Yield Evaluation of Low Linoleic vs. Conventional Soybeans

Objective

The objective of this trial was to compare yield and economic benefit of low linoleic soybeans to conventional soybeans.

Background

Soil Type:	Hoytville silty clay loam, Haskins loam, Millgrove silt loam	Variety:	see Methods
		Herbicide:	
		PREPLANT: (May 7)	Sonic at 3 oz/A + Glyphomax XRT at 1.5 pt/A + 2,4-D LVE6 at 10 oz/A + AMS at 2 lb/A
Drainage:	Non-systematic Tile		
Previous Crop:	Corn		
Tillage:	No-till		
Soil Test (2005):	Field #1: pH 6.5, P 73 ppm, K 172 ppm	POST: (June 25)	Glyphomax XRT at 3 pt/A + AMS at 2.0 lb/A
	Field #2: pH 6.9, P 65 ppm, K 145 ppm	Row Width:	7.5 inch
		Planting Rate:	215,000 seeds/A
Fertilizer:	Field #1: none	Planting Date:	May 18, 2007
	Field #2: 100 lb/A 0-0-60 surface broadcast (January 2007)	Harvest Date:	Field #1: October 12, 2007
			Field #2: October 31, 2007

Methods

This trial was set up with two low-linoleic soybean varieties, each compared to a conventional soybean variety of similar genetics. Treatments were arranged in a split planter design such that each low-linoleic/conventional pair was replicated a minimum of nine times in an alternating pattern. The low-linoleic/conventional pairs consisted of the following:

1. Croplan Genetics RT 3126V Low-Linoleic (Vistive) + Croplan Genetics RT 3253 Conventional
2. Croplan Genetics RC 3556V Low-Linoleic (Vistive) + Croplan Genetics RC 3624 Conventional

This trial is being conducted in two different fields which both compare two different sets of varieties. Field #1 has earlier maturing varieties (3253, 3126V) while Field #2 has later maturing beans (3624, 3556V).

Plots were planted using a John Deere 750 No-till drill with one side of the drill containing the low-linoleic seed and the other side of the drill containing the conventional seed. The drill was fitted with a center divider in the hopper to prevent seed from intermixing, and the seed hole on each side of the center divider was covered to create a border spacing between each variety strip. The 3126V/3253 pair was planted with each plot a minimum of 450 feet in length; the 3556V/3624 pair was planted with each plot a minimum 510 feet in length. Individual plot width was 13.75 feet wide.

Harvest populations (October 6-9) were estimated by counting the number of plants on each side of a 10 foot section at three different locations in each plot. The average number of plants counted per 10 feet was converted to plants per acre. Yields were collected from one combine pass (13.75 feet width) with a John Deere 6620 combine equipped with a calibrated AgLeader PF3000 yield monitor. Grain weights were measured with a calibrated weigh wagon. Grain moistures were taken from the combine yield monitor. Yields are adjusted to 13% moisture.

Results

Table 1. Harvest population, moisture and yield means[1] for Croplan Genetics 3126V/3253 pair.

Treatment	Harvest Population	Moisture	Yield
	(plants/A)	(%)	(bu/A)
Croplan Genetics RT 3126V Low-Linoleic (Vistive)	146,100	14.0	74.7
Croplan Genetics RT 3253 Conventional	133,800	13.7	79.5
Expected t	2.262	2.145	2.145
Observed t	1.907	1.081	8.133

Table 2. Harvest population, moisture and yield means[1] for Croplan Genetics 3556V/3624 pair.

Treatment	Harvest Population	Moisture	Yield
	(plants/A)	(%)	(bu/A)
Croplan Genetics RC 3556V Low-Linoleic (Vistive)	146,000	12.5	61.3
Croplan Genetics RC 3624 Conventional	152,800	12.7	66.2
Expected t	2.306	2.306	2.306
Observed t	1.175	2.673	6.375

[1] Observed t values larger than Expected t values indicate a statistically significant difference between treatments.

Summary

Statistical analysis was performed using a paired t-test. Results from this split planter trial indicate there were significant differences among the two different pairs of variety for yield. In both pairs, the conventional variety provided a statistically significant yield advantage compared to the low-linoleic Vistive variety. Moisture was statistically lower for the 3556V variety compared to the 3624 conventional variety, although the 3556V contained noticeably green stems at harvest.

Farmers can expect to receive an additional $0.50-0.60 per bushel premium for low-linoleic Vistive soybeans; likewise, farmers do not have to pay additional fees to plant low-linoleic Vistive soybeans. As such, planting low-linoleic Vistive soybeans is cost competitive with most other conventional soybean varieties. The decision to use seed with low-linoleic traits should be based on the expected potential return in premium above and beyond commodity price for soybeans; keeping in mind some of the premium paid for growing Vistive soybeans may be offset by potential yield lag depending on the varieties.

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