



Take Home Message

- Glyphosate was not required to achieve excellent season-long control of troublesome weeds.
- Several of the herbicide programs evaluated provided excellent control of broadleaf (waterhemp, common ragweed, velvetleaf) and grass weeds (giant foxtail, wild-proso millet).
- An effective PRE-emergence herbicide is recommended to reduce early-season crop competition and weed density.
- Lower weed density at POST application can improve the efficacy of a POST herbicide program.

Objective

- Evaluate various corn herbicide programs without glyphosate for season long weed control in conventional corn.

Trial Summary

Trials were established in May 2021 at the Arlington Ag Research Station near Arlington, WI and at O'Brien Hybrids farm located north of Brooklyn, WI. Multiple two pass (PRE followed by POST around V4/V5 corn) herbicide programs were developed for control of waterhemp and annual grass weeds. Atrazine was not included in any treatments as both locations were in atrazine prohibition areas. Specific information regarding soil type, planting, and herbicide application can be found on the following page. Visual weed control and crop injury ratings were taken at the POST application and 14 and 28 days after the POST application at both locations. At Arlington, a final weed control rating was taken just prior to corn harvest. Corn grain yield data was only collected from the Arlington location.

There was no visible corn injury from any of the PRE herbicides evaluated at either location. At Arlington, there was visible corn stunting (~6-7%) 7 days after the POST application of Capreno (data not shown); however later corn development was not affected as no stunting was evident 14 days after application. At Brooklyn, there was corn "leaning" 8 days following the POST application in all treatments; however, it tended to be worse in treatments containing Status (data not shown). A storm had gone through the night prior to rating. Corn showed no leaning 14 days after application.

Several of the herbicide programs evaluated provided excellent control of broadleaf (waterhemp, common ragweed, velvetleaf) and grass weeds (giant foxtail, wild-proso millet) (Tables 1, 2). The PRE applications of Harness + Princep 4L and Dual II Magnum + Princep 4L did not provide adequate control of velvetleaf at Brooklyn where the velvetleaf population density was much higher than Arlington. The Dual II Magnum + Princep 4L treatment also did not adequately control giant foxtail and the Arlington location. Poor control was likely due to the lack of rain (0.02") 1 week following application as Dual will typically provide excellent grass control if properly activated. Giant foxtail control remained poor in treatment 12 following the POST application as the height and density was too great for Callisto to provide effective POST control.

Corn yield was very similar for all treatments except for treatment 12 (Table 1). Giant foxtail control was very poor the entire growing season and competition led to yield loss.

Site Description and Trial Information



Site Description				
Trial #:	21-ARL-CN18		21-BRO-CN18	
Location:	Arlington, WI		Brooklyn, WI	
Soil Type:	Plano silt loam		Dresden loam	
Soil Texture % sand/silt/clay:	7 / 70 / 23		50 / 39 / 12	
% OM:	3.8		1.2	
pH:	5.9		7.1	
Fertilization:	148 lb N/acre		none	
Previous Crop:	Soybean		Corn	
Tillage:	conventional		conventional	
Variety:	DKC 54-36		DKC 54-36	
Planting Date:	5/10		5/13	
Emergence Date:	5/20		5/22	
Seeding Rate:	34,500 seeds/acre		32,000 seeds/acre	
Depth:	2 in		2 in	
Row Spacing:	30 in		30 in	
Plot Size:	10 x 25 ft		10 x 25 ft	
Herbicide Application Information				
Trial #:	21-ARL-CN18		21-BRO-CN18	
Date:	5/10	6/10	5/14	6/10
Treatment:	PRE (A)	POST (B)	PRE (A)	POST (B)
Air Temp (°F):	64	98	72	87
2" Soil Temp (°F):	59	92	65	80
Soil moisture [surface]:	dry	dry	dry	very dry
RH %:	28	46	24	65
Cloud cover %:	60	15	10	0
Wind speed (mph)/direction:	2-9/SW	0-5/NE	3-7/SE	0-1/W
Rainfall (in) 1 wk after APP:	0.02"	0.42"	0.83"	1.22"
Rainfall (in) 2 wks after APP:	0.62"	3.22"	1.50"	3.22"
GPA:	15		15	
PSI:	34		34	
Nozzle:	TTI 110015		TTI 110015	
Crop and Weed Information at POST Application				
	Height	Stage	Height	Stage
Corn	9-12 in	V5	10-12 in	V5
	Height	Density	Height	Density
Waterhemp	-	-	0.5-3 in	1-38/m ²
Velvetleaf	1-3 in	0-1/m ²	1-3 in	0-20/m ²
Common Ragweed	1-3 in	0-17/m ²	-	-
Wild-proso Millet	-	-	0.5-4"	1-3/m ²
Giant Foxtail	1-6 in	2-360/m ²	-	-

Weed Control and Corn Yield – Arlington, WI



Table 1. Weed control ratings and corn grain yield for trial #21-ARL-CN18 at the Arlington Ag Research Station near Arlington, WI

Trt #	Herbicide (rate acre ⁻¹)	Common Ragweed ^a			Velvetleaf ^a			Giant Foxtail ^a			Yield ^b bu acre ⁻¹
		6/10	6/25	10/19	6/10	6/25	10/19	6/10	6/25	10/19	
1	Untreated Check	0	0	0	0	0	0	0	0	0	158 c
Two-Pass – PRE (5/10) fb POST (6/10)											
2	Harness MAX (2 qt) fb Capreno (3 oz) + Superb HC 0.5% v/v + AMS (2 lb)	98	100	100	100	100	100	99	95	97	249 a
3	Harness MAX (2 qt) fb Diflexx Duo (28 oz) + COC 1% v/v + AMS (2 lb)	98	100	100	99	100	100	99	89	83	242 a
4	Acuron Flexi (1.1 qt) fb Acuron Flexi (1.1 qt) + NIS 0.25% v/v + AMS (2 lb)	93	99	100	100	100	100	88	80	72	243 a
5	Verdict (16 oz) fb Armezon (1 oz) + Status (5 oz) + MSO 1% v/v + AMS (2 lb)	98	100	100	100	100	100	95	97	100	249 a
6	Verdict (10 oz) + Callisto (3 oz) fb Armezon PRO (16 fl oz) + MSO 1% v/v + AMS (2 lb)	95	99	100	100	100	100	95	95	99	252 a
7	Surestart II (2 pt) fb Accent Q (0.9 oz) + Status (5 oz) + COC 1% v/v + AMS (2 lb)	99	100	100	98	99	99	98	97	99	247 a
8	Harness (2 pt) + Princep 4L (1 qt) fb Revulin Q (4 oz) + Status (5 oz) + COC 1% v/v + AMS (2 lb)	98	100	100	98	100	100	99	98	100	247 a
9	Harness (2 pt) + Princep 4L (1 qt) fb Revulin Q (4 oz) + Status (5 oz) + Zidua SC (3 oz) + COC 1% v/v + AMS (2 lb)	98	100	100	95	100	100	99	99	98	238 a
10	Harness (2 pt) + Princep 4L (1 qt) fb Shieldex (1 oz) + Accent Q (0.9 oz) + COC 1% v/v + AMS (2 lb)	98	100	100	94	97	99	99	98	100	248 a
11	Harness (2 pt) + Princep 4L (1 qt) fb Laudis (3 oz) + Warrant (48 oz) + MSO 1% v/v + AMS (2 lb)	99	100	100	96	99	100	97	100	99	252 a
12	Dual II Magnum (1.67 pt) + Princep 4L (1 qt) fb Callisto (3 oz) + Status (5 oz) + COC 1% v/v + AMS (2 lb)	88	100	100	90	100	100	59	60	45	219 b
LSD (α=0.10)		3	1	ns	4	1	ns	7	2	6	15
p value		<0.001	0.036	ns	0.003	<0.001	ns	<0.001	<0.001	<0.001	<0.001

^aVisual control from 70-100% is illustrated on a color scale with green representing greater weed control values.

^bYield values with the same letter are not significantly different.

Weed Control – Brooklyn, WI



Table 2. Weed control ratings for trial #21-BRO-CN18 at Brooklyn, WI

Trt #	Herbicide (rate acre ⁻¹)	Waterhemp ^a			Velvetleaf ^a			Wild-PrOSO Millet ^a		
		6/10	6/24	7/8	6/10	6/24	7/8	6/10	6/24	7/8
1	Untreated Check	0	0	0	0	0	0	0	0	0
Two-Pass – PRE (5/14) fb POST (6/10)										
2	Harness MAX (2 qt) fb Capreno (3 oz) + Superb HC 0.5% v/v + AMS (2 lb)	100	99	96	100	100	100	99	99	100
3	Harness MAX (2 qt) fb Diflexx Duo (28 oz) + COC 1% v/v + AMS (2 lb)	100	99	97	100	100	98	98	100	98
4	Acuron Flexi (1.1 qt) fb Acuron Flexi (1.1 qt) + NIS 0.25% v/v + AMS (2 lb)	92	82	83	100	100	100	95	98	98
5	Verdict (16 oz) fb Armezon (1 oz) + Status (5 oz) + MSO 1% v/v + AMS (2 lb)	95	97	93	100	100	100	97	100	100
6	Verdict (10 oz) + Callisto (3 oz) fb Armezon PRO (16 fl oz) + MSO 1% v/v + AMS (2 lb)	98	92	90	100	100	100	93	100	99
7	Surestart II (2 pt) fb Accent Q (0.9 oz) + Status (5 oz) + COC 1% v/v + AMS (2 lb)	95	97	95	92	99	100	91	97	95
8	Harness (2 pt) + Princep 4L (1 qt) fb Revulin Q (4 oz) + Status (5 oz) + COC 1% v/v + AMS (2 lb)	99	99	98	46	100	100	97	100	96
9	Harness (2 pt) + Princep 4L (1 qt) fb Revulin Q (4 oz) + Status (5 oz) + Zidua SC (3 oz) + COC 1% v/v + AMS (2 lb)	100	100	100	45	100	100	99	99	99
10	Harness (2 pt) + Princep 4L (1 qt) fb Shieldex (1 oz) + Accent Q (0.9 oz) + COC 1% v/v + AMS (2 lb)	99	95	89	50	99	100	99	100	100
11	Harness (2 pt) + Princep 4L (1 qt) fb Laudis (3 oz) + Warrant (48 oz) + MSO 1% v/v + AMS (2 lb)	97	98	94	46	100	98	97	100	100
12	Dual II Magnum (1.67 pt) + Princep 4L (1 qt) fb Callisto (3 oz) + Status (5 oz) + COC 1% v/v + AMS (2 lb)	76	97	90	20	100	100	96	95	96
LSD ($\alpha=0.10$)		4	3	6	15	1	1	4	3	ns
p value		<0.001	<0.001	<0.001	<0.001	0.014	0.017	0.016	0.07	ns

^aVisual control from 70-100% is illustrated on a color scale with green representing greater weed control values.

Herbicide Programs for Conventional Corn Arlington, WI 2021

Trial Information

Trial Sponsor: Wisconsin Cropping Systems Weed Science

Objective: Evaluate various corn herbicide programs for season long weed control in conventional corn

Crop: Corn

Hybrid: Dekalb DKC 54-36

Weed species (pressure): Common ragweed (moderate-high)
Velvetleaf (low-moderate)
Giant foxtail (high)

Herbicide Application(s): PRE – 5/10
POST – 6/10 (V5 corn)



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Herbicide Programs for Conventional Corn Arlington, WI 2021

Plot pictures taken on 6/10
31 days after the PRE application
The day of the POST application

The numbers in the upper right-hand corner are the average
% common ragweed and giant foxtail control of 4 replications

31 days after PRE (6/10) – Arlington, WI
Untreated Check

C. Ragweed = 0%
G. Foxtail = 0%



31 days after PRE (6/10) – Arlington, WI
PRE: 2 qt Harness MAX

C. Ragweed = 98%
G. Foxtail = 99%



31 days after PRE (6/10) – Arlington, WI
PRE: 1.1 qt Acuron Flexi

C. Ragweed = 93%
G. Foxtail = 88%



31 days after PRE (6/10) – Arlington, WI
PRE: 16 fl oz Verdict

C. Ragweed = 98%
G. Foxtail = 95%



31 days after PRE (6/10) – Arlington, WI
PRE: 10 fl oz Verdict + 3 fl oz Callisto

C. Ragweed = 95%
G. Foxtail = 95%



31 days after PRE (6/10) – Arlington, WI
PRE: 2 pt SureStart II

C. Ragweed = 99%
G. Foxtail = 98%



31 days after PRE (6/10) – Arlington, WI
PRE: 2 pt Harness + 1 qt Princep 4L

C. Ragweed = 98%
G. Foxtail = 99%



31 days after PRE (6/10) – Arlington, WI
PRE: 1.67 pt Dual II Magnum + 1 qt Princep 4L

C. Ragweed = 88%
G. Foxtail = 59%



Herbicide Programs for Conventional Corn Arlington, WI 2021

Plot pictures taken on 6/25
15 days after the POST application

The numbers in the upper right-hand corner are the average % common ragweed and giant foxtail control of 4 replications

15 days after POST (6/25) – Arlington, WI
Untreated Check

C. Ragweed = 0%
G. Foxtail = 0%



15 days after POST (6/25) – Arlington, WI

PRE: 2 qt Harness MAX fb

POST: 3 fl oz Capreno + 0.5% Superb HC + 2 lb AMS

C. Ragweed = 100%

G. Foxtail = 95%



15 days after POST (6/25) – Arlington, WI
PRE: 2 qt Harness MAX *fb*
POST: 28 fl oz Diflexx Duo + 1% COC + 2 lb AMS

C. Ragweed = 100%
G. Foxtail = 89%



15 days after POST (6/25) – Arlington, WI
PRE: 1.1 qt Acuron Flexi
POST: 1.1 qt Acuron Flexi + 0.25% NIS + 2 lb AMS

C. Ragweed = 99%
G. Foxtail = 80%



15 days after POST (6/25) – Arlington, WI

PRE: 16 fl oz Verdict

POST: 1 fl oz Armezon + 5 oz Status + 1% MSO + 2 lb AMS

C. Ragweed = 100%

G. Foxtail = 97%



15 days after POST (6/25) – Arlington, WI
PRE: 10 fl oz Verdict + 3 fl oz Callisto
POST: 16 fl oz Armezon PRO + 1% MSO + 2 lb AMS

C. Ragweed = 99%
G. Foxtail = 95%



15 days after POST (6/25) – Arlington, WI

PRE: 2 pt SureStart II

POST: 0.9 oz Accent Q + 5 oz Status + 1% COC + 2 lb AMS

C. Ragweed = 100%

G. Foxtail = 97%



15 days after POST (6/25) – Arlington, WI

PRE: 2 pt Harness + 1 qt Princep 4L

POST: 4 oz Revulin Q + 5 oz Status + 1% COC + 2 lb AMS

C. Ragweed = 100%

G. Foxtail = 98%



15 days after POST (6/25) – Arlington, WI

C. Ragweed = 100%

PRE: 2 pt Harness + 1 qt Princep 4L

G. Foxtail = 99%

POST: 4 oz Revulin Q + 5 oz Status + 3 fl oz Zidua SC + 1% COC + 2 lb AMS



15 days after POST (6/25) – Arlington, WI

PRE: 2 pt Harness + 1 qt Princep 4L

POST: 1 fl oz Shieldex + 0.9 oz Accent Q + 1% COC + 2 lb AMS

C. Ragweed = 100%

G. Foxtail = 98%



15 days after POST (6/25) – Arlington, WI

PRE: 2 pt Harness + 1 qt Princep 4L

POST: 3 fl oz Laudis + 48 fl oz Warrant+ 1% MSO + 2 lb AMS

C. Ragweed = 100%

G. Foxtail = 100%



15 days after POST (6/25) – Arlington, WI

PRE: 1.67 pt Dual II Magnum + 1 qt Princep 4L

POST: 3 fl oz Callisto + 5 oz Status + 1% COC + 2 lb AMS

C. Ragweed = 100%

G. Foxtail = 60%



Herbicide Programs for Conventional Corn Arlington, WI 2021

Plot pictures taken on 10/19
The day of corn harvest

The numbers in the upper right-hand corner are the average % common ragweed and giant foxtail control of 4 replications

Corn Harvest (10/19) – Arlington, WI
Untreated Check

C. Ragweed = 0%
G. Foxtail = 0%



Corn Harvest (10/19) – Arlington, WI

PRE: 2 qt Harness MAX *fb*

POST: 3 fl oz Capreno + 0.5% Superb HC + 2 lb AMS

C. Ragweed = 100%

G. Foxtail = 97%



Corn Harvest (10/19) – Arlington, WI

PRE: 2 qt Harness MAX *fb*

POST: 28 fl oz Diflexx Duo + 1% COC + 2 lb AMS

C. Ragweed = 100%

G. Foxtail = 83%



Corn Harvest (10/19) – Arlington, WI

PRE: 1.1 qt Acuron Flexi

POST: 1.1 qt Acuron Flexi + 0.25% NIS + 2 lb AMS

C. Ragweed = 100%

G. Foxtail = 72%



Corn Harvest (10/19) – Arlington, WI

PRE: 16 fl oz Verdict

POST: 1 fl oz Armezon + 5 oz Status + 1% MSO + 2 lb AMS

C. Ragweed = 100%

G. Foxtail = 100%



Corn Harvest (10/19) – Arlington, WI

C. Ragweed = 100%

PRE: 2 pt SureStart II

G. Foxtail = 99%

POST: 0.9 oz Accent Q + 5 oz Status + 1% COC + 2 lb AMS



Corn Harvest (10/19) – Arlington, WI

PRE: 2 pt Harness + 1 qt Princep 4L

POST: 4 oz Revulin Q + 5 oz Status + 1% COC + 2 lb AMS

C. Ragweed = 100%

G. Foxtail = 100%



Corn Harvest (10/19) – Arlington, WI

C. Ragweed = 100%

PRE: 2 pt Harness + 1 qt Princep 4L

G. Foxtail = 98%

POST: 4 oz Revulin Q + 5 oz Status + 3 fl oz Zidua SC + 1% COC + 2 lb AMS



Corn Harvest (10/19) – Arlington, WI

PRE: 2 pt Harness + 1 qt Princep 4L

POST: 1 fl oz Shieldex + 0.9 oz Accent Q + 1% COC + 2 lb AMS

C. Ragweed = 100%

G. Foxtail = 100%



Corn Harvest (10/19) – Arlington, WI

PRE: 2 pt Harness + 1 qt Princep 4L

POST: 3 fl oz Laudis + 48 fl oz Warrant+ 1% MSO + 2 lb AMS

C. Ragweed = 100%

G. Foxtail = 99%



Herbicide Programs for Conventional Corn Brooklyn, WI 2021

Trial Information

Trial Sponsor: Wisconsin Cropping Systems Weed Science

Objective: Evaluate various corn herbicide programs for season long weed control in conventional corn

Crop: Corn

Hybrid: Dekalb DKC 54-36

Weed species (pressure): Waterhemp (moderate-high)
Velvetleaf (moderate-high)
Wild-proso millet (moderate)

Herbicide Application(s): PRE – 5/14
POST – 6/10 (V5 corn)



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Herbicide Programs for Conventional Corn Brooklyn, WI 2021

Plot pictures taken on 6/10
27 days after the PRE application
The day of the POST application

The numbers in the upper right-hand corner are the average
% waterhemp and velvetleaf control of 4 replications

27 days after PRE (6/10) – Brooklyn, WI
Untreated Check

Waterhemp = 0%
Velvetleaf = 0%



27 days after PRE (6/10) – Brooklyn, WI
PRE: 2 qt Harness MAX

Waterhemp = 100%
Velvetleaf = 100%



27 days after PRE (6/10) – Brooklyn, WI
PRE: 1.1 qt Acuron Flexi

Waterhemp = 92%
Velvetleaf = 100%



27 days after PRE (6/10) – Brooklyn, WI
PRE: 16 fl oz Verdict

Waterhemp = 95%
Velvetleaf = 100%



27 days after PRE (6/10) – Brooklyn, WI
PRE: 10 fl oz Verdict + 3 fl oz Callisto

Waterhemp = 98%
Velvetleaf = 100%



27 days after PRE (6/10) – Brooklyn, WI
PRE: 2 pt SureStart II

Waterhemp = 95%
Velvetleaf = 92%



27 days after PRE (6/10) – Brooklyn, WI
PRE: 2 pt Harness + 1 qt Princep 4L

Waterhemp = 99%
Velvetleaf = 47%



27 days after PRE (6/10) – Brooklyn, WI
PRE: 1.67 pt Dual II Magnum + 1 qt Princep 4L

Waterhemp = 76%
Velvetleaf = 20%



Herbicide Programs for Conventional Corn Brooklyn, WI 2021

Plot pictures taken on 6/24
14 days after the POST application

The numbers in the upper right-hand corner are the average
% waterhemp and velvetleaf control of 4 replications

14 days after POST (6/24) – Brooklyn, WI
Untreated Check

Waterhemp = 0%
Velvetleaf = 0%



14 days after POST (6/24) – Brooklyn, WI

PRE: 2 qt Harness MAX fb

POST: 3 fl oz Capreno + 0.5% Superb HC + 2 lb AMS

Waterhemp = 99%

Velvetleaf = 100%



14 days after POST (6/24) – Brooklyn, WI

PRE: 2 qt Harness MAX fb

POST: 28 fl oz Diflexx Duo + 1% COC + 2 lb AMS

Waterhemp = 99%

Velvetleaf = 100%



14 days after POST (6/24) – Brooklyn, WI

PRE: 1.1 qt Acuron Flexi

POST: 1.1 qt Acuron Flexi + 0.25% NIS + 2 lb AMS

Waterhemp = 82%

Velvetleaf = 100%



14 days after POST (6/24) – Brooklyn, WI

PRE: 16 fl oz Verdict

POST: 1 fl oz Armezon + 5 oz Status + 1% MSO + 2 lb AMS

Waterhemp = 97%

Velvetleaf = 100%



14 days after POST (6/24) – Brooklyn, WI
PRE: 10 fl oz Verdict + 3 fl oz Callisto
POST: 16 fl oz Armezon PRO + 1% MSO + 2 lb AMS

Waterhemp = 92%
Velvetleaf = 100%



14 days after POST (6/24) – Brooklyn, WI

PRE: 2 pt SureStart II

POST: 0.9 oz Accent Q + 5 oz Status + 1% COC + 2 lb AMS

Waterhemp = 97%

Velvetleaf = 99%



14 days after POST (6/24) – Brooklyn, WI

PRE: 2 pt Harness + 1 qt Princep 4L

POST: 4 oz Revulin Q + 5 oz Status + 1% COC + 2 lb AMS

Waterhemp = 99%

Velvetleaf = 100%



14 days after POST (6/24) – Brooklyn, WI

Waterhemp = 100%

PRE: 2 pt Harness + 1 qt Princep 4L

Velvetleaf = 100%

POST: 4 oz Revulin Q + 5 oz Status + 3 fl oz Zidua SC + 1% COC + 2 lb AMS



14 days after POST (6/24) – Brooklyn, WI

PRE: 2 pt Harness + 1 qt Princep 4L

POST: 1 fl oz Shieldex + 0.9 oz Accent Q + 1% COC + 2 lb AMS

Waterhemp = 95%

Velvetleaf = 99%



14 days after POST (6/24) – Brooklyn, WI

PRE: 2 pt Harness + 1 qt Princep 4L

POST: 3 fl oz Laudis + 48 fl oz Warrant+ 1% MSO + 2 lb AMS

Waterhemp = 98%

Velvetleaf = 100%



14 days after POST (6/24) – Brooklyn, WI
PRE: 1.67 pt Dual II Magnum + 1 qt Princep 4L
POST: 3 fl oz Callisto + 5 oz Status + 1% COC + 2 lb AMS

Waterhemp = 97%
Velvetleaf = 100%

