Switchgrass (\textit{Panicum virgatum}) is a hardy, tall-growing, deep-rooted perennial grass native to North America east of the Rocky Mountains. It is a warm season grass, which means it grows in the warm months of the year until frost, and is dormant in winter and early spring. Warm season grasses typically take longer to establish than their cool-season counterparts, but once established, they tend to live much longer with less maintenance. As a perennial species, switchgrass can be harvested annually for approximately twenty years.

Switchgrass is a promising bioenergy crop for several reasons. Switchgrass can be harvested as biomass annually and used as feedstock for biofuel production. It can be converted to ethanol for use as a transportation fuel, or it can be pelletized and burned for heat production. In addition, it can be used as livestock forage and wildlife cover. As switchgrass grows, it pulls carbon from the atmosphere for developing its deep and dense root structures. If properly measured and reported, this carbon sequestration can be traded as carbon credits to offset industrial carbon emissions.

West Virginia has up to 150,000 acres of reclaimed and soon-to-be reclaimed surface mine sites that are potentially available for conversion to production of bioenergy crops. High yields of switchgrass can be achieved with minimal fertilizers or other agricultural inputs even on WV’s marginal soils like these reclaimed mine lands. Switchgrass is known to tolerate soils with pH levels from 5.0 to 8.0, and with textures from sandy to clayey. It is also drought tolerant and has many cultivars. Therefore growers can make site-specific seed selections that also allow for tolerance of periodic flooding (which often occurs during WV’s spring months.) When varieties are selected and established properly, yields of 3 to 6 tons per acre can be expected annually on marginal lands.
Switchgrass is grown from tiny seeds that offer only limited resources for new seedlings to become established. It is therefore crucial to provide as good a soil environment as possible so that the seedlings can take root and grow in soil with adequate water and nutrients. Unlike established switchgrass plants, seedlings with immature root structures are not drought tolerant. To ensure optimal establishment, mine sites may be reclaimed with biosolids, original topsoil, or other organic materials prior to planting. Full establishment of switchgrass can take as many as three years, but generally, little fertilization or other inputs are required beyond that point.

Switchgrass can be successfully planted by traditional drilling or by broadcasting seed with a hydroseeder or spinner spreader. Ensuring that seeds have good contact with the soil is the most important factor in switchgrass germination. Therefore soil preparation can make a dramatic difference in the seeding rates necessary for a viable stand. Weed competition is also a concern during the establishment phase of switchgrass, therefore nitrogen should not be applied in the first year. WVU researchers can be consulted for details regarding seeding rates and fertilization needs on a site-specific basis.

Yields of switchgrass typically reach their full potential in three years. For biofuel production, switchgrass should not be harvested until after the killing frost in the fall. This permits nutrients to move from the plant back to the soil, which reduces the fertilizer requirements in the coming year and the costs of drying the harvest. Traditional hay mowing and baling equipment is ideal for switchgrass harvest.

For more information visit WVU’s Agriculture and Natural Resources website [http://anr.ext.wvu.edu](http://anr.ext.wvu.edu) and the NEWBio website [www.newbio.psu.edu](http://www.newbio.psu.edu)