### IOWA STATE UNIVERSITY Digital Repository

Iowa State Research Farm Progress Reports

2013

# Weed Management Programs in Corn

Michael D. Owen Iowa State University, mdowen@iastate.edu

Damian D. Franzenburg *Iowa State University,* dfranzen@iastate.edu

Dean M. Grossnickle Iowa State University

James F. Lux Iowa State University, jlux@iastate.edu

Follow this and additional works at: http://lib.dr.iastate.edu/farms\_reports Part of the <u>Agricultural Science Commons</u>, <u>Agriculture Commons</u>, and the <u>Agronomy and Crop</u> <u>Sciences Commons</u>

#### **Recommended** Citation

Owen, Michael D.; Franzenburg, Damian D.; Grossnickle, Dean M.; and Lux, James F., "Weed Management Programs in Corn" (2013). *Iowa State Research Farm Progress Reports*. 1935. http://lib.dr.iastate.edu/farms\_reports/1935

This report is brought to you for free and open access by Iowa State University Digital Repository. It has been accepted for inclusion in Iowa State Research Farm Progress Reports by an authorized administrator of Iowa State University Digital Repository. For more information, please contact digirep@iastate.edu.

# Weed Management Programs in Corn

#### Abstract

The purpose of this study was to evaluate various herbicides and application timings in corn for crop injury and weed control.

### Keywords

RFR A1293

#### Disciplines

Agricultural Science | Agriculture | Agronomy and Crop Sciences

## Weed Management Programs in Corn

#### **RFR-A1293**

Micheal Owen, professor Damian Franzenburg, ag specialist Dean Grossnickle, ag specialist James Lux, ag specialist Department of Agronomy

#### Introduction

The purpose of this study was to evaluate various herbicides and application timings in corn for crop injury and weed control.

#### **Materials and Methods**

The study was established using a randomized complete block design with three replications. Herbicides were applied in 20 gallons of water/acre. The crop rotation was corn following soybean. The pre-plant seedbed was prepared with a field cultivator. Corn was planted at 35,000 seeds/acre in 30-in. rows on May 14. Preemergence (PRE) treatments were applied following planting. Postemergence (EPOST and POST) treatments were applied on June 7 and 14. Corn growth was V4 to V5 and V5 to V6 on June 7, and 14, respectively. Weeds were generally 0.25-3.5 and 0.25-4 in. tall, on June 7 and 14, respectively. Weed species in the study included giant foxtail, velvetleaf, common waterhemp, and common lambsquarters with average populations of < 1–10 plants/ft<sup>2</sup>. Giant foxtail populations approached 10 plants/ft<sup>2</sup>. Visual estimates of corn injury and percentage weed control were made during the growing season. These observations were compared with an untreated control and made on a zero to 100 rating scale (0 percent = no control or injury; 100 percent)= complete control or crop kill).

#### **Results and Discussion**

Summarized in Tables 1, 2, and 3 are the results of the study. None of the PRE treatments caused more than 3 percent corn

injury when observed on June 14 (Table 1). Prior to postemergence applications, PRE treatments of Lexar, Lumax, and Zemax applied at 3.5, 3.0, and 2.4 gts/acre, respectively, provided 90–99 percent giant foxtail and velvetleaf control. The same herbicides applied PRE at 1.5, 1.0, and 1.0 qts/acre, respectively, provided 82-91 percent giant foxtail and velvetleaf control. Remaining PRE treatments gave 85-99 percent giant foxtail and velvetleaf control, with the exception of 8 and 32 percent velvetleaf control by Outlook and Breakfree ATZ, respectively. All PRE treatments afforded 99 percent common waterhemp control. With the exception of 87 and 93 percent common lambsquarters control by Outlook and Breakfree ATZ, respectively, all PRE treatments gave at least 98 percent common lambsquarters control.

Postemergence (EPOST and POST) treatments did not cause more than 7 percent injury on June 22, 8 and 15 days after applications, respectively (data not shown). On June 29, 8 days after the POST application, all treatments with postemergence applications gave at least 93 percent giant foxtail, velvetleaf, common waterhemp, and common lambsquarters control (Table 2).

No POST treatments exhibited injury on July 6 (data not shown). Treatments with only PRE applications maintained at least 87 percent velvetleaf and 90 percent giant foxtail control through July 13 (Table 3). Common waterhemp and common lambsquarters control remained at 99 percent.

#### Acknowledgements

We would like to thank Ken Pecinovsky and farm staff for their assistance with this study. Funding for this study was provided by the crop protection industry.

Treatment	Rate product/acre	Appln	Injury Jun 14 -(%)-	Setfa <sup>d</sup>	Abuth	Amata	Cheal
				Jun	Jun	Jun	Jun 14
		timing		<u>14 14 14 1</u> (% weed control)			
Untreated	productiacte		0	0	0	0	0
Lexar	3.5 qt	PRE	0	94	95	99	99
Lumax	3.0 qt	PRE	0	95	96	99	99
Zemax	2.4 qt	PRE	0	90	91	99	99
Lexar +	3.5 qt +	PRE +	0	98	99	99	99
$(Touchdown Total + AMS^{a})$	(32.0  fl oz + 17.0  lb/100  gal)	(POST)	Ū	70	,,,		,,
Lumax +	3.0 qt +	PRE +	0	96	98	99	99
(Touchdown Total + AMS)	(32.0  fl oz + 17.0  lb/100  gal)	(POST)	Ū	20	20	,,,	,,,
Lexar +	1.5 qt +	PRE +	0	90	88	99	99
(Halex GT + Atrazine +	(3.6  pt + 1.0  pt +	(POST)	Ū	20	00	,,,	
$NIS^{b} + AMS$	1.0  qt/100  gal + 8.5  lb/100  gal	(1001)					
Lumax +	1.0 qt +	PRE +	0	87	90	99	99
(Halex GT + Atrazine +	(3.6  pt + 1.0  pt +	(POST)	0	07	70	,,	
NIS + AMS)	1.0  qt/100  gal + 8.5  lb/100  gal	(1051)					
Zemax +	1.0 qt +	PRE +	0	82	85	99	99
(Halex GT + Atrazine +	(3.6  pt + 1.0  pt +	(POST)	0	02	05	,,	))
NIS + AMS)	1.0  qt/100  gal + 8.5  lb/100  gal	(1051)					
Zemax +	1.0 qt +	PRE +	0	90	91	99	99
(Callisto Xtra +	(20.0  fl oz +	(POST)	0	90	91	"	"
Touchdown Total + AMS)	32.0  fl oz + 8.5  lb/100  gal	(1051)					
Halex GT + Atrazine +	32.0  ff 62 + 8.3  fb 100  gal 3.6  pt + 1.0  pt +	EPOST	2	99	98	99	99
NIS + AMS	1.0  qt/100  gal + 8.5  lb/100  gal	EFUSI	2	99	90	99	99
Outlook +	16.0  fl oz +	PRE +	0	92	8	99	87
(Status +	(5.0  oz wt +		0	92	0	99	0/
(Status + Roundup PowerMAX +	(3.0  62 wt + 22.0  fl oz +	(POST)					
NIS + AMS)	0.25 %  v/v + 8.5  lb/100 gal						
Verdict +	15.0  fl oz +	PRE +	0	88	91	99	99
	(0.75  fl oz + 1.0  pt +	(POST)	0	00	91	99	99
(Armezon + Atrazine +		(POST)					
Roundup PowerMAX	22.0  fl oz + 0.25 % x/x + 8.5 lb/100 ccl)						
NIS + AMS)	0.25 %  v/v + 8.5  lb/100 gal		0	01	05	00	00
SureStart + Atrazine +	2.5  pt + 2.0  pt +	PRE +	0	91	85	99	99
(Durango DMA +	(1.5  pt + 2.5  pt + 1.5  pt)	(POST)					
N-Pak AMS Liquid <sup>c</sup> )	2.5 % v/v)	FDOGT	2	00	0.0	00	00
SureStart + Durango DMA +	2.0  pt + 1.5  pt +	EPOST	3	99	98	99	98
N-Pak AMS Liquid	2.5 % v/v	DDE	0	0.2	0.0	0.0	0.0
Keystone LA + Hornet WDG	2.1  qt + 3.5  oz wt	PRE	0	93	90	99	99
Breakfree ATZ +	3.0 pt +	PRE +	0	88	32	99	93
(Realm Q + Abundit Extra +	(4.0  oz wt + 32.0  fl oz +	(POST)					
Atrazine)	1.0 pt)		0	0.5	0.2	0.0	00
Prequel + Atrazine +	1.66  oz wt + pt +	PRE +	0	85	93	99	99
(Realm Q + Abundit Extra +	(4.0  oz wt + 32.0  fl oz +	(POST)					
Atrazine)	1.0 pt)		~	10	10	0	_
$\frac{\text{LSD}(\text{P}=.05)}{^{\text{a}}\text{AMS} = \text{comparison on least factor}}$	ilizan faran Ilaitad Campliana		2	10	19	0	5

#### Table 1. Two and one-pass weed management programs in corn in mid-June.

<sup>a</sup>AMS = ammonium sulfate fertilizer from United Suppliers.

<sup>b</sup>NIS = Preference nonionic surfactant from WinField Solutions.

<sup>c</sup>N-Pak AMS liquid = ammonium sulfate from WinField Solutions, LLC. <sup>d</sup>Setfa = giant foxtail, Abuth = velvetleaf, Amata = common waterhemp, Cheal = common lambsquarters.

	eed management programs in corn	Appln	Injury Jun	Setfa <sup>d</sup> Jun	Abuth Jun	Amata Jun	Cheal Jun
Treatment	Rate	timing	29	29	29	29	29
Untracted	product/acre		-(%)-	(% weed control) 0 0 0			0
Untreated Lexar	3.5 qt	PRE	0 0	93	98	99	99
Lumax	3.0 qt	PRE	0	93 91	98 99	99 99	99 99
Zemax	2.4 qt	PRE	0	91 90	99 96	99 99	99 99
Lexar +	3.5  qt +	PRE +	0	90 99	90 99	99 99	99 99
$(Touchdown Total + AMS^{a})$	(32.0  fl oz + 17.0  lb/100  gal)	(POST)	0	77	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	77	77
Lumax +	3.0 qt +	PRE +	0	99	99	99	99
(Touchdown Total + AMS)	(32.0  fl oz + 17.0  lb/100  gal)	(POST)	0	77	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	77	77
Lexar +	(32.0  fr 62 + 17.0  fo/100  gar) 1.5 qt +	(POST) PRE +	2	96	99	99	99
(Halex GT + Atrazine +	(3.6  pt + 1.0  pt +	(POST)	2	90	99	99	99
$NIS^{b} + AMS)$	1.0  qt/100  gal + 8.5  lb/100  gal	(1031)					
Lumax $+$		PRE +	2	96	99	99	99
(Halex GT + Atrazine +	1.0 qt + (3.6 pt + 1.0 pt +	PRE + (POST)	2	90	99	99	99
		(FUST)					
NIS + AMS)	1.0 qt/100 gal + 8.5 lb/ 100 gal)		2	05	00	00	99
Zemax +	1.0  qt + (2.6  rt + 1.0  rt +	PRE +	2	95	99	99	99
(Halex GT + Atrazine + NIS)	(3.6  pt + 1.0  pt + 1.	(POST)					
NIS + AMS)	1.0 qt/100 gal + 8.5 lb/ 100 gal)		2	0(	00	00	00
Zemax +	1.0  qt +	PRE +	3	96	99	99	99
(Callisto Xtra +	(20.0  fl oz + 22.0  fl oz + 0.5  ll  (100  ll oz + 10.5  ll  (100  ll oz + 10.5  ll o	(POST)					
Touchdown Total + AMS)	32.0 fl oz + 8.5 lb/100 gal)	EDOCT	•	0.6	0.0	0.0	0.0
Halex GT + Atrazine +	3.6 pt + 1.0 pt +	EPOST	2	96	99	99	99
NIS + AMS	1.0 qt/100 gal + 8.5 lb/100 gal		0	0.0	0.6		0.0
Outlook +	16.0  fl oz +	PRE +	0	98	96	99	99
(Status +	(5.0 oz wt +	(POST)					
Roundup PowerMAX +	22.0 fl oz +						
NIS + AMS)	0.25 %  v/v + 8.5  lb/100 gal	DDE		0.6			0.0
Verdict +	15.0 fl oz +	PRE +	2	96	98	99	99
(Armezon + Atrazine +	(0.75  fl oz + 1.0  pt +	(POST)					
Roundup PowerMAX	22.0 fl oz +						
NIS + AMS)	0.25 % v/v + 8.5 lb/100 gal)						
SureStart + Atrazine +	2.5 pt + 2.0 pt +	PRE +	0	93	93	99	99
(Durango DMA +	(1.5 pt +	(POST)					
N-Pak AMS Liquid <sup>c</sup> )	2.5 % v/v)						
SureStart + Durango DMA +	2.0 pt + 1.5 pt +	EPOST	5	98	95	99	99
N-Pak AMS Liquid	2.5 % v/v +						
Keystone LA + Hornet WDG	2.1 qt + 3.5 oz wt	PRE	0	93	88	99	99
Breakfree ATZ +	3.0 pt +	PRE +	0	96	99	99	99
(Realm Q + Abundit Extra +	(4.0 oz wt + 32.0 fl oz +	(POST)					
Atrazine)	1.0 pt)						
Prequel + Atrazine +	1.66 oz wt + pt +	PRE +	2	98	99	99	99
(Realm Q + Abundit Extra +	(4.0 oz wt + 32.0 fl oz +	(POST)					
Atrazine)	1.0 pt)						
LSD (P=.05)			3	6	5	0	0

#### Table 2. Two and one-pass weed management programs in corn in late June.

<sup>a</sup>AMS = ammonium sulfate fertilizer from United Suppliers.

<sup>b</sup>NIS = Preference nonionic surfactant from WinField Solutions.

<sup>c</sup>N-Pak AMS liquid = ammonium sulfate from WinField Solutions, LLC. <sup>d</sup>Setfa = giant foxtail, Abuth = velvetleaf, Amata = common waterhemp, Cheal = common lambsquarters.

Treatment	Rate	Appln timing	Injury Jul 13	Setfa <sup>d</sup>	Abuth	Amata	Cheal
				Jul	Jul	Jul	Jul 13
				<u>13</u> <u>13</u> <u>13</u> (% weed control)			
Untreated	product/acre		- (%) - 0	(%	o weed co	0	0
Lexar	3.5 qt	PRE	0	93	98	99	99
Lumax	3.0 qt	PRE	0	93 90	98 99	99 99	99 99
Zemax	2.4 qt	PRE	0	90 91	99 98	99 99	99 99
Lexar +	3.5  qt +	PRE +	0	99	98 99	99	99
$(Touchdown Total + AMS^{a})$	(32.0  fl oz + 17.0  lb/100  gal)	(POST)	0	77	77	77	77
Lumax +	3.0 qt +	PRE +	0	99	99	99	99
(Touchdown Total + AMS)	(32.0  fl oz + 17.0  lb/100  gal)	(POST)	0	))	))	,,	))
Lexar +	1.5 qt +	PRE +	0	96	99	99	99
(Halex GT + Atrazine +	(3.6  pt + 1.0  pt +	(POST)	0	90	"	"	"
$NIS^{b} + AMS$	1.0  qt/100  gal + 8.5  lb/100  gal	(1051)					
Lumax +	1.0 qt +	PRE +	0	98	99	99	99
(Halex GT + Atrazine +	(3.6  pt + 1.0  pt +	(POST)	0	90	"	"	"
NIS + AMS)	1.0  qt/100  gal + 8.5  lb/100  gal	(1051)					
Zemax +	1.0 qt +	PRE +	0	92	99	99	99
(Halex GT + Atrazine +	(3.6  pt + 1.0  pt +	(POST)	0	92	77	77	77
NIS + AMS)	1.0  qt/100  gal + 8.5  lb/100  gal	(1051)					
Zemax +	1.0 qt +	PRE +	0	96	99	99	99
(Callisto Xtra +	(20.0  fl oz +	(POST)	0	90	"	"	"
Touchdown Total + AMS)	32.0  fl oz + 8.5  lb/100 gal	(1051)					
Halex GT + Atrazine +	3.6  pt + 1.0  pt +	EPOST	0	99	99	99	99
NIS + AMS	1.0  qt/100  gal + 8.5  lb/100  gal	EFUSI	0	99	99	99	99
Outlook +	16.0 fl oz +	PRE +	0	96	92	99	96
(Status +	(5.0  oz wt +		0	90	92	99	90
Roundup PowerMAX +	(3.0  62 wt + 22.0  fl oz +	(POST)					
NIS + AMS)	0.25 %  v/v + 8.5  lb/100 gal						
Verdict +	15.0  fl oz +	PRE +	0	96	99	99	99
(Armezon + Atrazine +	(0.75  fl oz + 1.0  pt +	(POST)	0	90	99	99	99
	(0.75  fr  oz + 1.0  pt + 22.0  fl oz +	(POST)					
Roundup PowerMAX							
NIS + AMS)	0.25 %  v/v + 8.5  lb/100 gal		0	02	92	00	98
SureStart + Atrazine +	2.5  pt + 2.0  pt +	PRE +	0	92	92	99	98
(Durango DMA + N B L i guidc)	(1.5  pt + 2.5  pt + 2.	(POST)					
N-Pak AMS Liquid <sup>c</sup> )	2.5 % v/v)	FDOGT	0	0.0	02	00	00
SureStart + Durango DMA +	2.0  pt + 1.5  pt + 2.5  pt	EPOST	0	98	92	99	98
N-Pak AMS Liquid	2.5% v/v +	DDE	0	0.5	07	00	00
Keystone LA + Hornet WDG	2.1 qt + 3.5 oz wt	PRE	0	95	87	99	99
Breakfree ATZ +	3.0 pt +	PRE +	0	96	99	99	99
(Realm Q + Abundit Extra +	(4.0  oz wt + 32.0  fl oz + 1.0  st)	(POST)					
Atrazine)	1.0 pt)		0	0.6	0.0	0.0	0.2
Prequel + Atrazine +	1.66  oz wt + pt +	PRE +	0	96	99	99	99
(Realm Q + Abundit Extra +	(4.0  oz wt + 32.0  fl oz + 1.0  wt)	(POST)					
Atrazine)	1.0 pt)		0	6	4	0	2
$\frac{\text{LSD}(\text{P}=.05)}{^{\text{a}}\text{AMS}} = constraints and factor from the from the second seco$	ilizan farm Ilizitad Campliana		0	6	4	0	2

#### Table 3. Two and one-pass weed management programs in corn in mid-July.

<sup>a</sup>AMS = ammonium sulfate fertilizer from United Suppliers.

<sup>b</sup>NIS = Preference nonionic surfactant from WinField Solutions.

<sup>c</sup>N-Pak AMS liquid = ammonium sulfate from WinField Solutions, LLC. <sup>d</sup>Setfa = giant foxtail, Abuth = velvetleaf, Amata = common waterhemp, Cheal = common lambsquarters.