

Project Goal: Evaluate herbicide programs to provide recommendations for XtendFlex soybean weed management in counties under restrictions from the endangered species act (ESA).

Site Description:

Location: Brooklyn, WI	Crop: XtendFlex soybean
Field #: OB-5	Variety: AG20XF1
Soil type: Kegonsa silt loam	Planting Date: 5/23
% OM: 1.6	Emergence Date: 6/6
pH: 6.7	Population: 140,000 seeds/acre
Fertilization: -	Depth: 1.25 in
Previous crop: Seed Corn	Row spacing: 30 in
Tillage: conventional	Plot Size: 10 x 30 ft
Weed species: glyphosate-resistant waterhemp (AMATA); velvetleaf (ABUTH); fall panicum (PANDI)	

Herbicide Application Information:

Date:	5/24	6/29
Treatment:	PRE (A)	POST (B)
Air Temp (°F):	58	77
2" Soil Temp (°F):	60	75
Soil moisture [surface]:	moist	dry
RH %:	62	63
Cloud cover %	90	0
Wind speed (mph)/direction	2-5/SE	0-6/ENE
Rainfall (in) 1 wk after APP:	2.14"	1.32"
GPA:	15	15
PSI:	35	35
Nozzle:	TTI 110015	TT 110015
Nozzle spacing (in):	20	20
Boom Height (in):	20	25

Crop and weed information at application:

	Date:	5/24	6/29
Soybean	Height:	-	3-6"
	Stage:	-	V4
waterhemp	Height:	-	1-8" Avg=3"
	Density:	-	0-1/ft ²
velvetleaf	Height:	-	0.5-2"
	Density:	-	0-1/ft ²
fall panicum	Height:	-	1-4"
	Density:	-	0-5/ft ²

*Weed density recorded from plots with a previous herbicide treatment.
Density and height varied depending on the effectiveness of the PRE herbicide.

Trt #	Treatment	Formulation	SOA Group	Rate	App Timing	App Code
1	Check					
2	Fierce EZ	3.04 lb/gal	14, 15	6 fl oz/a	PRE	A
	Liberty	2.34 lb/gal	10	32 fl oz/a	POST	B
	MON 301668*	4.61 lb/gal	15	30 fl oz/a	POST	B
	AMS			2.5% v/v	POST	B
3	Fierce EZ	3.04 lb/gal	14, 15	6 fl oz/a	PRE	A
	XtendiMax	2.89 lbae/gal	4	22 fl oz/a	PRE	A
	VaporGrip Xtra			20 fl oz/a	PRE	A
	Liberty	2.34 lb/gal	10	32 fl oz/a	POST	B
	MON 301668*	4.61 lb/gal	15	30 fl oz/a	POST	B
	AMS			2.5% v/v	POST	B
4	Fierce EZ	3.04 lb/gal	14, 15	6 fl oz/a	PRE	A
	Liberty	2.34 lb/gal	10	32 fl oz/a	POST	B
	Roundup PowerMAX 3	4.8 lbae/gal	9	30 fl oz/a	POST	B
	MON 301668*	4.61 lb/gal	15	30 fl oz/a	POST	B
	AMS			2.5% v/v	POST	B
5	Fierce EZ	3.04 lb/gal	14, 15	6 fl oz/a	PRE	A
	XtendiMax	2.89 lbae/gal	4	22 fl oz/a	PRE	A
	VaporGrip Xtra			20 fl oz/a	PRE	A
	Liberty	2.34 lb/gal	10	32 fl oz/a	POST	B
	Roundup PowerMAX 3	4.8 lbae/gal	9	30 fl oz/a	POST	B
	MON 301668*	4.61 lb/gal	15	30 fl oz/a	POST	B
	AMS			2.5% v/v	POST	B
6	Fierce EZ	3.04 lb/gal	14, 15	6 fl oz/a	PRE	A
	Warrant Ultra	3.45 lb/gal	14, 15	48 fl oz/a	POST	B
	Liberty	2.34 lb/gal	10	32 fl oz/a	POST	B
	AMS			2.5% v/v	POST	B
7	Fierce EZ	3.04 lb/gal	14, 15	6 fl oz/a	PRE	A
	XtendiMax	2.89 lbae/gal	4	22 fl oz/a	PRE	A
	VaporGrip Xtra			20 fl oz/a	PRE	A
	Warrant Ultra	3.45 lb/gal	14, 15	48 fl oz/a	POST	B
	Liberty	2.34 lb/gal	10	32 fl oz/a	POST	B
	AMS			2.5% v/v	POST	B
8	Fierce EZ	3.04 lb/gal	14, 15	6 fl oz/a	PRE	A
	Warrant Ultra	3.45 lb/gal	14, 15	48 fl oz/a	POST	B
	Liberty	2.34 lb/gal	10	32 fl oz/a	POST	B
	Roundup PowerMAX 3	4.8 lbae/gal	9	30 fl oz/a	POST	B
	AMS			2.5% v/v	POST	B
9	Fierce EZ	3.04 lb/gal	14, 15	6 fl oz/a	PRE	A
	XtendiMax	2.89 lbae/gal	4	22 fl oz/a	PRE	A
	VaporGrip Xtra			20 fl oz/a	PRE	A
	Warrant Ultra	3.45 lb/gal	14, 15	48 fl oz/a	POST	B
	Liberty	2.34 lb/gal	10	32 fl oz/a	POST	B
	Roundup PowerMAX 3	4.8 lbae/gal	9	30 fl oz/a	POST	B
	AMS			2.5% v/v	POST	B

Adjuvants: AMS = Amsol (liquid AMS); VaporGrip Xtra = volatility reducing agent (VRA)

***MON301668** is an experimental formulation of encapsulated acetochlor similar to Warrant herbicide with a higher active ingredient load per gallon of formulated product.

Trial Summary:

The trial was established at the O'Brien Hybrids farm located north of Brooklyn, WI. This trial evaluated multiple 2-pass herbicide programs to provide recommendations for weed management in XtendFlex soybeans in counties under restrictions from the endangered species act (ESA). Currently 26 Wisconsin counties are listed as counties under the ESA. Since, over the top applications of XtendiMax have further in field buffer requirements these programs were designed to avoid POST applications of XtendiMax all together. There was only minor (<3%) soybean injury from the PRE herbicides 36 days after application (data not shown). There was soybean injury 8 and 14 days after the POST application (Table 10). Injury symptoms included leaf necrosis (burn) and leaf crinkling. Tank mixes with Warrant Ultra had the greatest % injury (~14%) while tank mixes with Liberty + MON 301668 had ~6% injury.

The trial was conducted in a field with a population of glyphosate-resistant waterhemp. All treatments provided excellent season long waterhemp control (Table 22). Waterhemp control from the PRE herbicides at the time of POST application was good to excellent ~89-95%. The addition of XtendiMax to the tank at the PRE application did not improve control of waterhemp or velvetleaf. The same trial was conducted in 2021 and PRE applications of XtendiMax did improve control of broadleaf weeds under drier conditions. See trial 21-BRO-SB13 in last years [2021 Wisconsin Weed Science Research Report](#) for a full report. All POST herbicide programs provided excellent waterhemp control.

Soybean yield of the various herbicide programs was very similar and did not statistically differ (Table 10). Yield across all herbicide treatments = 75 bu acre⁻¹, while the untreated check was 40 bu acre⁻¹.

Plot photos from throughout the growing season are available [XtendFlex Soybean Herbicide Recommendations for ESA Counties](#) published on wiscweeds.info.

Table 10. Soybean injury, weed control ratings, and soybean yield for trial #22-BRO-SB22 at Brooklyn, WI.^a

Trt #	Herbicide (rate acre ⁻¹)	Injury ^c (%)		Waterhemp			Velvetleaf		Fall Panicum		Yield ^b bu acre ⁻¹
		7/7	7/13	6/14	6/29	9/29	6/29	9/29	6/29	9/29	
1	Untreated Check	0	0	0	0	0	0	0	0	0	40 b
Two-Pass – PRE (5/24) fb POST (6/29)											
2	Fierce EZ (6 fl oz) fb Liberty (32 fl oz) + MON 301668 (30 fl oz) + AMS**	4.0	4.5	100	95	100	99	100	93	100	76 a
3	Fierce EZ (6 fl oz) + XtendiMax (22 fl oz)* fb Liberty (32 fl oz) + MON 301668 (30 fl oz) + AMS**	4.8	7.8	100	91	100	96	100	91	100	76 a
4	Fierce EZ (6 fl oz) fb Liberty (32 fl oz) + Roundup PM3 (30 fl oz) + MON 301668 (30 fl oz) + AMS**	4.5	7.5	100	92	99	96	100	94	100	76 a
5	Fierce EZ (6 fl oz) + XtendiMax (22 fl oz)* fb Liberty (32 fl oz) + Roundup PM3 (30 fl oz) + MON 301668 (30 fl oz) + AMS**	5.0	5.8	100	91	99	98	100	93	100	74 a
6	Fierce EZ (6 fl oz) fb Warrant Ultra (48 fl oz) + Liberty (32 fl oz) + AMS**	7.8	14.0	100	90	100	98	100	90	98	75 a
7	Fierce EZ (6 fl oz) + XtendiMax (22 fl oz)* fb Warrant Ultra (48 fl oz) + Liberty (32 fl oz) + AMS**	8.3	13.3	100	95	99	96	100	90	100	75 a
8	Fierce EZ (6 fl oz) fb Warrant Ultra (48 fl oz) + Liberty (32 fl oz) + Roundup PM3 (30 fl oz) + AMS**	8.0	14.0	99	89	100	96	100	92	100	74 a
9	Fierce EZ (6 fl oz) + XtendiMax (22 fl oz)* fb Warrant Ultra (48 fl oz) + Liberty (32 fl oz) + Roundup PM3 (30 fl oz) + AMS**	7.5	14.8	100	92	99	97	100	90	100	75 a
LSD ($\alpha=0.10$)		1.5	2.2	ns	ns	ns	ns	ns	ns	1	5
p value		<.001	<.001	0.284	0.623	0.713	0.576	0.459	0.824	0.096	<.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.

^cCrop injury symptoms included leaf necrosis (burn) and leaf crinkling.

*All PRE applications of XtendiMax included 20 fl oz/a VaporGrip Xtra, a volatility reducing agent.

**Liquid AMS was applied at 2.5% v/v