



United States Department of Agriculture

TEXAS A&M UNIVERSITY-KINGSVILLE
CAESAR KLEBERG WILDLIFE RESEARCH INSTITUTE
TEXAS NATIVE SEEDS PROGRAM
KINGSVILLE, TEXAS

And

TEXAS A&M AGRILIFE RESEARCH CENTER
STEPHENVILLE, TEXAS

And

UNITED STATES DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE
JAMES E. "BUD" SMITH PLANT MATERIALS CENTER
KNOX CITY, TEXAS

NOTICE OF RELEASE OF TAYLOR GERMPLASM SAND DROPSEED
SELECTED PLANT MATERIAL

Texas A&M University-Kingsville, Caesar Kleberg Wildlife Research Institute, *Texas Native Seeds* Program (TNS), Kingsville, TX, Texas A&M AgriLife Research Center Stephenville, TX, and the United States Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS), James E. "Bud" Smith Plant Materials Center (PMC), Knox City, TX announce the release of a selected class natural-track germplasm of sand dropseed [*Sporobolus cryptandrus* (Torr.) A. Gray] for the central Texas ecoregion. This plant will be referred to as Taylor Germplasm sand dropseed and identified by USDA NRCS accession number 9112353.

This release is justified because there are no existing commercial sources of tested and adapted sand dropseed for use in the central 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.

Collection Site Information: Accessions comprising Taylor Germplasm sand dropseed were collected from native populations in the following Major Land Resource Areas (MLRA) of central Texas: Texas Central Basin (MLRA 82A), Central Rolling Red plains (MLRA 78C), Rolling Limestone Prairie (MLRA 78A), and the Cross Timbers (MLRA 84B) (Web Soil Survey Staff, 2020).

Accession **9110824** was collected along FM 587 west of De Leon on 6/29/2012 by Mia McCraw formerly of TNS. This collection was made from a Demona loamy sand soil in Comanche county near 32° 6' 28" latitude and 98° 33' 11" longitude. This site is classified as West Cross Timbers (MLRA 84B) and a sandy ecological site (Web Soil Survey Staff, 2020).

Accession **9110865** was collected from the Rolling B Ranch on 7/22/2012 by Mia McCraw formerly of TNS. This collection was made from a Sagerton clay loam soil in Taylor County near 32° 14' 0" latitude and 99° 38' 32" longitude. This site is classified as the Eastern Part of



Central Rolling Red Plains (MLRA 78C) and a clay loam ecological site (Web Soil Survey Staff, 2020).

Accession **9111134** was collected off Highway 87 on 9/13/2013 by Mia McCraw formerly of TNS. The collection site was made from a Keese-Rock outcrop sandy loam soil in Mason County near 30° 33' 7" latitude and 99° 0' 37" longitude. This site is in the Texas Central Basin (MLRA 82A) and a shallow granite ecological site (Web Soil Survey Staff, 2020).

Accession **9111140** was collected from the Merick Davis Ranch on 10/22/2013 by Mia McCraw formerly of TNS. This collection was made from a Throck-Palopinto association clay soil in Shackelford County near 32° 40' 52" latitude and 99° 25' 37" longitude. This site is classified as the Rolling Limestone Prairie (MLRA 78A) and a clay slopes ecological site (Web Soil Survey Staff, 2020).

Description:

Sand dropseed is a native, cespitose perennial without rhizomes. Culms erect ranging from 18 to 30 inches (46 to 75 cm) tall. Sheaths average 0.12 inches (3 mm) long and have distinct tufts of white erect hairs on either side of the collar. Panicles are open or closed depending on the 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 average 9 inches (24 cm) long. Spikelets average 0.08 inches (2.1 mm) long and brown to purplish in color. Caryopses are about 0.04 inches (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).

Method of Breeding and Selection:

Collections comprising Taylor Germplasm were initially evaluated under accession numbers 9110824, 9110865, 9111134, and 9111140 from 2015 to 2016. Sand dropseed seed collections were made by personnel from the *Central Texas Native Seed Project* of the *Texas Native Seeds Program* and evaluated with other seed collections available through the USDA NRCS Plant Materials Program and commercial selections of the species. In total, 24 populations of sand dropseed originating from Texas were evaluated. Two sites were used for initial evaluation: Texas AgriLife Research Center in Stephenville, Texas, and the USDA NRCS James E. "Bud" Smith Plant Materials Center in Knox City, Texas. These sites are broadly representative of variations in soils and climate across Central Texas where sand dropseed occurs.

Accessions were planted into plug trays in the greenhouse March 2015, and transplanted into the evaluation plots in May 2015. Each collection (or accession) was planted in a randomized complete block design with two replications of 10 plants at each location. Plants were irrigated for the first year to ensure establishment. The plants grew under natural precipitation conditions throughout the remainder of the evaluation period.

Data were collected on traits that are important for commercial seed production and ecological function. These traits include plant vigor, foliage density, uniformity, forage or biomass production, seed production, plant height, and plant canopy cover. Data were collected based on

a visual ranking system utilizing a 1 to 10 scale (1 being the best performance for the trait and 10 the worst). Scores from each year were pooled, and the average performance in each category was used to select the best performing accessions (Tables 1 and 2).

Seed was collected from all accessions during each growing season and tested for germination. All accessions had high germination percentage with minimal variation. Soil texture and ecological site information of original collection sites for each accession were taken into consideration in the selection of each accession for inclusion in the release of Taylor Germplasm sand dropseed.

Accession **9110824** was originally collected in Comanche County from a Demona loamy sand soil. This collection was selected as the easternmost-origin high performing accession from the West Cross Timbers ecoregion. Evaluation rankings of this accession in Knox City were also among the top five in seed production, forage production, and uniformity.

Accession **9110865** was originally collected in Taylor County from a Sagerton clay loam soil. This collection was selected as the westernmost-origin high performing accession from the eastern part of Central Rolling Red Plains ecoregion. This accession scored among the top five in plant vigor and foliage density in Stephenville. In Knox City, it scored the highest in uniformity, canopy cover, and seed production.

Accession **9111134** was originally collected in Mason County from a Keese sandy loam soil. This collection was selected as the southernmost-origin high performing accession from the Texas Central Basin ecoregion. This accession scored among the top five in foliage density, uniformity, and seed production in Stephenville. Overall, 9111134 was the best performer compared to all accessions originating from the southern part of the region.

Accession **9111140** was originally collected in Shackelford County from a Throck-Palopinto association clay soil. This collection was selected as the northernmost-origin high performing accession from the Rolling Limestone Prairie ecoregion. This accession had the highest scores ranking among the top five in plant vigor, foliage density, uniformity, and seed production in Stephenville. In Knox City, it had the highest canopy cover percentage and was also the only accession to score among the top five in the most categories (plant vigor, foliage density, uniformity, seed production, and forage production).

Table 1. Comparative plant performance of sand dropseed accessions used in the development of Taylor Germplasm evaluated in 2015-2016 at the Texas A&M AgriLife Research Center Stephenville, Texas.

Accession	Vigor*	Foliage Density*	Uniformity*	Seed Production*	Forage Production*	Height (cm)	Cover (%)
9110824	4.6	4.3	4.3	5.0	5.4	46	50
9110865	4.2	3.9	3.3	4.4	4.8	46	62
9111134	4.2	3.8	3.0	3.3	4.1	55	63
9111140	3.5	3.8	2.5	2.8	3.7	54	72
Mean	4.1	4.0	3.3	3.9	4.5	50	62

*Data based on ocular estimates with 1 being the best and 10 being the poorest.

Table 2. Comparative plant performance of sand dropseed accessions used in the development of Taylor Germplasm evaluated in 2015-2016 at the USDA NRCS James E. "Bud" Smith Plant Materials Center, Knox City, Texas.

Accession	Vigor*	Foliage Density*	Uniformity*	Seed Production*	Forage Production*	Height (cm)	Cover (%)
9110824	4.9	4.2	2.1	3.5	3.7	61	95
9110865	4.6	4.8	2.3	3.5	4.2	61	99
9111134	4.6	4.8	2.8	4.4	3.9	75	96
9111140	4.8	4.1	3.1	3.9	4.2	57	98
Mean	4.7	4.5	2.6	3.8	4.0	64	97

*Data based on ocular estimates with 1 being the best and 10 being the poorest.

Following selection, isolated seed production blocks of each selection were established at the Texas AgriLife Research Center in Stephenville. Seed increase plots were established using transplants grown from the original seed collections. Average plot size contained 1,200 plants spaced 1-ft apart on 3-ft rows. Seed was harvested in 2017 and 2018. Each accession yielded an average of 16 pure live seed (PLS) lb/acre annually. After harvesting, the seed was tested for purity and germination. Annual seed yield was 194 lb/acre from 36-inch bedded rows with a plant population of 14,000 plants/acre. Average PLS was 96%.

Seed fields of Taylor Germplasm are established from either transplants or directly seeded into a bedded seedbed or flat ground. Well maintained 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, OK) or a conventional combine. If a Flail-Vac is used to harvest seed, it is recommended that previous year's seedheads are removed by mowing between crops/harvest to ensure a uniform stand and to stimulate a second seed crop for harvest. After drying, process the seed with an air screen cleaner.

Conservation Use: Taylor Germplasm sand dropseed is recommended for addressing conservation practices in critical area plantings (code 342), upland wildlife habitat management (code 645), conversation cover (code 327), range planting mixes (code 550), and right-of-way plantings in the Central Rolling Red Plains (MLRA 78C), West Cross Timbers (MLRA 84B), Rolling Limestone Prairies (MLRA 80A), and Central Texas Basin (MLRA 82A) ecoregions of Texas (Conservation Practice Standards).

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 Taylor 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.

Area of Adaptation

Taylor Germplasm is likely to perform best on sand, sandy loam, clay, or clay loam soils in central Texas, including the Central Rolling Red Plains (MLRA 78C), West Cross Timbers (MLRA 84B), Rolling Limestone Prairies (MLRA 80A), and Central Texas Basin (MLRA 82A) ecoregions of Texas.

Availability of Plant Materials:

Generation (G1) seed will be distributed by TNS.

Maintaining Stock Classes of Seed:

The parent populations (Generation 0) of the 4 accessions that make up Taylor Germplasm are maintained by TNS. Generation 1 seed is a composite of these 4 accessions made up of equal amounts (by % PLS, +/- 10%) for distribution to commercial growers.

Commercial producers may increase G1 seed for up to two generations and sell Taylor Germplasm sand dropseed as either G2 or G3. Fields of Taylor Germplasm may be grown no longer than 7 years before being replaced. Taylor Germplasm requires a minimum isolation of 900 feet from any other sand dropseed production field or natural population.

Will application be made to the Plant Variety Protection Office? YES___NO X
requirements.

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___

References:

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- Tilley, D., L. St. John, and D. Ogle. 2009. Fact Sheet for Sand dropseed (*Sporobolus cryptandrus*) USDA Natural Resource Conservation Service, Idaho Plant Materials Center Aberdeen, ID 83210.



United States Department of Agriculture

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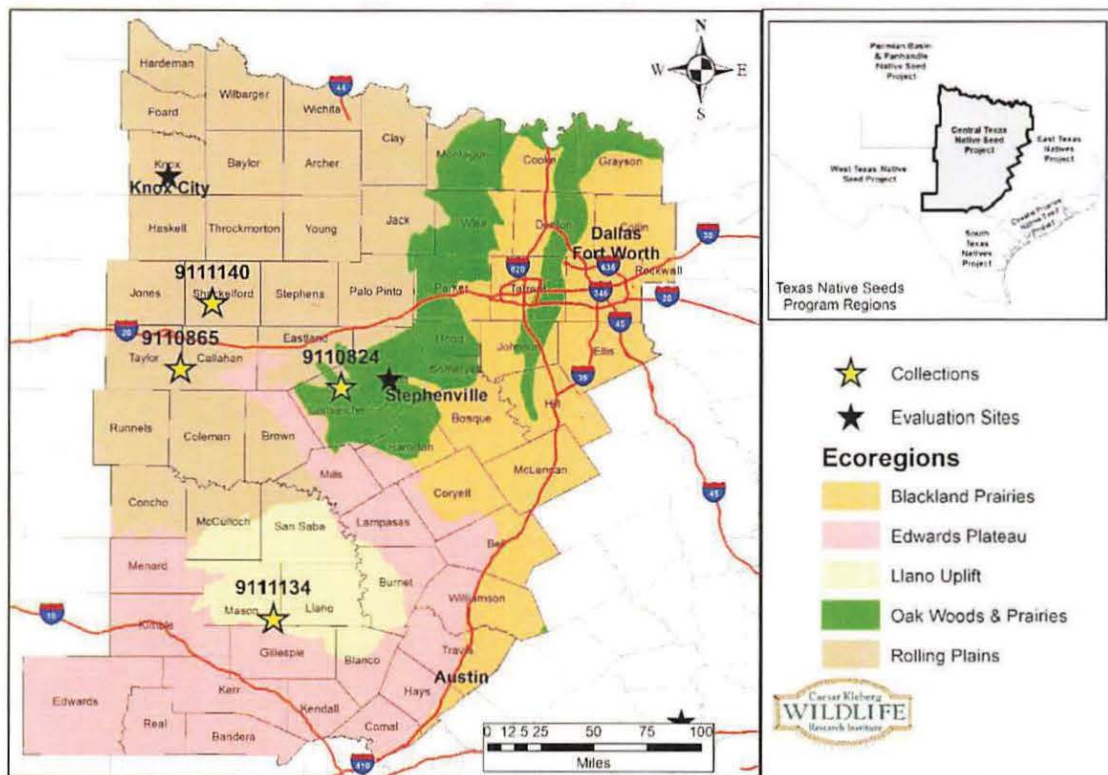
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Figure 1. Collection sites of selected accessions (yellow stars) and evaluation sites (black stars) used in the development of Taylor Germplasm.





United States Department of Agriculture

Signatures for release of:
TAYLOR GERmplasm SAND DROPSEED
Sporobolus cryptandrus (Torr.) A. Gray

Dr. David G. Hewitt
Leroy Denman, Jr. Endowed Director of Wildlife Research
Caesar Kleberg Wildlife Research Institute
Texas A&M University-Kingsville
Kingsville, TX

26 Feb. 2024

Date

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

27 Feb 2024

Date

Dr. Brent Auvermann
~~Interim~~ Director
Texas A&M AgriLife Research Center
Stephenville, TX

DEC 13 2024

Date

KRISTY OATES

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Kristy Oates, Texas State Conservationist
United States Department of Agriculture
Natural Resources Conservation Service
Temple, TX

Date

DANA ASHFORDKORNBURGER

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Dana Ashford, Acting Director, Ecological Sciences Division
United States Department of Agriculture
Natural Resources Conservation Service
Washington, D.C.

Date



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