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Soybean Weed Competition Study

Southeast Iowa Agricultural Research Association

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Soybean Weed Competition Study

Abstract

This ongoing project is designed to study the effects of delaying post-applied Roundup Ultra weed control in Roundup Ready soybeans. Discussion about conducting this project began in 1996 before most producers were growing these soybeans. However, the Southeast Iowa Agricultural Research Association (S.E.I.A.R.A.) board of directors saw the value of this technology as a research tool because, for the first time, there was a herbicide able to kill weeds at most growth stages. Consequently, research could be conducted to see the effects of delayed weed control without having to physically remove large weeds that could not be controlled with other herbicides. This meant that this project could be conducted much more easily and cheaply.

Disciplines

Agricultural Science | Agriculture

Soybean Weed Competition Study

S.E.I.A.R.A. Board of Directors
Kevin Van Dee, superintendent

Introduction

This ongoing project is designed to study the effects of delaying post-applied Roundup Ultra™ weed control in Roundup Ready® soybeans. Discussion about conducting this project began in 1996 before most producers were growing these soybeans. However, the Southeast Iowa Agricultural Research Association (S.E.I.A.R.A.) board of directors saw the value of this technology as a research tool because, for the first time, there was a herbicide able to kill weeds at most growth stages. Consequently, research could be conducted to see the effects of delayed weed control without having to physically remove large weeds that could not be controlled with other herbicides. This meant that this project could be conducted much more easily and cheaply.

Materials and Methods

The first year of this research at the Southeast Research and Demonstration Farm was 1997. However, weed pressure was extremely low and spotty. Thus, we started over in 1998 and applied supplemental weed pressure to the study area. The chosen supplemental weed pressure was approximately 30,000 seeds/acre of corn and 45 pounds/acre (#/A) of small grain seed (either oats or barley) applied at planting.

Tillage involved fall chisel plowing and field cultivation before planting. Soil samples were taken routinely; they suggested that no fertilization or liming was necessary. The farm superintendent chose the soybean variety that was planted. Soybean row width was 30 inches wide, so that wheel trafficking during the post herbicide applications would not be a problem.

The study was randomized and replicated three times. Roundup Ultra™ herbicide was applied at

a rate of 32 ounces/acre with 2.5 #/A ammonium sulfate. The carrier was 23 gallons of water/acre. Herbicide applications initially began approximately 32 days after planting (DAP). Subsequent applications were made approximately every 10 days through 62 DAP. In 2000 and thereafter, the first application was made at 22 DAP instead of 32 DAP, and the last application was made at 52 DAP instead of 62 DAP. The first change was made because there appeared to be weed competition before 32 DAP, and the purpose of the experiment was to maximize yields with the first herbicide application. The second change involved dropping the latest spray date because this extensive of a delay rarely occurs in actual farming practices.

Results and Discussion

Soybean yields were impacted negatively by delayed applications of Roundup Ultra™ herbicide as shown in Tables 1 and 2. Frequently, yields declined slower during early applications, then more rapidly during later applications. There were differences among the years as well. For example, 1999 was drier when weeds were present; consequently, yields suffered more with delayed herbicide applications this year than in the other years of the experiment.

Herbicide applications were effective in weed pressure clean-up; second applications were not necessary. By late summer, initially weedy plots containing soybeans looked similar to plots without weeds. The exception was the 62 DAP treatment, where the soybeans looked somewhat stunted.

Acknowledgments

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Roundup Ultra™ are trademarks of the Monsanto Company. No endorsement is intended of the herbicide used in this study, nor is criticism implied of herbicides not used.

Table 1. Soybean grain yield (percent of maximum yield) as influenced by delayed herbicide applications, Southeast Research and Demonstration Farm 1998–1999.

Year	Percent Yield			
	32 DAP	42 DAP	52 DAP	62 DAP
1998	100	97.4	91.5	83.1
1999	100	81.8	66.8	53.2

Table 2. Soybean grain yield (percent of maximum yield) as influenced by delayed herbicide applications, Southeast Research and Demonstration Farm 2000–2001.

Year	Percent Yield			
	22 DAP	32 DAP	42 DAP	52 DAP
2000	100	97.0	91.6	73.8
2001	100	96.8	89.5	77.7