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All About Switchgrass

About the plant

Switchgrass is a warm-season prairie grass that is native to North America. It is a perennial grass that can be harvested annually. Many stands of switchgrass have been managed for 10 to 20 years or more with no re-seeding and no decline in biomass yield. As a perennial, switchgrass requires less intensive management than many traditional crops.

Switchgrass can grow in a variety of climates and soil conditions. It is most commonly associated with low productivity soils and other land less suitable for crop production. It typically produces the most biomass on moderately well- to well-drained soils with a soil pH of 5.0 or above. Switchgrass is drought and heat tolerant, performing better under these conditions than many other plants.

There are two types of switchgrass, upland and lowland varieties. The UT Biofuels Initiative recommends the Alamo lowland variety. Lowland varieties typically grow much taller, seven to 10 feet, and produce more biomass than upland varieties. Alamo performed best of all varieties tested in Tennessee over the last two decades.

Establishment and Management

Switchgrass is typically planted at a very shallow depth using a no-till grain drill. UT recommends planting six pounds of pure live seed per acre to establish an adequate stand. Switchgrass is slow to establish, reaching full maturity in three years. At maturity, it will typically exceed seven feet in height. With an extensive root system, it has been used often for soil conservation and erosion control.

Weed control is the biggest challenge to establishing switchgrass. During the first growing season, it is vital to control competing broad leaf weeds and grasses. There are few herbicides labeled for the crop, so careful consideration must be given to management practices that can help slow competing vegetation. Although switchgrass is drought tolerant and not irrigated, adequate moisture is important in the first establishment year. Though slow to establish, the plant is very competitive from the second year on and will out compete other plants. It is not, however, an invasive plant. Fertilizer requirements vary by soil. For phosphorous and potassium, a soil test should be conducted annually and the recommended amount applied to the field. No nitrogen should be applied during the first growing season, as that would further encourage weed problems. After the first year, UT recommends applying 60 units of nitrogen per acre.

Switchgrass grown for energy is typically harvested once after the first of November or the first killing frost. This timing allows the plant to dry on the stalk and the nutrients to move back down into the roots for use during the next growing season. Mowing and harvesting is conducted with conventional hay equipment such as round or square balers. Mature switchgrass yields are usually six to eight dry tons per acre, though switchgrass grown on Tennessee farms participating in pilot energy crop demonstrations over the last several years has yielded up to 12 dry tons per acre. Using conservative estimates of 70 gallons per ton of switchgrass and seven tons per acre, switchgrass can produce close to 500 gallons of ethanol per acre. With advances in research, that number could

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double in the near future.