

Roundup Ready® and Conventional Soybean Yield Trial

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Introduction

A yield performance study was conducted at the ISU NE Research and Demonstration Farm to compare twelve Roundup Ready® soybean varieties, and eleven conventional soybean varieties, one of which is a soybean variety grown for the organic market. Roundup Ultra 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 Clyde silty clay loam and Floyd and Kenyon loam with a pH of 6.75 and with 6.1% organic matter. 1999 soil tests reported 38 ppm P205 and 148 ppm K20. The experimental design was a randomized complete block with three replications, and plots were 15 by 73 ft. The 1998 and 1999 crop was corn. The study used a conventional tillage system—fall chisel plowing and spring field cultivating prior to planting. Soybean varieties were planted 1.5 inches deep on May 15 at 182,402 seeds/acre except organic soybeans which were planted at 175,000 seeds/acre in 30 inch rows. Roundup Ultra was sprayed postemergently on June 27 at 35 oz per acre to the Roundup Ready® soybean varieties. The conventional soybean varieties were sprayed with 12 oz per acre Fusion, 1.15 oz per acre Pursuit, 2 oz per acre Cobra, 0.125 oz per acre Pinnacle, 0.25% V/V Activator 90 (non-ionic surfactant), and 32 oz per acre 28%

nitrogen on June 27. Plots were machine harvested for yield on September 30.

Results

Soybean variety harvest moisture, yield at 13% moisture, and income per acre are shown in Table 1. Yields were significantly different due to variety and herbicide program, if you exclude the HP-204 soybeans used for the organic market. The organically grown ISU HP-204's yielded 21.5 and 23.2 bushels per acre less than the RR® soybean and conventional varieties, respectively, but gained a premium of up to \$15 per bushel if grown as organic certified. Net income for RR® and conventional soybean varieties only differed by \$1.48 per acre. Conventional soybeans yielded about 1.7 bushels per acre greater compared with the RR® soybeans. The dollar savings on herbicide cost for the Roundup Ultra program more than offset the added cost of the technology fee on the RR® seed. Herbicide cost was approximately \$15/acre more for the conventional soybeans because four herbicides were required to control the weed species. Weed control was excellent for both herbicide programs.

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Table 1. Yields of twelve Roundup Ready® and eleven conventional soybean varieties.

Variety	RR®	H ₂ O	Yield@13% moisture	Income/Acre**
Crows 2200-1	Yes	10.9	63.8	\$79.01
Novartis S24-K4	Yes	11.5	63.5	\$77.65
Stine 2506-4	Yes	11.1	63.2	\$75.83
Asgrow 2301	Yes	10.9	63.0	\$75.19
Pioneer 92B71	Yes	11.5	62.7	\$73.62
Kruger 202+	Yes	10.8	62.4	\$72.14
Stine 2101-4	Yes	10.9	61.5	\$67.71
Stine 1991-4	Yes	11.0	61.0	\$65.22
Asgrow 2401	Yes	11.1	60.3	\$61.60
Golden Hrv X92356	Yes	11.4	60.2	\$61.15
Pioneer 92B05	Yes	11.2	60.1	\$60.46
Stine 1901-4	Yes	11.0	59.3	\$56.40
Kruger 2525+	No	11.3	65.7	\$81.58
Mershman Com V	No	11.6	65.5	\$80.50
Golden Hrv X2120	No	10.7	64.7	\$76.32
Stine 2490-1	No	11.3	64.4	\$75.24
Stine 2499-0	No	11.1	63.5	\$70.59
Kruger 2343+	No	11.4	63.5	\$70.44
Pioneer 9233	No	11.0	63.1	\$68.35
Stine 2500	No	11.1	62.7	\$66.54
Asgrow 2247	No	10.9	61.2	\$59.09
LG Seeds 6200	No	11.7	60.3	\$54.44
HP204	No (with herbicide)	11.5	46.4	\$51.71
HP204	No (no pesticide)	11.1	40.3	\$301.40
Variety Average - LSD (P<0.05)		0.44	2.9	
Average (non-RRS) (excluding HP204)		11.2a	63.5a	\$70.31
Average (RRS)		11.1b	61.8b	\$68.83
Herbicide Program - LSD (P<0.05)		0.13	0.84	

** = Conventional soybeans @ \$5/bu, organic-certified soybeans @ \$15/bu (20% clean out), HP-204 soybeans with herbicide @ \$6.80/bu (20% clean out), non-RRS seed @ \$17/ac, RR® seed @ \$25/ac, P/K fertility maintenance @ \$20/ac, conventional herbicide cost @ \$35/ac, RR® herbicide cost @ \$20/ac, field operations @ \$50/ac, land rent @ \$125/ac.