Evaluation of Summer Switchgrass and Selected Prairie Cordgrass for Biomass Production

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The evaluation of devoting land to biomass production has been limited in this region. This study was conducted as a preliminary investigation to determine the potential productivity of promising species of grass for biomass production in this area. The study was conducted on two locations at the Carrington Research Extension Center, Carrington, ND. One site was on poor soil that had been disturbed for construction several years ago and the other was an intact site adjacent to existing biomass trials. The study tests potential for cellulosic biomass production of Summer Switchgrass and a selection of Prairie Cordgrass. The trial was planted in 2007 and was harvested a couple weeks after a killing frost in 2008, 2009, 2010, and 2011 to determine yield and harvest moisture.

Year as well as location and species had a significant impact on yield (Tables 1, 2 and 3). As one would expect with most crops, yields were improved when grown on better soils. Years with more moisture and warmer, longer falls like 2011 show increased production with these warm-season grasses. Also, soils and years with more moisture increase production through the years especially with Prairie Cordgrass which has a competitive advantage in wetter soils. In addition, both species have shown to be a marked improvement over current CRP fields and current grass hay fields (1-2 ton/ac) in terms of overall yield.

Table 1. Yearly comparison of Summer Switchgrass to an improved germplasm selection of Prairie Cordgrass averaged across locations and species.

	Harvest Moisture	Biomass Weight
	%	Dry T/A
Year		
2008	21.8	3.6
2009	37.5	6.3
2010	29.4	5.1
2011	34.8	7.5
Mean	29.6	5.0
C.V. (%)	13.5	15.8
LSD 0.05	3.5	0.7

Table 2. Location comparison of Summer Switchgrass to an improved germplasm selection of Prairie Cordgrass averaged across years and species.

	Harvest Moisture	Biomass Weight
	%	Dry T/A
Location[1]		
Good Soil	31.1	6.8
Poor Soil	30.6	4.5
Mean	30.9	5.6
C.V. (%)	13.5	15.8
LSD 0.05	2.5	0.5

[1] Good Soil = typical farmland; Poor Soil = disturbed construction site

Table 3. Comparison of Summer Switchgrass to an improved germplasm selection of Prairie Cordgrass.

Species	Harvest Moisture	Biomass Weight
	%	Dry T/A
Prairie Cordgrass (SD Germplasm)	34.7	6.5
Summer Switchgrass	27.0	4.7
Mean	30.9	5.0
C.V. (%)	13.50	15.8
LSD 0.05	2.5	0.5