2020 Pest Management Update Virtual Meetings

November 10 – 12, 2020

Herbicide-Resistant Waterhemp and Protecting our Tools for Management

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Outline

- Waterhemp Herbicide Resistance Update
- Residual Control of Giant Ragweed in Soybean
- Layered Approach of Soil Residual Herbicides for Waterhemp Control
- Comparison of Burndown Products for Waterhemp Control
- Update on Dicamba Registration

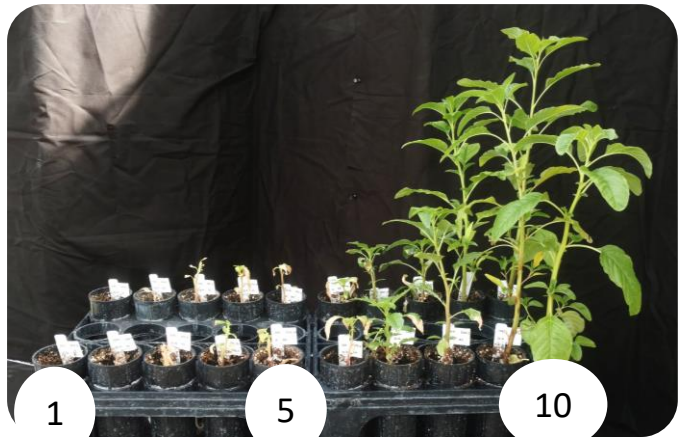
Waterhemp Herbicide Resistance Screening

Seed samples received from 88 WI fields in fall of 2018

POST – 21 DAT – Visual Evaluation (VE) 1-10 scale

1 = dead plant, 10 = completely healthy

Populations determined resistant if > 50% of plants had VE ≥ 5



PRE – 28 DAT – Live Plant Stand Counts Taken

Populations determined resistant if average % stand reduction ≤ 90%

MS Research: Felipe Faleco, UW-Madison WiscWeeds Program

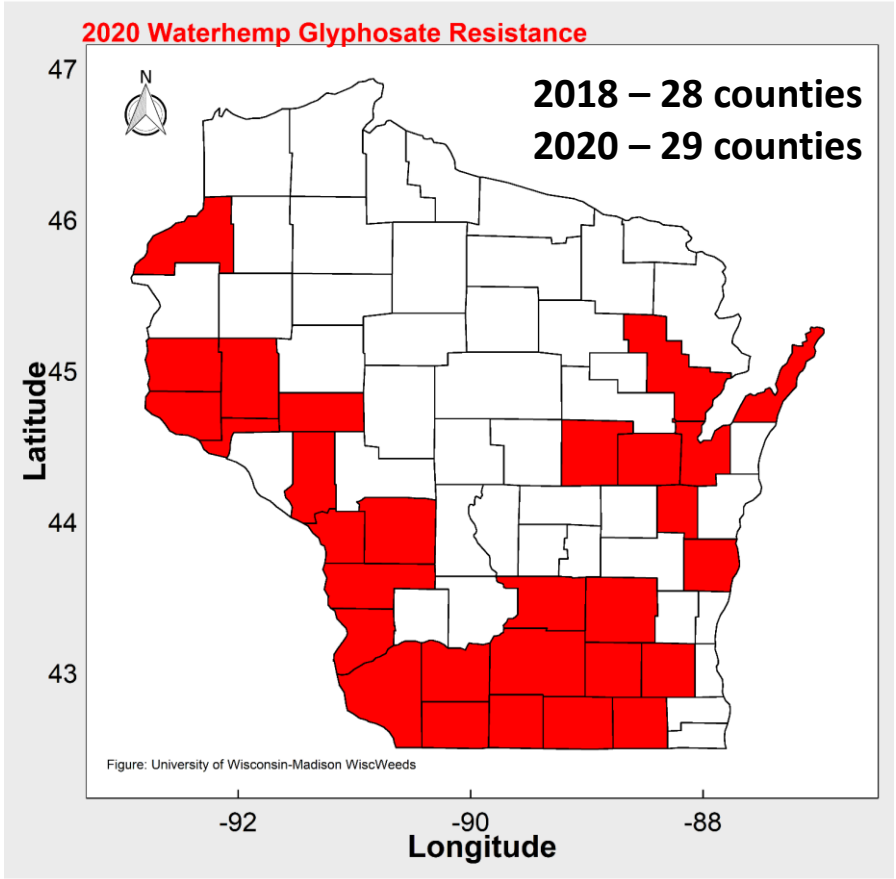
Waterhemp POST Screening

- Preliminary Results -

SOA Group	Treatment	Populations Screened	% Resistant Populations
2	1x imazethapyr	82	99%
	3x imazethapyr		94%
5	1x atrazine	80	11%
	3x atrazine		4%
9	1x glyphosate	86	95%
	3x glyphosate		78%

Population determined resistant if ≥ 50% of treated plants have VE ≥ 5

1x imazethapyr = 4 fl oz Pursuit
1x atrazine = 2 pts Aatrex 4L
1x glyphosate = 22 fl oz Roundup Powermax



MS Research: Felipe Faleco, UW-Madison WiscWeeds Program

Data Source: University of Illinois Plant Clinic; University of Wisconsin-Madison Weed Science; Faleco et al. 2020

Waterhemp POST Screening

- Preliminary Results -

SOA Group	Treatment	Populations Screened	# Treated Plants	# Plants Survived (%)	% Resistant Populations
4	1x dicamba	29	379	159 (40%)	0%
	3x dicamba		376	15	0%
	1x 2,4-D		379	83 (22%)	3%
	3x 2,4-D		373	5	0%
10	1x glufosinate	26	402	0	0%
	3x glufosinate			0	0%
14	1x fomesafen			26 (6%)	0%
	3x fomesafen			6 (1%)	0%
27	1x mesotrione			34 (8%)	0%
	3x mesotrione			0	0%

1x dicamba = 22 fl oz Xtendimax
1x 2,4-D = 1.5 pts Enlist One
1x glufosinate = 32 fl oz Liberty
1x fomesafen = 1 pt Flexstar
1x mesotrione = 3 oz Callisto

Population determined resistant if ≥ 50% of treated plants have VE ≥ 5

MS Research: Felipe Faleco, UW-Madison WiscWeeds Program

dicamba

2,4-D

MS Research: Felipe Faleco, UW-Madison WiscWeeds Program

Waterhemp PRE Screening

- Preliminary Results -

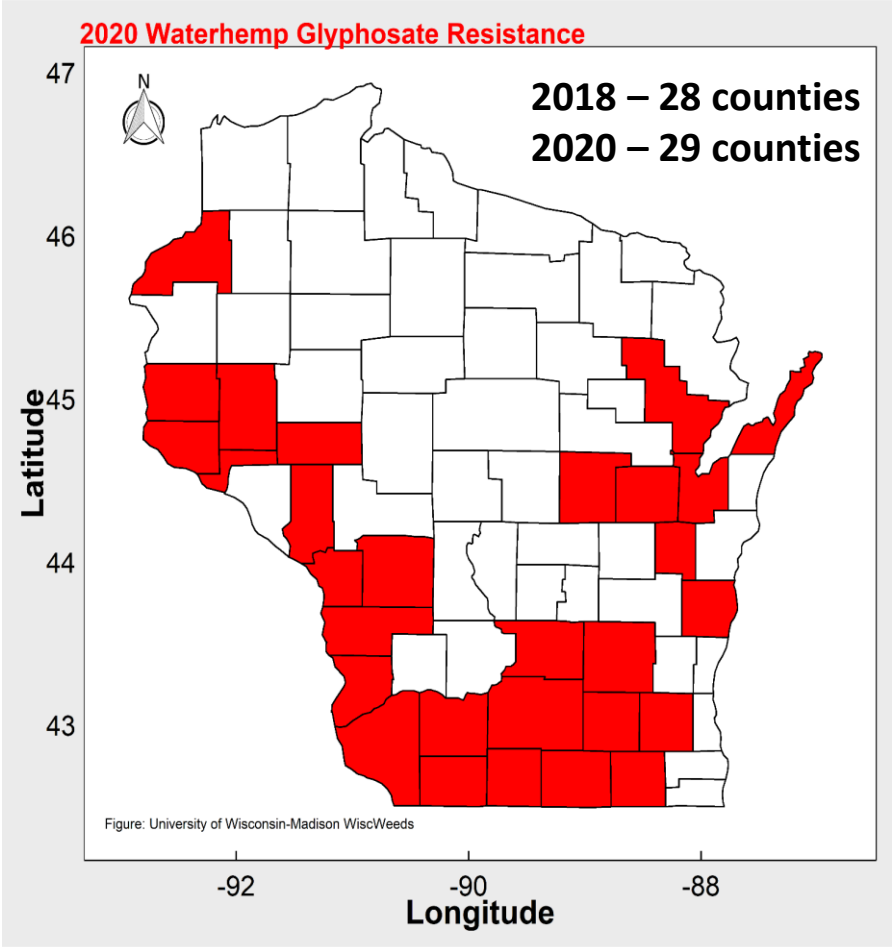
SOA Group	Treatment	Populations Screened	% Resistant Populations
5	0.5x atrazine	29	93%
	1x atrazine		72%
	3x atrazine		34%
	0.5x metribuzin		0%
	1x metribuzin		0%
	3x metribuzin		0%
14	0.5x fomesafen	30	10%
	1x fomesafen		3%
	3x fomesafen		0%

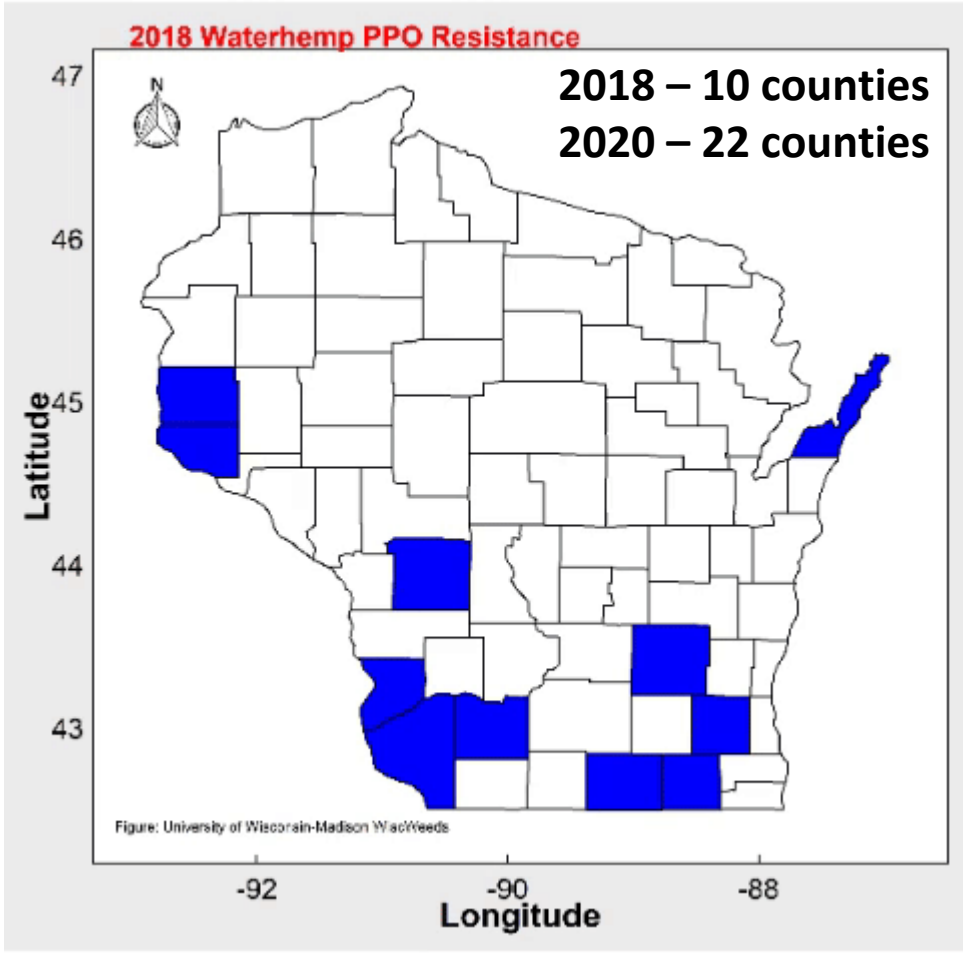
SOA Group	Treatment	Populations Screened	% Resistant Populations
15	0.5x S-metolachlor	30	3%
	1x S-metolachlor		0%
	3x S-metolachlor		0%
27	0.5x mesotrione		3%
	1x mesotrione		0%
	3x mesotrione		0%

Population determined resistant if average % stand reduction ≤ 90%

1x atrazine = 2 pts Aatrex 4L
1x metribuzin = 10.7 oz Tricor DF
1x fomesafen = 1 pt Flexstar
1x S-metolachlor = 26.7 fl oz Dual II Magnum
1x mesotrione = 7.7 fl oz Callisto

Prevalence of Waterhemp Resistance



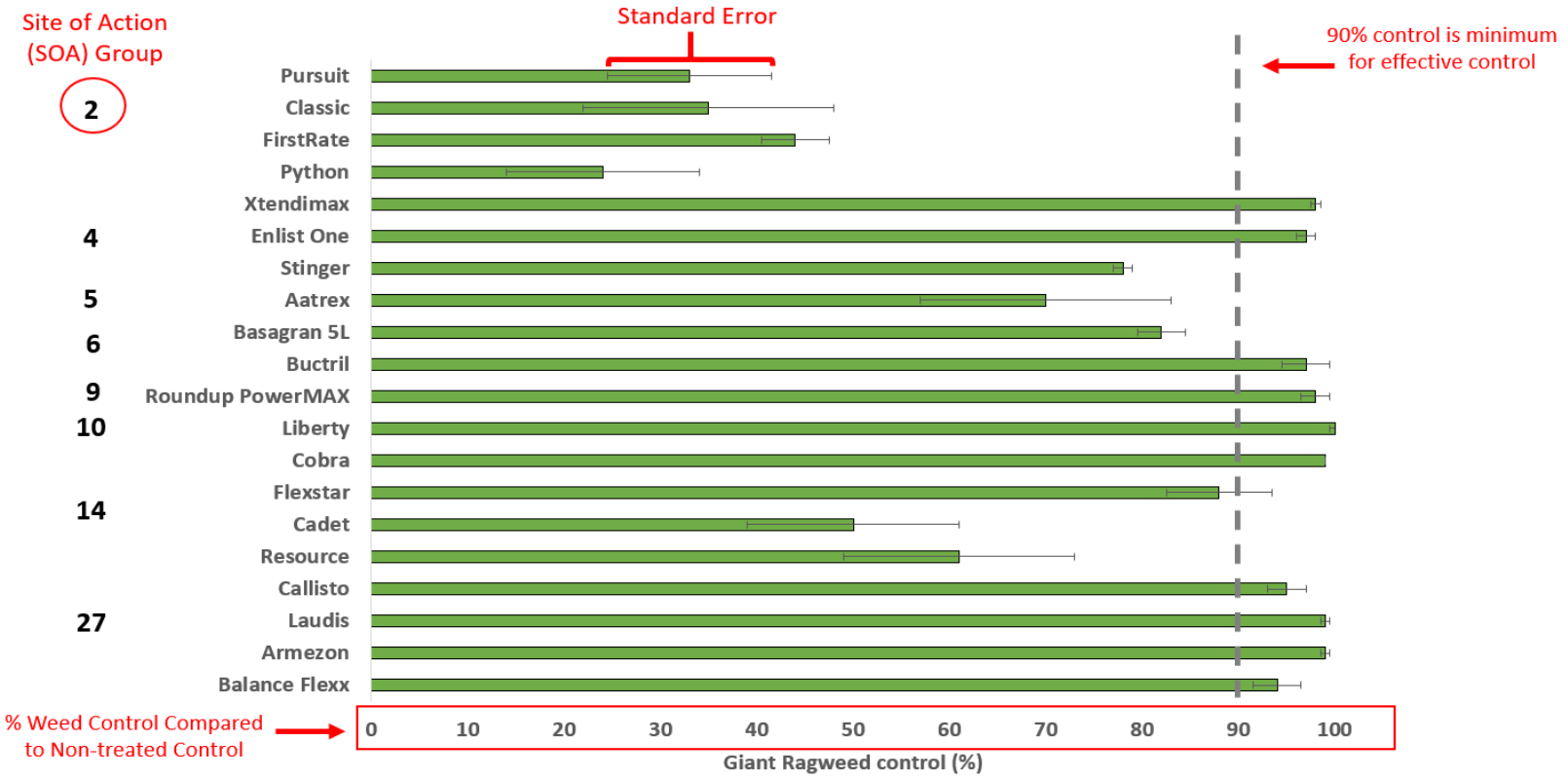


Data Source: University of Illinois Plant Clinic; University of Wisconsin-Madison Weed Science; Faleco et al. 2020

Outline

- Residual Control of Giant Ragweed in Soybean
- Layered Approach of Soil Residual Herbicides for Waterhemp Control
- Comparison of Burndown Products for Waterhemp Control
- Update on Dicamba Registration

Chart Interpretation Key



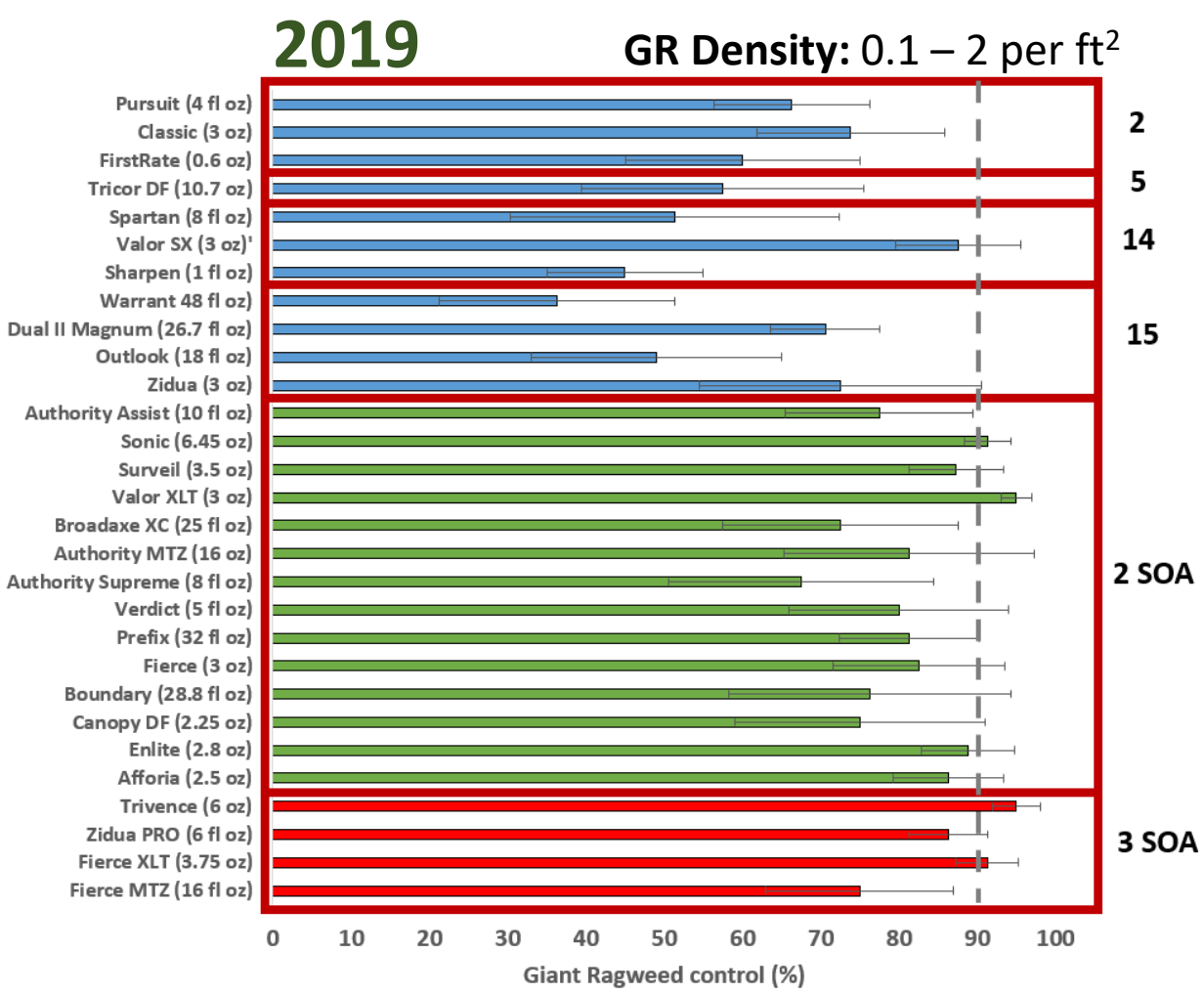
2020 Pest Management Update Meetings

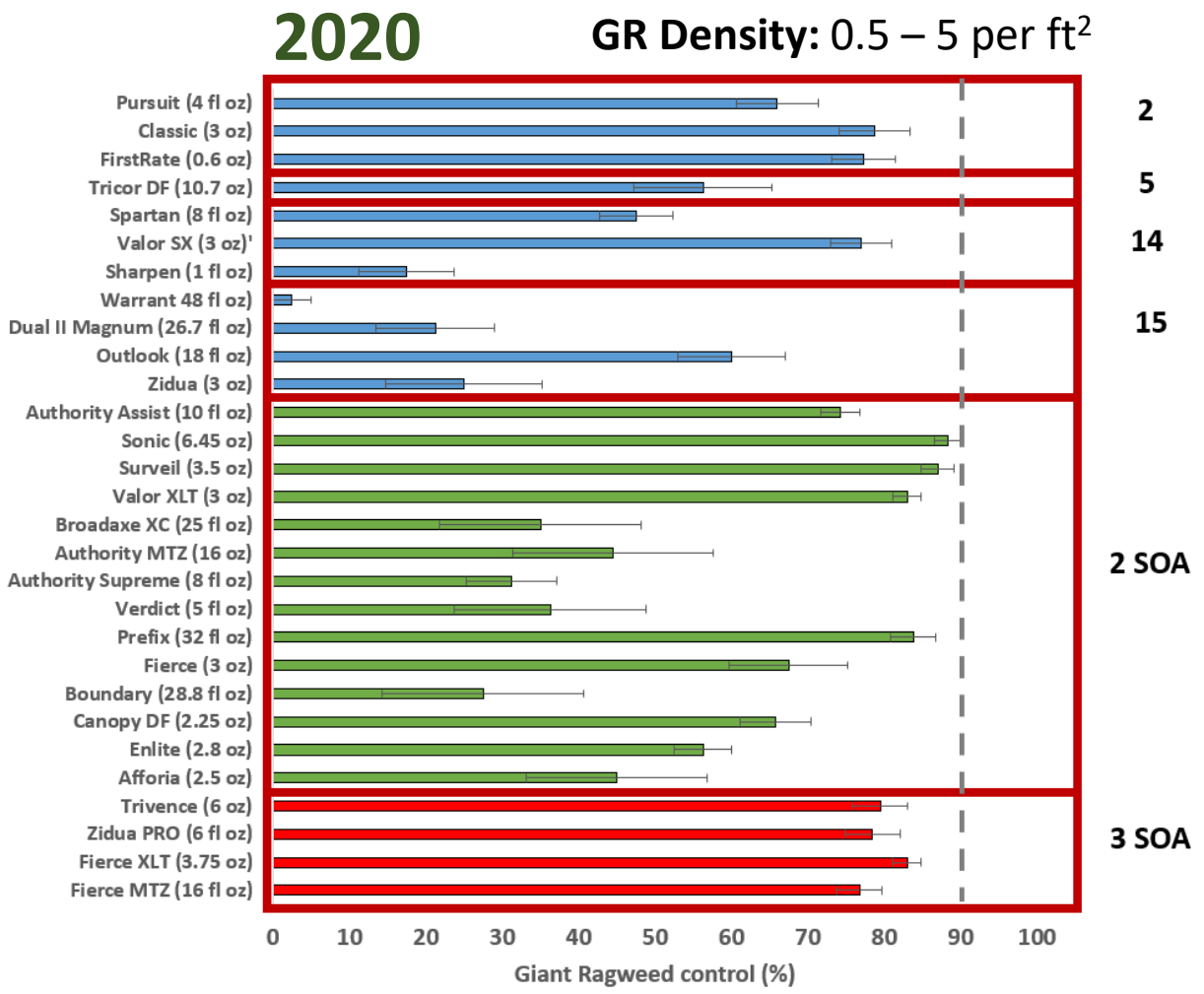
WiscWeeds
Research Update

Cropping Systems Weed Science
UNIVERSITY OF WISCONSIN-MADISON

PDF available following today's meeting

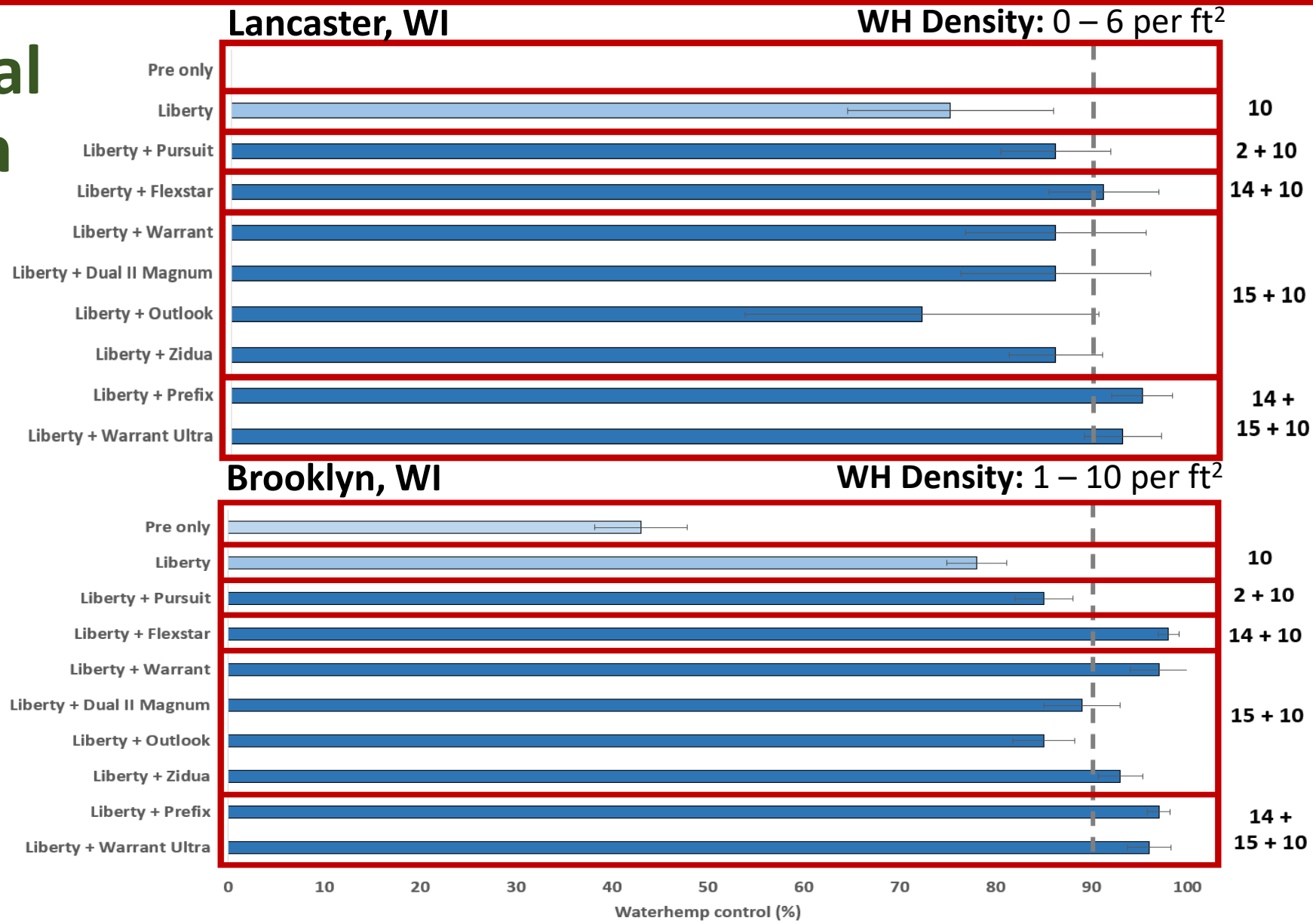
Giant Ragweed PRE Residual Control in Soybean – 25 DAT





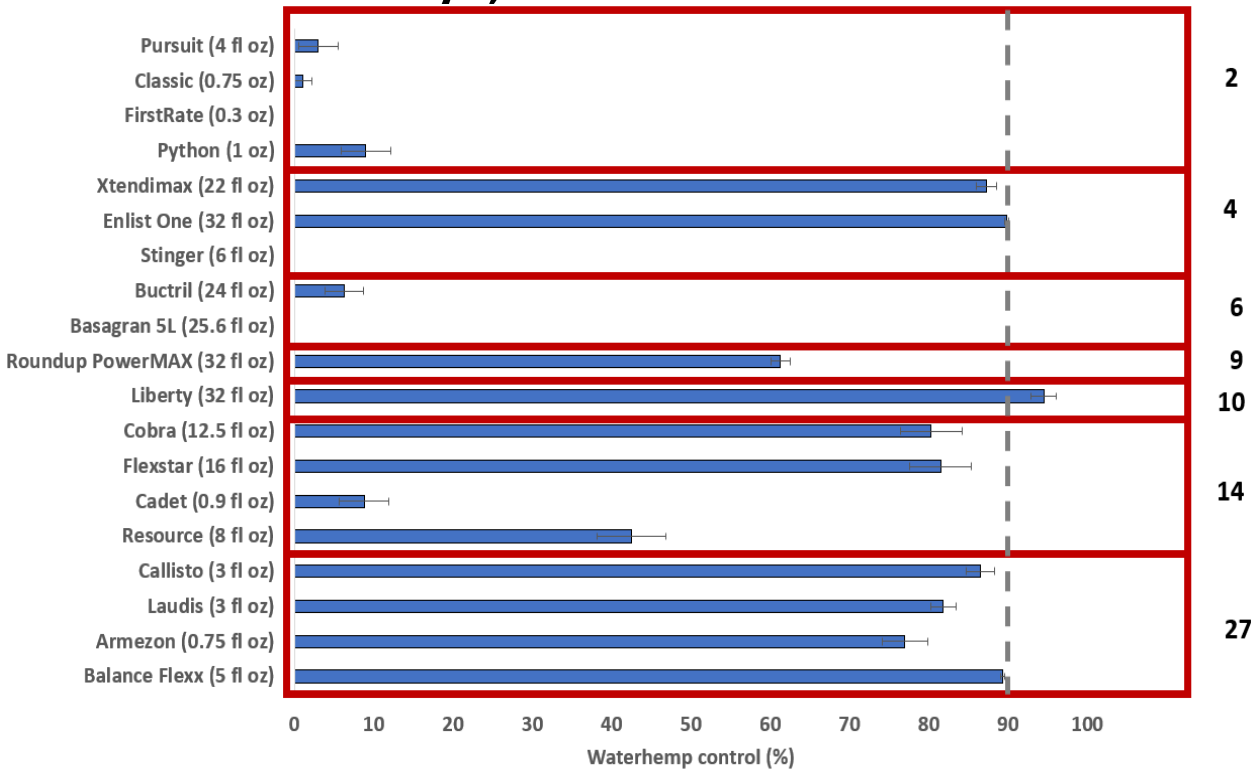
Waterhemp Residual Control in Soybean 25 DAT

PRE : 12 fl oz Authority MTZ

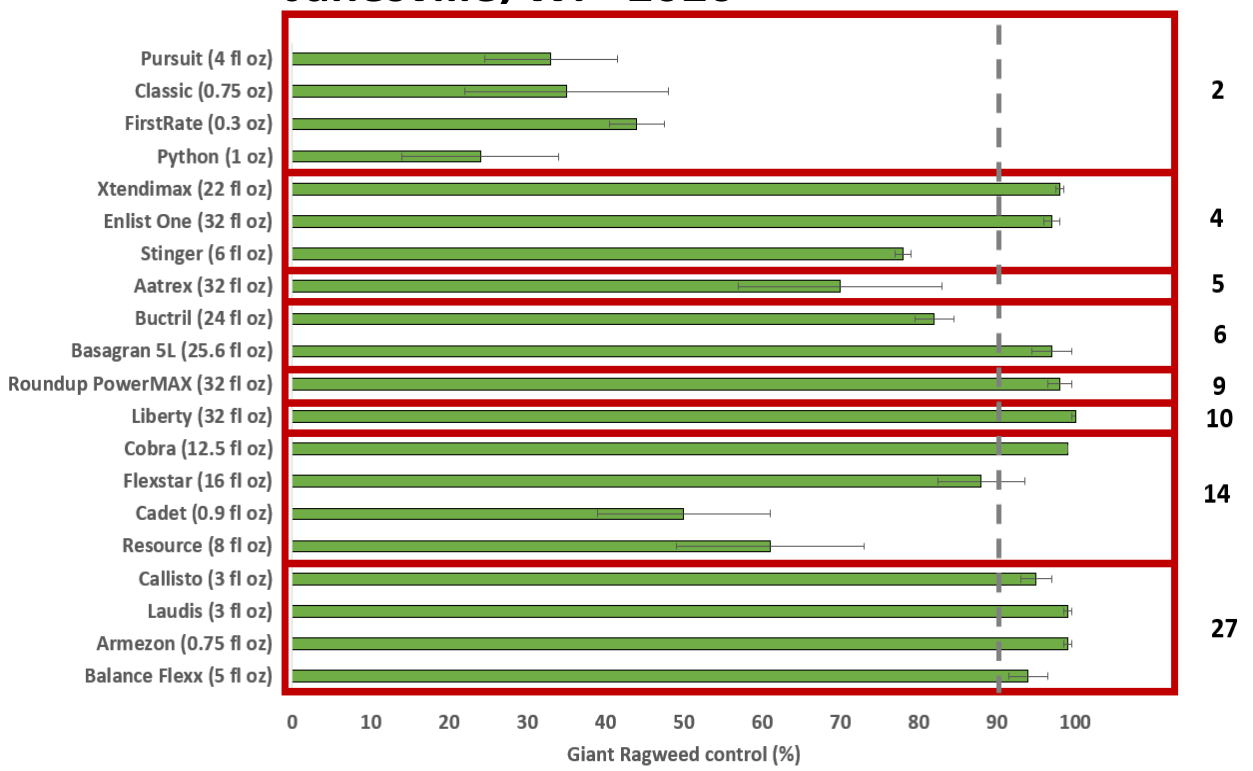


Burndown Control Comparison – 14 DAT

Brooklyn, WI - 2020



Janesville, WI - 2020



Waterhemp Density: 12 – 46 per ft^2

Giant Ragweed Density: 0.5 – 7 per ft^2

Preliminary Results – Not for Publication

EPA United States Environmental Protection Agency

Environmental Topics | Laws & Regulations | About EPA | Search EPA.gov

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News Releases

News Releases from Headquarters > Chemical Safety and Pollution Prevention (OCSPP)

EPA Announces 2020 Dicamba Registration Decision

10/27/2020

Contact Information:
EPA Press Office (press@epa.gov)

Brooklet, Ga. (October 27, 2020) — At the Cromley Farm, U.S. Environmental Protection Agency (EPA) Administrator Andrew Wheeler announced that EPA is approving new five-year registrations for two dicamba products and extending the registration of an additional dicamba product. All three registrations include new control measures to ensure these products can be used effectively while protecting the environment, including non-target plants, animals, and other crops not tolerant to dicamba.

"With today's decision, farmers now have the certainty they need to make plans for their 2021 growing season," **said EPA Administrator Andrew Wheeler.** "After reviewing substantial amounts of new information, conducting scientific assessments based on the best available science, and carefully considering input from stakeholders we have reached a resolution that is good for our farmers and our environment."

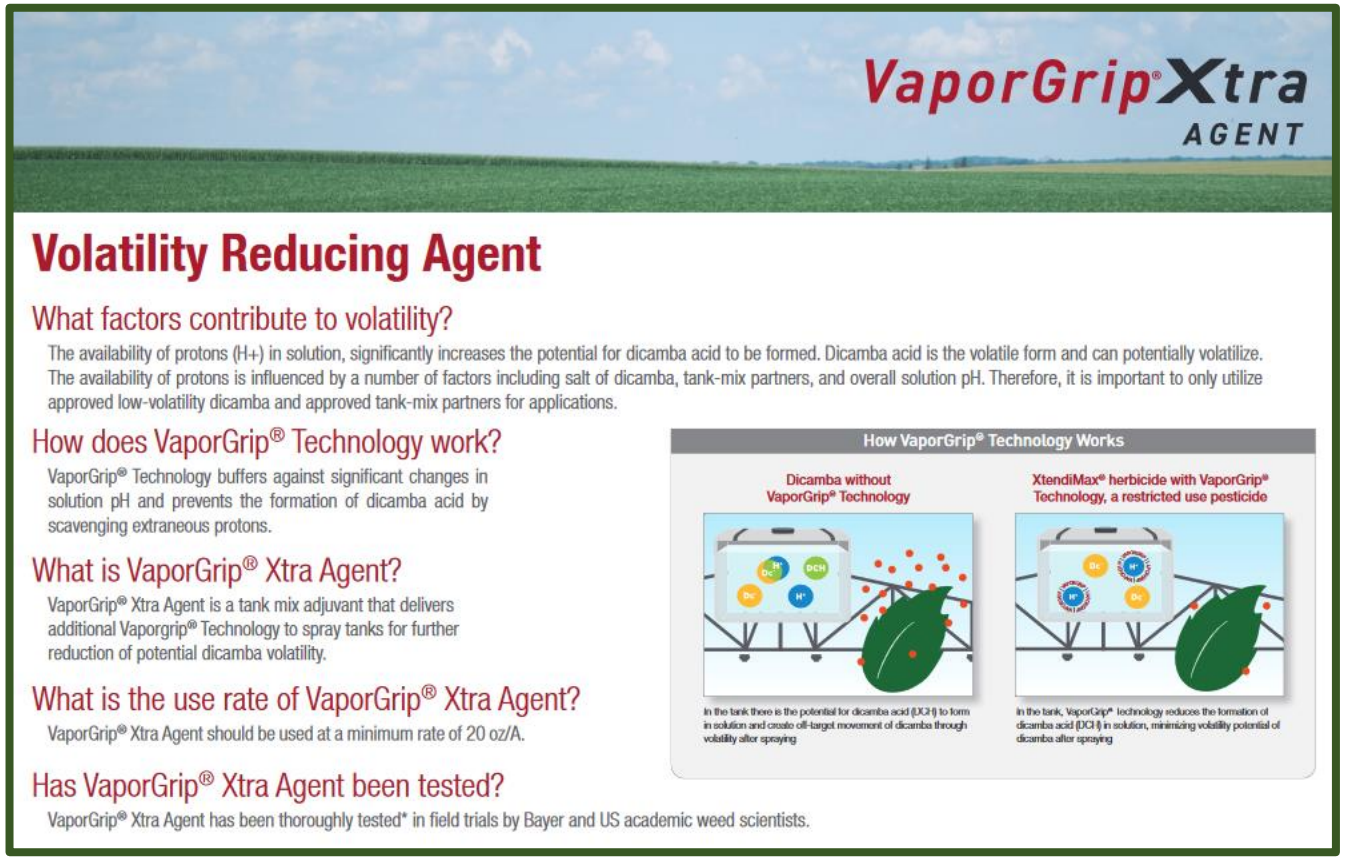
Through today's action, EPA approved new registrations for two "over-the-top" (OTT) dicamba products—XtendiMax with VaporGrip Technology and Engenia Herbicide—and extended the registration for an additional OTT dicamba product, Tavium Plus VaporGrip Technology. These registrations are only for use on dicamba-tolerant (DT) cotton and soybeans and will expire in 2025, providing certainty to American agriculture for the upcoming growing season and beyond.

To manage off-site movement of dicamba, EPA's 2020 registration features important control measures, including:

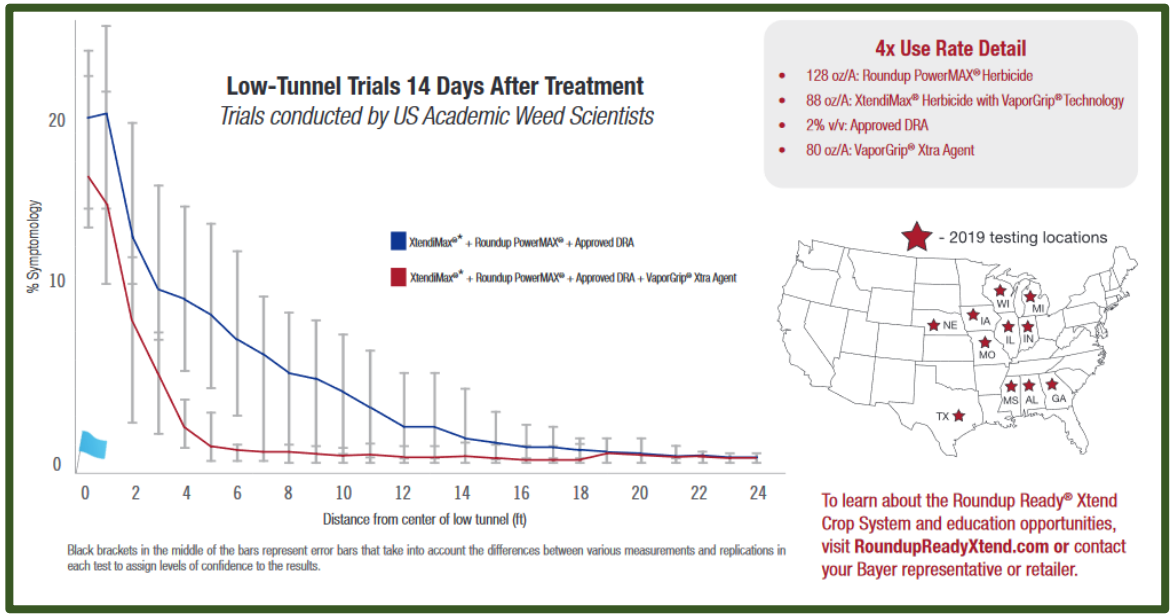
- Requiring an approved pH-buffering agent (also called a Volatility Reduction Agent or VRA) be tank mixed with OTT dicamba products prior to all applications to control volatility.
- Requiring a downwind buffer of 240 feet and 310 feet in areas where listed species are located.
- Prohibiting OTT application of dicamba on soybeans after June 30 and cotton after July 30.
- Simplifying the label and use directions so that growers can more easily determine when and how to properly apply dicamba.

https://www.epa.gov/newsreleases/epa-announces-2020-dicamba-registration-decision

VaporGrip® Xtra = acetic acid–acetate buffering syster



https://www.roundupreadyxtend.com/Documents/vgxagent-one-sheet.pdf



https://www.roundupreadyxtend.com/Documents/vgxagent-one-sheet.pdf

Weed Technology

www.cambridge.org/wet

Spray solution pH and soybean injury as influenced by synthetic auxin formulation and spray additives

Sarah Striegel[1], Maxwel C. Oliveira[2], Nicholas Arneson[3], Shawn P. Conley[4], David E. Stoltenberg[4] and Rodrigo Werle[5]

[1]Graduate Student, Department of Agronomy, University of Wisconsin-Madison, Madison, WI, USA; [2]Postdoctoral Researcher, Department of Agronomy, University of Wisconsin-Madison, Madison, WI, USA; [3]Research Associate, Department of Agronomy, University of Wisconsin-Madison, Madison, WI, USA; [4]Professor, Department of Agronomy, University of Wisconsin-Madison, Madison, WI, USA and [5]Assistant Professor, Department of Agronomy, University of Wisconsin-Madison, Madison, WI, USA

Research Article

Cite this article: Striegel S, Oliveira MC, Arneson N, Conley SP, Stoltenberg DE, Werle R (2020) Spray solution pH and soybean injury as influenced by synthetic auxin formulation and spray additives. Weed Technol. doi: 10.1017/wet.2020.89

Table 5. Mean solution pH and 95% CIs for laboratory experiment 2 as affected by GLY-K and pH buffer addition.

Treatment solution components[ab]				1× Treatment rate			4× Treatment rate		
Dicamba formulation	GLY formulation	DRA	pH buffer	Mean pH[c]	95% CI		Mean pH[c]	95% CI	
		yes/no			lower limit	upper limit		lower limit	upper limit
DGA+VG	None	Yes	None	6.17	6.14	6.20	5.48	5.45	5.51
DGA+VG	GLY-K	Yes	None	4.96	4.93	4.98	4.80	4.77	4.83
DGA+VG	None	Yes	MON 51817	6.30	6.27	6.33	6.12	6.09	6.14
DGA+VG	GLY-K	Yes	MON 51817	5.34	5.31	5.37	5.42	5.39	5.45
HSD					0.01				

[a]Abbreviations: DGA, diglycolamine salt of dicamba; CI, confidence interval; DRA, drift reduction agent; GLY, glyphosate; GLY-K, potassium salt of glyphosate; HSD, honest significant difference; VG, VaporGrip® (acetic acid-acetate buffer).
[b]Average pH of water source used was 7.70.
[c]Means separation used was Tukey HSD at $P < 0.05$.

https://doi.org/10.1017/wet.2020.89

WiscWeeds Research Update Series: Articles 1 & 2

WiscWeeds Research Coalition

Extension UNIVERSITY OF WISCONSIN-MADISON

Weed Seed Movement via Combines: 2019-2020 Case Study

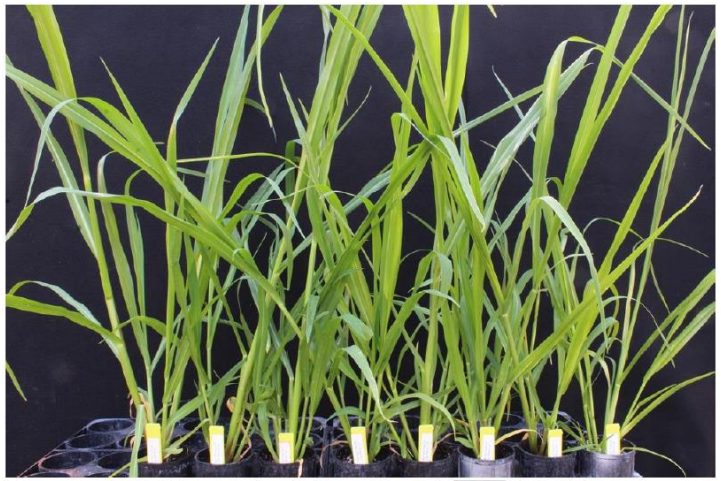
Authors: Nicholas J. Arneson, Cropping Systems Weed Science Outreach Specialist; Daniel H. Smith, Southwest Regional Outreach Specialist, Nutrient and Pest Management Program; and Rodrigo Werle, Assistant Professor and Extension Cropping Systems Weed Scientist, University of Wisconsin-Madison

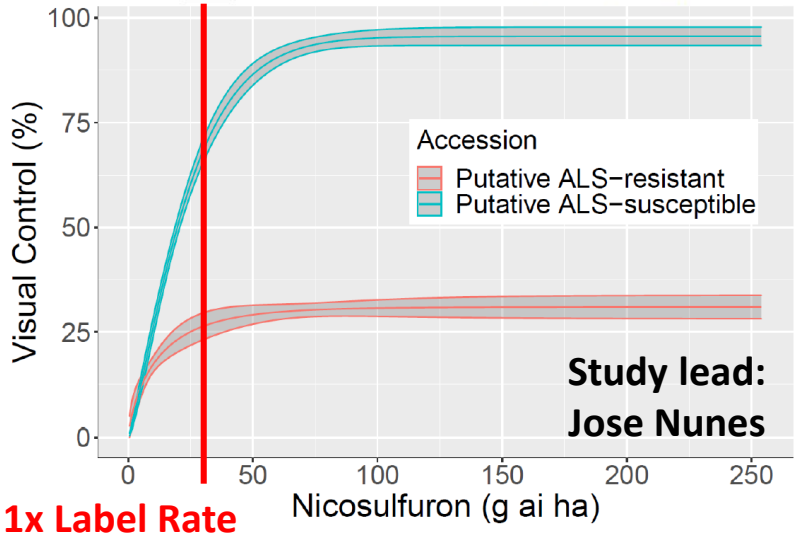
TAKE HOME POINTS

- ✓ Weed seeds replenish the soil seedbank and increase opportunity for herbicide resistance. **Do not let weeds go to seed. No Seed, No Weed!**
- ✓ The part of the combine with the highest number of weed seed was the header, followed by the feeder house, rock trap and rotor.
- ✓ Most frequently observed weeds were grasses, pigweeds & lambsquarters.

Study lead:
Nick Arneson

Putative ALS-resistant Fall Panicum



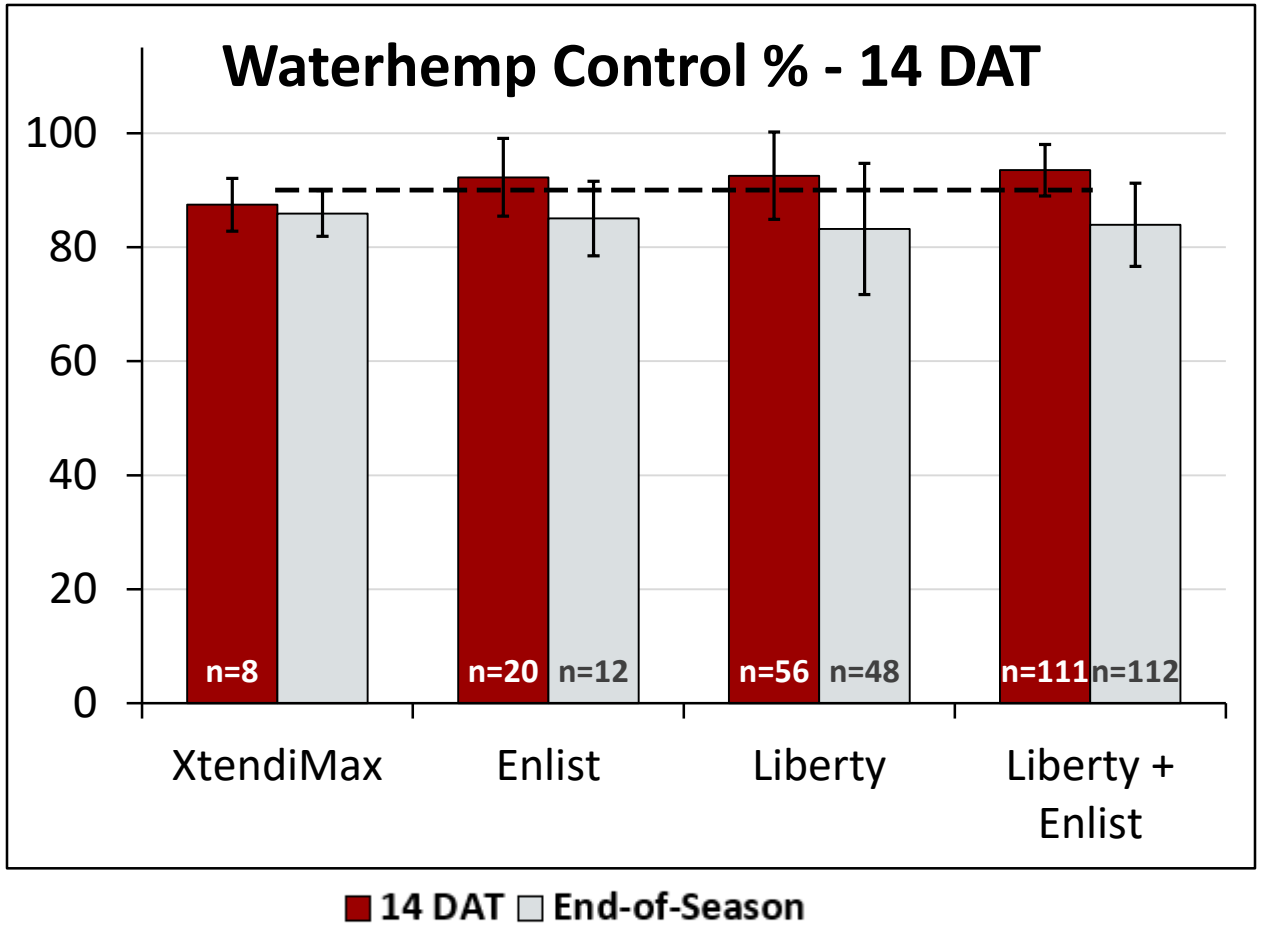


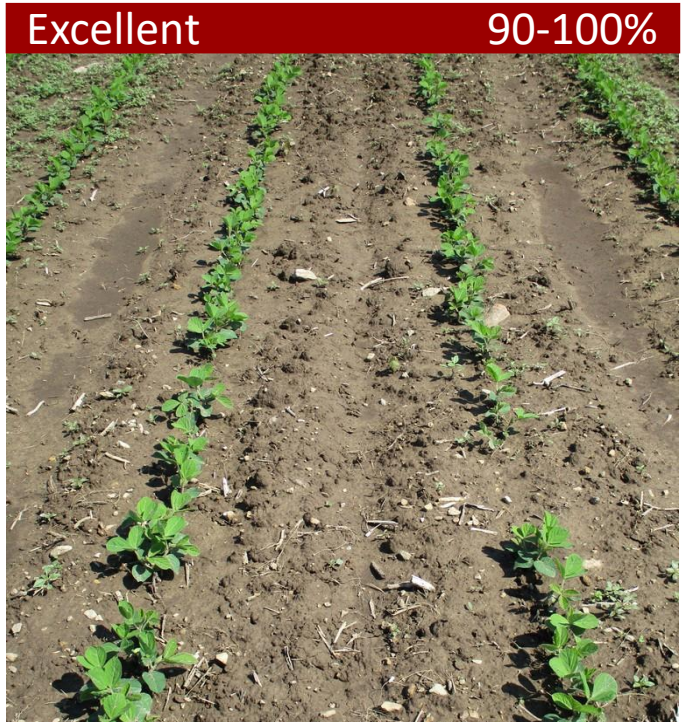
1x Label Rate

Marestail Screening

Study lead:
Dr. Alex Rosa

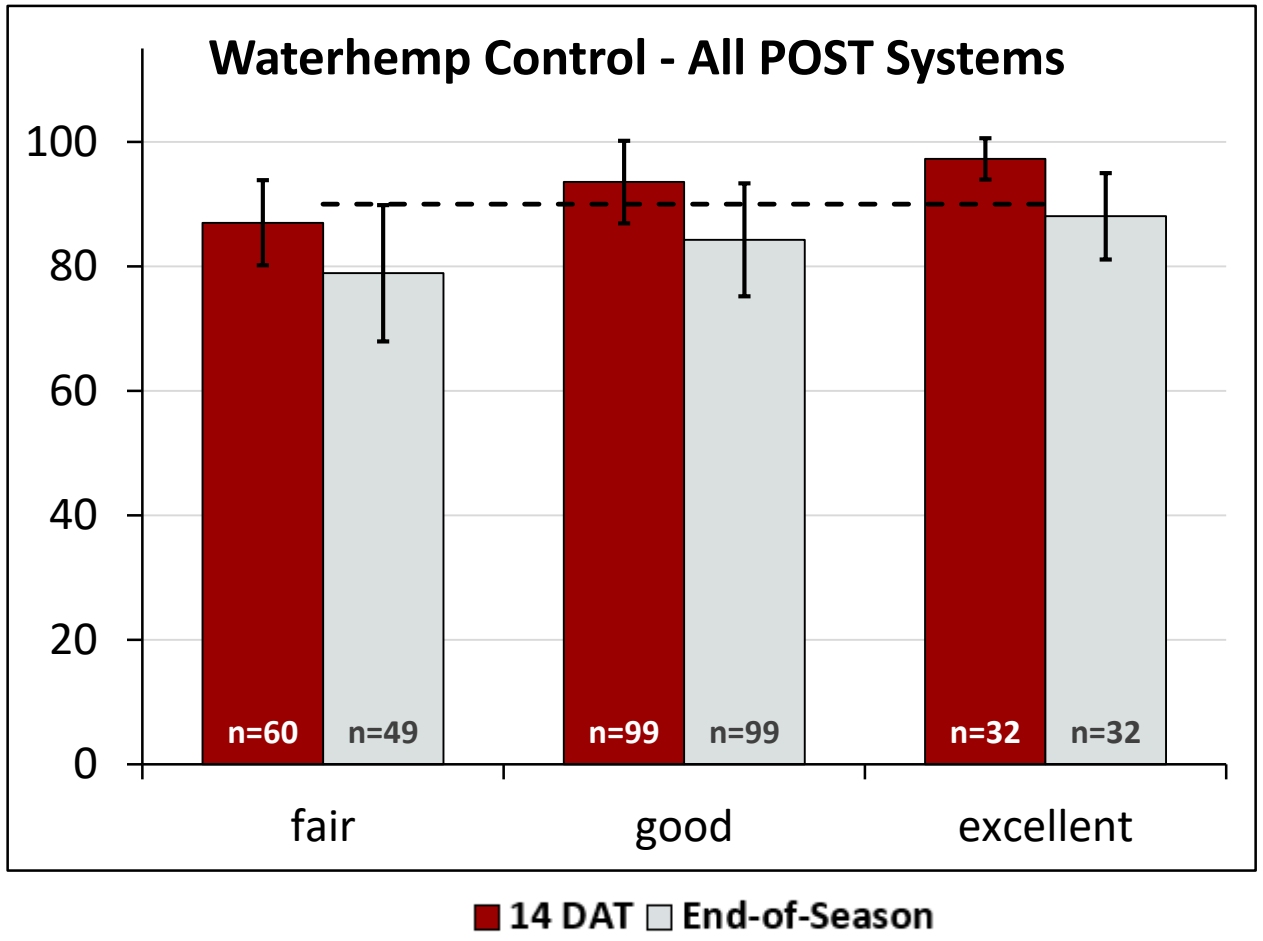
Waterhemp Control POST – Multi-trial Summary





Credit: R. DeWerff, 2020

Waterhemp Control PRE – Multi-trial Summary



Credit: R. DeWerff, 2020

Take Home Message

- Waterhemp herbicide resistance is widespread – not just glyphosate!
- PRE and POST tools available – must protect through stewardship

Do your part – adopt non-chemical strategies for weed control

MS Research: Nikola Arsenijevic

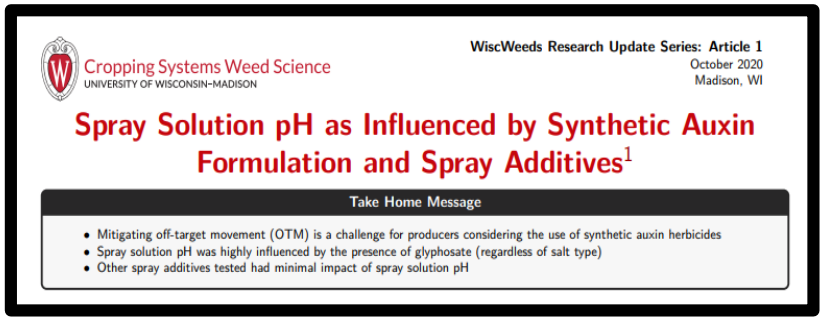
Resources Available Following the Meeting

2019 Pest Management Update Meetings

2020 Pest Management Update Meetings

WiscWeeds Research Update

Cropping Systems Weed Science
UNIVERSITY OF WISCONSIN-MADISON



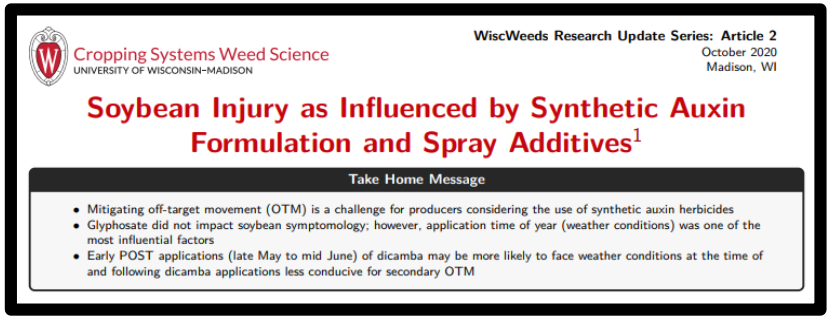
Cropping Systems Weed Science
UNIVERSITY OF WISCONSIN-MADISON

WiscWeeds Research Update Series: Article 1
October 2020
Madison, WI

Spray Solution pH as Influenced by Synthetic Auxin Formulation and Spray Additives[1]

Take Home Message

- Mitigating off-target movement (OTM) is a challenge for producers considering the use of synthetic auxin herbicides
- Spray solution pH was highly influenced by the presence of glyphosate (regardless of salt type)
- Other spray additives tested had minimal impact of spray solution pH



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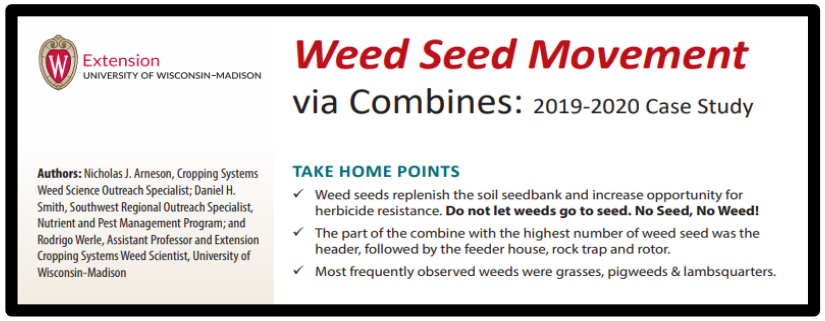
WiscWeeds Research Update Series: Article 2
October 2020
Madison, WI

Soybean Injury as Influenced by Synthetic Auxin Formulation and Spray Additives[1]

Take Home Message

- Mitigating off-target movement (OTM) is a challenge for producers considering the use of synthetic auxin herbicides
- Glyphosate did not impact soybean symptomology; however, application time of year (weather conditions) was one of the most influential factors
- Early POST applications (late May to mid June) of dicamba may be more likely to face weather conditions at the time of and following dicamba applications less conducive for secondary OTM



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WiscWeeds Blog: www.wiscweeds.info

Thanks!

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Questions?