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## **Abstract**

The purpose of this study was to evaluate various herbicides and application timings for injury and weed control in Liberty Link, Roundup Ready, and conventional soybean varieties.

## **Keywords**

Agronomy

## **Disciplines**

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# Herbicide Application Timings in Liberty Link, Roundup Ready, and Conventional Soybean Varieties

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## Introduction

The purpose of this study was to evaluate various herbicides and application timings for injury and weed control in Liberty Link, Roundup Ready, and conventional soybean varieties.

## Materials and Methods

The study was established using a randomized complete block design with four replications. Herbicides were applied in 20 gallons of water/acre. The crop rotation was soybean following corn. The pre-plant seedbed was prepared with a chisel plow and field cultivator.

Soybeans were planted at 150,000 seeds/acre in 30-in. rows on May 8. Preemergence (PRE) treatments were applied following planting. Postemergence (EPOST, MPOST, and LPOST) treatments were applied on June 18, 24, and July 14, respectively. Soybean growth was V3 to V4, V5 to V6, and R2 on June 18, 24, and July 14, respectively. Weeds were generally 0.25 to 5 in. tall, 0.25 to 6 in. tall, and 0.25 to 3 in. tall, on June 18, 24, and July 14, respectively. Weed species in the study included: woolly cupgrass, velvetleaf, common waterhemp, and common lambsquarters averaging a population of <1 to 2 plant/ft<sup>2</sup>.

Visual estimates of crop injury and percentage weed control were made during the growing season. These observations are compared with an untreated control and made on a zero to 100 rating scale (0% = no control or injury;

100% = complete control or crop kill). Herbicide treatment soybean yields were measured and adjusted to 13% moisture.

## Results and Discussion

Summarized in Tables 1, 2, and 3 are the results of the study. Generally, Prowl H20 applied PRE as a set-up treatment at 3/4 labeled rate, provided fair, overall weed control prior to any POST treatment application timing (data not shown). Treatments of EPOST and MPOST resulted in 3–28% soybean injury when observed on June 24 and July 2–6 and 8 days after application, respectively (Table 1). Ignite 280 and Roundup PowerMAX applied EPOST and MPOST provided 90–99% overall weed control on July 14–26 and 20 days after application, respectively. Ultra Blazer plus Basagran plus Poast Plus applied EPOST provided 76% woolly cupgrass control and 96–99% broadleaf weed control on July 14. Negligible soybean injury was observed on July 23 from several EPOST and MPOST treatments—35 and 29 days after application (Table 2). No injury was observed from the LPOST treatment timing. Generally, Ignite 280 and Roundup PowerMAX applied EPOST, MPOST, and LPOST continued to provide 90–99% overall weed control when observed on July 29 and August 20 (Table 2 and 3). Ignite 280 applied MPOST was an exception, where 84–88% velvetleaf control was observed on August 20. Ultra Blazer plus Basagran plus Poast Plus applied EPOST only provided 55% woolly cupgrass control on August 20, but still effectively controlled the broadleaf weeds. Herbicide treated soybean yields ranged from 45–54 bushels/acre. Within the Liberty Link and Roundup Ready soybean varieties, few significant differences in yield between the herbicide treatments were observed.

**Table 1. Weed management strategies in Liberty Link, Roundup Ready, and conventional soybean varieties, Lewis, IA.**

Treatment <sup>a</sup>	Rate <sup>b</sup> Product/acre	Appln timing	Injury			Erbvi <sup>c</sup> July 14	Abuth July 14	Amata July 14	Cheal July 14
			June 24	July 2	July 14				
			----- (%) -----			----- (% weed control) -----			
<b>Liberty Link Soybean Variety</b>									
Prowl H20 + Ignite 280 + AMS	2.0 pt + 22.0 fl oz + 8.5 lb	PRE + MPOST	0	3	0	96	90	97	97
Prowl H20 + Ignite 280 + AMS + Ignite 280 + AMS	2.0 pt + 22.0 fl oz + 8.5 lb + 22.0 fl oz + 8.5 lb	PRE + EPOST + LPOST	8	0	0	96	97	99	96
Ignite 280 + AMS	22.0 fl oz + 8.5 lb	EPOST	9	3	3	91	95	98	91
Ignite 280 + AMS	22.0 fl oz + 8.5 lb	MPOST	0	6	6	97	92	97	96
Ignite 280 + AMS + Ignite 280 + AMS	22.0 fl oz + 8.5 lb + 22.0 fl oz + 8.5 lb	EPOST + LPOST	8	1	1	91	92	96	91
Untreated			0	0	0	0	0	0	0
<b>Roundup Ready Soybean Variety</b>									
Prowl H20 + Roundup PowerMAX + AMS	2.0 pt + 22.0 fl oz + 8.5 lb	PRE + MPOST	0	5	3	96	95	99	98
Prowl H20 + Roundup PowerMAX + AMS + Roundup PowerMAX + AMS	2.0 pt + 22.0 fl oz + 8.5 lb + 22.0 fl oz + 8.5 lb	PRE + EPOST + LPOST	8	0	0	95	98	99	97
Roundup PowerMAX + AMS	22.0 fl oz + 8.5 lb	EPOST	9	4	1	94	97	99	96
Roundup PowerMAX + AMS	22.0 fl oz + 8.5 lb	MPOST	0	5	4	99	97	99	96
Roundup PowerMAX + AMS + Roundup PowerMAX + AMS	22.0 fl oz + 8.5 lb + 22.0 fl oz + 8.5 lb	EPOST + LPOST	9	3	0	94	94	99	97
Untreated			0	0	0	0	0	0	0
<b>Conventional Soybean Variety</b>									
Prowl H20 + Ultra Blazer + Basagran + Poast Plus + COC	2.0 pt + 0.7 pt + 1.5 pt + 1.5 pt + 2.0 pt	PRE + EPOST	28	21	9	76	98	99	96
Untreated			0	0	0	0	0	0	0
LSD (P = 0.05)			3	3	3	4	5	3	3

<sup>a</sup>AMS = ammonium sulfate fertilizer from Agrilience, LLC; COC = Herbimax crop oil concentrate from UAP, Loveland Industries.<sup>b</sup>Rate = AMS rate at 8.5 lb/100 gallons.<sup>c</sup>Erbvi = woolly cupgrass, Abuth = velvetleaf, Amata = common waterhemp, Cheal = common lambsquarters.

**Table 2. Weed management strategies in Liberty Link, Roundup Ready, and conventional soybean varieties, Lewis, IA.**

Treatment <sup>a</sup>	Rate <sup>b</sup>	Appln timing	Injury July 23 - (%) -	Erbvi <sup>c</sup> July 29	Abuth July 29	Amata July 29	Cheal July 29
	Product/Acre				----- (% weed control) -----		
<b>Liberty Link Soybean Variety</b>							
Prowl H20 + Ignite 280 + AMS	2.0 pt + 22.0 fl oz + 8.5 lb	PRE + MPOST	1	96	87	98	94
Prowl H20 + Ignite 280 + AMS + Ignite 280 + AMS	2.0 pt + 22.0 fl oz + 8.5 lb + 22.0 fl oz + 8.5 lb	PRE + EPOST + LPOST	0	99	99	99	99
Ignite 280 + AMS	22.0 fl oz + 8.5 lb	EPOST	0	91	95	98	98
Ignite 280 + AMS	22.0 fl oz + 8.5 lb	MPOST	5	94	88	94	95
Ignite 280 + AMS + Ignite 280 + AMS	22.0 fl oz + 8.5 lb + 22.0 fl oz + 8.5 lb	EPOST + LPOST	0	99	99	99	99
Untreated			0	0	0	0	0
<b>Roundup Ready Soybean Variety</b>							
Prowl H20 + Roundup PowerMAX + AMS	2.0 pt + 22.0 fl oz + 8.5 lb	PRE + MPOST	1	95	95	99	96
Prowl H20 + Roundup PowerMAX + AMS + Roundup PowerMAX + AMS	2.0 pt + 22.0 fl oz + 8.5 lb + 22.0 fl oz + 8.5 lb	PRE + EPOST + LPOST	0	99	99	99	99
Roundup PowerMAX + AMS	22.0 fl oz + 8.5 lb	EPOST	1	91	97	99	95
Roundup PowerMAX + AMS	22.0 fl oz + 8.5 lb	MPOST	4	95	97	99	95
Roundup PowerMAX + AMS + Roundup PowerMAX + AMS	22.0 fl oz + 8.5 lb + 22.0 fl oz + 8.5 lb	EPOST + LPOST	0	99	98	99	99
Untreated			0	0	0	0	0
<b>Conventional Soybean Variety</b>							
Prowl H20 + Ultra Blazer + Basagran + Poast Plus + COC	2.0 pt + 0.7 pt + 1.5 pt + 1.5 pt + 2.0 pt	PRE + EPOST	5	63	98	99	96
Untreated			0	0	0	0	0
LSD (P = 0.05)			2	6	5	1	4

<sup>a</sup>AMS = ammonium sulfate fertilizer from Agrilience, LLC; COC = Herbimax crop oil concentrate from UAP, Loveland Industries.

<sup>b</sup>Rate = AMS rate at 8.5 lb/100 gallons.

<sup>c</sup>Erbvi = woolly cupgrass, Abuth = velvetleaf, Amata = common waterhemp, Cheal = common lambsquarters.

**Table 3. Weed management strategies in Liberty Link, Roundup Ready, and conventional soybean varieties, Lewis, IA.**

Treatment <sup>a</sup>	Rate <sup>b</sup>	Appln timing	Erbvi <sup>c</sup> Aug 20	Abuth Aug 20	Amata Aug 20	Cheal Aug 20	Yield Oct 20
	Product/Acre		----- (% weed control) -----				(bu/acre)
<b>Liberty Link Soybean Variety</b>							
Prowl H20 + Ignite 280 + AMS	2.0 pt + 22.0 fl oz + 8.5 lb	PRE + MPOST	96	84	98	94	49
Prowl H20 + Ignite 280 + AMS + Ignite 280 + AMS	2.0 pt + 22.0 fl oz + 8.5 lb + 22.0 fl oz + 8.5 lb	PRE + EPOST +	99	98	99	99	54
Ignite 280 + AMS	22.0 fl oz + 8.5 lb	EPOST	90	96	98	88	50
Ignite 280 + AMS	22.0 fl oz + 8.5 lb	MPOST	91	88	94	95	45
Ignite 280 + AMS + Ignite 280 + AMS	22.0 fl oz + 8.5 lb + 22.0 fl oz + 8.5 lb	EPOST + LPOST	96	99	99	99	52
Untreated			0	0	0	0	13
<b>Roundup Ready Soybean Variety</b>							
Prowl H20 + Roundup PowerMAX + AMS	2.0 pt + 22.0 fl oz + 8.5 lb	PRE + MPOST	95	95	99	97	50
Prowl H20 + Roundup PowerMAX + AMS + Roundup PowerMAX + AMS	2.0 pt + 22.0 fl oz + 8.5 lb + 22.0 fl oz + 8.5 lb	PRE + EPOST + LPOST	99	99	99	99	46
Roundup PowerMAX + AMS	22.0 fl oz + 8.5 lb	EPOST	91	97	99	94	47
Roundup PowerMAX + AMS	22.0 fl oz + 8.5 lb	MPOST	95	97	99	95	45
Roundup PowerMAX + AMS + Roundup PowerMAX + AMS	22.0 fl oz + 8.5 lb + 22.0 fl oz + 8.5 lb	EPOST + LPOST	99	98	99	99	51
Untreated			0	0	0	0	16
<b>Conventional Soybean Variety</b>							
Prowl H20 + Ultra Blazer + Basagran + Poast Plus + COC	2.0 pt + 0.7 pt + 1.5 pt + 1.5 pt + 2.0 pt	PRE + EPOST	55	97	99	96	23
Untreated			0	0	0	0	13
LSD (P = 0.05)			7	5	1	4	6

<sup>a</sup>AMS = ammonium sulfate fertilizer from Agrilience, LLC; COC = Herbimax crop oil concentrate from UAP, Loveland Industries.

<sup>b</sup>Rate = AMS rate at 8.5 lb/100 gallons.

<sup>c</sup>Erbvi = woolly cupgrass, Abuth = velvetleaf, Amata = common waterhemp, Cheal = common lambsquarters.