

# Propagation Protocol for *Hierochloa odorata*

## Sweetgrass

SUSAN WINSLOW

**M**any North American tribes use sweetgrass (*Hierochloa odorata* (L.) Beauv. [Poaceae]) as a holy purifier, incense, medicine, and perfume (Moerman 1998). In ceremonies, many tribes passed persons and sacred objects through smoke of braided, dried sweetgrass leaves. The Blackfeet used smoke of burning leaves for coughs and colds, soaked stems in water and used the solution as a dermatological aid for chapping and windburn, as an eyewash, and as a veterinary aid to make horses long-winded on the chase (Moerman 1998; KickingWoman 2000). Intricately braided necklaces of sweetgrass were worn or woven into women's hair as a perfume and decoration and placed among clothing for the pleasant scent. The Iroquois, Kiowa, MicMac, Menominee, and Mohawk incorporated sweetgrass into basketry and mats (Moerman 1998). Because of the cultural importance, susceptibility to overgrazing, and its localized occurrence in any

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given area, tribal nurseries and the USDA Natural Resources Conservation Service are evaluating establishment methods and developing propagation protocols for seed production and restoration.

### Description, Distribution, and Habitat

Sweetgrass is a fragrant, rhizomatous perennial with culms that are usually red to purple at the base. Two types of leaf blade are present: 3-cm-long (1.25-in) fertile stems that emerge early in the growing season, and 30- to 60-cm-long (1- to 2-ft) sterile stems that appear later in the summer. Sweetgrass inconsistently produces flowering stalks. The pyramidal shaped inflorescence appears in spring and early summer and consists of several shiny, bronze-colored spikelets (Figure 1). Each spikelet is surrounded by transparent, membranous glumes, which fall soon after maturation. Three flowers are borne in each spikelet but only one produces a seed. Sweetgrass is a circum-boreal species that grows in moist prairie grasslands and montane to

subalpine meadows, wetland margins, sloughs, and streambanks. In North America, it is found from Alaska to Labrador, south to Oregon, Nevada, Arizona, and through the Rocky Mountains to New Mexico; also east to South Dakota, Indiana, and Pennsylvania (Hitchcock and Cronquist 1973). It is not found in pure stands, but among other grasses, sedges, forbs, and shrubs in mid-successional communities.

### Vegetative Propagation

Sweetgrass is easily propagated by dividing rhizomes (underground horizontal stems) of established nursery stock maintained in 170-ml (10 in<sup>3</sup>) to 3-l (1-gal) containers filled with an all purpose, well-drained growing medium. Rhizomes with at least 1 active shoot are transplanted into containers having about 170 ml (10 in<sup>3</sup>) volume, a density around 525 seedlings per m<sup>2</sup> (50/ft<sup>2</sup>), and filled with the same medium (Figure



Figure 1 • Flowering sweetgrass.

Photo by Rose Lake Plant Materials Program

2). Plants grow rapidly in a greenhouse maintained at 22 °C (72 °F) during the day (ambient photoperiod) and 16 °C (61 °F) during the night or in shadehouses. Plants are fertilized weekly with 9N:45P<sub>2</sub>O<sub>5</sub>:15K<sub>2</sub>O at 100 ppm N. After about 3 mo, plants have firm root plugs and should be hardened-off for 4 wk outdoors before outplanting at 30-cm (1-ft) spacings into areas of partial shade to full sun—adequate available moisture is necessary (Winslow 1995; Bush 2000).

### Stand Establishment

#### Site Preparation and Planting

Sweetgrass is a cool-season species and its seeds require a period of cold temperatures before they will germinate. Late fall, late winter, and early spring are the best times to sow seeds. Prepare the site well in advance of planting. Soil should be free of weeds, loose and friable, raked or smoothed to a level, clump-free grade, packed or rolled firmly (only light foot imprints should be visible when walked across), and evenly moistened to a depth of 5 to 7.5 cm (2 to 3 in) (or when surface puddling is evident) with a sprinkler or hand-held spray nozzle.

Seeds should be fully ripened (very firm when squeezed between fingernails or when clipped with a

fingernail clipper) and free of debris. Sweetgrass seeds are very small (2.4 million/kg [1.1 million/lb]) and germination averages 25% to 50%. Seeds can either be dribbled in rows or broadcast to achieve an optimum plant density of 140 plants/m<sup>2</sup> (13/ft<sup>2</sup>) after germination. After seeding, it is very important to re-roll or pack the site to ensure satisfactory seed-to-soil contact. The tiny seeds are easily washed away, so immediately follow planting with a light watering. Keep the area moist until seedling emergence, about 10 to 14 d. In clayey soils prone to crusting, subsequent periodic, short-duration watering may be necessary.

#### Stand Management

To avoid damaging seedlings, wait until plants grow at least 10 to 15 cm (4 to 6 in) tall before beginning routine weeding. Diligent weeding reduces competition for light, nutrients, and water, and encourages vigorous plant growth and development. Sweetgrass prefers a moist environment, so regularly water the site. Rhizomes develop early and will emerge during the first growing season and the grass will continue to spread if left unattended. Leaves will reach a length of about 30 to 38 cm (12 to 15 in) and can be removed once or twice a year. The foliage is very

supple, and it will be necessary to carefully lift the leaves and cut the stems close to the ground (leave 5 to 7.5 cm (2 to 3 in) of plant stem). The actual number of harvests per year will depend on climatic conditions and seasonal timing. Plan the final harvest (late summer in northern climates) so that there will be adequate time for the plants to prepare for the onset of winter conditions. Failure to allow the grass to natural hardening-off eventually will have a detrimental effect on the long-term persistence and survival of the stand. Fertilizing is not recommended the first year because it seems only weeds reap the most benefit. In subsequent years during spring, apply a low analysis, balanced granular fertilizer at a rate of 1.5 kg N per 1000 m<sup>2</sup> (3 lb per 1000 ft<sup>2</sup>) to stimulate foliage production (Winslow 1995).

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### Author Information

Susan Winslow  
Agronomist  
USDA Natural Resources  
Conservation Service  
Bridger Plant Materials Center  
Bridger, MT 59014  
[Susan.Winslow@mt.usda.gov](mailto:Susan.Winslow@mt.usda.gov)

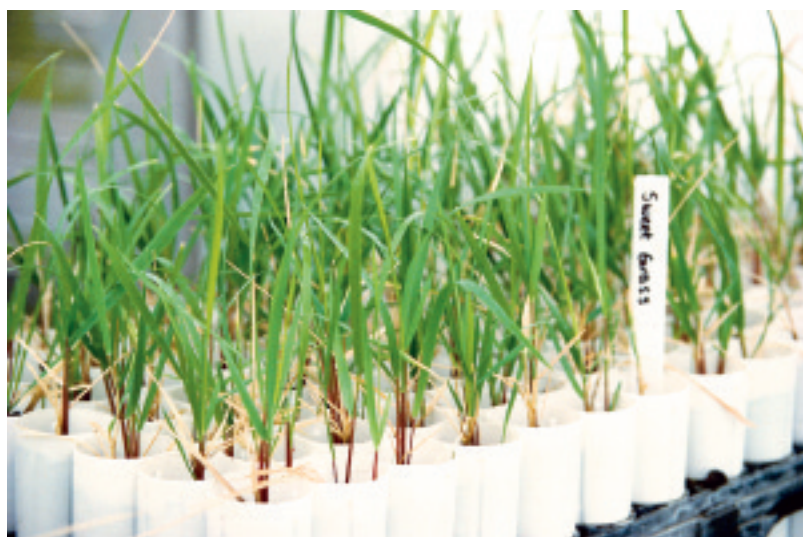


Figure 2 • Sweetgrass plants propagated from rhizomes.

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