UNITED STATES DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

EAST TEXAS PLANT MATERIALS CENTER
NACOGDOCHES, TEXAS

NOTICE OF RELEASE OF
PINELAND GOLD GERMPLASM SELECTED CLASS OF NATURAL GERMPLASM

The Natural Resources Conservation Service (NRCS), U.S. Department of Agriculture announces the naming and release of a seed propagated selected class germplasm of swamp sunflower (*Helianthus angustifolius* L.). This selected class pre-varietal release will be referred to as Pineland Gold Germplasm swamp sunflower.

Pineland Gold Germplasm swamp sunflower was developed from a composite of eleven collections from east Texas (Table 2). It is a selected class of seed (natural track) assigned NRCS accession number 9095309.

This alternate release is justified because commercially available swamp sunflower seed sources do not state seed origin or only denote general adaptation, such as USDA Plant Hardiness Zone, and not a specific area or region of origin. Environmental conditions and soils where these commercial sources are produced may be different than in the western coastal plain of Texas. Pineland Gold Germplasm swamp sunflower was developed for resource conservation and environmental programs in the Western Coastal Plain, especially for longleaf (*Pinus palustris*) and shortleaf (*Pinus echinata*) pine understory enhancement.

Collection Site Information: USDA NRCS and US Forest Service personnel collected seed from native stands of swamp sunflower in east Texas in 2009-2010, 2012-2013, and 2016. The collection area included Major Land Resource Areas (MLRA) 133B, Western Gulf Coastal Plain, and 152B, Western Gulf Coast Flatwoods within USDA Plant Hardiness Zones 8b and 9a (USDA, 2006; USDA ARS, 2012). Average annual rainfall ranges from 42 to 56 inches and average frost-free days vary from 270 to 290 in the collection area (Griffiths and Orton, 1968; USDA NRCS, 2006).

Description: Pineland Gold Germplasm swamp sunflower is a composite of 11 accessions from native stands in east Texas (Table 1). Plant specimens were identified as swamp sunflower (*Helianthus angustifolius*) by James Van Kley, Stephen F. Austin State University Herbarium, Nacogdoches, Texas.

Pineland Gold Germplasm swamp sunflower is a native, warm season, perennial forb. Plants overwinter as a rosette and in the spring, produce one or more main erect, branching stems 4 to 6 feet tall. Stem branching differs among the plants and may begin 2 to 3 inches above ground level. Basal leaves are opposite or alternately arranged while remaining leaves are alternate. Leaves are dark to medium green and rough to the touch. They are 3 to 8 inches long, vary from 0.13 to 0.35 inches wide and have entire margins that may roll under. Pineland Gold Germplasm begins blooming in late September to October at the ETPMC. Numerous bright yellow blooms vary from 1.5 to about 2 inches wide with yellow ray florets surrounding dark brown disks. Seeds mature in November. Mature seeds or achenes vary in length from 0.09 inch to 0.19 inch with an average of 0.13 inch. Achenes are triangular, flattened, varying from solid tan to dull black or spotted with tan markings.

Conservation Use: Pineland Gold Germplasm is recommended in the Western Coastal Plain for NRCS conservation practices including conservation cover (327), field border (386), and wildlife habitat planting (420). Grelen and Hughes (1984) recognized swamp sunflower as a valuable forb in the longleaf-slash pine-bluestem range making it a suitable species for native pine understory restoration plantings. Swamp sunflower is utilized by wildlife and pollinators throughout the year. Whitetail deer browse the nutritious foliage in summer (Grelen and Hughes, 1984). This forb serves as a host plant for four species of butterfly caterpillars and a fall nectar source for Monarch (*Danaus plexippus*) butterflies (New Moon Nurseries, 2017; USDA NRCS, 2017).

Method of Breeding and Selection: The original swamp sunflower assembly consisted of 30 seed collections. Seed of the 30 accessions were planted into Hiko HV93 transplant trays (Stuewe and Sons, Inc., Tangent, OR) and monitored for emergence and seedling vigor under greenhouse and shadehouse conditions. Accessions were subjectively rated for seedling vigor using a scale of 1 (excellent) to 7 (poor). Eight accessions receiving a rating of 7 were eliminated from evaluation. Twenty-two accessions were transplanted in replicated rows on a Woden fine sandy loam soil at the East Texas Plant Materials Center (ETPMC), Nacogdoches, TX and evaluated for survival and plant growth characteristics from 2017 to spring 2019.

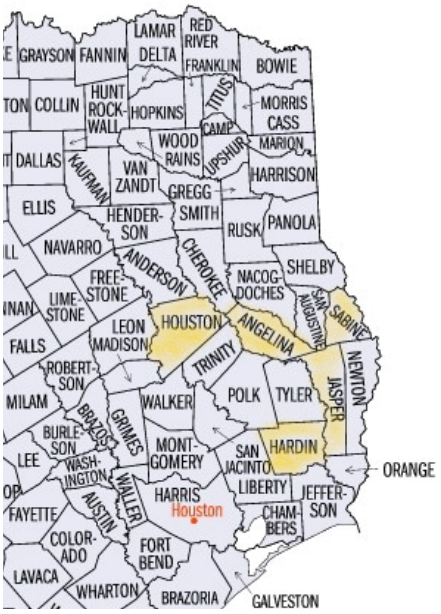

Figure 1. Collection locations of Pineland Gold Germplasm swamp sunflower highlighted in yellow.

Eleven accessions represented by 5 Texas counties were selected in June 2019 as best performing compared to the other eleven accessions in the evaluation (Fig. 1 and Table 1). Selections for composite release were based on percent seed germination, transplant survival, and reproductive stem number. Non-selected accessions in the study plot were clipped regularly to prevent bloom and seed set while selected accessions crossed and set seed in summer and fall 2019. Seed harvested from the 11 accessions were equally combined to produce accession 9095309 (Fehr, 1987). Seed was planted in the greenhouse in January-February in 2020 to produce transplants to establish a seed increase block (0.4 acre) in May 2020 at the ETPMC. The seed increase block exhibited good to excellent plant vigor and produced a seed crop the first year. Seed harvested from the seed increase block in November produced 25 lb/acre.

Table 1. Swamp sunflower accessions comprising Pineland Gold Germplasm by county of origin, percent seed germination in 2017, spring survival in 2019, 3-year average reproductive stems, plant height, and leaf width. USDA- NRCS East Texas Plant Materials Center, Nacogdoches, Texas. 2020.

Accession Number	County	% Seed germination [1/ 2/]	% Spring survival [3/]	Avg number reproductive stems [1/ 4/]	Avg plant height (in) [5/]	Avg leaf width (in) [6/]
9094902	Hardin	72	93	47	55	0.19
9095029	Houston	53	82	22	57	0.35
9095066	Angelina	74	72	23	50	0.17
9095071	Angelina	69	80	32	52	0.17
9095073	Sabine	85	98	28	70	0.16
9095074	Angelina	60	75	35	55	0.18

Table 1. (Cont.) Swamp sunflower accessions comprising Pineland Gold Germplasm by county of origin, percent seed germination in 2017, spring survival in 2019, 3-year average reproductive stems, plant height, and leaf width. USDA- NRCS East Texas Plant Materials Center, Nacogdoches, Texas. 2020.

Accession Number	County	% Seed germination [1/ 2/]	% Spring survival [3/]	Avg number reproductive stems [1/ 4/]	Avg plant height (in) [5/]	Avg leaf width (in) [6/]
9095076	Sabine	80	80	17	56	0.16
9095083	Sabine	89	80	34	55	0.14
9095084	Jasper	86	78	19	48	0.17
9095085	Sabine	74	93	24	59	0.13
9095087	Jasper	73	78	41	54	0.14
Mean		74	83	29	56	0.18

1/=criteria used for accession selection from initial evaluation, 2/=percent germination of original seed collections, 3/=determined by counting the number of plant surviving the winter (average), 4/= determined by direct count of three plants/replication then averaging over four replications, 5/=determined by measuring three plants/replication from ground level to top of tallest stem then averaging over four replications, 6/=determined by measuring three leaves from three plants/replication then averaging over four replications.

Ecological Considerations and Evaluation: An Environmental Evaluation of Plant Materials Releases was completed using guidelines established by the NRCS (USDA, NRCS, 2010) and best available information for this species. Results from this evaluation determined Pineland Gold Germplasm was suitable for release based on criterion contained in this document. Swamp sunflower is a naturally occurring species in North America and release of Pineland Gold Germplasm for public use would not constitute introduction of a foreign species to local ecosystems. Pineland Gold Germplasm was selected from native stands of swamp sunflower and has had no genetic modification. It is believed that any negative impact to other native species would be minimal to nonexistent.

Area of Adaptation: Pineland Gold Germplasm is adapted to the area of original seed collections in eastern Texas (Fig.1) in MLRA's 133B and 152B (USDA, 2006). Further testing is needed to determine its adaptation in adjoining states and MLRAs.

Availability of Plant Materials: Generation 1 (G1) seed will be distributed by the USDA NRCS East Texas Plant Materials Center, Nacogdoches, Texas.

Maintaining Stock Classes of Seed: The parent population of the composite of the 11 accessions that make up Prairie Gold Germplasm (Generation 0) is maintained by the East Texas Plant Materials Center. The seed harvested from the G0 population will be designated as G1 seed and distributed to commercial growers. Growers may increase G2 and G3 seed for commercial sale. Increase of Prairie Gold Germplasm beyond G3 seed is prohibited. All G2 and G3 seed fields have a seven-year production limitation. All seed production fields of Prairie Gold Germplasm must be isolated from other increase fields or native populations of *Helianthus angustifolius* by a minimum of 450 feet.

References:

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Signatures for the release of:

Pineland Gold Germplasm swamp sunflower

KRISTY OATES Digitally signed by KRISTY OATES Date: 2022.02.07 09:41:30 -06'00'

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

2/7/2022
Date

TERRON HILLSMAN Digitally signed by TERRON HILLSMAN Date: 2022.02.11 14:21:20 -05'00'

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

Date