

# High Tide Germplasm Switchgrass

*(Panicum virgatum) L.*

A Conservation Plant Released by the USDA NRCS Cape May Plant Materials Center, Cape May, NJ



*Hide Tide Germplasm switchgrass (Panicum virgatum L.) is a tested plant release. Photo by, USDA NRCS.*

## Description

Switchgrass (*Panicum virgatum* L.), is C<sub>4</sub> perennial, warm-season grass that is native to all the United States except California and the Pacific Northwest. It is a 3 to 5 foot bunchgrass that can be distinguished from other warm-season grasses by the white patch of hair at the point where the leaf attaches to the stem. The stem is round and usually has a reddish tint. The seed head is an open, spreading panicle. It can spread by seed or rhizomatous growth. This tested release grows 5 to 6 feet tall.

## Source

High-Tide Germplasm is a tested release found growing in the upper margins of the inter-tidal zone where the Susquehanna River enters the Chesapeake Bay near Perryville, Maryland. This corresponds to USDA Plant Hardiness Zone 7a; with average annual extreme minimum temperatures of 0–5°F. Plant material was hand-collected from the site and planted at the Cape May Plant Materials Center (PMC) in Cape May, NJ for production.

## Conservation Uses

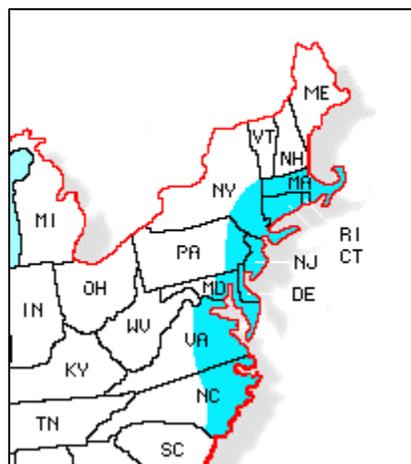
Switchgrass can be used for erosion control in critical areas to stabilize soil in strip-mines, sand dunes, or along dikes or gullies. Hide Tide Germplasm is specialized for use in stabilizing tidal shorelines and streambanks. A versatile conservation plant, it can also be used as a forage, hay, riparian buffer, field windbreak, biofuel source, or as nesting and cover for wildlife in both wet and dry soils.

As a bioenergy crop High Tide Germplasm showed the least amount of winter injury when compared to other

switchgrass varieties and matured later than other upland types—allowing more time for biomass production. Although it is one of the latest maturing and tallest upland ecotypes, it still did not outperform the eastern lowland ecotype ‘Timber’ as a biomass producer for the Northeast/Mid-Atlantic region (Cortese and Bonos, 2012).

## Area of Adaptation and Use

High Tide is well adapted to the growing conditions of the Middle Atlantic States, but its northern limit is undetermined. The optimum soil type is a loamy or sandy well-drained soil, however, it will also grow on poorly drained and saturated soils on the toe of slopes. Under more saturated conditions it behaves as a more sod-forming grass.



*Map of High Tide Germplasm area of adaptation and recommended area of use.*

## Establishment and Management for Conservation Plantings

Successful solid stands of switchgrass are best achieved by drilling 8–10 lb of pure live seed (PLS) per acre into a well-prepared seedbed. If it is not possible to drill into a clean seedbed, you can no-till seed into a killed sod at a seeding depth of ½ inch. If seed is broadcast, lightly rake and culti-pack the site to provide good seed to soil contact. The seeding rate should be lower (4–6 lb/ac) in a mixed seeding with other warm-season grasses.

The best time to sow seed is from mid-April to mid-June. If early cool-season weeds are a problem, suppress weed competition and plant towards the later end of the seeding window (late spring to early summer). On sites where weeds are not a problem, an early spring seeding (April) is best. When weeds are mowed, timing should not interfere with ground-bird nesting season in the area—especially if land is under a USDA–NRCS conservation

program. If needed, fertilization can be used moderately as determined by a soil test, however, fertilization will also increase weed competition. Nitrogen should only be applied after green growth has begun in the second growing season. The soil pH should be adjusted to a range of 5.5–6.5.

Switchgrass seedlings are slow to establish relative to cool-season grasses such as fescue and ryegrass. Stands that appear poor the first year will most likely improve the second growing season. Two or more years may be required to establish productive stands for seed production. To control weeds mow to the height of 4–6 inches three to four times the first year after planting. Pre and post-emergent herbicides for broadleaf and grassy weeds may be applied, however do not apply post-emergent herbicide until switchgrass has developed at least four leaves.

High Tide Germplasm switchgrass naturally occurs in the intertidal shoreline of the Susquehanna River. We are currently recommending that this material be planted by vegetative plugs rather than direct seeding.

### **Ecological Considerations**

Switchgrass is a highly adaptable, cross-pollinated plant with physiological traits that are greatly influenced by regional environmental conditions. Therefore, varieties should be selected or developed with awareness to the plant's stress tolerances and photoperiod requirements to the specific seeding location.

Over time, switchgrass tiller densities (in both upland and lowland ecotypes) tend to decline, along with chlorine and potassium levels. Phosphorus tends to increase with plant maturity, and is greater in upland types than lowland types. Upland ecotypes of switchgrass such as High Tide are more susceptible to lodging than lowland ecotypes (Cortese and Bonos, 2013). There are no known limitations or cautions for its use.

Switchgrass can be negatively affected by insect and disease such as grasshoppers, flea beetles, leaf and stem rust, as well as spot blotch and anthracnose (Bonos et al., n.d.).

### **Seed and Plant Production**

Generally, many environmental factors influence the performance of switchgrass populations including photoperiod, cold and heat tolerance, precipitation, and humidity. In a study comparing ten species of switchgrass, High Tide Germplasm was the latest maturing upland variety, and had similar biomass yields to the cultivars 'Alamo', 'Carthage', and 'Kanlow'. It also

had a greater tiller density and was taller than most varieties (Cortese and Bonos, 2013).

In studies conducted by the Cape May Plant Materials Center in Cape May, NJ, High Tide Germplasm produced an average of 10,100 lb/ac of biomass from 2011 to 2013. High Tide seed had 40 percent germination from three harvests at the Cape May PMC from 2010 to 2012. There are approximately 250,000 seeds per pound.

### **Availability**

*For conservation use:* For sources of supply for High Tide Germplasm switchgrass or for more information on the availability, planting and use, contact your local NRCS office or Soil and Water Conservation District.

*For seed or plant increase:* High Tide Germplasm switchgrass is an eastern US selected germplasm. NRCS maintains foundation stock at the Cape May Plant Materials Center (PMC) in Cape May Court House, NJ. It is now available from most commercial nurseries in the Northeastern United States.

*For more information, contact:*

USDA-NRCS

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Cape May Court House, NJ 08210

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<http://plant-materials.nrcs.usda.gov/njpmc/>

### **Citation**

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For additional information about this and other plants, please contact your local USDA Service Center, NRCS field office, or Conservation District <<http://www.nrcs.usda.gov/>>, and visit the PLANTS Web site <<http://plants.usda.gov/>> or the Plant Materials Program Web site <<http://www.plant-materials.nrcs.usda.gov/>>

### **References**

Bonos, S., Z. Hiesel, and W. Hlubik. n.d. Switchgrass production and use in New Jersey. NJ Cooperative Extension. Fact Sheet 1075.  
Cortese, L.M. and S.A. Bonos. 2013. Bioenergy traits of ten switchgrass populations grown in the Northeastern/Mid-Atlantic USA. BioEnergy. Res. 6:580-590. DOI: 10.1007/s12155-012-9271-6.

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