

Subsurface Irrigation Project- Marsh Foundation/Farm Focus Site

Objectives

The objective of this subsurface irrigation project is threefold: 1) to provide water to the crop to increase production, 2) to retain and breakdown potential water pollutants on site, and 3) to provide a wetlands habitat for wildlife. This report addresses the yield results of using the subsurface irrigation system in 2005 in both corn and soybeans.

Background- Corn

Soil Type:	Hoytville clay	Herbicide:	4 pt/A Guardsman Max +
Drainage:	Tile- systematic	PRE(April 18):	1.5 oz/A Balance Pro
Previous Crop:	Soybeans	POST(June 7):	1 pt/A Buctril
Tillage:	Fall disk/ripper; spring field cultivate (2x)	Hybrid:	Wellman W2510
Fertilizer:	260 lb/A 6-26-30 2X2 banded at planting	Insecticide:	Poncho 250 seed treatment
	175 lb nitrogen/A sidedressed as 28% UAN (June 2)	Row width:	30 inches
		Planting Rate:	31,920 seeds/A
		Planting Date:	April 18, 2005
		Harvest Date:	October 14, 2005

Background- Soybeans

Soil Type:	Hoytville clay	Herbicide:	1.5 oz/A Synchrony XP(MP) +
Drainage:	Tile- systematic	PREPLANT	24 oz/A Glyphomax XRT +
Previous Crop:	Corn	(May 5)	1 pt/A 2,4-D LVE + 17 lb/ 100 gallons AMS
Tillage:	No-till	POST	24 oz/A Glyphomax XRT +
Fertilizer:	Zone 3 East- 390 lb/A 4-18-39 surface broadcast (Fall 2004)	(June 22)	17 lb/ 100 gallons AMS ¹
	Zone 2- 225 lb/A 0-0-60 surface broadcast (Fall 2004)	Variety:	Wellman W3431RR
		Row Width:	7.5 inches
		Planting Rate:	220,000 seeds/A
		Planting Date:	May 12, 2005
		Harvest Date:	October 6, 2005

¹ Post spray on Prudent/Presto plots did not require AMS as ingredients in this product replace it.

Methods

In 2005 the subsurface irrigation project fields were designed to serve a dual purpose. They were used to evaluate the use of subsurface irrigation to supply water to the plants, and also as the test fields for Prudent/Presto foliar fertilizer treatments. The same untreated check plots and Prudent/Presto treatments were repeated in the non-irrigated drainage only test field as well.

Control structure boards were lowered in early June to begin raising the water tables in both corn and soybeans. Irrigation of the corn plots began on June 10 immediately following the foliar application of Prudent/Presto. Irrigation water was supplied continuously to the corn after this date except for when rainfall events occurred. Irrigation of corn stopped in early September

when the plants approached physiological maturity. Irrigation of the soybean plots began on June 22 following the first application of Prudent/Presto. Irrigation water was supplied to the soybeans for four days following each weekly foliar application. It was stopped after the four days to allow the soil surface time to dry out prior to the next foliar fertilizer application. This process was followed for six weeks while the foliar fertilizers were being applied to the soybeans. After the final foliar application on August 1, irrigation was run continuously on the soybean field except for when rainfall events occurred. Soybean irrigation was suspended in mid-September when the majority of the plant's leaves had turned yellow.

Yield and moisture data were collected using a John Deere 6620 combine equipped with a calibrated AgLeader PF3000 yield monitor. Yields reported are adjusted to a moisture standard of 13% for soybeans, and 15% for corn.

Results

The following results are from non-replicated plots in the non-irrigated field (due to limited area that is available), so this data has not been statistically analyzed.

Table 1. Corn moisture and yield data.

Treatment	Moisture (%)	Yield (bu./A)	Irrigated Yield Increase (bu./A)	Irrigated Yield Increase (%)
Irrigated Prudent/Presto	18.1	187.5		
Non-irrigated Prudent/Presto	18.6	188.8	(-1.3)	(-0.7)
Irrigated Check	18.1	187.6		
Non-irrigated Check	18.4	188.1	(-0.5)	(-0.3)

Table 2. Soybean moisture and yield data.

Treatment	Moisture (%)	Yield (bu./A)	Irrigated Yield Increase (bu./A)	Irrigated Yield Increase (%)
Irrigated Prudent/Presto	11.6	75.8		
Non-irrigated Prudent/Presto	11.1	69.8	6.0	8.6
Irrigated Check	11.6	74.3		
Non-irrigated Check	11.1	70.7	3.6	5.1

Summary

The results from this year's study indicate no advantage to using subsurface irrigation in corn. The results did show a yield advantage in soybeans. Although many counties in northwest Ohio including Van Wert were thought to have had a dry summer, rainfall data collected at the Van Wert County EMA office (see Weather Data page in this book) just south of the Farm Focus site indicated we were only a little over an inch shy of the 10 year average. The yield results above indicate that rainfall received at the site was timely to crop needs, and additional water supplied by subsurface irrigation which was running for much of the growing season had no effect on corn yield and an average yield increase of 4.8 bu/A for soybeans in 2005.

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