, right-of-way seedings, erosion control, and for inclusion in range seeding mixes.

A. Proposed Variety Name and Temporary Designation:

NUECES GERMPLASM SAND DROPSEED

B. Family, kind, genus and species:

Family: Poaceae

Kind: sand dropseed

Genus and species: *Sporobolus cryptandrus* (Torr.) A. Gray

C. Origin and breeding history of the variety:

Collection Site Information: All accessions comprising Nueces Germplasm sand dropseed were collected from native populations originating from the Rio Grande Plains, Coastal Sand Plains, or Gulf Coast Prairies and Marshes ecoregions of southern Texas.

Accession **9088909** was collected from a private ranch on 8/14/2002 by Forrest Smith of the *South Texas Natives* Project. This collection originated from a Maverick clay loam soil in Dimmit county near 28° 14' 38" Latitude and 99° 33' 23" Longitude. This site is classified as Rolling Hardland ecological site (MLRA 83B) (Web Soil Survey Staff 2014).

Accession **9088993** was collected from a private ranch on 8/10/2002 by Forrest Smith. This accession originated from a Copita fine sandy loam in Webb county near 28° 2' 31" Latitude and 98° 54' 28" Longitude. This site is classified as a Gray Sandy Loam ecological site (MLRA 83B) (Web Soil Survey Staff 2014).

Accession **9093451** was collected from a private ranch on 7/29/2008 by Forrest Smith and Keith Pawelek of the *South Texas Natives* project. This collection originated from a Nueces sand in Jim Hogg county near 27° 11' 13" Latitude and 98° 32' 37" Longitude. This site is classified as a sandy ecological site (MLRA 083E) (Web Soil Survey Staff 2014).

Accession **9093458** was collected on 7/30/2008 from a private ranch by Forrest Smith and Keith Pawelek. This accession was collected from a Imogene very fine sandy loam in La Salle county near 28° 10' 55" Latitude and 98° 53' 27" Longitude. This site is classified as a tight sandy loam ecological site (MLRA 83B) (Web Soil Survey Staff 2014).

Accession **9093511** was collected from a railroad right-of-way on 10/3/2008 by Eric Grahmann. This collection originated from a Raymondville complex clay loam soil in Nueces county. This site is in the clay loam ecological site description (MLRA 83B) (Web Soil Survey Staff 2014).

Breeding history: Plants evaluated in the initial trials were grown from the original seed collection. Breeder seed of the accession was grown from an isolated increase plot that was derived from the original seed collection. All seed increase plots were grown in isolation from other sand dropseed accessions and from wild populations of the species. No intentional breeding, selection or genetic manipulation was used in the development of Nueces Germplasm sand dropseed.

D. Objective description of the variety:

Description: Sand dropseed is a caespitose perennial without rhizomes. Culms range from 50 to 100 cm tall. Sheaths have distinct tufts of white erect hairs on either side of the collar. Blades are elongate, 8-25 cm in length, and 1-2 mm wide with lower blades wider. Panicles are open or closed depending on amount exposed from the elongated upper sheath. As the panicle matures the upper most sheath leaf twists and separates from the panicle leaving a flagged appearance nearly perpendicular to the culm. Panicles are 15-30 cm long. Spikelets 1.5-2.5 mm long and are brown to purplish in color. Caryopses are about 1 mm long, light brown to orange with 4,813,240 seeds per pound (Barkworth et al. 2007, Hatch et al. 1999, and Shaw 2012). Powell (1994) ranked sand dropseed as an important livestock forage species due to its abundance. Sand dropseed is widespread across North America extending from Canada into Mexico and is found on a wide variety of soils (Barkworth et al. 2007).

Potential Uses: Nueces Germplasm sand dropseed is recommended for wildlife plantings since seeds and seed heads are eaten by scaled quail and wild turkeys (Everitt et al. 2011). Sand dropseed can also be used for critical site revegetation, erosion control, and rights-of-way plantings due to its fibrous root system, ability to establish and persist in low moisture situations, and abundant seed production (Tilley et al. 2009). This species is commonly included in range seeding mixes throughout North America.

E. Evidence

Method of Breeding and Selection:

Initial Evaluation

Nueces Germplasm was evaluated under accession numbers 9088909, 9088993, 9093451, 9093458, and 9093511 as part of a common garden study to evaluate several species of dropseed (*Sporobolus* spp.) from 2000-2009. Dropseed collections from the South Texas region collected by *South Texas Natives* and available in the USDA NRCS Plant Materials Program seed collections were evaluated. Past dropseed releases made by the Plant Materials Program in Texas were also evaluated as standards for comparison, including Duck Creek Germplasm Texas dropseed, Borden County Germplasm sand dropseed, and Potter County Germplasm spike dropseed. In total, 26 populations of native dropseeds originating from Texas were evaluated. These initial evaluations were conducted from 2010-2011 by personnel from the *South Texas Natives* Project of the Caesar Kleberg Wildlife Research Institute (STN). Three sites were used for initial evaluation, including the *South Texas Natives* Farm at the Caesar Kleberg Wildlife Center in Kingsville, Texas (WLC); Rio Farms near Monte Alto, Texas; and Rancho Blanco near Laredo, Texas. These sites are representative of the variations in soils and climate along north to south and east to west gradients encompassing ecoregions where sand dropseed occurs within the area of intended benefit from our work.

Evaluation criteria used for initial selections included plant survival and rankings of vigor, leaf density, seed production and forage production. Seed was also collected from each accession for seed quality testing, and tested for germination and viability.

Accessions 9088909, 9088993, 9093458, and 9093511 were 4 of the top 5 performing sand dropseed accessions at Rancho Blanco and Rio Farms evaluation sites (Table 1&2). These accessions were also in the top 8 at the WLC (Table 3). All 4 of these accessions greatly outperformed the already released Borden County Germplasm sand dropseed in all measurements (Tables 1, 2, and 3). These 4 accessions encompass an east to west distribution and a variety of soil types in which sand dropseed occurs within the area of intended use.

Accession 9093451 was selected based on origin, plant structure and ecological niche. This accession was selected because it originated from the Sandsheet Prairie (MLRA083E). The region is characterized by very deep moderately well drained fine sand soils prone to drought (Soil Survey Staff 2014). Sand dropseed is an important member of the plant community that is often found in great abundance in late seral stages. The structure of this ecotype of sand

dropseed is drastically different than other sand dropseeds selected, being taller with less leaf density.

Table 1. Plant performance of *Sporobolus* spp. from the WLC in Kingsville, TX. Data presented are an average of rankings given (1 best, 10 worst) from 2010 and 2011.

Accession	# Plants	Vigor	Foliage Density	Seed Production	Forage Production
9093511	9.9	2.9	3.3	4.6	3.6
9088997	9.1	2.9	3.4	5.5	4.1
9093458	8.4	3.5	4.0	4.8	4.1
9088909	10.0	4.4	3.8	4.9	4.1
9088993	9.0	3.8	4.1	5.0	4.4
9093377	9.8	4.3	4.1	5.0	4.2
9093188	9.6	4.3	4.8	3.8	4.8
9093209	9.8	4.0	4.2	5.1	4.7
9093457	7.9	4.2	4.4	5.1	4.3
9093427	9.7	4.2	5.1	4.3	5.1
9090366	9.5	4.5	4.6	4.9	4.8
9093431	9.4	4.5	5.2	4.2	5.3
9093426	10.0	5.0	5.6	3.8	5.3
9093376	9.8	5.0	4.6	4.9	5.3
9093451	7.6	5.0	5.4	4.1	5.3
9090461	8.5	4.7	5.4	4.3	5.6
9093536	8.2	5.0	5.4	4.3	5.3
9090321	8.9	4.8	5.4	4.6	5.5
9029932	5.3	6.0	5.5	5.6	6.4
9042767*	9.0	6.0	5.6	5.6	6.4
9093450	9.4	5.2	5.3	20.5	5.4

*Borden County Germplasm sand dropseed

Table 2. Plant performance of *Sporobolus* spp. from Rio Farms near Monte Alto, TX from 2010 and 2011. Data presented are an average of rankings given (1 best, 10 worst) from 2010 and 2011.

Accession	# Plants	Vigor	Foliage Density	Seed Production	Forage Production
9088993	6.5	4.0	3.3	3.8	3.3
9093511	8.8	4.2	4.3	4.7	4.4
9093458	8.0	4.4	4.2	4.9	4.4
9093376	7.2	4.5	4.5	4.6	4.5
9088909	8.8	4.6	4.6	4.6	4.6
9093209	6.8	4.9	4.6	4.6	4.8
9093188	7.4	5.0	4.9	4.0	5.2
9090461	8.5	4.4	5.6	4.2	5.3
9093427	9.1	4.8	5.3	4.4	5.1
9093426	9.0	4.8	5.1	4.6	5.2
9090366	8.8	4.8	4.9	5.1	5.0
9093377	6.7	5.5	4.8	5.3	4.9
9088997	6.0	5.0	5.3	5.0	5.3
9093457	7.3	5.0	5.1	5.5	5.1
9029932	1.8	4.7	5.3	4.7	6.3
9090321	8.5	4.8	5.7	4.9	5.8
9093536	8.0	5.0	5.5	5.5	5.5
9093451	7.7	5.4	5.8	4.6	5.8
9093450	7.5	5.5	6.1	5.2	6.1
9042767*	7.2	5.9	5.6	5.9	6.0
9093433	10.0	5.5	5.5	7.0	5.5
9093431	8.1	5.8	6.2	5.5	6.1

*Borden County Germplasm sand dropseed

Table 3. Plant performance of *Sporobolus* spp. from Rancho Blanco near Laredo, TX from 2010 and 2011. Data presented are an average of rankings given (1 best, 10 worst) from 2010 and 2011.

Accession	# Plants	Vigor	Foliage Density	Seed Production	Forage Production
9088993	7.4	4.0	3.9	4.3	4.0
9093511	8.7	4.1	3.8	4.6	4.0
9093376	9.4	5.2	4.4	4.0	4.5
9088997	6.3	4.0	4.6	4.8	4.9
9093209	8.1	4.9	4.3	4.6	4.7
9093458	7.3	4.9	5.0	4.6	5.0
9093188	8.5	5.3	5.3	4.2	5.2
9088909	7.3	5.4	5.0	4.8	5.0
9090366	8.7	5.5	5.4	4.5	5.2
9093427	9.3	5.8	5.4	4.2	5.3
9093377	8.0	5.3	4.4	6.2	4.9
9093431	7.8	5.3	5.8	4.1	5.8
9093536	8.2	5.3	5.8	4.6	5.5
9042767*	8.7	5.8	5.2	5.2	5.5
9093426	7.9	6.1	6.0	3.9	5.9
9090321	8.0	5.9	6.1	4.1	6.0
9093451	8.8	5.8	6.1	4.5	5.9
9090461	8.5	5.6	6.2	4.4	6.2
9093433	6.9	5.8	5.6	5.4	5.6
9093450	7.5	5.3	6.3	4.7	6.1
9093457	5.7	6.0	6.5	6.2	6.6

*Borden County Germplasm sand dropseed

Seed Increase

Following selection, isolated seed production blocks of each selection were established at the STN Farm and Rio Farms. Seed increase plots were established using transplants grown from the original seed collections. Average plot size was 200 plants. We harvested seed in 2012, 2013, and 2014. Each accession averaged 1 PLS pound of seed produced annually. After harvesting, the seed was tested for purity and quality. This production would be equal to 350 pounds pure live seed produced per year per acre on 36" bedded rows with a plant population of 14,000 plants per acre (plants established using transplants spaced 1' apart).

Seed Production, Harvest, and Cleaning

Seed production for Nueces Germplasm can be started from transplants or direct seeded on beds or flat ground. Well-maintained production plots can be expected to produce a marketable crop in the first production year. Seed is best harvested using either a Woodward Flail-Vac Seed Stripper (Ag-renewal, Inc., Weatherford, Oklahoma) or a conventional combine. If a Flail-Vac is used for harvest, it is recommended that the old seed heads be removed by mowing between

crops to ensure a uniform stand and to stimulate a second seed crop for harvest. Following harvest, trash can be removed using a Clipper seed cleaner (A. T. Farrell, Bluffton, Indiana).

G. Area of Adaptation

Nueces Germplasm is likely to perform best on sand, sandy loam, or clay loam soils in the Rio Grande Plains (MLRA 083B), Coastal Sand Plains (MLRA 083E) and Gulf Coast Prairies and Marshes (MLRA 150B) ecoregions. Adaptation of this release to adjacent regions has not been tested.

H. Procedure for maintaining stock classes of seed

The parent populations of each component of Nueces Germplasm will be maintained by *South Texas Natives*. G0 seed is the seed that has been harvested from isolated plantings of the parent lines. G1 seed is that which is harvested from plantings made using the G0 seed. G1 seed can be replanted for production of G2 seed. Increase from G2 seed is prohibited.

I. Additional restrictions, etc.

All commercial seed fields of Nueces Germplasm must be located in Texas and isolated from other cultivated varieties and wild populations of *Sporobolus cryptandrus* by a minimum of 300 feet. G1 and G2 seed fields have a 7 year production limit, after which time, fields must be replanted using the appropriate seed generation (G0 or G1).

G0 and G1 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__

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 Nueces Germplasm sand dropseed was suitable for release based on the criterion contained in this document. This conclusion is mainly because sand dropseed is a naturally occurring species in Texas and planting it would 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 potential forage source for livestock, and provide ecological benefits by maintaining and contributing to restoration and revegetation projects on many sites.

Conservation Use: Nueces Germplasm sand dropseed is recommended for upland wildlife plantings, critical site revegetation, right-of-way plantings, and inclusion in range seeding mixes in the Rio Grande Plains (MLRA 083B), Coastal Sand Plains (MLRA 083E) and Gulf Coast Prairies and Marshes ecoregions (MLRA 150B).

Availability of Plant Materials: Breeder Seed will be maintained by *South Texas Natives*. G0 seed will be released to qualified growers under license agreement stipulating production requirements.

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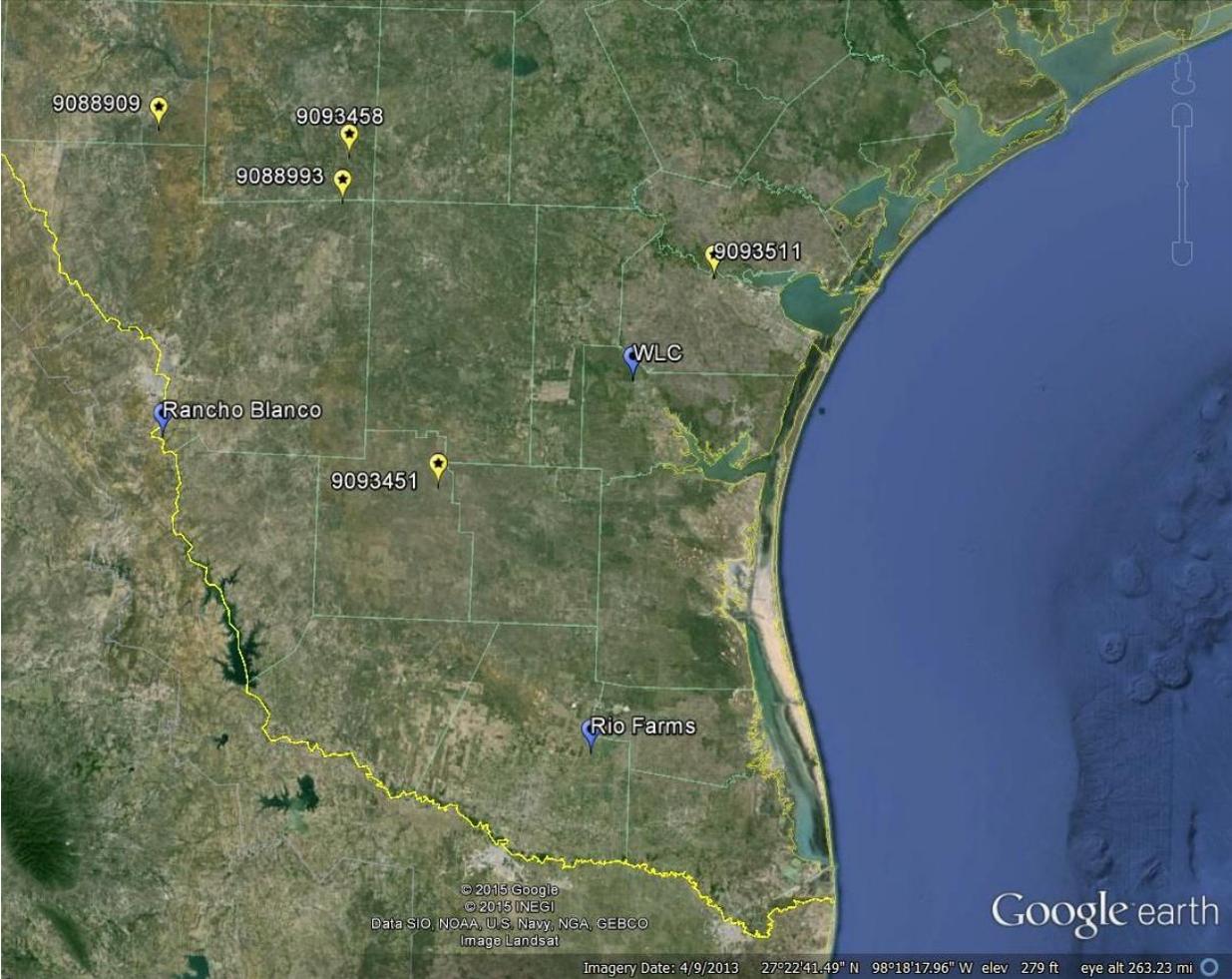
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Figure 1. Collection sites (yellow pins) and evaluation sites (blue pins) used in the development of Nueces Germplasm.



Signatures for release of:

NUECES GERMPLASM SAND DROPSEED

Sporobolus cryptandrus (Torr.) A. Gray

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