

UNITED STATES DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

BOONEVILLE PLANT MATERIALS CENTER
BOONEVILLE, ARKANSAS

NOTICE OF RELEASE OF
WYNIA GERmplasm SELECTED CLASS OF NATURAL GERmplasm

The Natural Resources Conservation Service (NRCS), U.S. Department of Agriculture announces the release of Wynia Germplasm Indiangrass [*Sorghastrum nutans* (L.) Nash] for conservation use in the southern Ozarks of Arkansas, Oklahoma and Missouri. Wynia Germplasm Indiangrass is a selected plant material class of certified seed (natural track) released under NRCS accession number 9107486.

This alternate release procedure is justified because there are no commercial sources of Indiangrass from the Ozark eco-region of Arkansas, Oklahoma and Missouri. The environmental conditions and soils of this eco-region are significantly different from those of the tall grass prairie and the southeastern U.S. where commercially available seed sources and cultivars of Indiangrass originate.

Description: Wynia Germplasm Indiangrass is a native, perennial, warm-season grass that reproduces from seed and short, scaly rhizomes. It grows to heights of 6-7 feet. Leaf blades elongate, flat, 7 to 10 mm wide, tapering to a narrow base; ligule deeply notched, two-part split ligule located where the leaf blade attaches to the leaf sheath. Panicle narrow, yellowish, 20-30 cm long; spikelets 6 to 8 mm long (Grelen and Hughes, 1984; Hitchcock, 1951).

Travis D. Marsico, Associate Professor and Associate Chair, Curator, Arkansas State University Herbarium (STAR), Jonesboro, Arkansas formally identified plants from the breeder block of Wynia Germplasm as *Sorghastrum nutans*.

Conservation Use: Wynia Germplasm is recommended in the southern Ozark region for NRCS conservation practices such as conservation cover (327), field border (386), upland wildlife habitat management (645), critical area planting (342), and forage and biomass (512).

Collection Site Information: Wynia Germplasm was developed from seed collected from native stands of Indiangrass in eastern Oklahoma and western Arkansas (Table 1). This region consist of Major Land Resource Areas (MLRA) 116A, 116B, 117, 118, and 119 (Ozark Highlands to the Ouachita Mountains) within USDA Hardiness Zones 6a, 6b, 7a and 7b (USDA 2012).

Table 1. Seed collection locations of Indiangrass germplasm that were included in the final assembly of Wynia Germplasm.

Accession	Location (County)
9092762	eastern OK
9092763	eastern OK
9092768	Sebastian, AR
9092777	Logan, AR
9092817	western AR
9092845	eastern OK
9092835	Sebastian, AR
9092837	Sebastian, AR
9107485	Sebastian, AR

Method of Breeding and Selection: The original assembly of Indiangrass consisted of 86 seed collections from native stands in eastern Oklahoma and western Arkansas. Each collection was given an accession number and

seeded into 14-in x 20-in plastic flats (Karden Corp) filled with a commercial potting media (Pro-Mix, Premier Company, Canada), and placed in the greenhouse in January 2006. Accessions were monitored for germination and seedling vigor. The most vigorous seedlings were excavated from each flat after 6 weeks and transplanted into RLC3 “cone-tainers”™ (Stuwe and Sons, Tangent, OR), and allowed to continue growth under optimum conditions in the greenhouse.

Forty-six (46) accessions were chosen for the initial evaluation nursery based on good germination and seedling vigor (visual observation; no data taken). The other 40 accessions either failed to germinate or exhibited poor seedling vigor, and were excluded from further testing.

Plants of each accession were transplanted in a randomized complete block with four replication on a Leadvale silt loam soil at the Booneville Plant Materials Center in April 2006. ‘Cheyenne’ and ‘Americus’ were included in the evaluation nursery for comparative evaluations. Plots were irrigated as needed to accelerate establishment in 2006. Accessions were evaluated during the growing season in 2007 and 2008 for disease and insect resistance, leafiness and plant height (boot stage and at maturity) and the date when plants reached 50% bloom (Table 2).

Nine accessions, three (3) from eastern Oklahoma (9092762, 9092763, and 9092845) and six (6) from western Arkansas (9092768, 9092777, 9092817, 9092835, 9092837, and 9107485), were chosen as superior performers compared to the other 37 accessions and ‘Cheyenne’ and ‘Americus’. In forage quality comparisons, the nine accessions were equal to or better than Cheyenne and Americus for crude protein and digestibility when cut at late vegetative growth stage in 2010-2011 (Table 3).

Due to similar plant attributes, phenology, and forage quality the nine accessions were planted into a polycross block for seed increase in 2012-2014. Seed harvested from the polycross block was planted in 2015 to establish a Wynia Germplasm breeder block.

Table 2. Average plant attributes of Indiangrass accessions that were included in Wynia Germplasm compared to ‘Americus’ and ‘Cheyenne’ cultivars, USDA-NRCS Booneville, AR 2008-2009.

Cultivar/ Accession	Disease Resist. ^{1/}	Insect Resist. ^{2/}	Plant Height (BS) ^{3/} (ft.)	Plant Height (ft.) ^{4/}	Leafiness ^{5/}	Bloom Date ^{6/}
Americus	7.5	9.5	2.9	5.3	7.4	6-Sep
Cheyenne	8	9.5	2.7	5	7.2	27-Aug
9092762	7	9.5	2.9	4.7	6.4	12-Sep
9092763	8.9	9.5	3.1	6.7	7.2	8-Sep
9092768	7.9	9.5	3.1	6	7.7	30-Aug
9092777	6.7	9.5	2.8	4	7	7-Sep
9092817	8.5	9.5	2.9	5	6.7	4-Sep
9092835	9.0	9.5	3.2	5.3	7.7	1-Sep
9092837	6.5	9.2	3	3.7	8	31-Aug
9092845	8.4	9.5	3.1	5.7	7.2	8-Sept
9107485	7.6	9.3	3.2	4.7	8	12-Sept

^{1/}disease resistance (scale = 1-9 with 9 the most resistant); ^{2/} insect resistance (scale = 1 to 9 with 9 the most resistant);

^{3/}plant height at boot stage of growth; ^{4/}absolute plant height; ^{5/}leafiness (scale = 1 to 9 with 9 the most leafiness),

^{6/}bloom date at 50% flowering.

Table 3. Average forage quality of nine accessions of Indiangrass combined to develop Wynia Germplasm compared to ‘Americus’ and ‘Cheyenne’ Indiangrass cultivars. USDA-NRCS Booneville, AR 2010-2011.

Source	Forage quality ^{1/}			
	CP ^{2/}	ADF ^{3/}	NDF ^{4/}	TDN ^{5/}
	-----%-----			
Americus	6	40	66	52
Cheyenne	8	35	63	57
9092762	7	36	64	56
9092763	8	36	65	56
9092768	7	35	63	57
9092777	8	34	66	58
9092817	8	35	66	57
9092835	6	35	65	57
9092837	6	36	63	56
9092845	7	36	63	53
9107485	6	36	66	52

^{1/} forage quality determined at late vegetative growth stage, ^{2/}crude protein, ^{3/}acid detergent fiber, ^{4/}neutral detergent fiber, ^{5/}total digestible nutrients.

Ecological Considerations and Evaluation: An Environmental Evaluation of Plant Materials Releases was completed using guidelines established by the NRCS (USDA-NRCS, 2010), and the best available information for this germplasm. Results from this evaluation determined that Wynia Germplasm is suitable for release based on a low chance this release will have a negative effect on the environment. Indiangrass is moderately easy to control. There is a moderate need for commercial availability of Wynia Germplasm for natural resource conservation activities. Indiangrass is a naturally occurring species throughout North America and the release of Wynia Germplasm for public use does not introduce a foreign species to local ecosystems. Wynia Germplasm was selected from native stands of Indiangrass and has had no purposeful genetic modification through the evaluation process. Wynia Germplasm should only be used in its intended area of adaptation until tested further in other locations.

Area of Adaptation: The full range of adaptation of Wynia Germplasm was unknown at time of its release, but we anticipate Wynia Germplasm is adapted within collection locations of eastern Oklahoma and western Arkansas. Observational plantings in Coffeetown, MS; Americus, GA, Nacogdoches, TX; Elsberry, MO; and Manhattan, KS compared the adaptation of Wynia Germplasm to ‘Americus’, ‘Rumsey’ and ‘Cheyenne’ Indiangrass in non-replicated plots. Initial results of the 2016-2017 plantings indicate Wynia Germplasm exhibits good to excellent survival and vigor in all of these locations with no major disease or insect problems.

Availability of Plant Materials: Breeder seed (G0) is maintained by the USDA NRCS Booneville Plant Materials Center, Booneville, Arkansas.

References:

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Signatures for the release of:

Wynia Germplasm Indiangrass




SEP 21 2017

Date

Michael E. Sullivan
State Conservationist
United States Department of Agriculture
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Little Rock, Arkansas

Handwritten note:
Handwritten
9/21/17



Sept 26, 2017

Date

Terrell Erickson
Director, Ecological Sciences Division
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