

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

NOTICE OF RELEASE OF FUEGO GERMPLASM INDIAN BLANKET
SELECTED CLASS OF NATURAL GERMPLASM

Texas A&M University-Kingsville, Caesar Kleberg Wildlife Research Institute, Texas Native Seeds (TNS), 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 class of Indian blanket (*Gaillardia pulchella* Foug.) for the South Texas region.

This plant will be referred to as Fuego Germplasm Indian blanket and is released as a selected class of certified seed (natural track). Fuego Germplasm was tested under the USDA NRCS accession numbers 9093225, 9093441, and 9093365. Seed of Fuego Germplasm Indian blanket release will be identified by USDA NRCS accession number 9113434.

This alternative release procedure is justified because there are no existing Texas commercial sources of Indian blanket that are ecotypic to the Rio Grande Plain, Gulf Coast Prairies and Marshes, and Coastal Sand Plain ecoregions of South Texas. The potential for immediate use is high, especially for upland wildlife plantings, pollinator habitat plantings, highway rights-of-way revegetation, reclamation of energy exploration sites, and for inclusion in range seeding mixes.

A. Proposed Variety Name and Temporary Designation:

FUEGO GERMPLASM INDIAN BLANKET

B. Family, kind, genus and species:

Family: Asteraceae

Kind: Indian blanket, firewheel

Genus and species: *Gaillardia pulchella* Foug.

C. Origin and breeding history of the variety:

Collection Site Information: Accession 9093225 was collected by Shelly Maher on March 3, 2003 from native plants in a vacant lot inside the South Padre Island city limits in Cameron County, Texas (MLRA 150B). Soil type of the collection site is a Galveston fine sand (USDA NRCS Web Soil Survey).

Accession 9093365 was collected by John Reilley on December 19, 2006 from native plants in Galveston State Park, Galveston County, Texas (MLRA 150B). Soil type of the collection site is a Mustang fine sand (USDA NRCS Web Soil Survey).

Accession 9093411 was collected by John Reilley on September 11, 2007 from native plants on the Flour Bluff Laguna Shores Turnaround, Nueces County, Texas (MLRA 150B). Soil type of the collection site is a Galveston and Mustang fine sands (USDA NRCS Web Soil Survey).

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 *Gaillardia pulchella* accessions, and from wild populations of the species. No intentional breeding, selection or genetic manipulation was used in the development of this release.

D. Objective description of the variety:

Description:

Indian blanket is a native forb with a range that extends from Nebraska, Colorado, and Arizona, rarely east into Arkansas, and south into Mexico (Correll and Johnston, 1996). Indian blanket is often found in sandy areas and is common throughout Texas. It grows to 60 cm. tall, with blue-green, semi-succulent, and aromatic leaves 2-6 cm. long. Ray flowers vary from red tipped with yellow to solid yellow and typically bloom from February to December. Fruit is an achene. Fuego Germplasm Indian blanket has 199,000 seeds per pound. Chromosome number is $2n=34$ (Ward 1983).

Potential Uses: Fuego Germplasm Indian blanket is recommended for pollinator habitat plantings, upland wildlife plantings, highway right-of-way revegetation, energy exploration reclamation, and for inclusion in range seeding mixes. White-tailed deer eat the leaves of this species (Everitt, Drawe, and Lonard, 1999).

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 (PMC) and South Texas Natives (STN) obtained seed of Indian blanket (*Gaillardia* spp.) from field locations in south Texas. Initial evaluations began in 2004 at the PMC with 24 accessions of Indian blanket seeded in the greenhouse. Germination ranged from 2 to 43% which was enough to transplant all accessions to two field trials in the spring of 2005. Accessions were evaluated on a Cranell sandy clay loam and a Delfina fine sandy loam soil. Evaluations were based on plant survival, vigor, leaf abundance and density, disease and insect resistance, uniformity of the plants within the accession, developmental stage, and growth form of the plants. There were no apparent insect or disease problems.

Accession 9093225 had thicker, green-blue leaves, more yellow to the tips of the ray flowers, lived longer, produced more seed and bloomed constantly for the entire year on the sandy clay loam soil. It was one of only two accessions to have any original plants survive to the next year on the sandy clay loam soil. Accession 9093225 also had the highest number of volunteer seedlings on the sandier site at ~ 75 seedlings and a mid-range of ~ 100 seedlings on the sandy clay loam site. This accession also rated high for vigor and density compared to other accessions. Because of its long lived and long blooming nature compared to the other accessions, it was chosen for seed release.

Due to the desirable characteristics of the coastal Cameron County collection, more collections were sought from the coast to add to the release to increase the geographic area represented.

Accession 9093365 from Galveston County was collected in 2006. It was seeded in the greenhouse in December of 2006 and had a 19% germination rate. It was planted in the field in the spring of 2007 for observation. A third accession, 9093441 from Nueces County, was collected in 2007 from the coast. It was seeded in the greenhouse in 2008, had a germination rate of 20.3%, and was planted in the field in 2008. Each of these new accessions exhibited the desirable characteristics of longer survival and blooming period and a growth form similar to accession 9093225. Seed was hand harvested from the small plots of accession 9093365 and 9093441 in 2008 and germination tested in 2010, with 18% and 28% active seed germination respectively. Accessions 9093365 and 9093441 were added to advanced evaluation with accession 9093225 to determine their suitability together and to increase the genetic diversity of the final release.

Advanced Evaluation

The three coastal accessions (9093225, 9093365, 9093441) used in the development of Fuego Germplasm were planted together in a small observation plot in 2011. They appeared compatible to mix in a seed release based on similar morphological characteristics and bloom

periods. In 2011, plants of the three selected accessions were sent to the East Texas Plant Materials Center (PMC) in Nacogdoches, Texas and the James E. “Bud” Smith PMC in Knox City, Texas for evaluation of cold tolerance. Plants performed well in both locations, even surviving and blooming after light freezes. Seed increase plots of all three accessions were initiated in 2012.

Seeding Trials

Fuego Germplasm was included in a pollinator restoration planting conducted on a Branyon clay soil in Bexar County. It was included in the seed mix at 1% and has subsequently contributed an equal portion to the vegetative cover. It was also included in two plantings conducted in Brooks County on a Nueces sandy soil. In these plantings it was only included as a trace amount of the seed mix and has been recorded on the site during sampling.

Seed Increase

Transplants of the three Indian blanket accessions were grown from the original seed collections and planted as isolated seed increase rows at the PMC for evaluation of harvest characteristics, seed set and timing, and adaptability to agronomic production. All accessions performed well in this evaluation, with similar growth rates and seed maturity dates.

Indian blanket can be harvested three times per year in south Texas, typically May, August and October. Flowering and seed production continue all season long, particularly in response to rainfall, but combine harvesting sets the vegetation back.

Seed production ranged from 11 to 80 lb/acre depending on harvest in the small experimental plots. Yields are estimated at 120-200 lb/acre per year in a commercial setting on 36-inch bedded rows with a plant population of 14,500 plants per acre. Plants are best established using transplants spaced 1-ft apart.

Seed Production, Harvest, and Cleaning

Irrigated seed fields of the three selected accessions (9093225, 9093365, 9093441) of Indian blanket were evaluated at the PMC in 2007. Plantings were established using transplants spaced at 1-ft apart on 36-inch bedded rows. Fields were harvested with a combine. Fuego Germplasm is best harvested using a combine with an all crop header, when 75% of the seed has reached maturity. Harvesting in this method stimulates subsequent flushes of flowering and seed production. Handpicking the stems and chaff can be done to further clean the seed or the seed can be run through a brush machine and then an air-screen cleaner for final cleaning.

The succulent nature of the leaves of this ecotype can make seed harvesting a challenge. A trial was conducted in 2007 to see if Cornerstone® Plus (active ingredient Glyphosate) could be used to defoliate but not kill the plants before seed harvest. This negatively impacted seed germination and was discontinued.

F. Area of adaptation

The best performance of Fuego Germplasm will be predominantly in the Rio Grande Plain and South Texas Sand Plain ecoregion (MLRA 83) as well as the Gulf Prairies and Marshes ecoregion (MLRA 150) of Texas. It is common along the Texas Gulf Coast. It also performed well in limited evaluations in the East Texas Pineywoods (MLRA 133B) and Rolling Plains (MLRA 78).

G. Procedure for maintaining stock classes of seed

Generation 0 seed will be produced and maintained by Texas Native Seeds. Seed production proposals will be sought, and licenses awarded to qualified seed producers based on bid proposals. 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.

Fuego Germplasm Indian blanket is released as a Selected Texas Native Germplasm. G0 seed of Fuego Germplasm Indian blanket is a composite of three individual accessions (9093225, 9093365, 9093441) grown in isolation from one another at ½ mile apart and maintained by the breeder. G1 seed is that harvested by isolated plantings of G0 seed and G2 seed is harvested from plantings of G1 seed. Increase beyond Generation 2 seed is prohibited. Generation 0 seed will consist of equal amounts (by percent PLS, +/-10%) of each of the three accessions.

I. Additional restrictions, etc.

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).

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 Fuego Germplasm was suitable for release based on the criterion contained in this document. This conclusion is mainly because Fuego Germplasm 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 pollinator habitat and rangeland plantings.

Conservation Use: Fuego Germplasm Indian blanket is recommended for pollinator habitat, rangeland plantings and wildlife habitat improvement.

Availability of Plant Materials: Generation 0 seed will be maintained by *Texas Native Seeds*. Generation 0 seed will be available by fall 2020. This germplasm must be grown within the Rio Grande Plain Ecoregion and isolated ½ mile from wild populations of *Gaillardia pulchella*.

References:

Correll, D.V., and M.S. Johnston. 1996. Manual of the Vascular Plants of Texas. The University of Texas at Dallas. Dallas, TX. Fourth Printing.

Everitt, J.H., D.L. Drawe, and R.I. Lonard. 1999. Field Guide to the Broad-leaved Herbaceous Plants of South Texas used by Livestock and Wildlife. Texas Tech University Press. Lubbock, TX.

Lehman, R.L., R. O'Brien, and T. White. 2005. Plants of the Texas Coastal Bend. Texas A&M University Press. College Station, TX.

USDA NRCS. 2018. Web soil survey. <http://websoilsurvey.nrcs.usda.gov>.

Ward, D.E., 1983. Chromosome counts from New Mexico and southern Colorado. *Phytologia*, 54:302-309.

Prepared by:

Shelly Maher

And

John Reilley
USDA-NRCS E. "Kika" de la Garza Plant Materials Center
3409 N. FM 1355
Kingsville, TX 7841

In Cooperation With:

Forrest S. Smith, Director
Texas Native Seeds
Caesar Kleberg Wildlife Research Institute
Texas A&M University-Kingsville
505 E Hundland Dr., Suite 320
Austin, TX 78752

And

Keith Pawelek, Associate Director

And

Anthony Falk, Assistant Director
South Texas Natives
Caesar Kleberg Wildlife Research Institute
Texas A&M University-Kingsville
MSC 218, 700 University Blvd.
Kingsville, TX 78363

Signatures for release of:

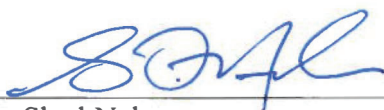
Fuego Germplasm Indian Blanket
(*Gaillardia pulchella* Foug.)



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

27 Sept 2020

Date



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

22 Sept 2020

Date

CLINTON EVANS

Digitally signed by CLINTON EVANS
Date: 2020.09.24 16:30:45 -06'00'

Clint Evans
Acting State Conservationist
United States Department of Agriculture
Natural Resources Conservation Service
Temple, TX

September 24, 2020

Date

BETSY DIERBERGER

Digitally signed by BETSY DIERBERGER
Date: 2020.09.28 12:42:00 -04'00'

Tom Hedt, Director
Ecological Sciences Division
United States Department of
Agriculture Natural Resources
Conservation Service Washington, D.C.

Date