

IMPACT OF SPRING - APPLIED WHEAT HERBICIDES ON NO-TILL DOUBLE-CROPPED SOYBEANS

William W. Witt, James R. Martin, and Dottie Call
Department of Agronomy

INTRODUCTION:

A number of herbicides are being evaluated for weed control in wheat in Kentucky, yet their potential to persist in soil and injure such rotational crops as double-cropped soybeans is not well understood. The fact that many of these herbicides are grouped in the sulfonyleurea class of chemistry makes it important to clarify this issue.

OBJECTIVE:

A number of herbicides were evaluated for their potential to carryover and injure double-cropped soybeans. The second objective was to determine if a soybean variety with the STS trait would minimize the injury from herbicides that present a risk of carryover problems.

METHODS:

Ally (metsulfuron), Everest (flucarbazone), Maverick (sulfosulfuron), Olympus (BAY MKH 6561), and Peak (prosulfuron) were applied with a CO₂ back pack sprayer April 2, 2001 to Pioneer 2552 wheat. A non-treated check was used for comparing with the herbicide treatments.

Once wheat was removed, soybeans were planted in 14-inch rows on June 13, 2001 (i.e. approximately 10 weeks after application). About 8.2 inches of precipitation occurred during this period, which was 3 inches below normal. Although April was somewhat dry, more than one inch of rainfall occurred two days following the herbicide treatments. The test area had a soil water pH of 6.0 and a buffer pH of 6.8.

The two soybean varieties included in this study were AG4702 (Roundup Ready) and AG4301 (Roundup Ready plus STS). The variety stacked with STS was included to determine if this trait would minimize impact from herbicide remaining in soil following the spring treatments. Roundup was applied postemergence to soybeans on July 13 to control scattered populations of johnsongrass and honeyvine milkweed.

Measurements used to evaluate soybean injury were: 1) stand counts on July 2; 2) visual ratings on July 13; and 3) plant height on October 29. Soybean plots were harvested with a plot combine to determine yield.

RESULTS:

There was a slight, but non-significant reduction of soybean stands for the non STS variety where Maverick was applied to wheat in the spring, yet this trend did not occur with the STS soybean variety. The other herbicides did not reduce the stands of either variety when compared with the non-treated checks.

Both Maverick and Peak caused 35% injury, in the form of stunted plants, for the non STS variety. However very little injury (i.e. $\leq 3\%$) occurred with the STS variety. Plant height measurements of the non STS variety at the end of the season indicated stunting was still evident where Maverick was applied. However, soybean plants stunted by Peak had recovered by the time of soybean harvest. None of the herbicide treatments stunted STS plants at the end of the season.

None of the herbicide treatments caused a significant reduction in yield of either soybean variety; however, the yield of the non STS variety where Maverick or Peak was applied to wheat, was less than the non-treated check.

SUMMARY / CONCLUSIONS:

The results of this study indicate that Maverick or Peak applied to wheat in the spring can persist long enough in soil to cause soybean injury and possibly reduce soybean yield. However, soybean varieties with the STS trait provided enough protection to avoid significant injury from these herbicides.

Herbicides	Stand ² (Plants/Ft)		Injury ³ (%)		Plant Height ⁴ (Inches)		Yield (Bu/A)	
	Non STS	STS	Non STS	STS	Non STS	STS	Non STS	STS
Ally 60 WG 0.1 oz/A Surfactant 0.25%	9.8	9.6	5	0	38.5	36.8	55	53.4
Everest 70 DF 0.62 oz/A Surfactant 0.25%	8.7	10	0	0	37.8	37.7	54.8	55.5
Maverick 75 WG 0.67 oz/A Surfactant 0.25%	7.1	10.5	35	1	32.7	36.8	47.5	54.3
Olympus 70 DF 0.92 oz/A Surfactant 0.25%	9	9.2	5	0	39	36.9	52.5	52.8
Peak 57 WG 0.5 oz/A Surfactant 0.25%	8.3	9.9	35	3	35.8	38.2	47.9	54.2
Non-treated Check	8.3	9.7	0	0	37.8	39.3	49.6	52.7
LSD (0.05)	1.8	NS	15	NS	4.3	NS	6.6	NS

¹ Treatments were applied in wheat April 2, 2001. Soybeans were planted June 13, 2001.
AG4702= Non STS, AG4301 = STS.
² Soybean stands were made July 2, 2001.
³ Visual rating of soybean injury was based on a 0 to 100 scale with 0= no injury and 100 = plant death.
⁴ Soybean plant height was measured October 29, 2001.