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Plant Chat

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Bismarck Plant Materials Center Newsletter
for NRCS Field Offices in North Dakota, South Dakota and Minnesota

All About Switchgrass

Switchgrass is a perennial warm-season grass native to the Northern Great Plains. It is found throughout most of the United States, absent only from California, Oregon and Washington. Switchgrass was a dominant species in tallgrass prairies of the eastern Dakota's and western Minnesota. It has a fibrous root system that is known to penetrate more than 10 feet deep into the soil profile. Plant height and growth habit (rhizomatous vs. bunchgrass) vary significantly across North America. Due to its large natural range, two distinct forms exist, upland and lowland ecotypes.

Upland Type

Upland type switchgrass' are adapted to drier, less fertile soil and commonly found on hillsides, prairies and well-drained sites. Most varieties (cultivars) originating in the Northern Great Plains are upland varieties. They are shorter in stature compared to lowland types, mature earlier, and have finer stems, which improves cold tolerance and winter survival in northern climates. While upland varieties typically produce lower biomass yields, they establish and spread extensively with rhizomes and persist well under challenging conditions. This makes upland type switchgrass varieties ideal in the Northern Great Plains for erosion control, conservation plantings, and marginal lands.

'Dacotah'(far right) and 'Forestburg'(second from right) switchgrass are upland type switchgrass with northern origins. They have shorter stature and mature earlier than lowland type switchgrass varieties with southern origins.

Lowland Type

Lowland type switchgrass' are generally taller in height and thrive in wetter, more fertile soils and are commonly found along river bottoms and floodplains. They grow taller and produce higher biomass yields than upland types, making them especially valuable for bioenergy production and forage. Lowland varieties tend to have thicker stems, later maturity, greater resistance to flooding, and display more bunchgrass type growth. Because of these traits, they are best suited for southern regions or low-lying areas with consistent moisture. Many lowland varieties are not winter hardy in the Northern Great Plains.

'Alamo' a lowland type switchgrass, with Texas origin, exhibits robust growth but lacks winter hardiness in the Northern Great Plains.

Identification

Photo by: Dr. John Jennings, retired University of Arkansas Division of Agriculture Extension Forage Specialist.

Switchgrass can be identified by their “hairy armpit” or “V patch of hair where the leaf attaches to the stem.

Switchgrass seed heads are easily identified by their open, spreading panicles.

PMC Switchgrass Varieties (cultivars)

The Bismarck Plant Materials Center has released two switchgrass varieties, ‘Forestburg’ and ‘Dacotah’. Both are commercially available. In addition to Forestburg and Dacotah, several other releases are adapted to the region. Information on variety adaptability and performance can be found in the following publications: “Switchgrass Biomass Trials” and “Growth Patterns, Forage Characteristics, and Wildlife Values” . General switchgrass information can be found in "Plant Guide for Switchgrass".

‘Forestburg’

Origin: Sanborn County, SD

Attributes: Upland type, taller in stature, and matures approximately three weeks later than Dacotah. Superior winter hardiness and seed production. Forage production exceeds that of Dacotah. Production at nine locations over an 11-year period averaged 6,000 lb/ac. Seed yields average 300 PLS lb/ac under irrigation at the Bismarck PMC. Recommended in plant hardiness zones 3-4.

‘Dacotah’

Origin: Morton County, North Dakota

Attributes: Upland type, shorter in stature, and matures approximately three weeks earlier than ‘Forestburg’. High plant vigor and seed yields with increased drought tolerance compared to other varieties. Demonstrated superior winter hardiness and averaged 3,600 lb./ac of dry matter over 18 evaluation years in trials at five locations in North Dakota, South Dakota, and Minnesota. Seed yields average 200 PLS lb/ac at the Bismarck PMC. Recommended in plant hardiness zone 3.

Did you know?

Through photosynthesis, switchgrass leaves capture solar energy to convert water and carbon dioxide to glucose, which the plant then converts into starch for long term storage in its rhizomes. Michigan State University researchers recently discovered that switchgrass exhibits a “full pantry” mechanism where is shuts down photosynthesis once the plants rhizomes (underground storage organs) are saturated with starch. The plant uses this as a survival strategy to help the grass prepare for winter, but it also means the plant potentially misses out on weeks of prime sunshine that could be converted to extra biomass.