South Dakota - Switchgrass Varieties for Long-Term Biomass Production

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The US Department of Energy identified northeastern SD as a region with good potential for production of switchgrass *(Panicum virgatum)* for biofuels. Research in northeastern SD revealed large differences among varieties for long-term biomass production. In June 1999, seven switchgrass varieties were planted at 45 pure live seeds/ft^2 in tilled, replicated plots at Bristol and South Shore, SD. Biomass was harvested after a hard frost (early October) each year from 2000-2004.

Averaged across years and locations, variety yields ranged from greater than 6,900 lb/ac for Summer and Sunburst down to 3,980 lb/ac for Dacotah (Table 1). Annual yields ranged from 8,660 lb/ac in 2001 to less than 4,110 lb/ac in 2003 and 2004. In 2001, Shawnee, Summer, and Sunburst produced similar biomass yields. However, in 2004, Summer, Sunburst, and Forestburg produced up to three times more biomass than Shawnee, Cave-In-Rock, and Trailblazer, which suffered extensive winterkill prior to the 2003 growing season.

Table 1. *Biomass production of switchgrass varieties over 5 years at 2 sites.*

Cultivar	Origin	2000-2004 Annnual Average	2001 2nd Prod. Year	2004 5th Prod. Year
		----------Total DM/ac----------		
Summer	East central NE	3.47	4.93	2.86
Sunburst	Southeastern SD	3.45	4.64	3.00
Trailblazer	NE and KS	3.06	4.32	2.28
Forestburg	South central SD	2.97	3.96	2.70
Shawnee	Southern IL	2.94	4.94	1.58
Cave-In-Rock	Southern IL	2.64	4.44	1.01
Dacotah	Southwestern ND	1.99	2.73	1.42
LSD (0.05)		0.23	0.64	0.35

Dacotah, because of its northern origin, was very persistent, but earliest maturing and thus lowest yielding. Varieties originating in southeastern SD (Sunburst and Forestburg) and east central NE (Summer) had superior stand persistence and long-term biomass production compared to Cave-In-Rock, Shawnee, and Trailblazer.