

**UNITED STATES DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE
BOONEVILLE, ARKANSAS**

NOTICE OF RELEASE OF HAMPTON GERmplasm BIG BLUESTEM

The Natural Resources Conservation Service (NRCS), U.S. Department of Agriculture (USDA), announces the naming and release of Hampton germplasm big bluestem (*Andropogon gerardii* Vitman). Hampton was tested under the accession number 9056854.

This plant will be referred to as Hampton germplasm big bluestem and is released as a select class of plant materials (natural track).

Hampton germplasm will provide a commercially available ecotype of big bluestem for use in western Arkansas, eastern Oklahoma and southern Missouri.

Collection Site Information: Hampton germplasm was collected November 1987, Wayne County, Marble Hill, MO (MLRA 116A). Seeds were collected from plants growing on a northwest exposure and on a Clarksville soil type with a 7 % slope.

Description: Big bluestem is a grass native to the United States that can be found from the New England States, west to Iowa and southeast Nebraska, and south to Kansas, Oklahoma and northeast Texas and southeast to the Gulf States. Big bluestem forms large clumps. The young shoots are somewhat flattened at the base and the lower leaves are usually covered with silky hair. Mature foliage height ranges from 1.5 to 2.5 meters (3.0 to 8.0 feet) tall. Foliage is a bluish-green color and the blades are about 30.5 centimeters (12 inches) long and from 0.6 to about 1.25 centimeters (0.25 to 0.5 inches) wide and scabrous on the margins. Mature plants have a reddish cast after frost. Flowers are produced from late-June to August, with maximum seed production generally occurring in mid-August. Racemes (usually 3 to 6) are on the long-exserted terminal peduncle and fewer are found on the branches. These are 5 to 10 centimeters (2 to 4 inches) long and often purplish or sometimes yellow. Spikelets are paired and nearly equal in length (7-10 millimeters). Awns are 1 to 2 centimeters (0.4 to 0.8 inches) and are geniculate and tightly twisted and pedicellate spikelets are awnless (Hitchcock, 1951 and Stubbendieck et al., 1992).

Potential Uses: Hampton germplasm is recommended primarily for livestock, forage production, and wildlife habitat. It is best used as a seasonal hay crop. The abundant, leafy forage is palatable to all classes of livestock. It can be utilized in grazing situations if appropriate grazing management techniques are applied (i.e. rotational grazing) to prevent damage to the plant community and stand population. Hampton germplasm may also be used for many types of conservation plantings, such as plant buffers and vegetative barriers. The extensive root system penetrates deeply which makes it ideal for holding soil particles and the prevention of erosion.

Method of Breeding and Selection:

Initial and advanced evaluation: Hampton germplasm was initially evaluated at the USDA-NRCS Booneville Plant Materials Center (PMC), Booneville, Arkansas, 1987 through 2006. Initially, 9056854 was one of a total of 365 accessions collected from eastern Oklahoma, southern Missouri, and western Arkansas that were included in the study. From this initial evaluation, 5 accessions plus 'Rountree', 'Niagara', and 'Kaw' were established in May, 1998 for further screening and testing. Hampton germplasm was determined to have superior vigor, growth form and development, and disease resistance (Table 1).

Regional Observation Trial: Hampton germplasm was selected by the PMC for inclusion in regional observation plantings at the Jimmy Carter PMC, Americus, GA, Manhattan PMC, Manhattan, KS, Jamie L. Whitten PMC, Coffeetown, MS, Elsberry PMC, Elsberry, MO, and East Texas PMC, Nacogdoches, TX. Vegetative propagules were planted at each location during May, 2004. Observations were collected on 15 July and 15 September. Soil conditions were a medium fertility and precipitation ranged from average to above average. Observations were based on fair, good, and excellent for insect resistance (good- 3 and excellent- 2), disease resistance (good- 3 and excellent- 2), and drought resistance (good- 2, excellent- 1, and 2- N/A due to sufficient moisture). Flowering ranged from mid-August to mid-September. Initial results show that Hampton germplasm appear to be adapted in these locations and additional field plantings would need to be conducted for verification.

Forage Production: Dry-matter values indicated that Hampton germplasm out yielded other big bluestem entries in the test (Table 2). The range of means for all big bluestems tested was from 7059 to 12361 kg/ha (6303 to 11037 lb/acre). Hampton germplasm produced 12361 kg/ha (11037 lb/acre).

Forage Quality: Values for crude protein (CP) of Hampton germplasm and big bluestem cultivars are presented in Table 3. Mean values were obtained over three years (2000 thru 2002) and CP means for Hampton germplasm were generally higher than the other four accessions and 'Rountree', 'Niagara' or 'Kaw'. Crude protein values for Hampton germplasm ranged from 104 to 119 gm/kg and averaged 1 gm/kg higher than the other seven entries which ranged from 890 to 108 gm/kg in the evaluation.

Means for total digestible nutrients (TDN) for Hampton germplasm were higher than the other entries. The TDN (expressed as a %) for Hampton germplasm ranged from 62.1 to 64.5% and means for TDN of the other entries ranged from 58.9 and 63.1%. The means for TDN for Hampton germplasm and the other entries were 63.7 and 61.2%, respectively.

Neutral detergent fiber (a negative correlation for the measure of intake) means indicated that Hampton germplasm was generally lower compared to other entry means in the study. Averaged over three years the mean for Hampton was 670 gm/kg. Means for other big bluestem entries ranged from 693 to 701 gm/kg.

Ecological Considerations and Evaluation: An Environmental Evaluation of Plant Materials Releases was completed using guidelines established by NRCS (USDA-NRCS, 2000), and the

best available information for this species. Results of this evaluation determined that Hampton germplasm was suitable for release based on the criterion contained in this document. This conclusion is mainly due to the fact that big bluestem is a naturally occurring species in the central and southeastern United States and planting Hampton germplasm would therefore not constitute an introduction of a foreign species into local ecosystems. Any negative impacts on other native plant species would likely be minimal to non-existent. Also, in addition to the evidence that Hampton germplasm provides excellent forage for livestock and critical wildlife habitat, it also may provide plant material for critical area remediation.

Conservation Use: Hampton germplasm can be used for forage production, erosion control, wildlife habitat, and water quality improvement. It has shown to have a high degree of tolerance to environmental stresses in northwestern Arkansas.

Area of Adaptation: Full area of adaptation for Hampton germplasm is unknown. However, there have been limited observational plantings in the central and mid-south portions of USDA Hardiness Zones 6b, 7a and b, and 8a that have provided evidence that it has potential for adaptation and use in this region.

Availability of Plant Materials: A limited amount of foundation seed will be maintained by the USDA-NRCS Booneville Plant Materials Center, Booneville, Arkansas.

Name Selection: Hampton germplasm big bluestem was named after Jeral Hampton. Mr. Hampton was born on a farm in Ione, Arkansas, 8 miles from Booneville, Arkansas. He is an ardent supporter of agriculture and conservation issues. Mr. Hampton generated the initial vision and provided boundless energy during a several year period that culminated in the establishment of the Bumpers Small Farm Research Center. Mr. Hampton’s community, agriculture, and research support and generosity has been invaluable to maintaining a viable economy.

Table 1. Visual assessment (means) for plant vigor, insect resistance, disease resistance, and drought resistance for five accessions and three cultivars of big bluestem, Booneville, AR, 1997-1999.

Entry	Plant Vigor	Insect Resistance	Disease Resistance	Drought Tolerance
9054237	3	3	4	3
9056854	4	5	5	5
9056944	3	3	2	2
9057029	3	3	3	2
BR-19	2	3	3	2
Kaw	4	5	5	4
Niagara	3	5	4	3
Rountree	4	5	5	3

Visual assessment ratings based on 5=excellent to 1=poor.

Table 2. Dry-matter production (lbs/acre) for five accessions and three cultivars of big bluestem Booneville, AR, 2000-2002.

Entry	2000	2001	2002	Mean
	----- lb/acre -----			
9054237	6612	7812	6734	7053
9056854	11037	11377	12600	11037
9056944	6303	6589	6606	6499
9057029	7230	7021	6945	7065
BR-19	7542	7856	8478	7958
Kaw	8821	8902	7899	8540
Niagara	9987	10046	10947	10326
Rountree	6512	6502	6606	6540

Table 3. Crude protein, neutral detergent fiber (NDF), acid detergent fiber (ADF), and total digestible nutrients (TDN) for five accessions and three cultivars of big bluestem, Booneville, AR, 2000-2002.

Entry	Protein	NDF	ADF	TDN
	----- % -----			
9054237	9.7	68.5	34.1	61.5
9056854	10.6	67.0	33.2	63.7
9056944	9.5	68.9	33.1	59.7
9057029	8.9	69.3	33.5	60.4
BR-19	9.5	69.5	34.8	61.3
Kaw	9.7	69.4	33.6	61.5
Niagara	9.6	69.6	35.8	60.9
Rountree	10.2	70.1	34.6	62.9

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References:

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Stubbendieck, J., S.L. Hatch and C.H. Butterfield. 1992. North American Range Plants. 4th ed. University of Nebraska Press

USDA. 1948. Grass. The Yearbook of Agriculture 1948. U.S. Government Printing Office. Washington D.C.

USDA-Natural Resources Conservation Service. 2000. National Plant Materials Manual, Title 190 (Washington, D.C., U.S. Government Printing Office, June, 2000).

Signatures for release of:

Hampton Germplasm Big Bluestem (*Andropogon gerardii* Vitman)

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