

**UNITED STATES DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE
BROOKSVILLE, FL**

**NOTICE OF RELEASE OF SEA ISLANDS GERMPLASM SWEETGRASS
SELECTED CLASS OF NATURAL GERMPLASM**

The U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS), announces the release of Sea Islands Germplasm, a selected-class sweetgrass (also known as Gulf hairawn muhly) [*Muhlenbergia sericea* (Michx.) P.M. Peterson]. The scientific nomenclature used in this document follows the *Muhlenbergia* key and species description included in the *Manual of Grasses for North America* (Peterson, 2003). The PLANTS Database currently uses the scientific name *M. filipes* M.A. Curtis for this species (USDA, NRCS, 2009), although this name will be changed to *M. sericea* in a future revision (Gerald Guala, personal communication, May 2009). Another synonym is *M. capillaris* (Lam.) Trin. var. *filipes* (M.A. Curtis) Chapm. ex Beal (Wunderlin and Hansen, 2008). Sea Islands Germplasm has been assigned the NRCS accession number 9060701.

Sweetgrass is an important part of the plant community in coastal areas of the south Atlantic and along the Gulf of Mexico (Burke, and Halfacre, 2003; Hitchcock, 1971; NatureServe, 2009a,b). Sweetgrass is culturally significant for the Gullah/Geechee community around Mt. Pleasant (Charleston County), SC, because they use it as the base material for their African-coiled basketry (Edwards, 1992; Gustafson et al., 2008). The potential for immediate use of Sea Islands Germplasm is high.

Collection Site Information: Sea Islands Germplasm was collected by Robert J. Dufault, Professor of Horticulture at Clemson University in the 1990s. He collected vegetative plant material from beach fronts on Kiawah Island, SC, and Little St. Simons Island, GA. He propagated these plants at the Clemson Coastal Research and Education Center in Charleston, SC. In 2006, Tommy Socha, US Army Corps of Engineers, Charleston District, contacted the Florida Plant Materials Specialist and the Brooksville Florida Plant Materials Center (PMC) with a request to accession this sweetgrass to facilitate specification of this material in the Corps coastal restoration plantings. He delivered sweetgrass plants to the PMC in December of that year. In January of 2007, Dr. Dufault sent a sample of seed collected from his plants at the Coastal Res. and Ed. Center for PMC personnel to use to grow additional plants.

Description: Sweetgrass is a clump-forming, perennial, warm-season grass that does not spread by rhizomes. The culms of this grass are erect, usually 70- to 160-cm tall and are mostly unbranched; culms are generally glabrous, but may be minutely pubescent at the internodes and at the sheath. Leaf blades are 35- to 100-cm long and 1- to 3-cm wide, usually involute (rolled inwards), dark green in color, smooth on the upper surface and rough on the lower. Ligules are 4- to 8-mm long and membranous. The elongated panicles are 20- to 60-cm long and diffuse or open, with fine branches. Spikelets are 3- to 5-mm long and purplish in color. The glumes of the spikelet are 1- to 2-mm long and glabrous. Both glumes are awned; the awns of the lower glume are 0.5- to 10-mm long and those of the upper glume are 2-25 mm in length. Lemmas are 3- to 5-mm long, lanceolate in shape, and have an awn that ranges from 8-35 mm in length.

Each lemma also has two delicate setaceous (hair-like) teeth, one on either side of the awn, that are 1- to 5-mm long. Paleas are 2- to 4.5-mm long, also lanceolate, and are generally awned (up to 2-mm long). Caryopses are brownish and 2-2.5 mm in length (Peterson, 2003).

Method of Breeding and Selection: No intentional selection or breeding has been performed on this material by either Dr. Dufault (the collector) or Plant Materials Center personnel. Plants being grown at the Brooksville PMC were directly increased from the original collections.

This accession has undergone limited adaptation testing. Sea Islands Germplasm was included in an evaluation planting installed in August 2007 at ten sites from Sullivan's Island to Garden City, SC. Included in this planting were nine other accessions, which were either *M. sericea* or *M. capillaris* selections from Florida chosen by PMC personnel during previous testing for their superior seed production characteristics. The ten sites were located in areas where beach vitex (*Vitex rotundifolia* L. f.), an exotic ornamental that has proven to be invasive when planted in coastal landscapes, was killed with herbicides. Each plot consisted of a single *Muhlenbergia* plant and there were 2 to 3 replications of each accession at each site. Survival was good at all sites except one and this was excluded from further analysis. An initial evaluation was conducted in December 2007 (Table 1). Initial survival of Sea Islands Germplasm (accession 9060701) was somewhat lower than several of the Florida accessions and this may have been due to an initial smaller size of the Sea Islands propagules. This reduced survival led to a slightly lower than average total value score; however, when the value score was divided by the number of plants which were evaluated, it ranked above average (Williams et al., 2008). A final evaluation was conducted in October 2008 (Table 2). Two additional sites had either been destroyed or plants within the site had been moved to other locations, so these sites were not evaluated. Again, survival of 9060701 at the remaining sites was still somewhat below average; however, the average appearance rating of the surviving plants was higher than all of the Florida accessions.

Area of Adaptation: The species can be found growing in coastal ecosystems from North Carolina to Texas. In South Carolina, where this accession was collected, sweetgrass is often found growing in association with saltmeadow cordgrass [*Spartina patens* (Aiton) Muhl.] and dune fingergrass [*Eustachys petraea* (Sw.) Desv.]. This community historically was found in broad grassy swards in the interdune areas along the barrier islands behind the primary dune and in front of the maritime forest, in an ecological community known as a maritime wet grassland (Gustafson et al., 2008; NatureServe, 2009a). However, populations have largely been destroyed by land use changes (urbanization) in the northern end of its range, particularly in the Charleston County, SC, area. Remaining populations around Charleston County are not available to basketmakers for harvesting due to restricted beach access caused by this development (Dufault, et al, 1993; Gustafson et al., 2008). Farther south into Florida, this community type is generally found in narrow bands between dune ridges (NatureServe, 2009a). In the southern portion of the state, sweetgrass also can be found on the coast in association with another plant community that includes beach creeper (*Ernodea littoralis* Sw.) and seaoats (*Uniola paniculata* L.) (NatureServe, 2009b) and further inland growing in seasonally wet prairies and pine barrens (Pinson and Batson, 1971). It is a facultative wetland plant throughout its native range (USDA, NRCS, 2009) and it may be dependent on high water tables for prolonged survival (Burke and Halfacre, 2003). Although Sea Islands Germplasm was collected in South Carolina, it has grown well under controlled conditions at the Plant Materials Center in Brooksville, FL. Further testing would be

required to determine if it can also be used in coastal planting sites in parts of its geographic range outside of South Carolina.

Table 1. Initial evaluation of 10 accessions of *Muhlenbergia* spp. planted at nine sites in coastal South Carolina approximately four months after planting.

Accession	Field Survival	Condition Score ¹			Value Score ²	Average Value Score ³	Flower
	-----%-----	Good	Fair	Poor			-----%--
9059224	92	19	3	1	64	2.3	46
9059516	100	11	11	7	62	2.1	27
9059523	71	2	15	3	39	1.9	39
9059524	92	8	10	6	50	2.3	38
9059885	100	11	4	3	44	1.6	48
9060044	86	14	7	3	59	2.1	46
9060048	64	14	3	1	49	1.7	50
9060317	89	14	10	0	62	2.3	52
9060437	96	14	11	1	65	2.4	59
9060701	91	14	3	3	51	2.3	45
Average	89						45

¹Good = >50% green leaves; fair = 1 to 50% green leaves; poor = 1 green leaf.

²Sum conditions score (good = 3; fair = 2; poor = 1); based on live plants, maximum potential value = 87.

³Value score divided by number plants of that accession planted.

Table 2. Final evaluation of 10 accessions of *Muhlenbergia* spp. planted at seven remaining sites in coastal South Carolina approximately 13 months after planting.

Accession	# Plants	Average Plant	# Plants With Seedheads
		Appearance Rating ¹	
9059224	16	2.63	11
9059516	15	2.40	10
9059523	17	2.76	4
9059524	14	2.71	10
9059885	8	2.13	4
9060044	15	2.50	5
9060048	6	2.14	1
9060317	17	2.29	14
9060437	11	2.65	2
9060701	12	2.83	8
Average	13	2.50	7

¹Rating Scale: 1 = poor; 3 = average; 5 = excellent.

Conservation Use: The sweetgrass population that Sea Islands Germplasm was collected from was identified by the Gullah/Geechee community as providing superior material for basket making. However, it is not known if the leaf properties that are required for this activity are derived from genotypically controlled traits inherent within this accession or result from the coastal environment in which this population of plants was growing (Gustafson et al., 2008).

Sweetgrass is also marketed as an ornamental and will often be labeled under the name purple muhly in the nursery trade.

Sea Islands Germplasm has also proven to be beneficial for soil stabilization and is currently being included in plantings in the Lowcountry of South Carolina designed by the U.S. Army Corp of Engineers for the dual purpose of providing erosion control and restoring a more readily available source of this culturally significant plant.

Ecological Considerations and Evaluation: An environmental evaluation was completed for Sea Islands Germplasm to assess its potential to adversely impact the environment. Sea Islands Germplasm does not spread vegetatively by rhizomes or stolons. There is no evidence that it is capable of spreading by seed into ecosystems other than those in which it is currently found. It is already in limited commercial use and is mainly being planted in coastal areas of South Carolina, which constitutes a reintroduction of this plant into its native ecosystem. Ecotypic variability has been documented in this species (Gustafson et al., 2008) and it is not known if planting Sea Islands Germplasm would pose any genetic risk to native sweetgrass populations in other parts of its native range; however, if there were, it would likely be minimal. Although as an ornamental, it may be used in entirely different types of sites than when planted for restoration use, it would still present little, if any, chance of escaping and becoming a problem plant.

Availability of Plant Materials: A breeder block of Sea Islands Germplasm sweetgrass will be maintained at the Brooksville Plant Materials Center in Brooksville, FL. Limited quantities of G0 planting stock are available for production purposes by request to the Florida Plant Materials Specialist.

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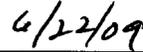
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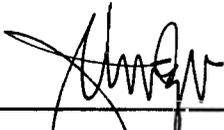
Sea Islands Germplasm Sweetgrass [*Muhlenbergia sericea* (Michx.) P.M. Peterson]

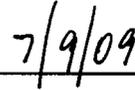




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