

2010 GLBRC G1

N-Sidedress application amount

$$\begin{array}{r} 130 \text{ lbs total N/A} \\ - 30 \text{ lbs at planting} \\ \hline 100 \text{ lbs N/A} \\ + 25 \text{ lbs for stover removal}^* \\ \hline 125 \text{ lbs N/A needed.} \end{array}$$

$$\frac{28}{100} \times \frac{125}{x} = 446.42857 \text{ lbs N} \times \frac{\text{gal}}{10.67} = 41.839 \text{ gals/A}$$

42 gals/A

~~All steps in GLBRC~~

The ~~average~~ average tons removed in 2009 was 1.1 tons

$$22 \times 1.1 = 24.2 \text{ lbs/A}$$

\* 22 lbs of N/A for each ton of stover removed.

example if 2.5 tons of stover was removed add 55 lbs N/A

$$(22 \times 2.5) = 55 \text{ lbs N/A}$$

190 lbs N/A  
 140 lbs v/A  
 170 lbs v/A

## GLBRC Main Site Corn Stover Biomass Data Comparison of Treatments G1 vs. G4

<b>Crop:</b>	Corn
<b>Variety:</b>	Dekalb DKC52-59 RR
<b>Planting date:</b>	May 9, 2009
<b>Irrigation:</b>	None
<b>Tillage:</b>	No-Till
<b>Row Spacing:</b>	30 inches
<b>Population:</b>	26,632 (G1) / 30,748 (G4)
<b>Harvest date:</b>	November 11, 2009
<b>Fertilization:</b>	05/12/09 19-17-0 @ 14 g/A 06/22/09 28-0-0 @ 37 gal/A
<b>Herbicide Burndown / Preemergence:</b>	05/12/09 Roundup Original Max 32 oz/A 2,4-D Ester 16 oz/A Lexar 3 qts/A Ammonium Sulfate 3.4 lbs/A

### Purpose

Determine the amount of corn stover biomass that can be harvested for use in bio-energy production. Treatment G1 is a high-intensity continuous corn cropping .

G4 is part of a rotational sequence of corn-soybean-canola in which the corn plots can be G2, G3 or G4 depending on the year.

All plots are no-till with additions of fertilizers and/or herbicides as needed.

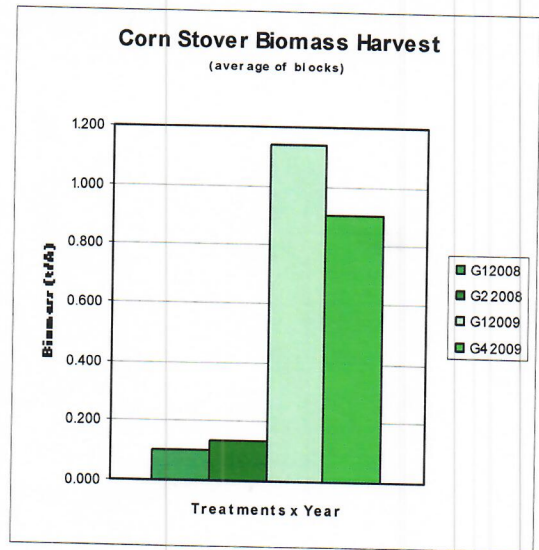
Replicate	Treatment Yields (t/A)	
	G1	G4
R1	1.378	0.855
R2	1.040	0.902
R3	1.123	0.657
R4	1.234	1.071
R5	0.929	1.047

No significant differences noted at p=95% for neither Treatment nor Replicate effects

### Results

No significant differences were noted between treatments in a single year.

Differences were noticed between years, however, the manner of collecting the biomass and the time of collection varied between years. In 2009, corn stover biomass was collected in early-November. Stover was first cut with a haybine and then collected with a round baler. For the 2008 season, stover was collected in early-2009 and was directly collected with a round baler.





## GLBRC Main Site Corn Grain Yield Data Comparison of Treatments G1 vs. G4

### Purpose:

Determine the amount of grain production for biofuel use under two different corn no-till cultivation systems: continuous corn monoculture (G1) vs. rotational agriculture (G4) of Corn-Soybean-Canola.

In both systems, some portion of the stover is removed for cellulosic yields.

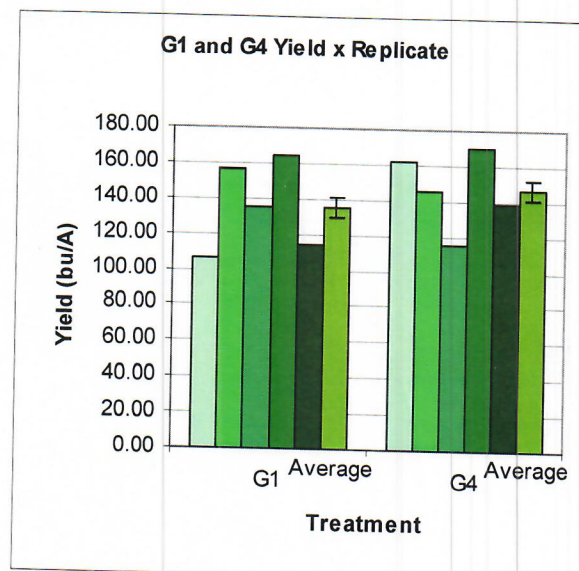
Yield (bu/A)	G1*	G4*
<b>Replicate1</b>	106.73	161.78
<b>Replicate2</b>	156.05	145.47
<b>Replicate3</b>	135.01	115.32
<b>Replicate4</b>	164.27	170.48
<b>Replicate5</b>	114.48	138.73
<b>Average</b>	135.31	146.35
	* Data not significantly different at 5% level	

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### Results

In 2009, there were no significant differences between the yields of treatments G1 and G4; however, there were no replication differences within any treatment. Average yield across G1 and G4 was 140.83 bu/A.

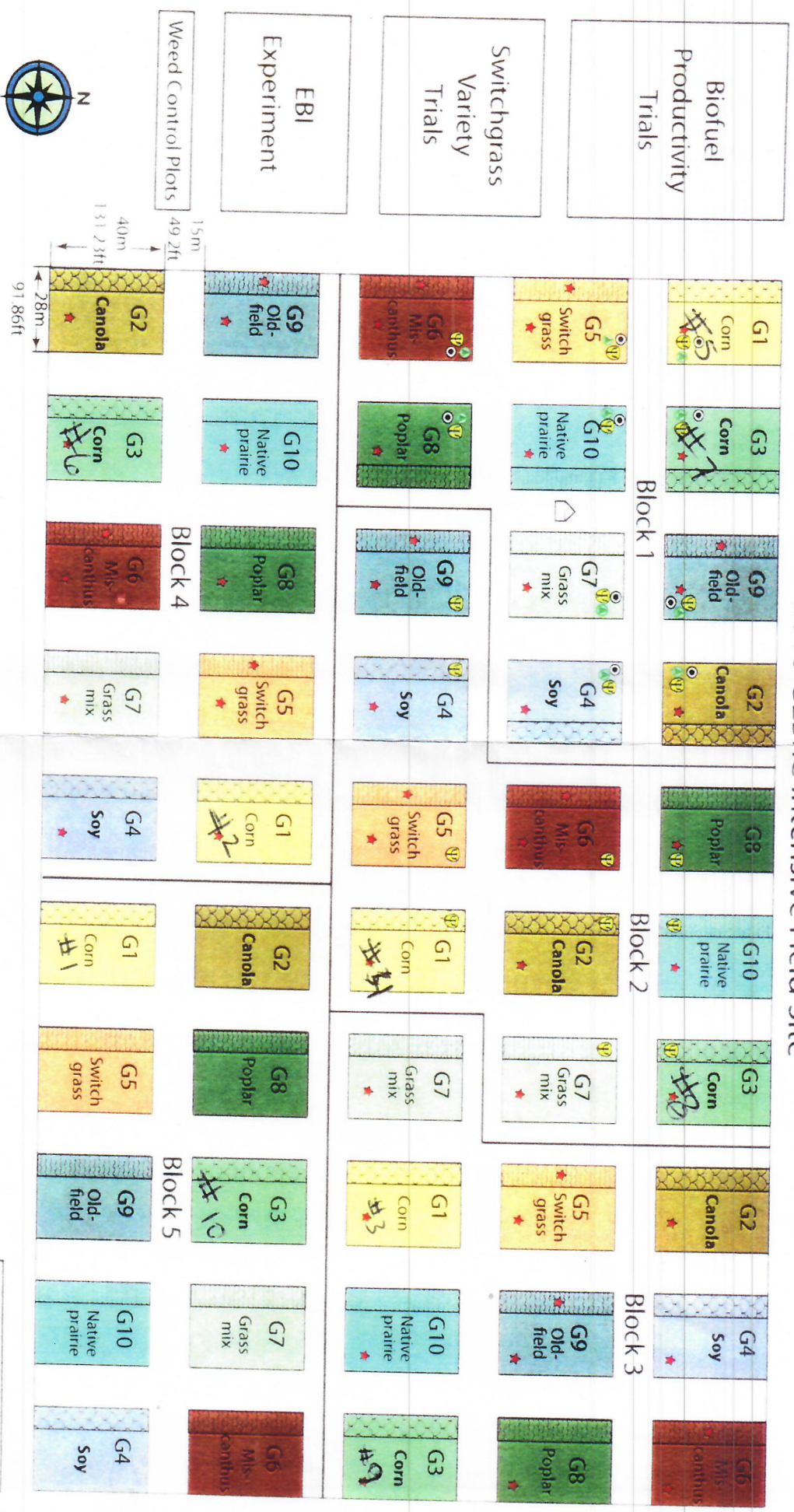
Yields may have been lower because of reduced rainfalls from mid-June through early-August. Visually, corn plants did not appear to have obtained their expected height and development, although this was not measured.





G1 continuous corn plots 100 105 N/A - 10 200/14 of 28-0-0 - 100 155 N/A = 34 gals/1A of 28-0-0 - 5:25 on pump

### 2010 GLBRC Intensive Field Site



#### Treatment Details

- G1 Continuous corn
- G2 Corn-Soybean-Canola
- G3 Soybean-Canola-Corn
- G4 Canola-Corn-Soybean
- G5 Switchgrass
- G6 Miscanthus
- G7 Grass mix
- G8 Poplar
- G9 Old field
- G10 Native prairie

Switchgrass Agronomy Trials

- ★ Trace gas flux chambers
- Ⓜ Low tension suction lysimeters
- Ⓛ Trace gas shed
- Ⓢ Time domain reflectometry
- Ⓜ Automated gas chambers

G3 @ C3 5.5mpt  
1000 corn  
24,12,3,5