

FIELD EXPERIMENT HISTORY

Title: Corn - Soybean Response to Tillage and Rotation - BioChar
Experiment: 09CS-Biochar **Trial ID:** 3644 **Year:** 2012
Personnel: J.G. Lauer, K.D. Kohn, and T. Diallo
Location: Arlington, WI **County:** Columbia
Supported By: HATCH

Site Information

Field: **Previous Crop:** See factors **Soil Type:** Plano Silt Loam
Soil Test Date: 11/06/12 **pH:** 5.5 **OM (%)** 3.7 **P (ppm)** 24 **K (ppm)** 157

Plot Management

Tillage Operations: Field Cultivator Soil Finisher

Fertilizer:	Preplant :	Analysis:	Rate lbs/A:	Date:
		Biochar	122.7 lb/ plot	5 /5 /09
	Starter :	N/A	N/A	N/A
	Post plant :	C: 28-0-0	210	6 /12/12
	Manure:	N/A	N/A	N/A
Herbicide:	2.4-D: 16 oz/A 4/6/12 Roundup: 22 oz/A 4/6/12 Dual II Mag: 24oz/A 5/21/12 Roundup: 22 oz/A 6/19/12		Insecticide:	N/A
Irrigation:	None	Hybrid:	C: Pioneer 0062XR (HXX, LL, RR2 - 100d RM AquaMax) S: Pioneer 92Y30	
Planting Date:	C: 5/17/12 S: 5/23/12	Row Width:	30"	
Target Plant Density:	Corn: 32500 Plants/A Soybean: 150000 Plants/A	Planting Depth:	C: 1.5" S: 1"	
Harvest Date:	Corn: 10/2/12 Soybean: 10/23/12	Planting Method:	Kinze 2000 Interplant planter	
Notes:		Harvest Method:	C: Kincaid plot combine S: Almaco plot combine #2	

Experimental Design

Design: RCB split-split-plot **Replications:** 4
Plot Size Seeded: MP: 30' x 70' **Experiment Size:** 2.7
Harvest Plot Size: 5' x 31

Factors/Treatments:

<u>Tillage</u>	<u>Rotation:</u>	<u>BioChar</u>
1) NT	1) CC - 1C	1) UTC
2) CT	2) CS - 1C	2) Biochar at 10 Mg/ha (122.7 lb/plot) applied in 2009
	3) SC - 1S	

Results: Table C-28 & C-29

**Table C-28. Biochar in Corn- Soybean Cropping Systems - Corn
Arlington, WI - 2012.**

Tillage	Rotation	Fertilizer	Yield bu/A	Moisture %	Test weight lbs/bu	Return \$6.65/bu \$/A	Lodged			Density plants/A
							Total %	Stalk %	Root %	
		Biochar	163	18.7	51.6	1039	30.4	30.1	0.4	34500
		UTC	160	19.0	51.4	1014	27.8	27.3	0.5	33750
	CC		154	20.6	50.3	976	15.9	15.9	0.1	33500
	CS		169	17.2	52.7	1077	42.3	41.5	0.8	34750
	CC	Biochar	155	20.5	50.3	983	18.4	18.4	0.0	33875
	CC	UTC	153	20.7	50.3	969	13.4	13.3	0.1	33125
	CS	Biochar	172	17.0	52.9	1095	42.4	41.7	0.7	35125
	CS	UTC	166	17.4	52.4	1059	42.1	41.2	0.9	34375
CT			165	16.4	52.7	1055	46.9	46.1	0.8	33875
NT			158	21.4	50.3	998	11.3	11.3	0.1	34375
CT		Biochar	167	16.4	52.7	1068	47.5	46.8	0.7	34625
CT		UTC	163	16.4	52.6	1041	46.2	45.3	0.9	33125
NT		Biochar	160	21.0	50.5	1009	13.3	13.3	0.0	34375
NT		UTC	157	21.7	50.1	987	9.3	9.2	0.1	34375
CT	CC		159	17.1	52.0	1018	30.3	30.2	0.1	33333
CT	CS		170	15.7	53.3	1092	63.4	62.0	1.5	34417
NT	CC		149	24.1	48.6	934	1.5	1.5	0.0	33667
NT	CS		167	18.7	52.0	1062	21.1	21.0	0.1	35083
CT	CC	Biochar	161	17.2	52.1	1029	36.8	36.8	0.0	34250
CT	CC	UTC	158	16.9	51.9	1006	23.8	23.5	0.3	32417
CT	CS	Biochar	173	15.6	53.4	1108	58.2	56.7	1.5	35000
CT	CS	UTC	168	15.8	53.3	1076	68.7	67.2	1.5	33833
NT	CC	Biochar	150	23.7	48.6	936	0.0	0.0	0.0	33500
NT	CC	UTC	149	24.5	48.7	931	3.1	3.1	0.0	33833
NT	CS	Biochar	170	18.4	52.4	1083	26.7	26.7	0.0	35250
NT	CS	UTC	164	19.0	51.6	1042	15.5	15.3	0.2	34917
Mean			162	18.9	51.5	1026	29.1	28.7	0.4	34125
Probability(%)										
Tillage(T)			50.0	0.0	0.0	35.1	0.1	0.2	16.2	47.0
Rotation (R)			15.4	0.3	0.0	11.1	0.9	1.2	17.1	7.5
Fertilizer(F)			21.4	50.9	34.1	19.4	62.8	61.2	79.6	28.0
T x R			71.4	4.7	4.6	64.8	43.8	48.4	25.3	80.9
T x F			89.2	46.3	67.5	91.5	80.3	80.6	97.7	28.0
R x F			56.4	86.6	40.0	56.2	67.3	67.5	99.8	100.0
T x R x F			72.1	72.5	40.7	73.8	9.2	8.9	81.6	63.0
LSD(0.10)										
Tillage(T)			NS	1.6	0.8	NS	15.1	15.3	NS	NS
Rotation (R)			NS	1.6	0.8	NS	15.1	15.3	NS	1150
Fertilizer(F)			NS	NS	NS	NS	NS	NS	NS	NS
T x R			NS	2.3	1.2	NS	NS	NS	NS	NS
T x F			NS	NS	NS	NS	NS	NS	NS	NS
R x F			NS	NS	NS	NS	NS	NS	NS	NS
T x R x F			NS	NS	NS	NS	23.0	23.2	NS	NS

**Table C-29. Biochar in Corn - Soybean Cropping Systems - Soybean
Arlington, WI - 2012.**

Tillage	Fertilizer	Yield bu/A	Moisture %	Return \$13.6/bu \$/A
	Biochar	50	8.5	665
	UTC	48	8.5	648
CT		49	8.4	655
NT		49	8.6	658
CT	Biochar	50	8.4	673
CT	UTC	47	8.5	636
NT	Biochar	49	8.7	657
NT	UTC	49	8.6	659
Mean		49	8.5	656
Probability(%)				
Tillage(T)		91.4	8.8	91.4
Fertilizer(F)		38.3	82.2	38.3
T x F		21.3	12.4	21.3
LSD(0.10)				
Tillage(T)		NS	0.2	NS
Fertilizer(F)		NS	NS	NS
T x F		NS	NS	NS