

Programs for Weed Control in No-Tillage Enlist Soybean

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Introduction

The purpose of this study was to evaluate weed control in no-tillage Enlist soybean for various herbicides in programs with preplant plus postemergence applications.

Materials and Methods

The study was established using a randomized complete block design with three replications. The crop rotation was soybean following soybean. The preplant seedbed was left untilled from the 2019 crop season. Early preplant (EPP) treatments were applied May 9 delivering 20 gallons/acre with 11002TTI tips at 35 psi. Glyphosate, glufosinate, and 2,4-D tolerant soybean, Syngenta S24-E3, was planted at 130,500 seeds/acre in 30-in. rows May 13. Postemergence (EPOST and POST) treatments were applied June 2 and June 12 delivering 20 gallons/acre with 11002TTI tips at 35 psi to soybean at VC and V2 growth stages, respectively. Weed species in the study included velvetleaf, common waterhemp, giant ragweed, and marestail that were 1-2, 1-2, 8, and 3-9 in. tall, at POST applications, respectively. Average populations were 1-2, 0.5-2, 1, and < 1 plants/ft², respectively. Visual estimates of percentage soybean injury and weed control during the growing season were compared with an untreated control; 0 percent = no injury or control and 99 percent = complete crop kill or control.

Results and Discussion

None of the EPP treatments caused soybean injury when observed 23 days after application June 1 (data not shown). POST Anthem Maxx

caused 20 percent injury and POST Perpetuo treatments caused 13-33 percent compared with 5-7 percent injury for the remaining treatments June 20, eight days after the June 12 POST application (Table 1).

EPP Enlist One + Roundup PowerMAX did not provide any residual control of velvetleaf June 1, 23 days after application (Table 1), while velvetleaf control was at least 96 percent for EPP treatments with residual herbicides. Velvetleaf control on July 3, varied from 73-90 percent for all EPP treatments, with the exception of 98 percent with Zidua PRO (Table 2). EPOST Perpetuo + Scout + Enlist One only gave 52 percent velvetleaf control.

Residual control of common waterhemp also was poor with EPP Enlist One + Roundup PowerMAX (17%) on June 1 compared with at least 98 percent control by EPP treatments containing residual herbicides (Table 1). All two-pass treatments provided at least 96 percent common waterhemp control by July 3 (Table 2). However, the EPOST treatment provided significantly less control than all other treatments with 91 percent.

There were no significant giant ragweed control differences between treatments for burndown June 1 and few differences later in the season July 3, 23 days after POST. All treatments afforded at least 92 percent giant ragweed control (Tables 1 and 2).

Marestail burndown control was similar among POST treatments at 78-90 percent June 1 (Table 1). However, there were some control differences between treatments July 3 following the EPOST and POST applications. EPOST Perpetuo + Scout + Enlist One gave 98 percent control and the POST treatments gave 82-96 percent control.

Soybean yield was 29-42 bushels/acre for herbicide treatments compared with only 13 bushels/acre for the untreated control. The few significant yield differences between herbicide treatments were not attributed to weed control, with the exception of significantly lower yield of 29 bushels/acre by EPOST Perpetuo + Scout + Enlist One.

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Table 1. Programs for weed control in no-tillage Enlist soybean in June.

Treatment	Rate product/acre	Appln timing	Abuth ^d Jun 1	Amata Jun 1	Ambtr Jun 1	Erica Jun 1	Injury Jun 20
			----- % weed control -----				
Untreated			0	0	0	0	0
Enlist One + Roundup PowerMAX + NIS ^a + (Enlist One + Roundup PowerMAX + Select Max + NIS + Amsol ^c)	1.0 pt + 1.0 qt + 0.25% v/v ^b + (1.0 pt + 1.0 qt + 9.0 fl oz + 0.25% v/v + 1.76 qt)	EPP + (POST)	0	17	88	82	7
Enlist One + Roundup PowerMAX + NIS + (Enlist One + Roundup PowerMAX + Perpetuo + Select Max + NIS + Amsol)	1.0 pt + 1.0 qt + 0.25% v/v + (1.0 pt + 1.0 qt + 6.0 fl oz + 9.0 fl oz + 0.25% v/v + 1.76 qt)	EPP + (POST)	0	17	83	80	33
Enlist One + Roundup PowerMAX + Fierce EZ + NIS (Enlist One + Roundup PowerMAX + Select Max + NIS + Amsol)	1.0 pt + 1.0 qt + 6.0 fl oz + 0.25% v/v + (1.0 pt + 1.0 qt + 9.0 fl oz + 0.25% v/v + 1.76 qt)	EPP + (POST)	99	99	95	83	5
Enlist One + Roundup PowerMAX + Fierce MTZ SC + NIS (Enlist One + Roundup PowerMAX + Select Max + NIS + Amsol)	1.0 pt + 1.0 qt + 1.0 pt + 0.25% v/v + (1.0 pt + 1.0 qt + 9.0 fl oz + 0.25% v/v + 1.76 qt)	EPP + (POST)	99	99	99	90	7
Enlist One + Roundup PowerMAX + Authority MTZ DF + NIS (Enlist One + Roundup PowerMAX + Anthem Maxx + Select Max + Amsol + NIS)	1.0 pt + 1.0 qt + 11.0 oz wt + 0.25% v/v + (1.0 pt + 1.0 qt + 2.5 fl oz + 9.0 fl oz + 1.76 qt + 0.25% v/v)	EPP + (POST)	96	98	93	88	20
LSD (P = 0.05)			2	21	17	15	4

^aNIS = preference, nonionic surfactant from Winfield United.

^bVolume of product per volume tank mix.

^cAmsol = liquid ammonium sulfate from Winfield United.

^dAbuth = velvetleaf, Amata = common waterhemp, Amtr = giant ragweed, Erica = marestail.

Table 1 (continued). Programs for weed control in no-tillage Enlist soybean in June.

Treatment	Rate	Appln timing	Abuth ^d Jun 1	Amata Jun 1	Ambtr Jun 1	Erica Jun 1	Injury Jun 20
	product/acre		----- % weed control -----				
Enlist One + Roundup PowerMAX + Zidua PRO + NIS ^a (Enlist One + Roundup PowerMAX + Pertetuo + Select Max + Amsol ^c + NIS)	1.0 pt + 1.0 qt + 6.0 oz wt + 0.25% v/v ^b + (1.0 pt + 1.0 qt + 6.0 fl oz + 9.0 fl oz + 1.76 qt + 0.25% v/v)	EPP + (POST)	98	99	87	86	20
Enlist One + Roundup PowerMAX + Fierce EZ + NIS (Enlist One + Roundup PowerMAX + Pertetuo + Select Max + Amsol + NIS)	1.0 pt + 1.0 qt + 6.0 fl oz + 0.25% v/v + (1.0 pt + 1.0 qt + 6.0 fl oz + 9.0 fl oz + 1.76 qt + 0.25% v/v)	EPP + (POST)	99	99	85	78	27
Enlist One + Roundup PowerMAX + Fierce MTZ SC + NIS (Enlist One + Roundup PowerMAX + Pertetuo + Select Max + Amsol + NIS)	1.0 pt + 1.0 qt + 1.0 pt + 0.25% v/v + (1.0 pt + 1.0 qt + 6.0 fl oz + 9.0 fl oz + 1.76 qt + 0.25% v/v)	EPP + (POST)	99	99	86	78	17
Pertetuo + Scout + Enlist One	6.0 fl oz + 32 fl oz + 1.5 pt	EPOST	0	0	0	0	13
LSD (P = 0.05)			2	21	17	15	4

^aNIS = preference, nonionic surfactant from Winfield United.^bVolume of product per volume tank mix.^cAmsol = liquid ammonium sulfate from Winfield United.^dAbuth = velvetleaf, Amata = common waterhemp, Amtr = giant ragweed, Erica = marestail.

Table 2. Programs for weed control in no-tillage Enlist soybean in July.

Treatment	Rate	Appln timing	Abuth ^d Jul 3	Amata Jul 3	Ambtr Jul 3	Erica Jul 3	Yield Oct 15
	product/acre		----- % weed control -----				bu/acre
Untreated			0	0	0	0	13
Enlist One + Roundup PowerMAX + NIS ^a + (Enlist One + Roundup PowerMAX + Select Max + NIS + Amsol ^c)	1.0 pt + 1.0 qt + 0.25% v/v ^b + (1.0 pt + 1.0 qt + 9.0 fl oz + 0.25% v/v + 1.76 qt)	EPP + (POST)	87	96	96	88	41
Enlist One + Roundup PowerMAX + NIS + (Enlist One + Roundup PowerMAX + Perpetuo + Select Max + NIS + Amsol	1.0 pt + 1.0 qt + 0.25% v/v + (1.0 pt + 1.0 qt + 6.0 fl oz + 9.0 fl oz + 0.25% v/v + 1.76 qt)	EPP + (POST)	88	99	95	87	30
Enlist One + Roundup PowerMAX + Fierce EZ + NIS (Enlist One + Roundup PowerMAX + Select Max + NIS + Amsol)	1.0 pt + 1.0 qt + 6.0 fl oz + 0.25% v/v + (1.0 pt + 1.0 qt + 9.0 fl oz + 0.25% v/v + 1.76 qt)	EPP + (POST)	73	98	98	91	38
Enlist One + Roundup PowerMAX + Fierce MTZ SC + NIS (Enlist One + Roundup PowerMAX + Select Max + NIS + Amsol)	1.0 pt + 1.0 qt + 1.0 pt + 0.25% v/v + (1.0 pt + 1.0 qt + 9.0 fl oz + 0.25% v/v + 1.76 qt)	EPP + (POST)	75	99	99	96	42
Enlist One + Roundup PowerMAX + Authority MTZ DF + NIS (Enlist One + Roundup PowerMAX + Anthem Maxx + Select Max + Amsol + NIS)	1.0 pt + 1.0 qt + 11.0 oz wt + 0.25% v/v + (1.0 pt + 1.0 qt + 2.5 fl oz + 9.0 fl oz + 1.76 qt + 0.25% v/v)	EPP + (POST)	88	99	93	85	37
LSD (P = 0.05)			12	5	6	14	9

^aNIS = preference, nonionic surfactant from Winfield United.^bVolume of product per volume tank mix.^cAmsol = liquid ammonium sulfate from Winfield United.^dAbuth = velvetleaf, Amata = common waterhemp, Amtr = giant ragweed, Erica = marestalk.

Table 2 (continued). Programs for weed control in no-tillage Enlist soybean in July.

Treatment	Rate	Appln timing	Abuth ^d Jul 3	Amata Jul 3	Ambtr Jul 3	Erica Jul 3	Yield Oct 15
	product/acre		----- % weed control -----				bu/acre
Enlist One + Roundup PowerMAX + Zidua PRO + NIS ^a (Enlist One + Roundup PowerMAX + Pertetuo + Select Max + Amsol ^c + NIS)	1.0 pt + 1.0 qt + 6.0 oz wt + 0.25% v/v ^b + (1.0 pt + 1.0 qt + 6.0 fl oz + 9.0 fl oz + 1.76 qt + 0.25% v/v)	EPP + (POST)	98	98	98	93	42
Enlist One + Roundup PowerMAX + Fierce EZ + NIS (Enlist One + Roundup PowerMAX + Pertetuo + Select Max + Amsol + NIS)	1.0 pt + 1.0 qt + 6.0 fl oz + 0.25% v/v + (1.0 pt + 1.0 qt + 6.0 fl oz + 9.0 fl oz + 1.76 qt + 0.25% v/v)	EPP + (POST)	90	99	96	82	38
Enlist One + Roundup PowerMAX + Fierce MTZ SC + NIS (Enlist One + Roundup PowerMAX + Pertetuo + Select Max + Amsol + NIS)	1.0 pt + 1.0 qt + 1.0 pt + 0.25% v/v + (1.0 pt + 1.0 qt + 6.0 fl oz + 9.0 fl oz + 1.76 qt + 0.25% v/v)	EPP + (POST)	82	98	95	83	42
Pertetuo + Scout + Enlist One	6.0 fl oz + 32 fl oz + 1.5 pt	EPOST	52	91	92	98	29
LSD (P = 0.05)			12	5	6	14	9

^aNIS = preference, nonionic surfactant from Winfield United.^bVolume of product per volume tank mix.^cAmsol = liquid ammonium sulfate from Winfield United.^dAbuth = velvetleaf, Amata = common waterhemp, Amtr = giant ragweed, Erica = marestail.