

2020 Pest Management Update Meetings

WiscWeeds Research Update



Cropping Systems Weed Science
UNIVERSITY OF WISCONSIN-MADISON

(Not for Publication)

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A3646, Pest Management in Wisconsin Field Crops

Despite careful proof reading, there may be some errors in this report.

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We sincerely thank the following organizations who have generously supported the research presented herein:

Wisconsin Soybean Marketing Board



United Soybean Board



Wisconsin Corn Promotion Board



We also sincerely thank the sponsorship from the crop protection industry in providing products and assistance with rate selection for the following research trials as well as the staff at Arlington Agricultural Research Station, Lancaster Agricultural Research Station, Rock County Farm, and O'Brien Hybrids.

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Understanding Relative Rankings

SOA Group	Preliminary Weed Control Ratings		Giant Ragweed (Janesville, WI)	Waterhemp (Brooklyn, WI)
	Corn growth stage (days after treatment)		V6 (25 DAT)	V7 (25 DAT)
	Herbicide and application rate (ac ⁻¹)		Relative Rank	
2	Python (1 oz)		5	5
2	Resolve SG (1.25 oz)		5	5
4	Stinger (6 fl oz)		5	5
4	Diflexx (10 fl oz)		5	5
5	Aatrex (28.8 fl oz)		5	3
5	Aatrex (57.6 fl oz)		5	3
5	Princep 4FL (64 fl oz)*		5	3
15	Harness (28.8 fl oz)		5	1
15	Dual II Magnum (32.1 fl oz)		5	3
15	Outlook (17.5 fl oz)		5	2
15	Zidua (3.25 fl oz)		5	4
27	Balance Flexx (4.5 fl oz)		5	3
27	Armezon (0.75 fl oz)		5	5
27	Callisto (2 fl oz)		5	4
27	Laudis (3 fl oz)		5	5
15 & 27	Armezon PRO (20 fl oz)		5	2
15 & 27	Harness Max (64 fl oz)		5	1
15 & 27	Acuron Flexi (64 fl oz)		5	1
2 & 27	Capreno (3 fl oz)		5	5
2 & 27	Corvus (5.6 fl oz)		5	3
2 & 27	Realm Q (4 oz)		5	4
4 & 27	Diflexx Duo (28 fl oz)		5	5
5 & 15	Bicep Lite II Magnum (56 fl oz)		5	1
5 & 15	Harness Xtra (64 fl oz)		5	1
2 & 4	Hornet WDG (4 oz)		5	5
14 & 15	Verdict (15 fl oz)*		5	1
9 & 15 & 27	Halex GT (64 fl oz)		5	1
4 & 15 & 27	Resicore (80 fl oz)		5	1
2 & 4 & 15	Surestart II (40 fl oz)		5	1
5 & 15 & 27	Acuron (80 fl oz)		5	1

27	Laudis (3 fl oz)	5	5
15 & 27	Armezon PRO (20 fl oz)	5	2
15 & 27	Harness Max (64 fl oz)	5	1
15 & 27	Acuron Flexi (64 fl oz)	5	1
2 & 27	Capreno (3 fl oz)	5	5
2 & 27	Corvus (5.6 fl oz)	5	3
2 & 27	Realm Q (4 oz)	5	4
4 & 27	Diflexx Duo (28 fl oz)	5	5
5 & 15	Bicep Lite II Magnum (56 fl oz)	5	1
5 & 15	Harness Xtra (64 fl oz)	5	1

Relative Weed Control Rankings:

(1) ≥ 90% weed control compared to non-treated control

(2) 80-89% weed control

(3) 70-79% weed control

(4) 60-69% weed control

(5) < 60% weed control

Chart Interpretation Key

Site of Action
(SOA) Group

2

4

5

6

9

10

14

27

Standard Error

90% control is minimum
for effective control

% Weed Control Compared
to Non-treated Control



Giant Ragweed control (%)

Preemergence Evaluation for Giant Ragweed Residual Control – Soybean

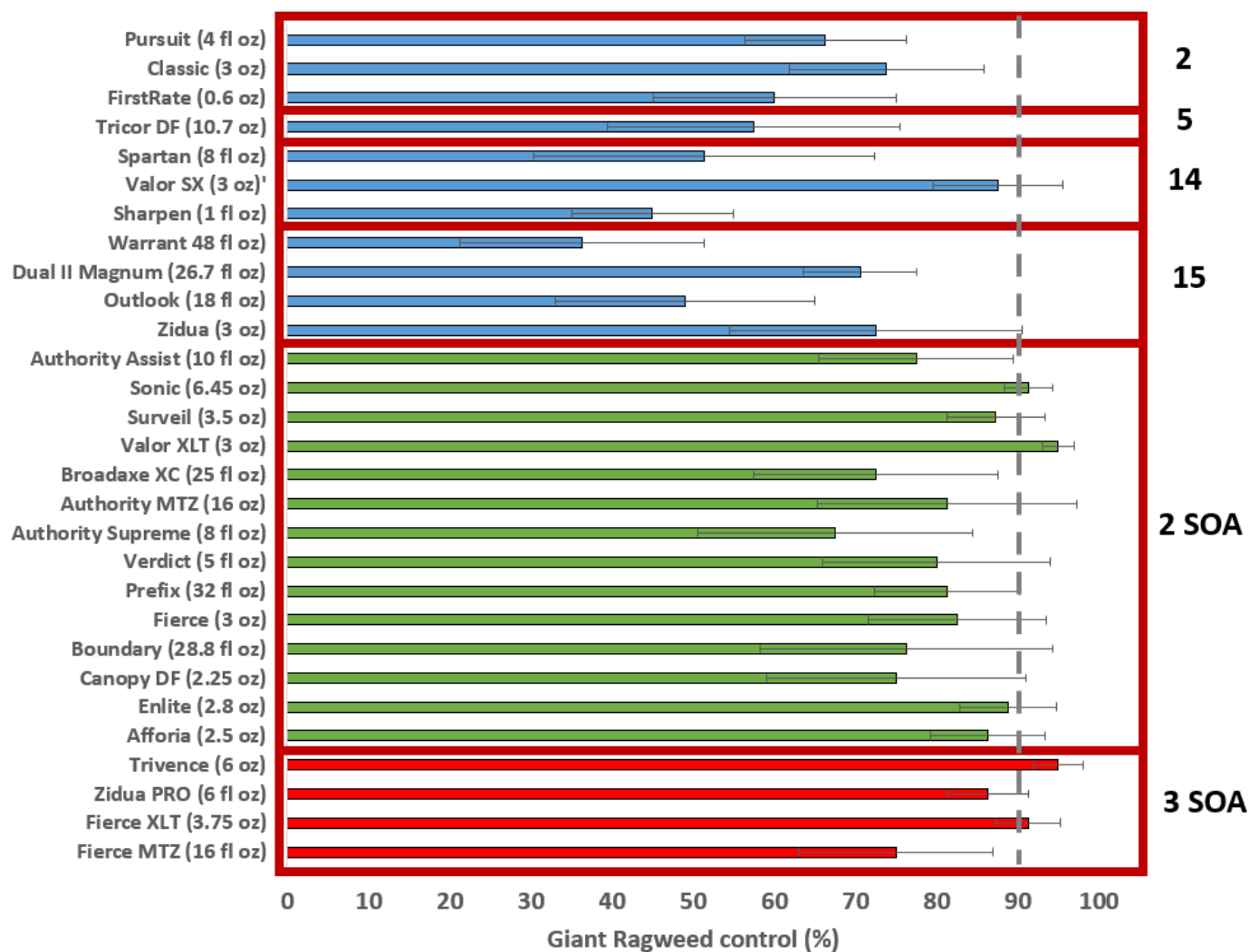
SOA Group	Herbicide and application rate (ac ⁻¹)	Active ingredient [ai concentration lb gal ⁻¹]	Equivalent Tank Mix (ac ⁻¹)
2	Pursuit (4 fl oz)	imazethapyr [2.0]	NA
2	Classic (3 oz)	chlorimuron-ethyl [25%]	NA
2	FirstRate (0.6 oz)	cloransulam-methyl [84%]	NA
5	Tricor DF (10.7 oz)	metribuzin [75%]	NA
14	Spartan (8 fl oz)	sulfentrazone [4.0]	NA
14	Valor SX (3 oz)	flumioxazin [51%]	NA
14	Sharpen (1 fl oz)	saflufenacil [2.85]	NA
15	Warrant (48 fl oz)	acetochlor [3.0]	NA
15	Dual II Magnum (26.7 fl oz)	S-metolachlor [7.64]	NA
15	Outlook (18 fl oz)	dimethenamid-P [6.0]	NA
15	Zidua (3 oz)	pyroxasulfone [85%]	NA
2 & 14	Authority Assist (10 fl oz)	imazethapyr + sulfentrazone	3.3 fl oz Pursuit + 8.3 fl oz Spartan
2 & 14	Sonic (6.45 oz)	cloransulam-methyl + sulfentrazone	0.6 oz FirstRate + 8.0 fl oz Spartan
2 & 14	Surveil (3.5 oz)	cloransulam-methyl + flumioxazin	0.5 oz FirstRate + 2.5 oz Valor SX
2 & 14	Valor XLT (3 oz)	chlorimuron-ethyl + flumioxazin	1.24 oz Classic + 1.8 oz Valor SX
14 & 15	Broadaxe XC (25 fl oz)	sulfentrazone + S-metolachlor	4.4 fl oz Spartan + 20.6 fl oz Dual II Magnum
5 & 14	Authority MTZ (16 oz)	metribuzin + sulfentrazone	5.76 oz Tricor DF + 5.76 fl oz Spartan
14 & 15	Authority Supreme (8 fl oz)	sulfentrazone + pyroxasulfone	4.15 fl oz Spartan + 2.45 oz Zidua
14 & 15	Verdict (5 fl oz)	saflufenacil + dimethenamid-P	1.0 fl oz Sharpen + 4.15 fl oz Outlook
14 & 15	Prefix (32 fl oz)	fomesafen + S-metolachlor	16.2 fl oz Flexstar + 18.2 fl oz Dual II Magnum
14 & 15	Fierce (3 oz)	flumioxazin + pyroxasulfone	1.97 oz Valor SX + 2.0 oz Zidua
5 & 15	Boundary (28.8 fl oz)	metribuzin + S-metolachlor	6.0 oz Tricor DF + 19.8 fl oz Dual II Magnum
2 & 5	Canopy DF (2.25 oz)	chlorimuron-ethyl + metribuzin	1.0 oz Classic + 1.95 oz Tricor DF
2 & 14	Enlite (2.8 oz)	chlorimuron-ethyl + thifensulfuron-methyl + flumioxazin	0.32 oz Classic + 0.05 oz Harmony + 2.0 oz Valor SX
2 & 14	Afforia (2.5 oz)	thifensulfuron-methyl + tribenuron-methyl + flumioxazin	0.25 oz Harmony + 0.25 oz Express + 2.0 oz Valor SX
2 & 5 & 14	Trivence (6 oz)	chlorimuron-ethyl + metribuzin + flumioxazin	0.94 oz Classic + 3.56 oz Tricor DF + 1.5 oz Valor SX
2 & 14 & 15	Zidua PRO (6 fl oz)	imazethapyr + saflufenacil + pyroxasulfone	4.0 fl oz Pursuit + 1.0 oz Sharpen + 2.0 oz Zidua
2 & 14 & 15	Fierce XLT (3.75 oz)	chlorimuron-ethyl + flumioxazin + pyroxasulfone	0.94 oz Classic + 1.78 oz Valor SX + 1.37 oz Zidua
5 & 14 & 15	Fierce MTZ (16 fl oz)	metribuzin + flumioxazin + pyroxasulfone	6.0 fl oz metribuzin + 2.0 oz Valor SX + 1.5 oz Zidua

Preemergence Evaluation for Giant Ragweed Residual Control – Soybean

Combined Preliminary Weed Control Ratings		Giant Ragweed Janesville - 25 DAT	
SOA Group	Year	2019	2020
	Herbicide and application rate (ac ⁻¹)	Relative Rank	
2	Pursuit (4 fl oz)	4	4
2	Classic (3 oz)	3	3
2	FirstRate (0.6 oz)	4	3
5	Tricor DF (10.7 oz)	5	5
14	Spartan (8 fl oz)	5	5
14	Valor SX (3 oz)	2	3
14	Sharpen (1 fl oz)	5	5
15	Warrant (48 fl oz)	5	5
15	Dual II Magnum (26.7 fl oz)	3	5
15	Outlook (18 fl oz)	5	4
15	Zidua (3 oz)	3	5
2 & 14	Authority Assist (10 fl oz)	3	3
2 & 14	Sonic (6.45 oz)	1	2
2 & 14	Surveil (3.5 oz)	2	2
2 & 14	Valor XLT (3 oz)	1	2
14 & 15	Broadaxe XC (25 fl oz)	3	5
14 & 15	Authority MTZ (16 oz)	2	5
14 & 15	Authority Supreme (8 fl oz)	4	5
14 & 15	Verdict (5 fl oz)	2	5
14 & 15	Prefix (32 fl oz)	2	2
14 & 15	Fierce (3 oz)	2	4
5 & 15	Boundary (28.8 fl oz)	3	5
2 & 5	Canopy DF (2.25 oz)	3	4
2 & 14	Enlite (2.8 oz)	2	5
2 & 14	Afforia (2.5 oz)	2	5
2 & 5 & 14	Trivence (6 oz)	1	2
2 & 14 & 15	Zidua PRO (6 fl oz)	2	3
2 & 14 & 15	Fierce XLT (3.75 oz)	1	2
5 & 14 & 15	Fierce MTZ (16 fl oz)	3	3

Rank: (1) ≥ 90% control (2) 80-89 % (3) 70-79% (4) 60-69% (5) < 60%

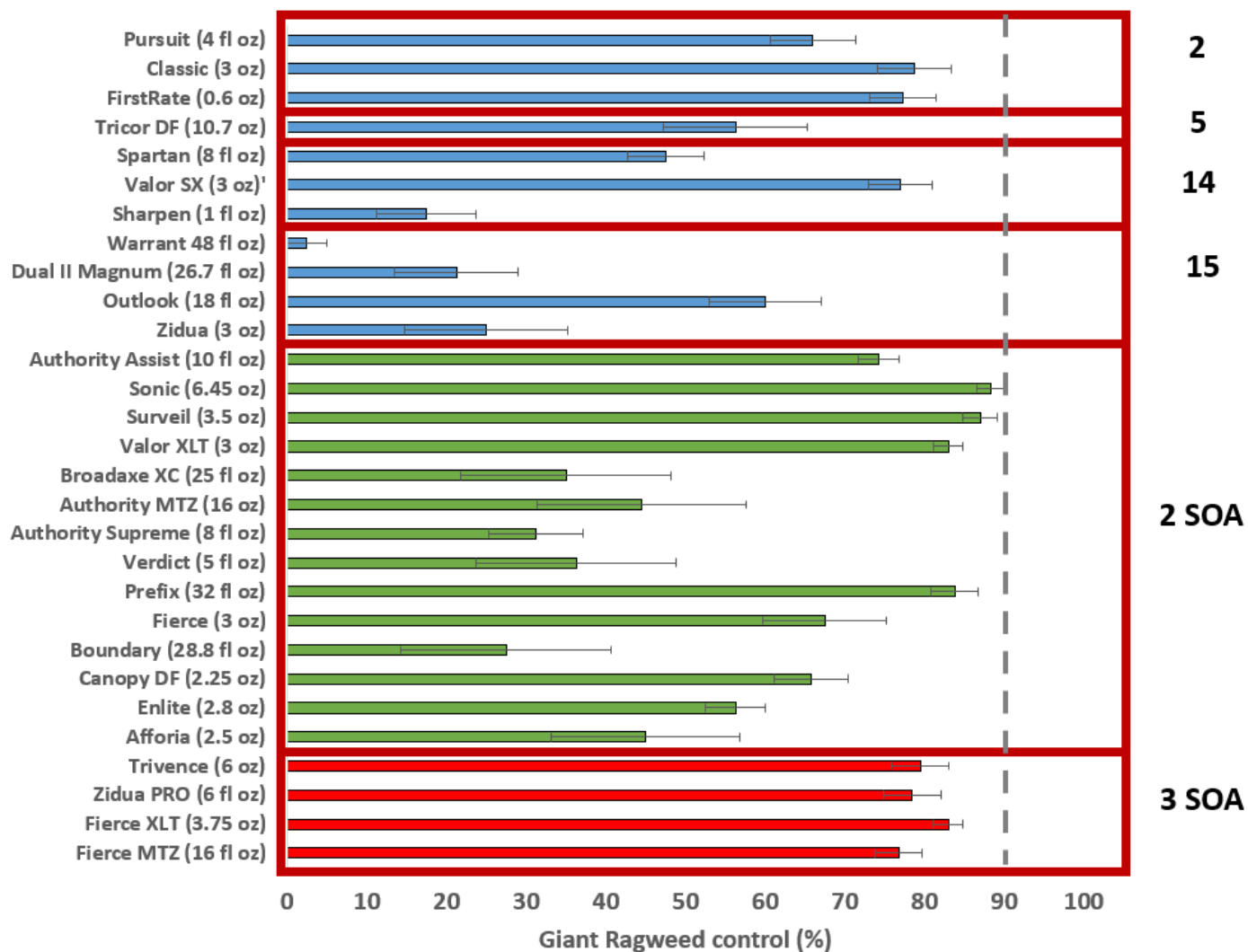
Giant Ragweed Residual Control 25 DAT (soybean, V1 stage) Janesville, WI 2019



1 Year Data

Preliminary Results – Not for Publication

Giant Ragweed Residual Control 25 DAT (soybean, V1 stage) Janesville, WI 2020



1 Year Data
Preliminary Results – Not for Publication

Systems Approach for Weed Management – Soybean

Treatments:	PRE (application rate ac ⁻¹)	Post (application rate ac ⁻¹)
1	Authority MTZ (12 oz) [metribuzin + sulfentrazone] 5 & 14	-
2		Liberty (32 fl oz) [glufosinate] 10
3		Pursuit (4 fl oz) + Liberty (32 fl oz) [imazethapyr + glufosinate] 2 & 10
4		Flexstar (16 fl oz) + Liberty (32 fl oz) [fomesafen + glufosinate] 14 & 10
5		Warrant (48 fl oz) + Liberty (32 fl oz) [acetochlor + glufosinate] 15 & 10
6		Dual II Magnum (20 fl oz) + Liberty (32 fl oz) [S-metolachlor + glufosinate] 15 & 10
7		Outlook (10 fl oz) + Liberty (32 fl oz) [dimethenamid-P + glufosinate] 15 & 10
8		Zidua (1.5 oz) + Liberty (32 fl oz) [pyroxasulfone + glufosinate] 15 & 10
9		Prefix (32 fl oz) + Liberty (32 fl oz) [fomesafen + S-metolachlor + glufosinate] 14 & 15 & 10
10		Warrant Ultra (50 fl oz) + Liberty (32 fl oz) [fomesafen + acetochlor + glufosinate] 14 & 15 & 10

Systems Approach for Weed Management – Soybean

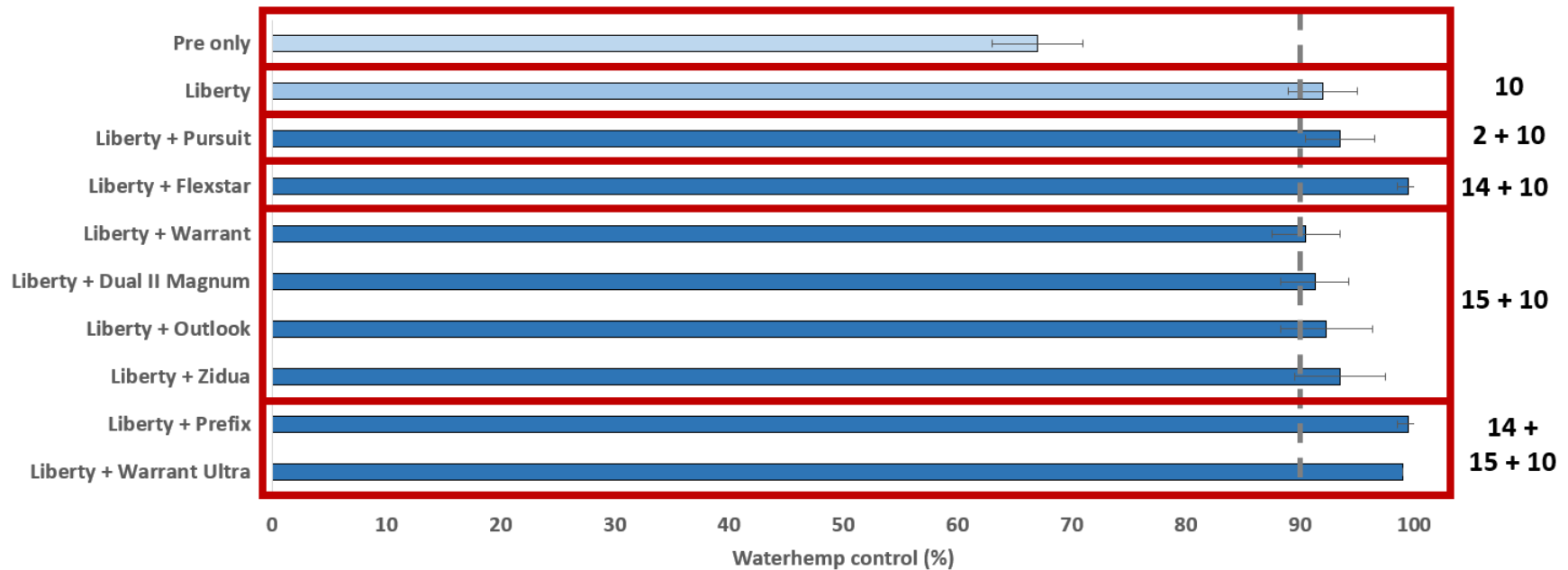
2019 Preliminary Weed Control Ratings		Waterhemp Control			
		Brooklyn		Lancaster	
SOA Group	Days After Treatment	14 DAT	35 DAT	14 DAT	25 DAT
	Herbicide and application rate (ac ⁻¹)	Relative Rank			
14	Pre only (Authority MTZ, 12 oz)	4	5	3	5
10	Liberty (32 fl oz)	1	2	1	1
2 & 10	Pursuit (4 fl oz)*	1	2	1	1
14 & 10	Flexstar (16 fl oz)*	1	1	1	1
15 & 10	Warrant (48 fl oz)*	1	2	1	1
15 & 10	Dual II Magnum (20 fl oz)*	1	2	1	1
15 & 10	Outlook (10 fl oz)*	1	2	1	1
15 & 10	Zidua (1.5 oz)*	1	2	1	1
14 & 15 & 10	Prefix (32 fl oz)*	1	1	1	2
14 & 15 & 10	Warrant Ultra (50 fl oz)*	1	1	1	1

2020 Preliminary Weed Control Ratings		Waterhemp Control			
		Brooklyn		Lancaster	
SOA Group	Days After Treatment	14 DAT	25 DAT	14 DAT	25 DAT
	Herbicide and application rate (ac ⁻¹)	Relative Rank			
14	Pre only (Authority MTZ, 12 oz)	5	5	5	5
10	Liberty (32 fl oz)	1	3	1	3
2 & 10	Pursuit (4 fl oz)*	1	2	1	2
14 & 10	Flexstar (16 fl oz)*	1	1	1	1
15 & 10	Warrant (48 fl oz)*	1	1	1	2
15 & 10	Dual II Magnum (20 fl oz)*	1	2	2	2
15 & 10	Outlook (10 fl oz)*	1	2	3	3
15 & 10	Zidua (1.5 oz)*	1	1	1	2
14 & 15 & 10	Prefix (32 fl oz)*	1	1	1	1
14 & 15 & 10	Warrant Ultra (50 fl oz)*	1	1	1	1

*All POST treatments tank mixed with Liberty (32 fl oz)

Rank: (1) ≥ 90% control (2) 80-89 % (3) 70-79% (4) 60-69% (5) < 60%

Waterhemp Control 14 DAT (soybean, V4 stage) Brooklyn, WI 2019

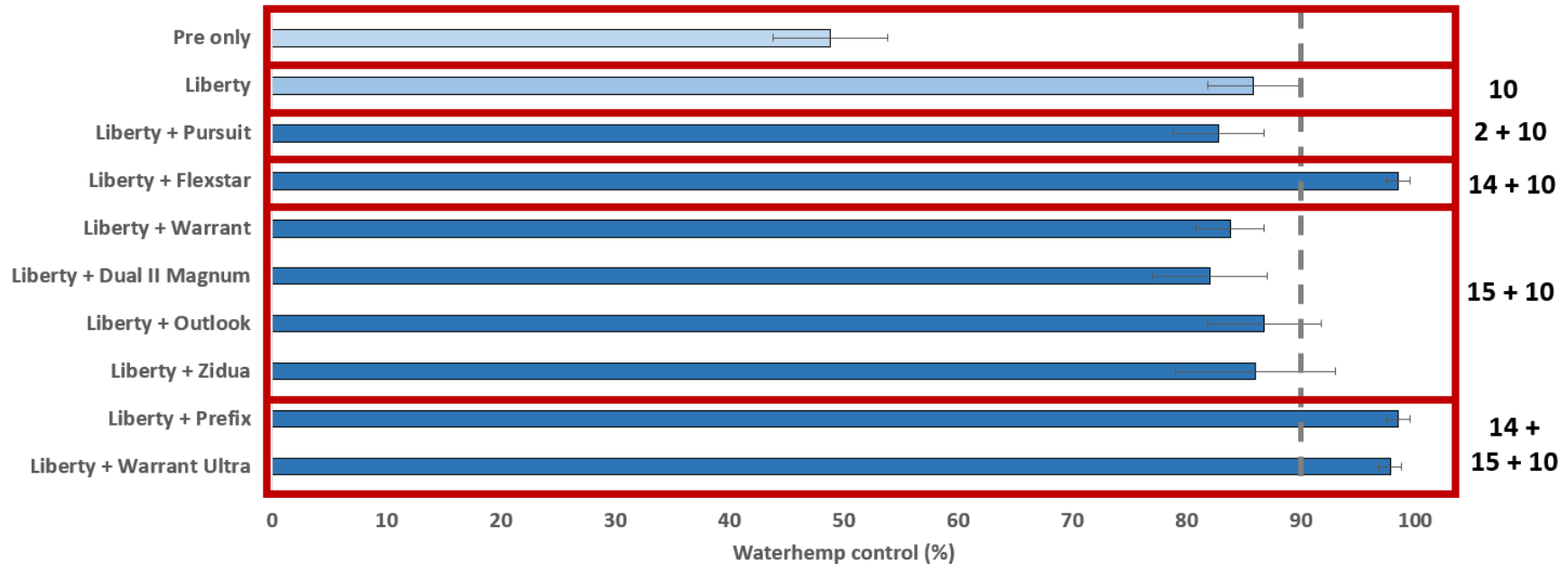


PRE: Authority MTZ 12 fl oz/ac

1 Year Data

Preliminary Results – Not for Publication

Waterhemp Control 35 DAT (soybean, R1 stage) Brooklyn, WI 2019

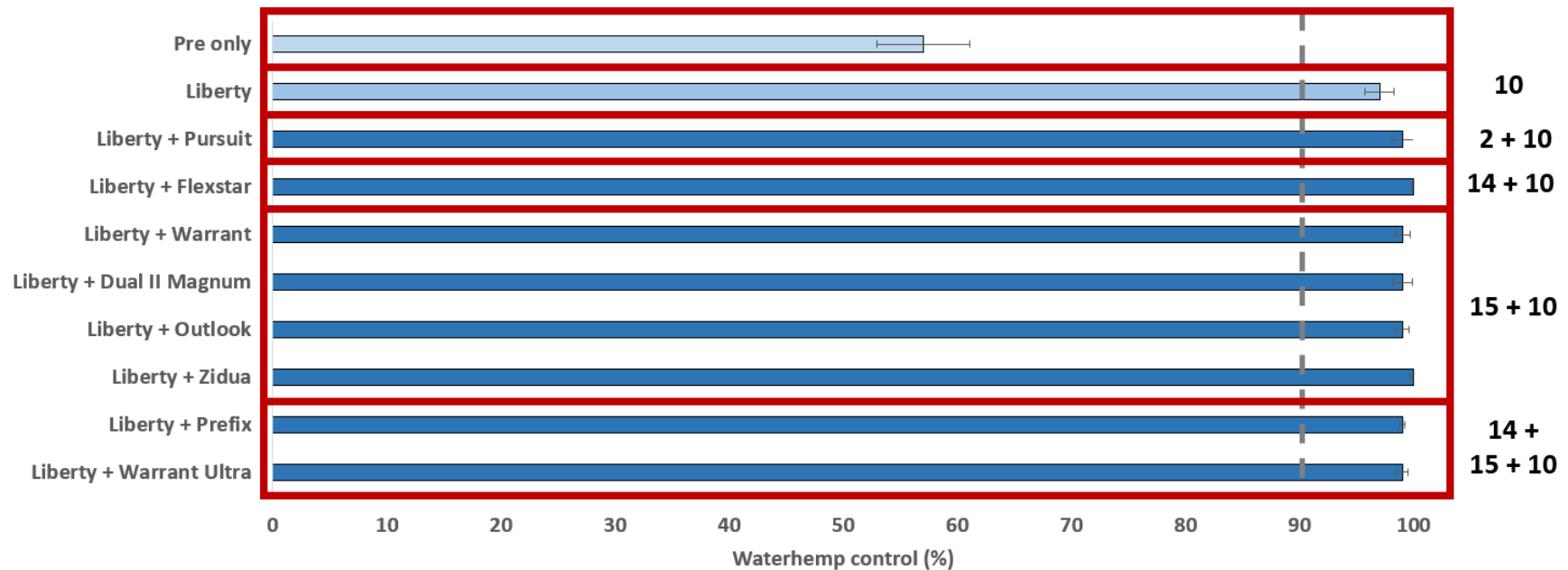


PRE: Authority MTZ 12 fl oz/ac

1 Year Data

Preliminary Results – Not for Publication

Waterhemp Control 14 DAT (soybean, V4 stage) Brooklyn, WI 2020

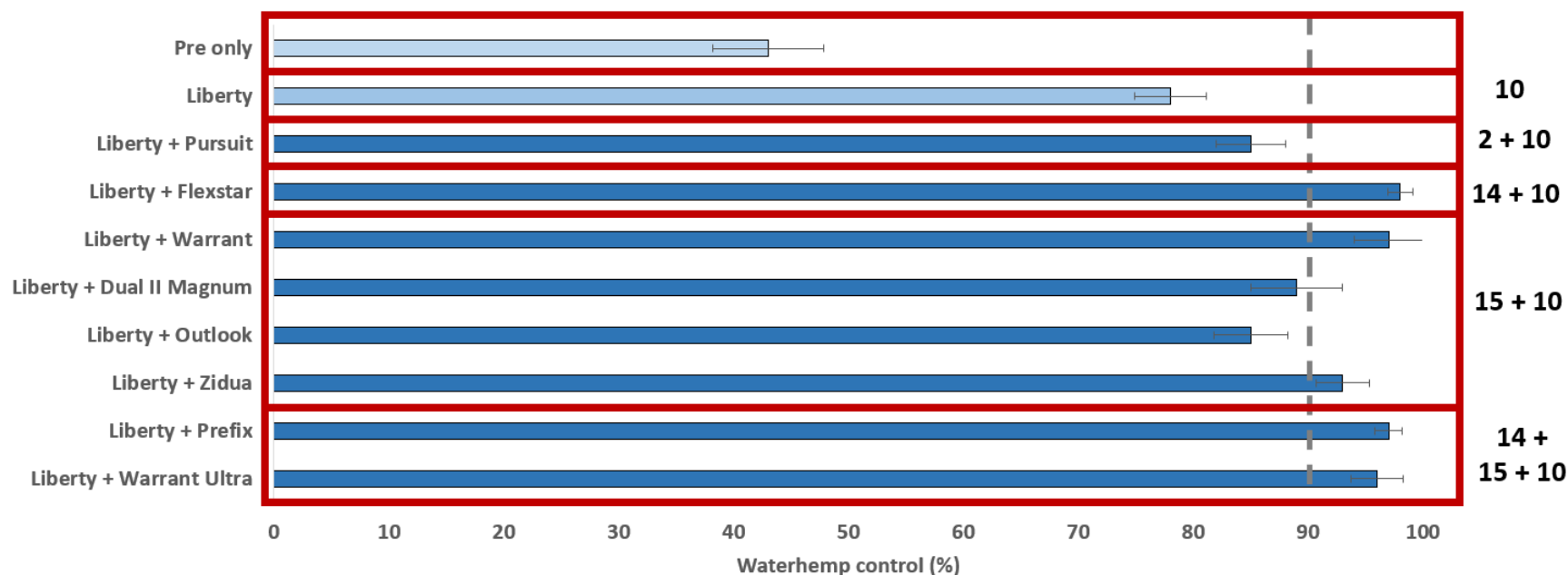


PRE: Authority MTZ 12 fl oz/ac

1 Year Data

Preliminary Results – Not for Publication

Waterhemp Control 25 DAT (soybean, R1 stage) Brooklyn, WI 2020

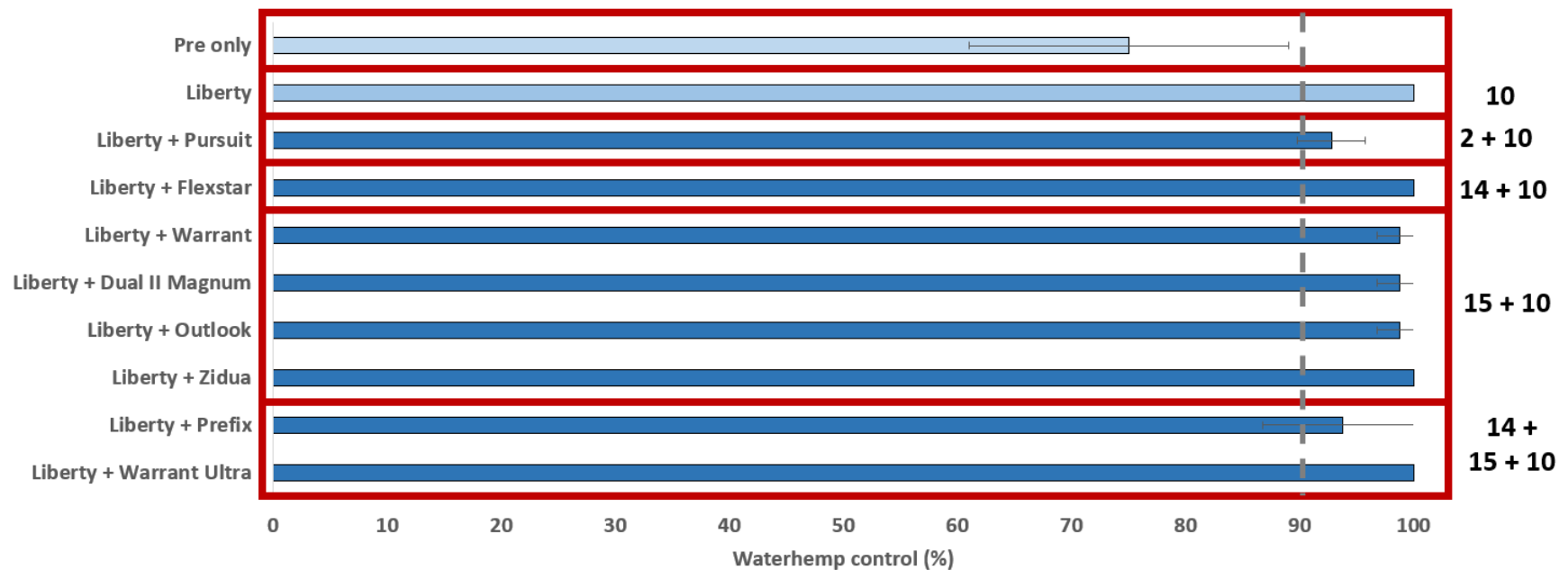


PRE: Authority MTZ 12 fl oz/ac

1 Year Data

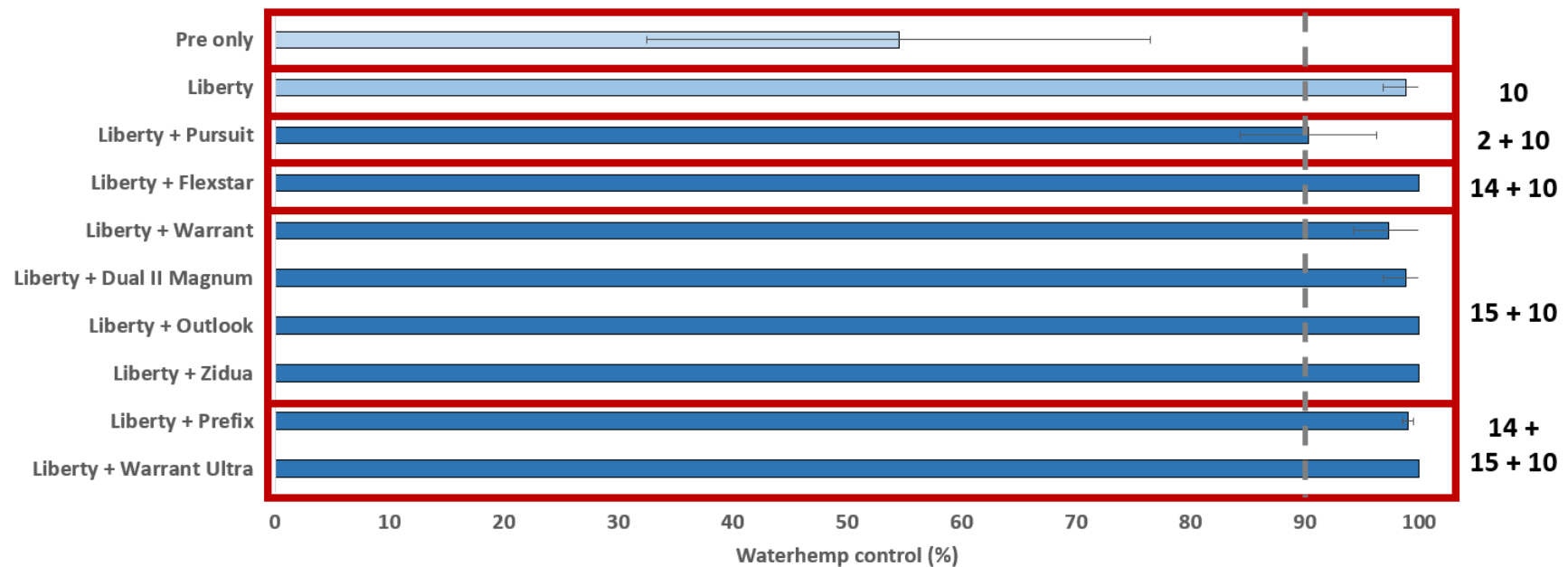
Preliminary Results – Not for Publication

Waterhemp Control 14 DAT (soybean, V4 stage) Lancaster, WI 2019



PRE: Authority MTZ 12 fl oz/ac

Waterhemp Control 25 DAT (soybean, R1 stage) Lancaster, WI 2019

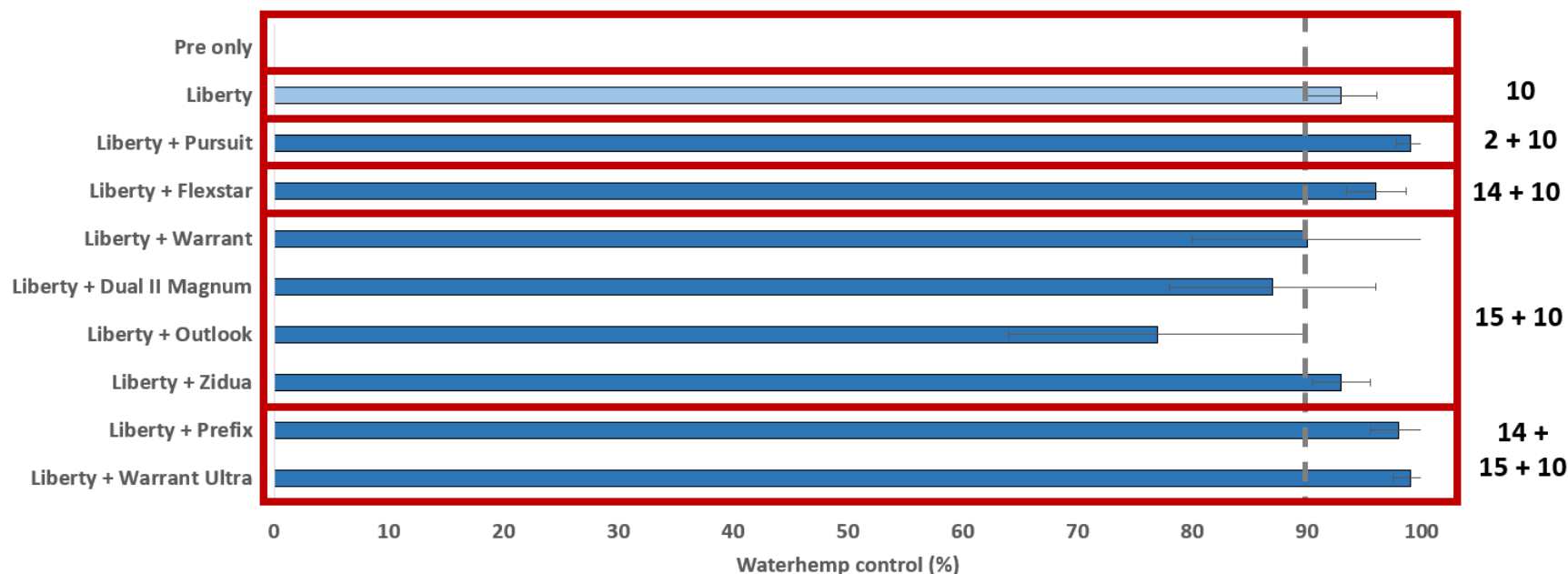


PRE: Authority MTZ 12 fl oz/ac

1 Year Data

Preliminary Results – Not for Publication

Waterhemp Control 14 DAT (soybean, V4 stage) Lancaster, WI 2020

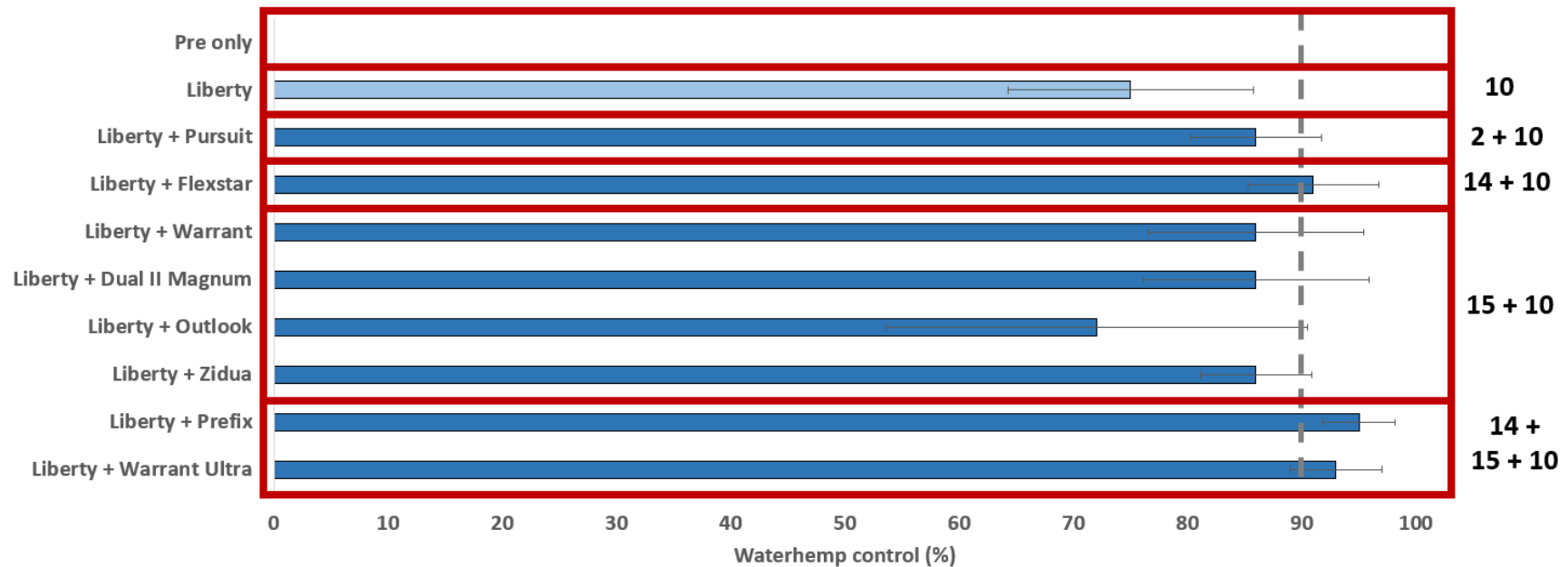


PRE: Authority MTZ 12 fl oz/ac

1 Year Data

Preliminary Results – Not for Publication

Waterhemp Control 25 DAT (soybean, R1 stage) Lancaster, WI 2020



PRE: Authority MTZ 12 fl oz/ac

1 Year Data

Preliminary Results – Not for Publication

Burndown Management of Waterhemp and Giant Ragweed – Bareground

SOA Group	Herbicide and adjuvant application rate (ac⁻¹)	Active ingredient [ai concentration lb gal⁻¹]
2	Pursuit (4 fl oz) + Ammonium Sulfate (AMS; 2 LB) + Crop Oil Concentrate (COC;1.25 % V/V)	imazethapyr [2.0]
2	Classic (0.75 oz)+ AMS (2 LB) + COC (1 % V/V)	chlorimuron-ethyl [25%]
2	FirstRate (0.3 oz) + AMS (2 LB) + COC (1.2 % V/V)	cloransulam-methyl [84%]
2	Python (1 oz) + AMS (2 LB) + COC (1 % V/V)	flumetsulam [80%]
4	Xtendimax (22 fl oz) + Class Act Ridion (1% V/V)	dicamba [2.9]
4	Enlist One (24 fl oz), 2020: (32 fl oz)* + AMS (2 LB)	2, 4-D [3.8]
4	Stinger (6 fl oz)	clopyralid [3.0]
5	Aatrex (32 fl oz) + COC (1.67 % V/V)	atrazine [4.0]
6	Buctril (24 fl oz)	bromoxynil [2.0]
6	Basagran 5L (25.6 fl oz) + AMS (2 LB) + COC (1 % V/V)	bentazon [5.0]
9	Roundup Powermax (32 fl oz) + AMS (2 LB)	glyphosate [5.5]
10	Liberty (32 fl oz) + AMS (2 LB)	glufosinate [2.34]
14	Cobra (12.5 fl oz) + AMS (2 LB) + COC (1.25 % V/V)	lactofen [2.0]
14	Flexstar (16 fl oz) + Methylated Seed Oil (MSO; 1 % V/V) + AMS (2 LB)	fomesafen [1.88]
14	Cadet (0.9 fl oz) + AMS (2 LB) + COC (1 %V/V)	fluthiacet-methyl [0.91]
14	Resource (8 fl oz) + AMS (2 LB) + COC (1.67 % V/V)	flumiclorac [0.86]
27	Callisto (3 fl oz) + AMS (2 LB) + COC (1 % V/V)	mesotrione [4.0]
27	Laudis (3 fl oz) + AMS (2 LB) + MSO (1 % V/V)	tembotrione [3.5]
27	Armezon (0.75 fl oz) + AMS (2 LB) + MSO (1 % V/V)	topramezone [2.8]
27	Balance Flexx (5 fl oz) + AMS (2 LB) + MSO (1 % V/V)	isoxaflutole [2.0]

*Enlist One rate adjusted in 2020 to better reflect common use rate in WI

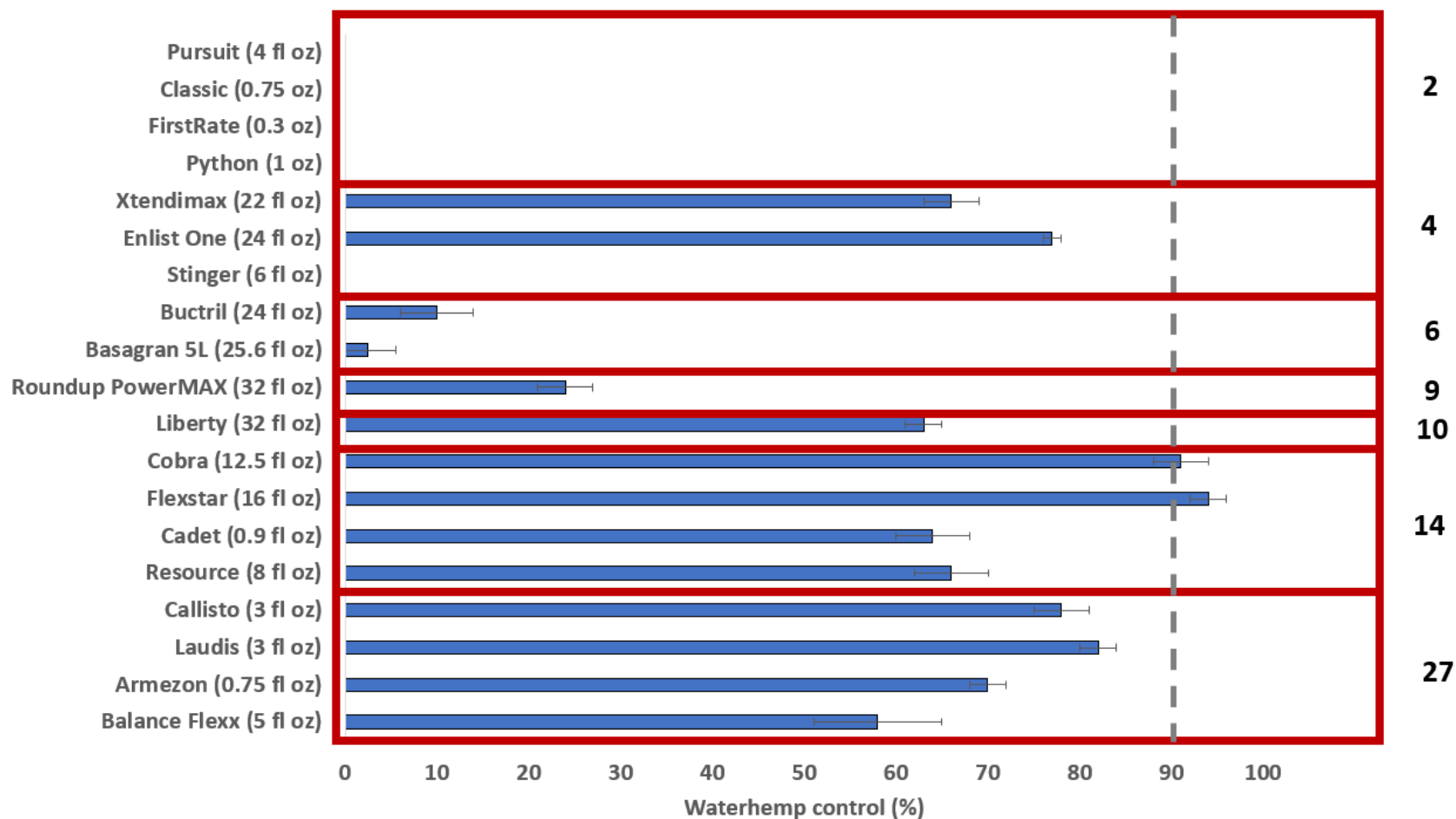
Burndown Management of Waterhemp and Giant Ragweed – Bareground

Preliminary Weed Control Ratings		Waterhemp 14 DAT			Giant Ragweed 14 DAT
SOA Group	Location	Brooklyn		Lancaster	Janesville
	Year	2019	2020	2019	2020
	Herbicide and application rate (ac ⁻¹)	Relative Rank			
2	Pursuit (4 fl oz)	5	5	5	5
2	Classic (0.75 oz)	5	5	5	5
2	FirstRate (0.3 oz)	5	5	5	5
2	Python (1 oz)	5	5	5	5
4	Xtendimax (22 fl oz)	4	2	2	1
4	Enlist One (24 fl oz)*	3	2	1	1
4	Stinger (6 fl oz)	5	5	5	3
5	Aatrex (32 fl oz)	-	-	4	3
6	Buctril (24 fl oz)	5	5	5	2
6	Basagran 5L (25.6 fl oz)	5	5	5	1
9	Roundup Powermax (32 fl oz)	5	4	2	1
10	Liberty (32 fl oz)	4	1	1	1
14	Cobra (12.5 fl oz)	1	2	1	1
14	Flexstar (16 fl oz)	1	2	1	2
14	Cadet (0.9 fl oz)	4	5	3	5
14	Resource (8 fl oz)	4	5	2	4
27	Callisto (3 fl oz)	3	2	1	1
27	Laudis (3 fl oz)	2	2	1	1
27	Armezon (0.75 fl oz)	3	3	1	1
27	Balance Flexx (5 fl oz)	5	2	1	1

* Enlist One rate adjusted in 2020 to better reflect common use rate in WI

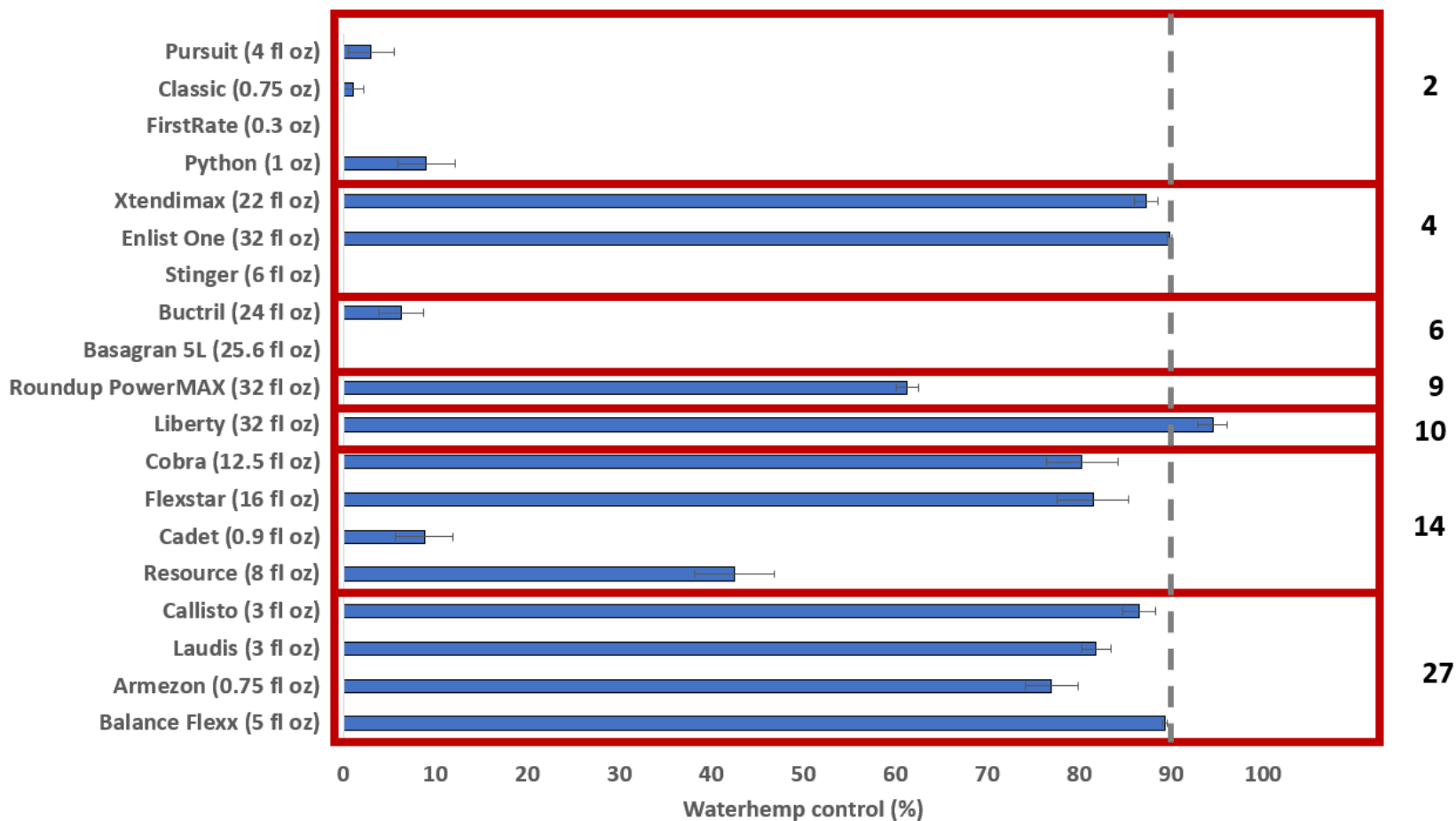
Rank: (1) ≥ 90% control (2) 80-89 % (3) 70-79% (4) 60-69% (5) < 60%

Waterhemp Control 14 DAT - Brooklyn, WI 2019



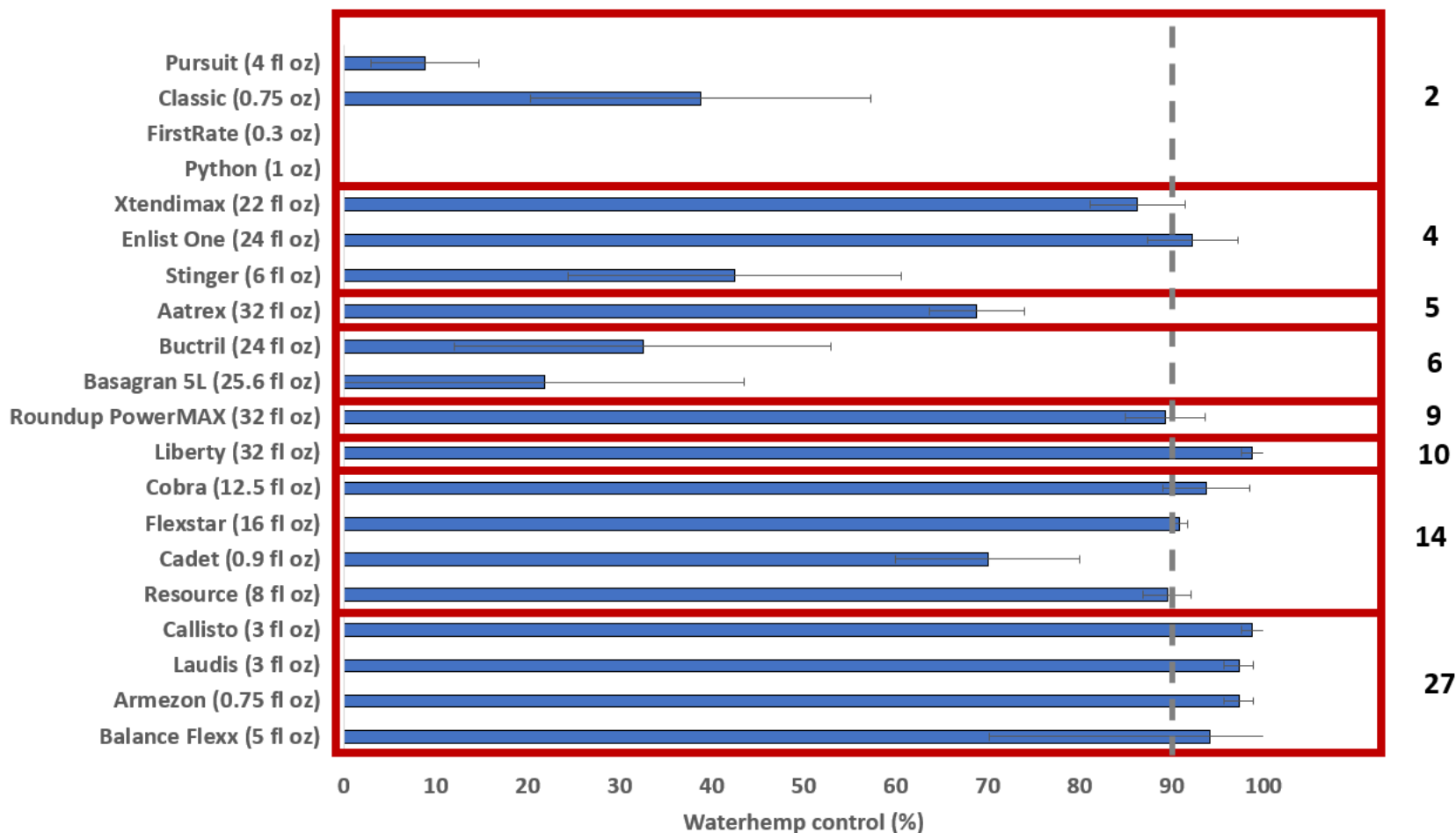
1 Year Data
Preliminary Results – Not for Publication

Waterhemp Control 14 DAT - Brooklyn, WI 2020



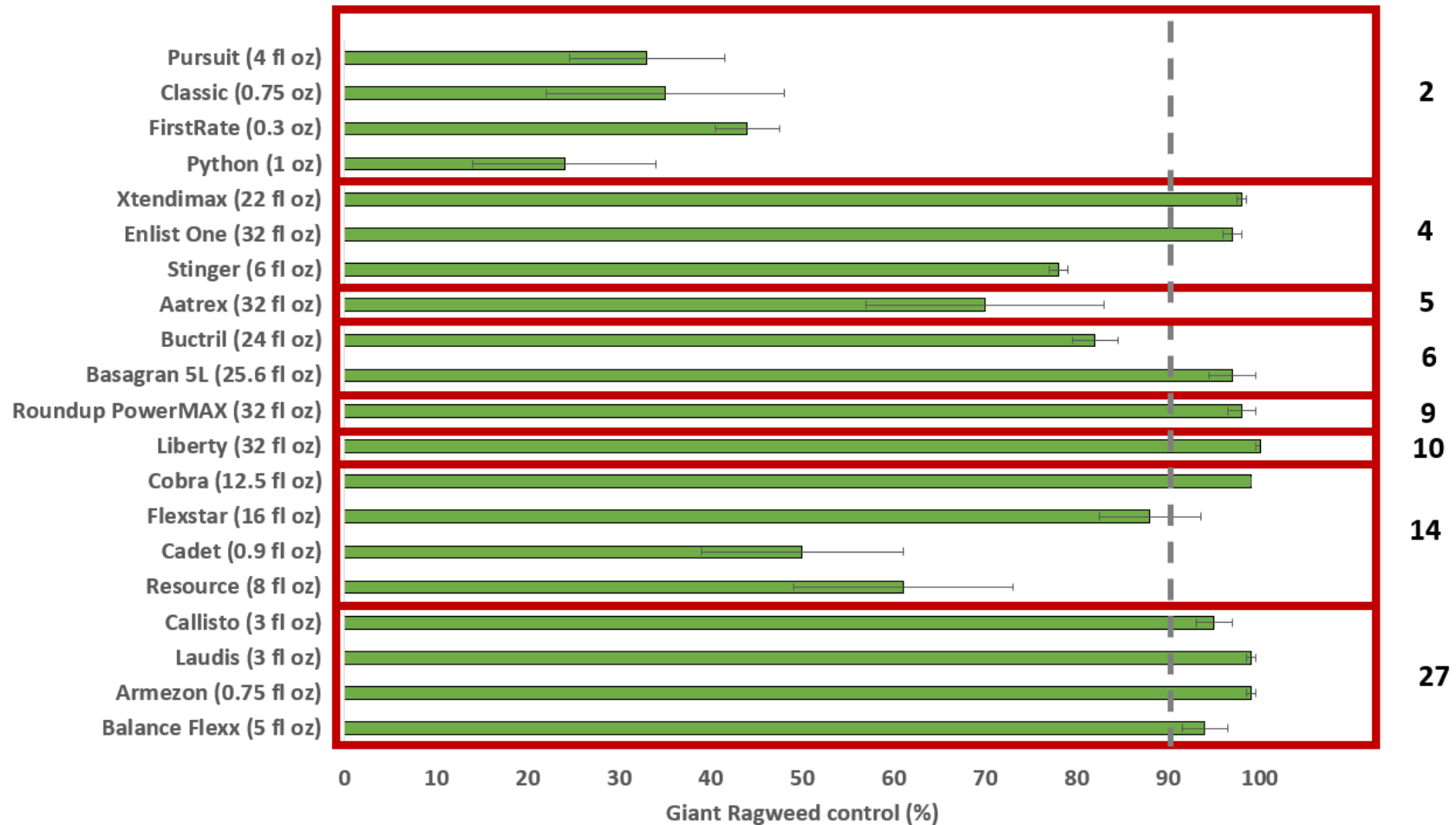
1 Year Data
Preliminary Results – Not for Publication

Waterhemp Control 14 DAT - Lancaster, WI 2019



1 Year Data
Preliminary Results – Not for Publication

Giant Ragweed Control 14 DAT - Janesville, WI 2020



1 Year Data
Preliminary Results – Not for Publication

Trial Site Description:

PRE Evaluation for Giant Ragweed Residual Control						
Location	Year	Previous Crop	Soil Type	% OM	pH	Planting Date
Janesville	2019	corn	Plano silt loam	3.3	7.0	5/15
	2020	corn	Plano silt loam	3.3	7.0	5/12
Systems Approach for Waterhemp Management						
Brooklyn	2019	soybean	Kengonsa silt loam	2.0	7.1	5/31
	2020	soybean	Kengonsa silt loam	2.0	7.1	5/22
Lancaster	2019	corn	Orion silt loam	2.6	7.5	6/3
	2020	corn	Fayette silt loam	2.4	7.3	5/20
Burndown Management of Waterhemp and Giant Ragweed						
Brooklyn	2019	soybean	Kengonsa silt loam	2.0	7.1	-
	2020	soybean	Kengonsa silt loam	2.0	7.1	-
Lancaster	2019	soybean	Fayette silt loam	2.4	7.3	-
Janesville	2020	corn	Plano silt loam	3.3	6.7	-

*All trials established following tillage.

**Soybeans planted at 140,000 seeds/acre at 1-1.5 inch depth.

Herbicide Application Information:

PRE Evaluation for Giant Ragweed Residual Control								
Location	Year	App. Date	Air Temp. (F)	Nozzle Tips	Pressure (psi)	Predominant Species	Density (ft ²)	Height (in)
Janesville	2019	5/16	61	TTI 110015	35	giant ragweed	0.1-2	-
	2020	5/27	58	TTI 110015	34	giant ragweed	0.5-5	-
Systems Approach for Waterhemp Management								
Brooklyn	2019	6/27	82	AIXR 110015	36	waterhemp	4-10	0.5-1
	2020	6/17	87	TTJ 110015	36	waterhemp	1-10	0.5-2.5
Lancaster	2019	7/5	86	XRFF 11002	25	waterhemp	0-5	0.5-16
	2020	6/23	70	TTJ 110015	34	waterhemp	0-6	1-3.5
Burndown Management of Waterhemp and Giant Ragweed								
Brooklyn	2019	6/27	82	TTI 110015	35	waterhemp	60-150	0.5-3
	2020	6/17	83	TTJ 110015*	34	waterhemp	12-46	1-5
Lancaster	2019	7/5	87	XRFF 11002	24	waterhemp	5-25	1-3
Janesville	2020	5/27	84	TTJ 110015*	34	giant ragweed	0.5-7	1-4

*TTI 110015 nozzle tips were used for the Xtendimax and Enlist One treatments.

For Questions and Additional Information:

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