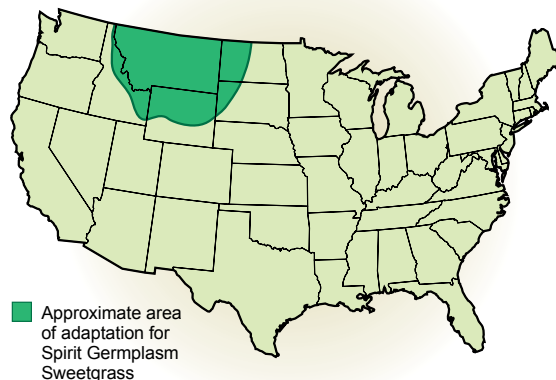


Spirit Germplasm Selected Class Sweetgrass

Spirit germplasm is a selected class, vegetative release of sweetgrass *Hierochloa odorata* (L.) Beauv. The vegetative propagules were originally collected in 1991 in the Sweetgrass Hills of Toole County, Montana. The site elevation is 3,700 ft. (1,128 m), soil texture is silty clay loam, and annual precipitation is 15 to 19 in. (382 to 485 mm). This release was tested at the Bridger PMC in comparison to 'Radora,' a commercial release from South Dakota, and collections from Colorado, Kansas, Michigan, Montana, and North Dakota. It was found to be superior in survival, number of tillers produced, spread rate, leaf length, and biomass production. The accepted propagation method of this species is asexual (vegetative), as it has very poor seed set.



regions of North America. It is considered a facultative wetland species in the lower 48 states, a facultative upland species in Alaska, and is listed as an endangered species in Maryland, North Carolina, and Pennsylvania. Sweetgrass is a very early flowering, mid-seral species that grows in mixed plant communities of wet meadows and in the transition zones of low, moist

communities along streams and rivers. It survives under a fairly wide range of environmental conditions and prefers medium- to coarse-textured soils with 20% to 30% soil moisture content, a depth to water table of 6 to 11 in. (14 to 28 cm), mostly full light conditions, and grows best with limited competition from other species. In Montana, it has been found at elevations as low as 3,600 ft. (1,100 m) and reported at 11,500 ft. (3,500 m) in Colorado and Utah. Spirit germplasm should do well throughout its range of native sites in Montana. It should also perform well in the intermountain west and Northern Great Plains regions, though it has not been thoroughly field tested in all sites.

Description

Sweetgrass, also known as vanillagrass and holy grass, is a strongly rhizomatous (spreading underground by horizontal stems), very early, native, cool-season grass. It grows in the foothills and mountains, in moist places such as wet meadows, sloughs, bogs, and along the shores of rivers, streams, and lakes. Sweetgrass is semi-erect, with flat, smooth, shiny leaves that are reddish-purple at the base, mostly 0.2 to 0.3 in. (4 to 7 mm) wide, and up to 20 in. (50 cm) long. The relaxed leaves tend to lay over the soil surface. The foliage is fragrant and vanilla-scented due to the presence of coumarin, which is a naturally occurring compound commonly used as a blood thinner. The flowering stalk is 6 to 10 in. (15 to 25 cm) tall, the inflorescence is a slightly drooping, pyramid-shaped panicle, and the bronze-colored, 3-flowered spikelets have one perfect, seed-bearing floret. The fruit is a very small, dark brown caryopsis that averages approximately 1.12 million seeds per pound (2.5 million seeds per kilogram).



Sweetgrass is not to be confused with the introduced, exotic plant sweet vernalgrass *Anthoxanthum odoratum*. Sweet vernalgrass has origins in Eurasia, the European continent, and Scandinavia, and it is considered invasive in this country where it occurs in all but 13 states. Dried braids of this material are often sold as sweetgrass.

Adaptation

Sweetgrass is widely distributed in the temperate and arctic

Uses

Spirit germplasm was selected for sweet vanilla fragrance and primarily for use as a culturally significant plant in Native American religious and spiritually-purifying ceremonies. The leaves are woven when green into long braids, dried, burnt as incense smudge, or used to perfume clothing and other personal items. Wildlife, such as rodents and small mammals, reportedly browse on sweetgrass. Sweetgrass has the ability to spread quickly and the dense, below-ground biomass may act to stabilize disturbed soil during restoration of riparian and wetland ecosystems.

Establishment

Sweetgrass plants spread from creeping rhizomes very early in the growing season, with leaf initiation occurring in late winter or early spring, followed by seed head emergence within 2 to 3 weeks. At the Bridger PMC, it is common for this plant to be completely headed out by mid-April, flowering in early May, and seed set by mid-June. Despite the development of inflorescence and anthesis, the infertile nature of the florets results in poor seed set and low



viability (25% to 50% germination). Coupled with a need to provide the seed a period of cold stratification and a slow rate of germination, the most successful method of producing sweetgrass is from vegetative propagules.

Vegetative Propagation

Sweetgrass is easily propagated by dividing rhizomes of established nursery stock. This species is fairly shallow-rooted with rhizomes spreading underground at an approximate depth of 4 to 6 in. (10 to 15 cm). There can be several hundred rhizomes densely packed into a square yard (0.8 m²) of soil. Sweetgrass rhizomes can be dug and transplanted anytime during the active growing season, but survival is best when planting occurs prior to the onset of warm summer temperatures. It is best if a rhizome with at least one active shoot (bud) is dug with some green leaf tissue attached to each propagule. The propagules must continuously be kept moist prior to planting. Place each propagule at a shallow depth with shoots above the soil surface and firmly tamp the soil down around the base of each plant. Spacing between plants should be 1.5 to 3 ft. (0.5 to 0.9 m). Plants that are not established on a subirrigated or wetland site should be watered on a regular basis. Sweetgrass is not drought tolerant. Incorporate a plant-starter fertilizer (moderately high in phosphorus and low in nitrogen) the first year to promote rooting and in subsequent years use a balanced fertilizer (moderately high in nitrogen) to promote leaf growth.

Availability

The NRCS Plant Materials Center in Bridger, Montana, released Spirit as a vegetative, selected class germplasm. The PMC maintains a vegetative stooling block and G₀ propagules are available through the Montana Foundation Seed Program at Montana State University-Bozeman and the University of Wyoming-Powell.

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**A
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