

Roundup Ready® and Conventional Soybean Yield Trial

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Introduction

A yield performance study was conducted at the ISU Northeast Research and Demonstration Farm to compare 11 Roundup Ready® soybean varieties, and 10 conventional soybean varieties, one of which is a soybean variety grown for the organic market. Roundup Ultramax was applied on the Roundup Ready® varieties, and a conventional herbicide program was used on the commercial soybean varieties to evaluate weed control and grain yield.

Materials

The soil consisted of a Kenyon loam with a pH of 6.70 and with 3.5% organic matter. Soil tests in 2001 reported 25 ppm P₂O₅ and 124 ppm K₂O. The experimental design was a randomized complete block with three replications and plots were 15 × 43 feet. The 2000 crop was corn. The study was a conventional tillage system, fall chisel plowed and spring field cultivated prior to planting. Soybean varieties were planted 1.5 inches deep on May 30, 2001, at 189417 seeds/acre in 30 inch rows. On July 5, Roundup Ultramax was sprayed postemergent at 26 oz/acre to the Roundup Ready® soybean varieties. On July 10, the conventional soybean varieties were sprayed with 12 oz/acre Fusion, 1.152 oz/acre Pursuit, 0.125 oz/ac Pinnacle DF, 2.0 oz/acre Cobra, 0.25% V/V Activator 90 (a non-ionic

surfactant), and 32 oz/acre 28% nitrogen. Plots were machine-harvested for yield October 7.

Results

Soybean variety, harvest moisture, yield at 13% moisture, and income/acre are shown in Tables 1 and 2. Yields were significantly different due to variety and herbicide program, if the HP-204 soybeans used for the organic market are excluded. The ISU HP-204's yielded 19.4 and 17.4 bushels/acre less than the conventional and RR® soybean varieties, respectively, yet, if grown as organic certified, they could possibly gain a premium of up to \$15/bushel. Net income was \$2.00/acre greater for the RR® soybean varieties, despite the added cost of the technology fee and lower yields compared with the conventional varieties. This was because cost of herbicides needed to control particular weed species in the conventional soybean varieties was greater than the cost of the Roundup program on soybeans. Weed control was excellent for both herbicide programs.

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Table 1. Yearly yields of Roundup Ready® and non-GMO soybean varieties, Northeast Research Farm, Nashua, IA.

Year	Variety	Bu/acre	Variety	Bu/acre
2001	Roundup Ready®	49.3	Non-GMO Seed Varieties	51.3
2000	Roundup Ready®	61.8	Non-GMO Seed Varieties	63.5
1999	Roundup Ready®	53.7	Non-GMO Seed Varieties	53.6
1998	Roundup Ready®	63.8	Non-GMO Seed Varieties	66.4
Avg	Roundup Ready®	57.2	Non-GMO Seed Varieties	58.7

Table 2. Yields of eleven Roundup Ready® and ten conventional soybean varieties

Variety	RR®	H ₂ O	Yield@13% moisture	Income/acre**
Pioneer 92B38	Yes	11.0	53.7	\$227.04
Dekalb B2651	Yes	12.1	52.0	\$218.97
Golden Hrv X12453	Yes	11.2	51.5	\$216.48
Golden Hrv X02151	Yes	11.0	50.3	\$210.27
Novartis S24-K4	Yes	11.1	50.2	\$209.99
Pioneer 92B71	Yes	11.3	48.7	\$202.26
Golden Hrv X12124	Yes	11.1	48.3	\$200.43
Stine 2506-4	Yes	11.5	48.1	\$199.42
Asgrow 2302	Yes	11.0	47.4	\$196.00
Novartis X019	Yes	10.8	46.4	\$190.61
Asgrow 2103	Yes	11.2	45.2	\$184.60
Golden Hrv X2120	No	10.9	54.2	\$217.54
Novartis S25-J5	No	12.4	53.8	\$215.36
Asgrow 2553	No	11.7	53.5	\$213.82
Mershman Com V	No	11.5	51.5	\$203.79
Kruger 2525+	No	11.4	50.8	\$200.50
Dekalb 2395	No	11.5	50.3	\$197.85
LG Seeds C2200	No	11.5	50.1	\$196.65
Novartis S19-T9	No	11.3	49.7	\$194.74
Pioneer 9233	No	11.7	48.3	\$187.66
ISU HP204	No (with herbicide)	11.5	32.9	\$161.36
ISU HP204	No (no herbicide)	11.2	31.9 (with cultivation)	\$378.08
Variety Average—LSD (P=0.05)		0.36	3.4	
Average (non-RRS) (excluding HP204)		11.5a	51.3a	\$203.10a
Average (RRS)		11.2b	49.3b	\$205.10a
Herbicide Program—LSD (P=0.05)		0.11	1.08	

* = Not significant.

** = “Net” Income = Income/acre – Seed Cost – (Herbicide + Application Cost (\$4.60/acre)).

Soybeans @ \$5.00/bushel, Non-RRS seed @ \$15/150000 seed bag, RR® Seed @ \$22/150000 seed bag.

Roundup @ \$8.83/acre, conventional herbicide program @ \$30.07/acre, row cultivation @ \$6.65/acre.