

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

And

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

And

TEXAS AGRILIFE RESEARCH CENTER  
STEPHENVILLE, TEXAS

And

SUL ROSS STATE UNIVERSITY  
BORDERLANDS RESEARCH INSTITUTE  
ALPINE, TEXAS

NOTICE OF RELEASE OF LOMA GERMPLASM PURPLE THREEAWN  
SELECTED PLANT MATERIAL

Texas A&M University-Kingsville, Caesar Kleberg Wildlife Research Institute, *Texas Native Seeds* (TNS), the U.S. Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS), E. “Kiki” de la Garza and James E. “Bud” Smith Plant Materials Centers, Sul Ross University, Borderlands Research Institute, and Texas AgriLife Research Center Stephenville, Texas announce the release of a selected plant material of purple threeawn (*Aristida purpurea* Nutt.) for South Texas.

This plant will be referred to as Loma Germplasm purple threeawn, and is released as a selected plant material class of certified seed (natural track). Seed of Loma Germplasm purple threeawn will be identified by USDA NRCS accession number 9088745.

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

***A. Proposed Variety Name and Temporary Designation:***

LOMA GERMPLASM PURPLE THREEAWN

***B. Family, kind, genus and species:***

Family: Poaceae

Kind: purple threeawn

Genus and species: *Aristida purpurea* Nutt.

***C. Origin and breeding history of the variety:***

**Collection Site Information:** Loma Germplasm purple threeawn was collected from native populations originating from the South Texas Sand Sheet of the Coastal Sand Plain ecoregion. Original material of accession 9088745 was collected from the King Ranch in Kenedy county on 6/20/2002 by Forrest Smith and Cody Lawson of the *South Texas Natives* Project. This accession originated from a Padrones fine sand soil near 26° 43' 44" Latitude and 97° 50' 16" Longitude. This site is classified as a sandy ecological site (083E-Sandsheet Prairie) (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 derived from the original seed collection. All seed increase plots were grown in isolation from other purple threeawn accessions and from wild populations of the species. No intentional breeding, selection or genetic manipulation has been carried out on this accession.

***D. Objective description of the variety:***

**Description:** Purple threeawn is a slender densely caespitose perennial bunchgrass. Culms are erect to ascending, and are 35–80 cm tall. Leaves are mostly basal with blades 15-25 cm in length, and 1-2 mm wide typically, involute but the bases remain flat (Hatch and Pluhar 1999). Inflorescences are usually a sparingly branched panicle. Glumes are unequal with the lower glume shorter than the upper and are light to dark brown or purple in color. Awns length is on the lower end for the species ranging from 15-50 mm in length with the central awn being thicker than the lateral awns (Shaw 2012). Caryopses are about 6-14 mm long, tan to chestnut. Purple threeawn is widespread across western North America extending from Canada into Mexico and is found on a wide variety of soils (Barkworth et al. 2007).

Loma Germplasm is a robust ecotype of purple threeawn and is typically found on sandy soils. Culms are erect and range from 60 to 90 cm tall. Leaves are mostly basal with blades 15-25 cm in length, and 0.7-2 mm wide typically, involute but the bases remain flat. Because of the blue-green coloration of the leaves it is classified by some as “blue threeawn. Inflorescences are similar to those described by Shaw (2012) in length and color. Loma Germplasm has 4,813,240 seeds per pound based on counts from seed production fields.

**Potential Uses:** Loma Germplasm purple threeawn can be used for critical site revegetation, erosion control, and rights-of-way plantings due to its fibrous root system, ability to establish quickly and persist in low moisture situations, and abundant seed production. It is classified as a pioneer species because of its colonizing ability following disturbance (Loflin and Loflin 2006). This species can be included in range seeding mixes across the state in most soil types, but will perform best on sandier soils. Although listed as poor forage, it is often utilized by cattle prior to seedhead development (Everitt et al. 2011). Purple threeawn can be included in wildlife plantings as it provides important nesting cover and substrate for bobwhite quail (Lehmann 1946).

## ***E. Evidence***

### **Method of Breeding and Selection:**

#### ***Initial Evaluation***

Loma Germplasm was evaluated under accession number 9088745 as part of a common garden study to evaluate several varieties of purple threeawn (*Aristida* spp.) collected between 2000-2010. Purple threeawn collections from the south, west, and central Texas regions collected by TNS and available collections stored by the USDA NRCS Plant Materials Program were evaluated. In total, 36 populations of purple threeawn originating from Texas were evaluated. These initial evaluations were conducted from 2010-2011. Four sites were used for initial evaluation, including the TNS Farm at the Caesar Kleberg Wildlife Center in Kingsville, Texas (WLC); Rio Farms near Monte Alto, Texas; The USDA Plant Material Center near Knox City, Texas, and Texas AgriLife Research Center near Stephenville, Texas. These sites are representative of the broad variations in soils and climate along north to south and east to west gradients encompassing the natural distribution of purple threeawn in the area of intended benefit from our work.

Accession 9088745 was selected primarily because it was the best performing accession in the trial that was representative of comparatively robust ecotypes of purple threeawn commonly found on deep sandy soils. This growth form is taller, more erect, and compact than all other accessions tested. Along with being representative of a different growth form, this accession had above average rankings for vigor and forage production at all locations. Visually, the selection could have horticultural value because of its coloration, size, and attractiveness.

Location	Plant Vigor*	Foliage Density*	Seed Production*	Forage Production*	Plant Height (cm)	Germination %
Kingsville	3.0	3.9	5.2	3.6	61.1	69
Monte Alto	2.9	4.2	3.0	3.0	88.5	60
Knox City	3.7	4.8	3.6	5.4	32.8	16
Stephenville	4.9	4.9	3.3	5.5	27.1	26

\*Rating scale for plant attributes are based on a scale of 1-9 with 1 being the best.

### ***Seed Increase***

Seed was harvested from small isolated seed increase plots of approximately 1000 plants in 2015, 2016, and 2017. After harvesting, the seed was tested for purity and quality. Harvested seed averaged 15% pure live seed (PLS). Estimated seed yield is 10 PLS lb/acre/year on 36" bedded rows with a plant population of 14,000 plants per acre (transplant spacing of 1-ft).

### ***Seed Production, Harvest, and Cleaning***

Seed production fields of Loma Germplasm can be started from transplants or direct seeded on bedded rows or flat ground. Well maintained production plots established from transplants can be expected to produce a marketable crop the first production year. Harvest seed with Flail-vac or other brush type harvester for optimum yields. If a Flail-vac is the preferred method, remove old seed heads by mowing between seed crops to stimulate a second seed crop for harvest. Little to no seed cleaning is needed if harvesting is performed with a Flail-Vac or brush type harvester. To increase flowability through seed drills, remove the awns by process the seed through a hammer mill.

### ***G. Area of Adaptation***

Based on origin and field evaluation plantings, Loma Germplasm is likely to perform best on sandy soils within the Rio Grande Plain, Coastal Sand Plain, and Gulf Coast Prairies and Marshes Ecoregions. Loma Germplasm may also be adapted to adjacent ecoregions and has shown to be adapted in limited trials in the Rolling Plains and Oak Woods and Prairies Ecoregions.

### ***H. Procedure for maintaining stock classes of seed***

The parent population of Loma Germplasm will be maintained by *Texas Native Seeds*. G0 seed is the seed that has been harvested from isolated plantings of the parent line. 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 of the variety using G2 seed is prohibited.

### ***I. Additional restrictions, etc.***

All commercial seed fields of Loma Germplasm must be located in Texas and isolated from other cultivated varieties and wild populations of *Aristida purpurea* by a minimum of 900 feet. Production of Loma Germplasm will be limited to licensed growers who meet production and seed certification requirements.

G1 and G2 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 Loma Germplasm purple threeawn was suitable for release based on the criterion contained in this document. This conclusion is mainly because purple threeawn 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 providing forage for livestock prior to seed set (Hatch and Pluhar 1999). Loma Germplasm will provide good cover for wildlife and bobwhite quail nesting sites after more palatable grasses have been eliminated (Peacock and Smith 2020)

**Conservation Use:** Loma Germplasm purple threeawn is recommended for upland wildlife plantings, critical site revegetation, right-of-way plantings, and inclusion in range seeding mixes on fine sandy soils in the Rio Grande Plains, Coastal Sand Plains, and Gulf Coast Prairies and Marshes ecoregions.

**Availability of Plant Materials:** Breeder Seed will be maintained by *Texas Native Seeds* project of the Caesar Kleberg Wildlife Research Institute. G0 seed will be released to qualified growers under license agreement stipulating production requirements.

## References:

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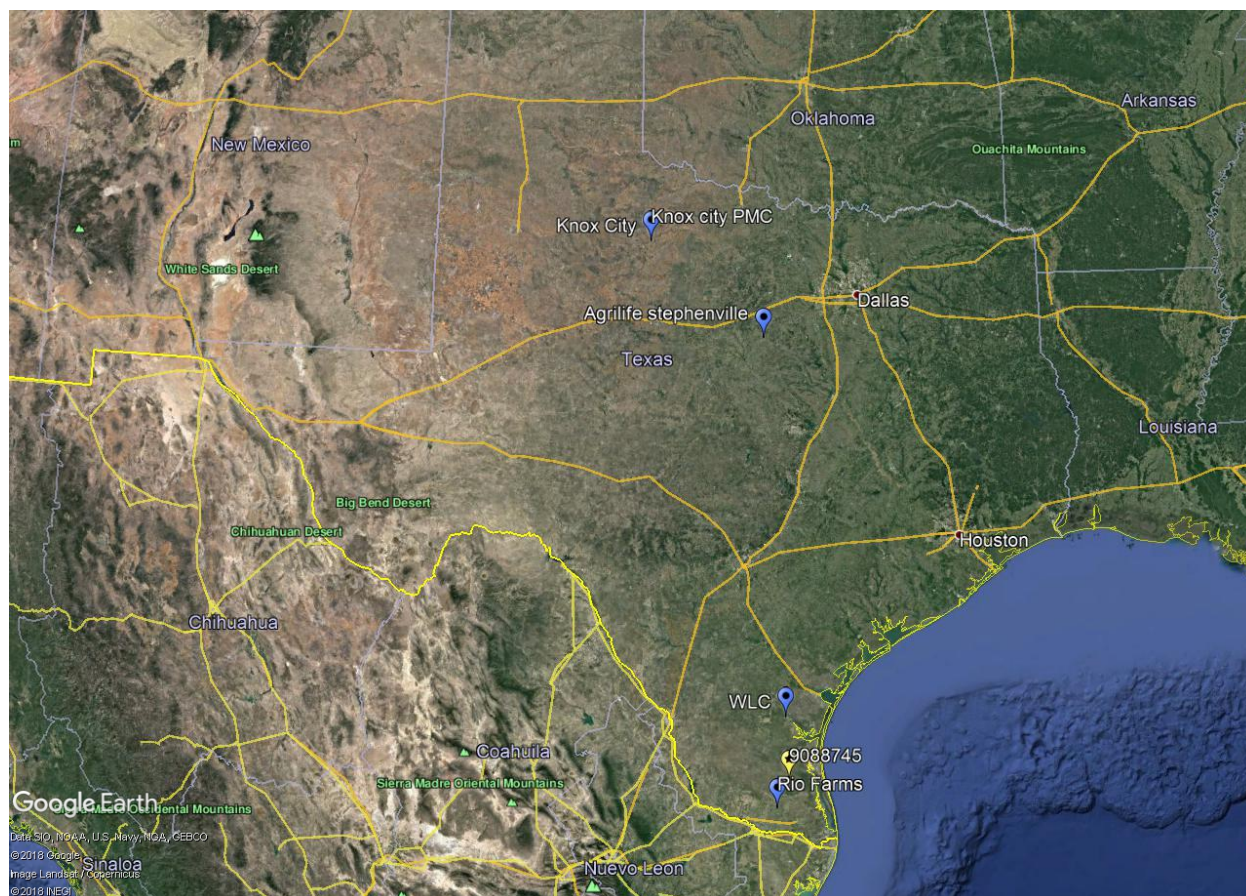
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**Figure 1.** Collection site (yellow pins) and evaluation sites (blue pins) used in the development of Loma Germplasm.





**Figure 2.** A representative plant of Loma Germplasm purple threeawn.

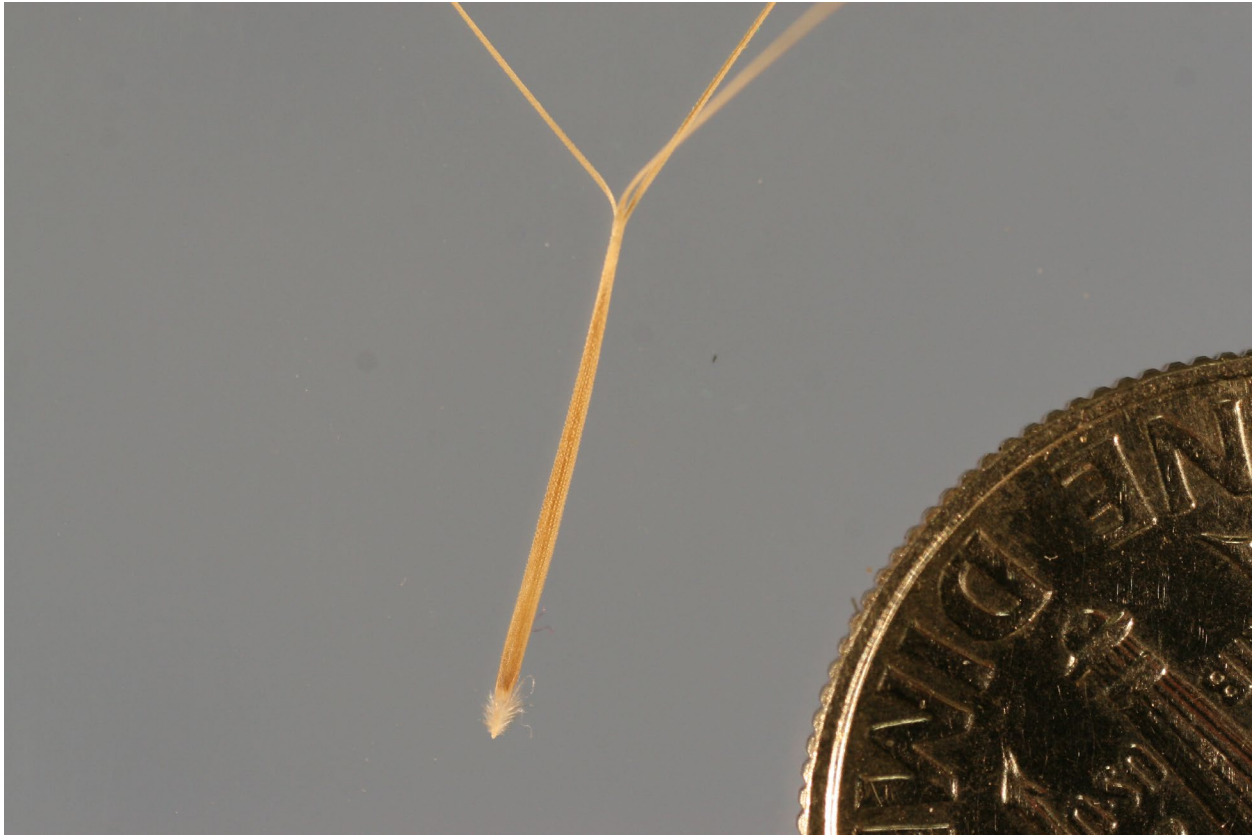


**Figure 3.** Seed increase field of Loma Germplasm purple threeawn.





**Figure 4.** Cleaned seed harvested from Loma Germplasm purple threeawn.



*Aristida purpurea* Nutt.

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