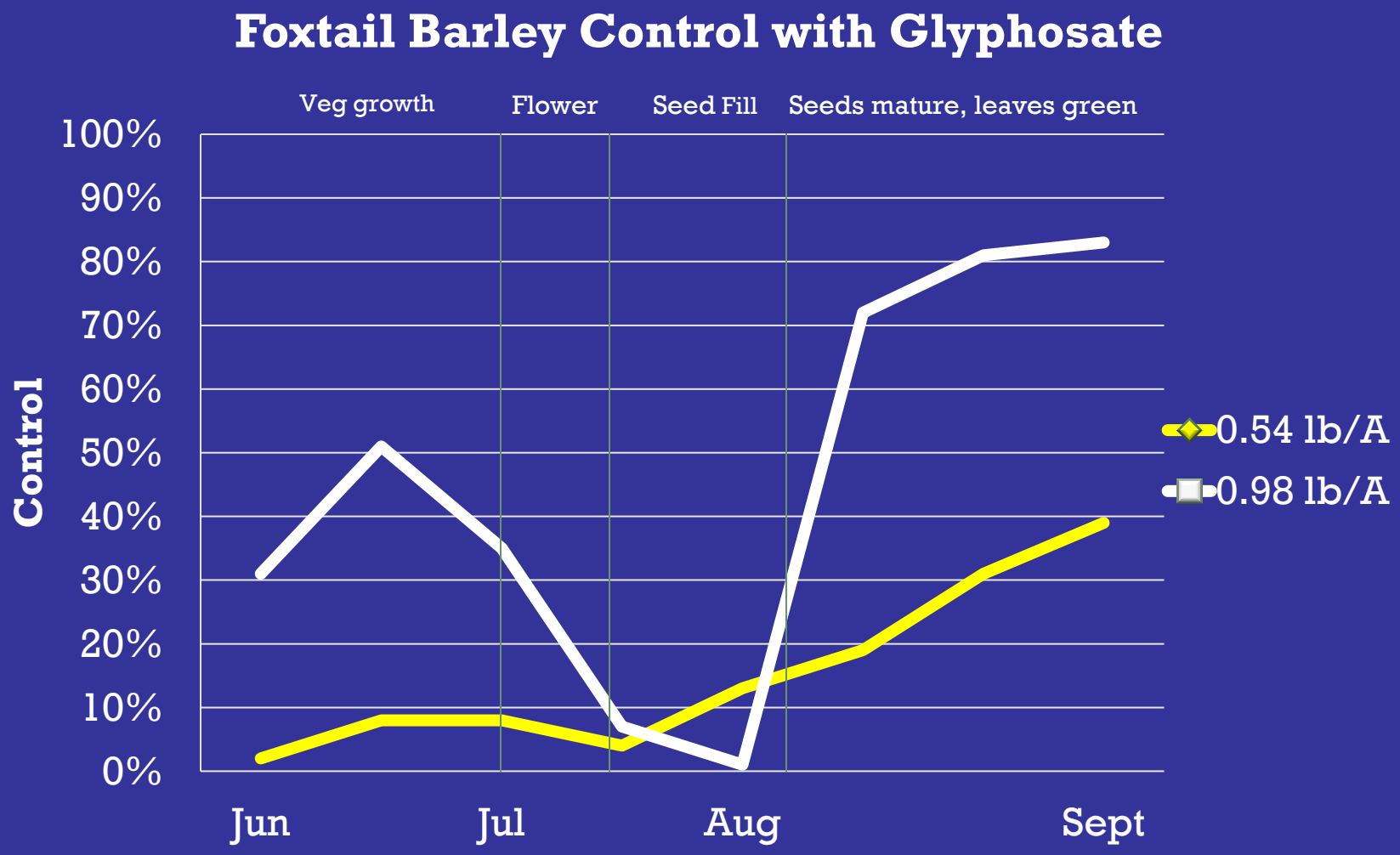
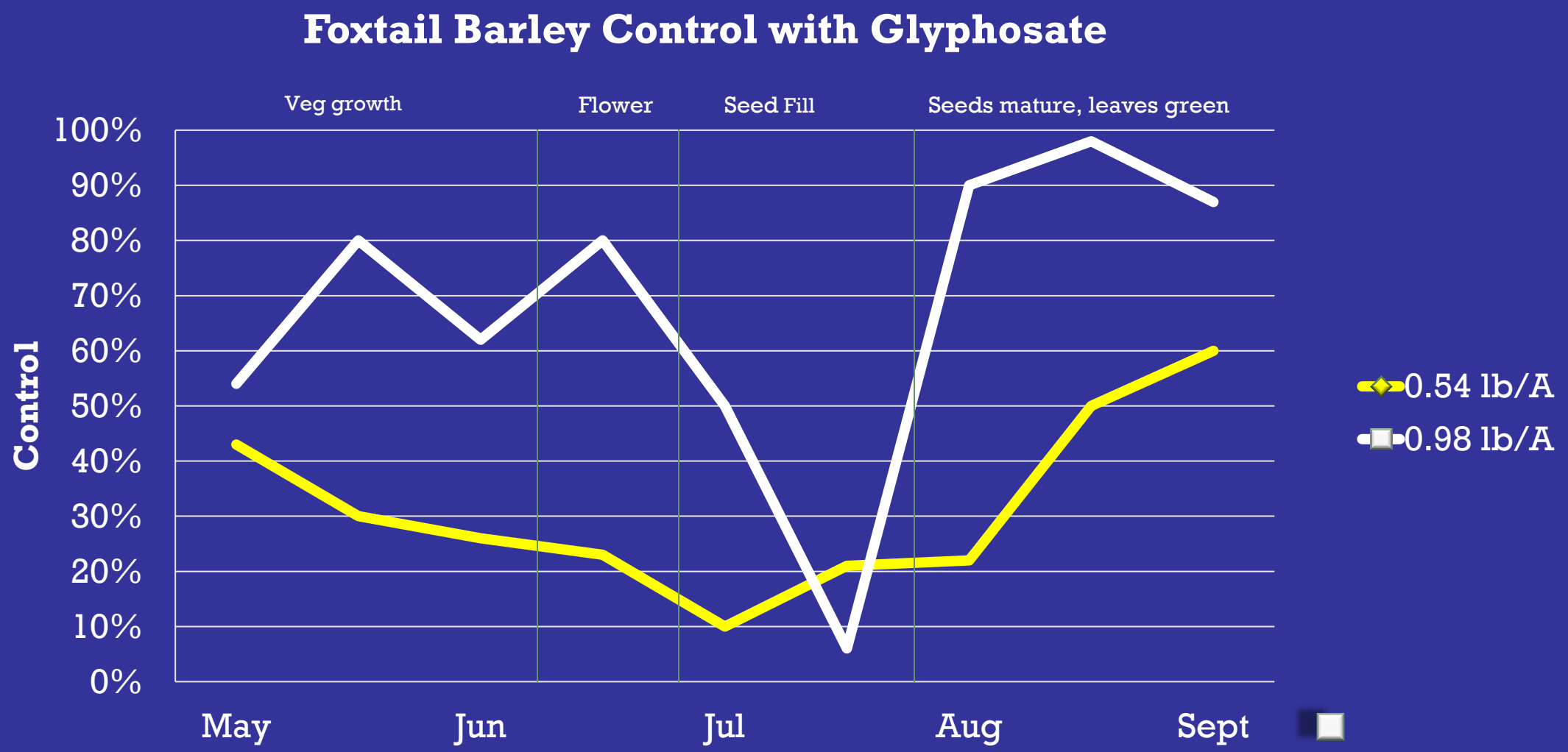
Foxtail Barley Control

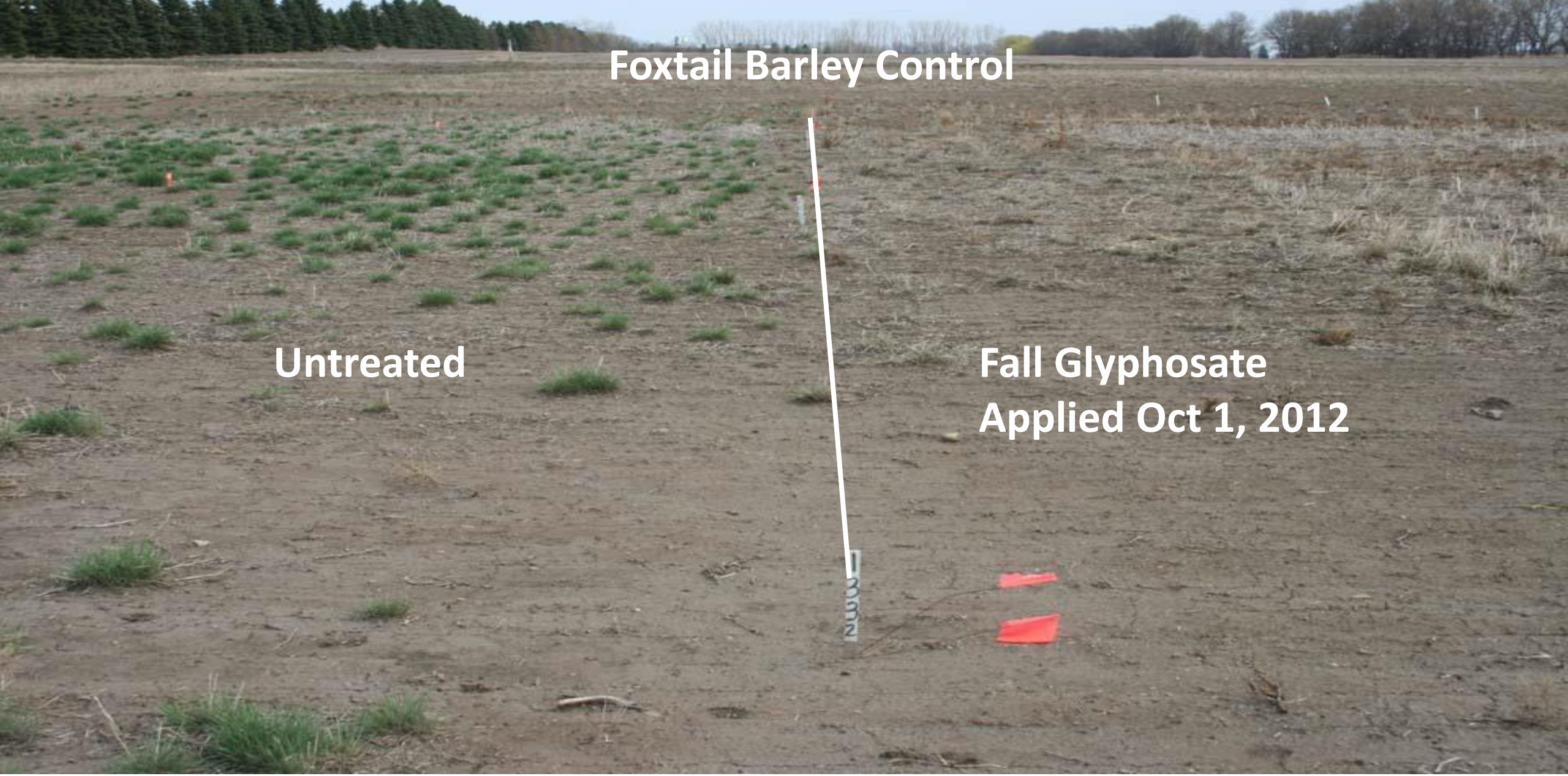
If there was one time you would spray foxtail barley, when would it be?

Conn and Deck (1992)



Conn and Deck (1993)





Picture taken May 17, 2013

Photo courtesy: Stan Vangsness

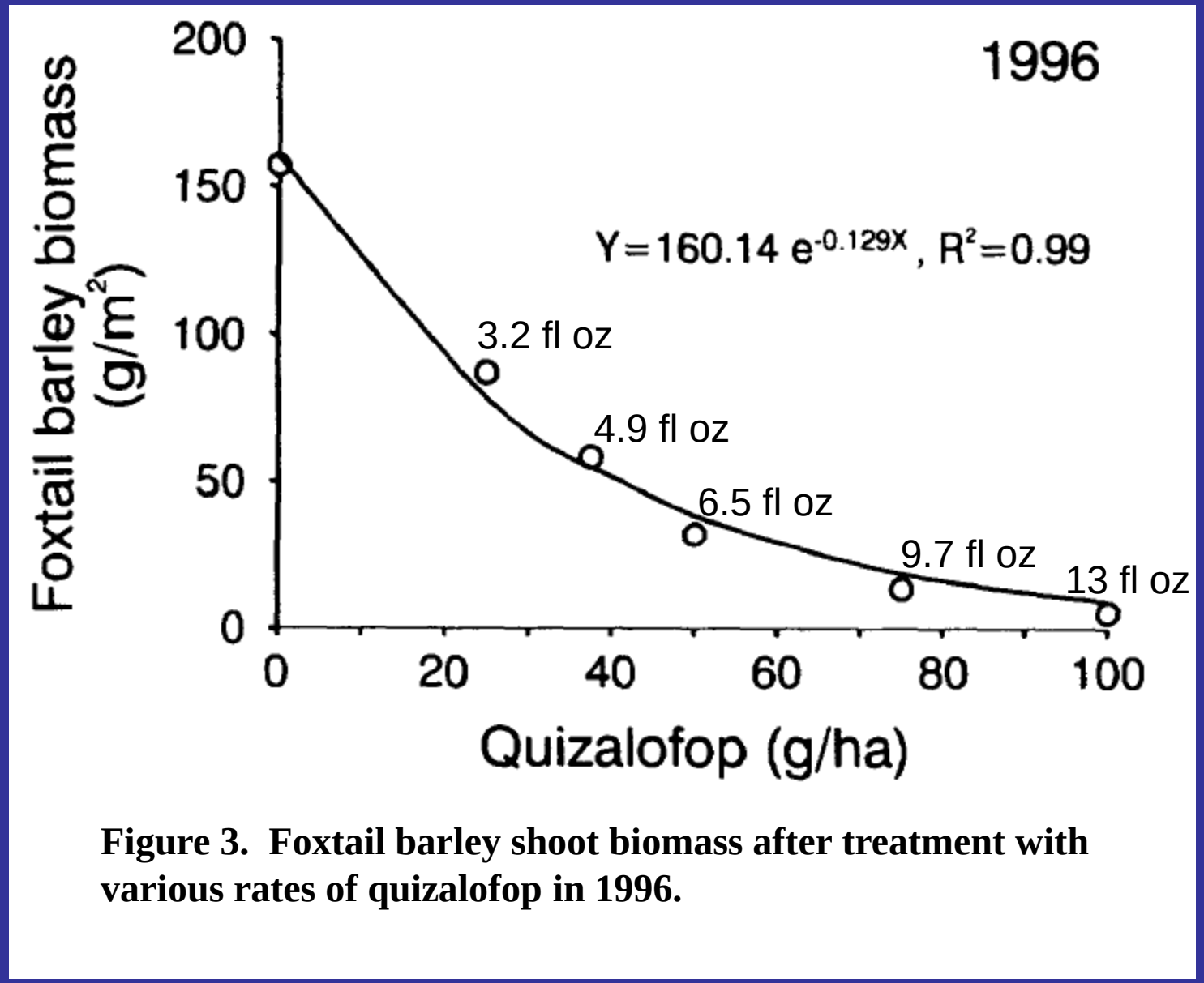


Figure 3. Foxtail barley shoot biomass after treatment with various rates of quizalofop in 1996.

Adapted from Blackshaw et al. Weed Tech. 1998. 12:610-616

Table 3. Foxtail barley shoot biomass after treatment with various herbicides applied at two growth stages in flax.

Treatment[a]	Rate	1995 Stage 1[b]	1995 Stage 2	1996 Stage 1	1996 Stage 2	1997 Stage 1	1997 Stage 2
	g/ha	g/m²					
Weedy control	0	717	750	196	179	802	863
Sethoxydim	200	181	255	28	92	38	159
Clethodim	45	333	292	25	99	147	298
Quizalofop	100	1	5	1	8	8	23
Fluazifop-P	100	316	570	109	157	385	745
Fluazifop-P + fenoxaprop-P	100 + 40	349	460	64	202	271	392
LSD (0.05)		108	136	58	76	83	122

[a] Merge was added at 0.7% v/v to sethoxydim, Amigo was added at 0.5% v/v to clethodim, Canplus 411 was added at 1% v/v to quizalofop, and Turbocharge was added at 1% v/v to fluazifop-P.

[b] Stage 1 = three- to four-leaf and stage 2 = one- to three-tiller stage, respectively, of foxtail barley.

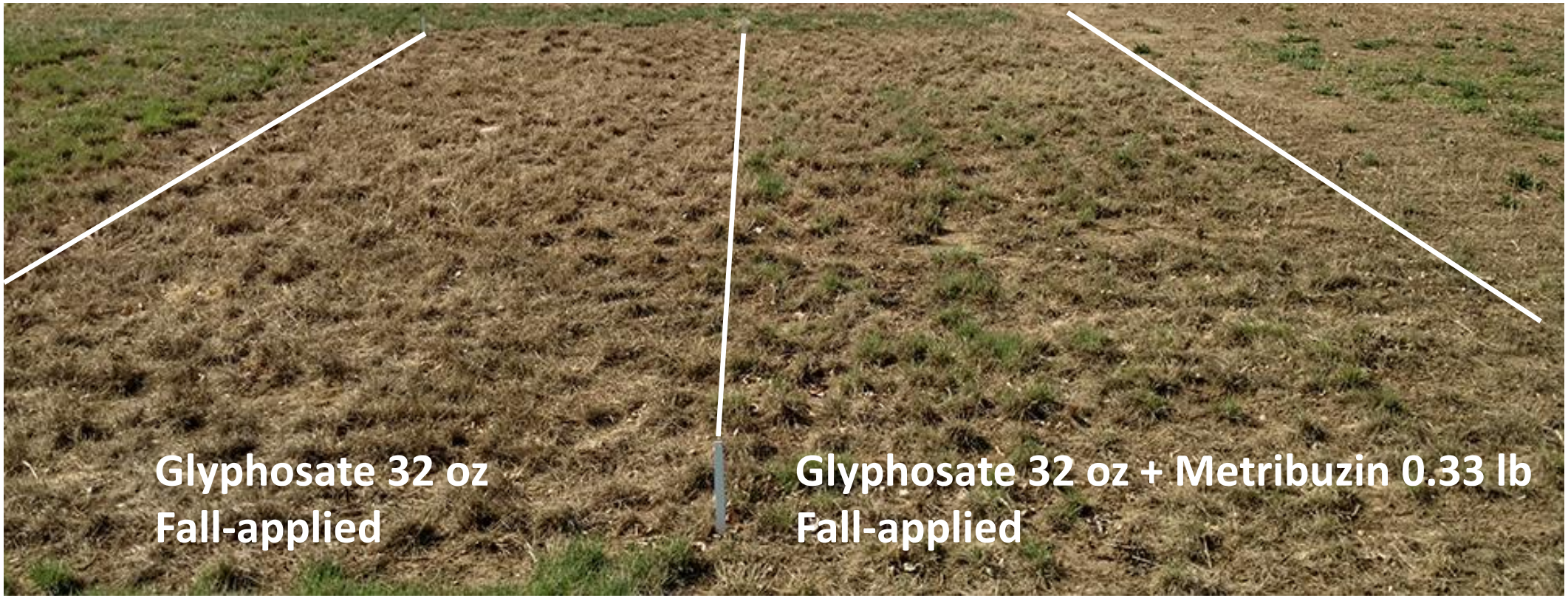
Blackshaw et al. Weed Tech. 1998. 12:610-616

Foxtail barley control in RR soybean (2017)

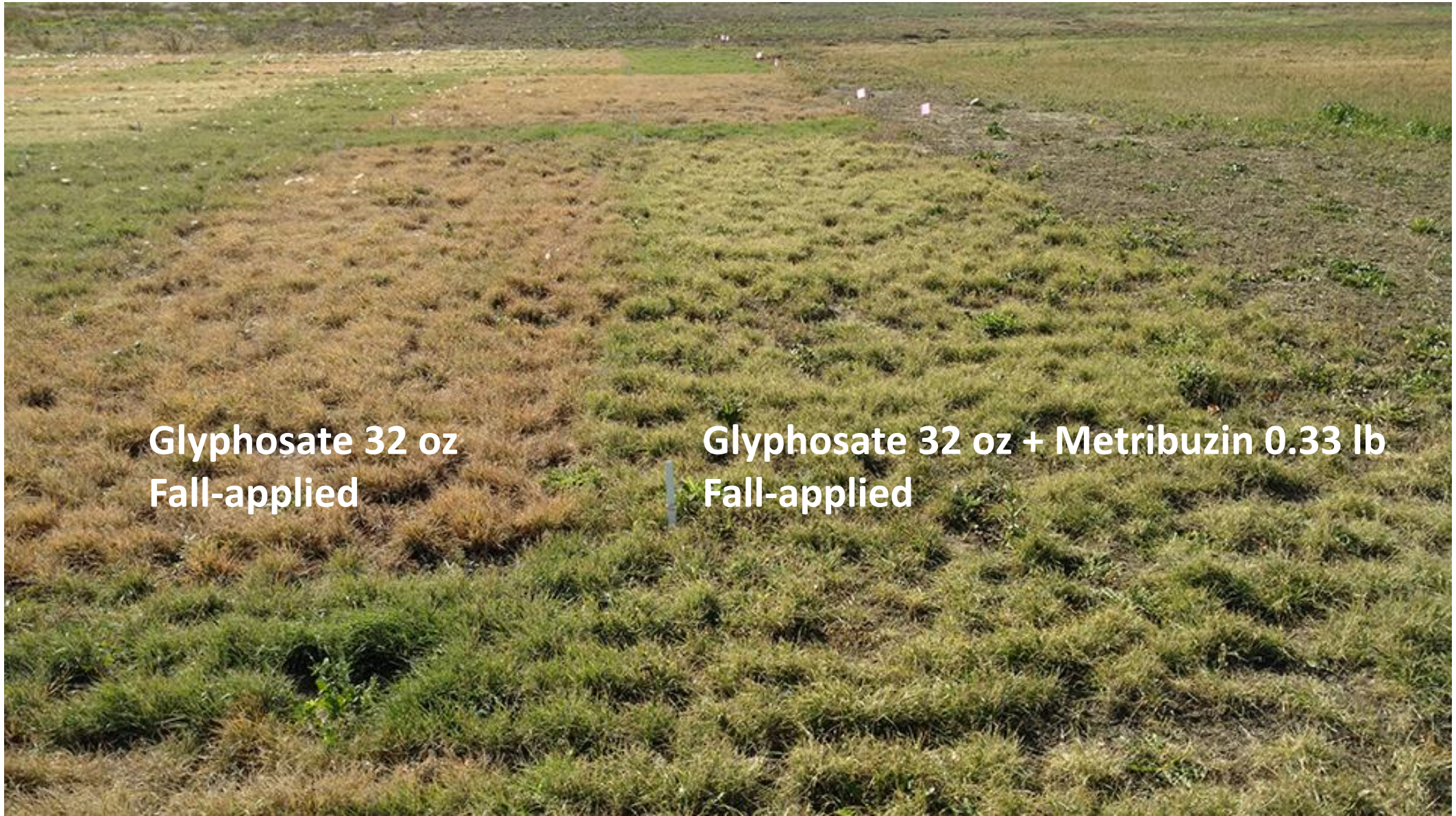
Treatment	Rate	Timing	Foba
	oz/A		--% control--
Untreated			0
ZP + Rup	4.5 + 32	PRE	94
ZP + Eng + Rup	4.5 + 12.8 + 32	PRE	90
ZP + Metr + Rup	4.5 + 4 + 32	PRE	23
Z + Eng + Rup	2.13 + 12.8 + 32	PRE	87
Z+Eng+Rup / Z+Eng+Rup	2.13+12.8+32/2.13+12.8+32	PRE/POST	99
Z + Eng + Rup + Purs	2.74 + 12.8 + 32 + 3	PRE	98
Z + Eng + Rup + Purs + NIS	2.74+12.8+32+3+0.25%	POST	93
Z+Eng+Rup+Purs / Z+Eng	2.74+12.8+32+3/2.13+12.8	PRE/POST	89

*ZP=Zidua Pro; Z=Zidua SC; Rup=Roundup; Eng=Engenia; Metr=Metribuzin; Purs=Pursuit

Foxtail barley control



Foxtail barley control



Foxtail barley control

In wheat:

- **Apply Roundup PP/PRE in warm temps**
- **Olympus POST 0.2 oz for suppression**

Foxtail isn’t competitive?

May 12: PRE
May 23: 0.13
May 24: 0.41
June 6: 0.61

Weed of the year 2024: Kochia

Herbicides used to control kochia

Group 3
Sonalan
Treflan
Prowl

Group 4
Starane
Dicamba

Group 5
Atrazine
Metribuzin

Group 6
Basagran
Bromoxynil
Tough

Group 9
Roundup

Group 10
Liberty

Group 27
Armezon+Atr
Callisto+Atr
Huskie
Talinor
Tolvera

Group 15
Anthem Flex
Zidua

Group 22
Gramoxone

Group 14
Aim
Sharpen
Vida
Reviton
→ Burndown herbicides

Spartan products
Valor
→ Soil-applied herbicides (residual)

Flexstar
Cobra
Ultra Blazer
→ Foliar soybean herbicides

Kochia control

Fall Zidua/AF (15)

Corn (9)	Soybean (9)	Wheat (7)	Sugarbeet (4)
Gramoxone (22)	Gramoxone (22)	Gramoxone (22)	Gramoxone (22)
Roundup (9)	Roundup (9)	Roundup (9)	
Aim/Sharpen (14)	Aim/Sharpen (14)	Aim/Sharpen (14)	
Dicamba (4)	Dicamba (4) (future?)	Dicamba (4)	
Balance Flexx (27)	Dicamba (4)	Zidua/AF (15)?	Nortron (15)
Zidua/AF (15)	Spartan / Valor (14)		
Fierce (14,15)	Metribuzin (5)		
Atrazine (5)	Zidua/AF (15)		
Dicamba (4)	Tref/Sonalan/Prowl (3)		
Grp27 + ATR (5)	Liberty (10)	Huskie FX (27,6,4)	Spin-Aid (5)
Diflexx (4)	Flexstar, Blazer (14)	Tolvera (27,6)	
Rup (9), Lib (10)	Basagran/Varisto (6)	Starane + Brom (4,6)	

Kochia control

Fall Zidua/AF (15)

Corn (9)	Soybean (9)	Wheat (7)	Sugarbeet (4)
Roundup (9)	Gramoxone (22)	Roundup (9)	Gramoxone (22)
Aim/Sharpen (14)		Dicamba (4)	
Dicamba (4)			
Balance Flexx (27)	Spartan (14)		Nortron (15)
Atrazine (5)	Metribuzin (5)		
	Tref/Sonalan/Prowl (3)		
Grp27 + ATZ (5)	Liberty (10)	Huskie FX (27,6,4)	Spin-Aid (5)
Roundup (9)	Flexstar, Blazer (14)		
Liberty (10)			

Grass control

Fall Zidua/AF (15)

Corn (6)

Gramoxone (22)
Roundup (9)

Balance Flexx (27)
Harness (15)
Dual II Mag (15)
Outlook (15)
Zidua/AF (15)
Atrazine (5)

Roundup (9)
Atrazine (5)
Liberty (10)

Soybean (6)

Gramoxone (22)
Roundup (9)

Dual (15)
Outlook (15)
Zidua/AF (15)
Warrant (15)
Group (3)

Liberty + Select (10,1)
Roundup (9)

Wheat (6)

Far-Go (15)
Gramoxone (22)
Roundup (9)

Zidua/AF (15)?

Tolvera (27)(18 mo Sbt)
Varro (2)
Everest (2)
Pyrox (2)
Axial (1)

Sugarbeet (3)

Nortron (15)
Warrant (15)
Dual (15)
Outlook (15)
Eptam (15)
Ro-Neet (15)

Roundup (9)
Group (1)

Grass control

Fall Zidua/AF (15)

Corn (6)	Soybean (6)	Wheat (6)	Sugarbeet (3)
		Far-Go (15)	
Roundup (9)	Gramoxone (22)	Roundup (9)	
			Nortron (15)
Balance Flexx (27)	Zidua/AF (15)		Eptam (15)
Harness (15)	Group (3)		Ro-Neet (15)
Atrazine (5)			
Roundup (9)	Liberty + Select (10,1)	Tolvera (27)(18 mo Sbt)	
Atrazine (5)	Roundup (9)	Axial (1)	Roundup (9)
Liberty (10)			Grp 1

Targeting Kochia

Wheat

Fall:

Valor (14)

Anthem Flex (15)

Spring burndown:

Glyphosate (9)

Sharpen (14)

Aim (14)

Gramoxone (22)

Dicamba (4)

POST:

Starane + Brom (4,6)

Huskie FX (4,6,27)

Talinor (6,27)

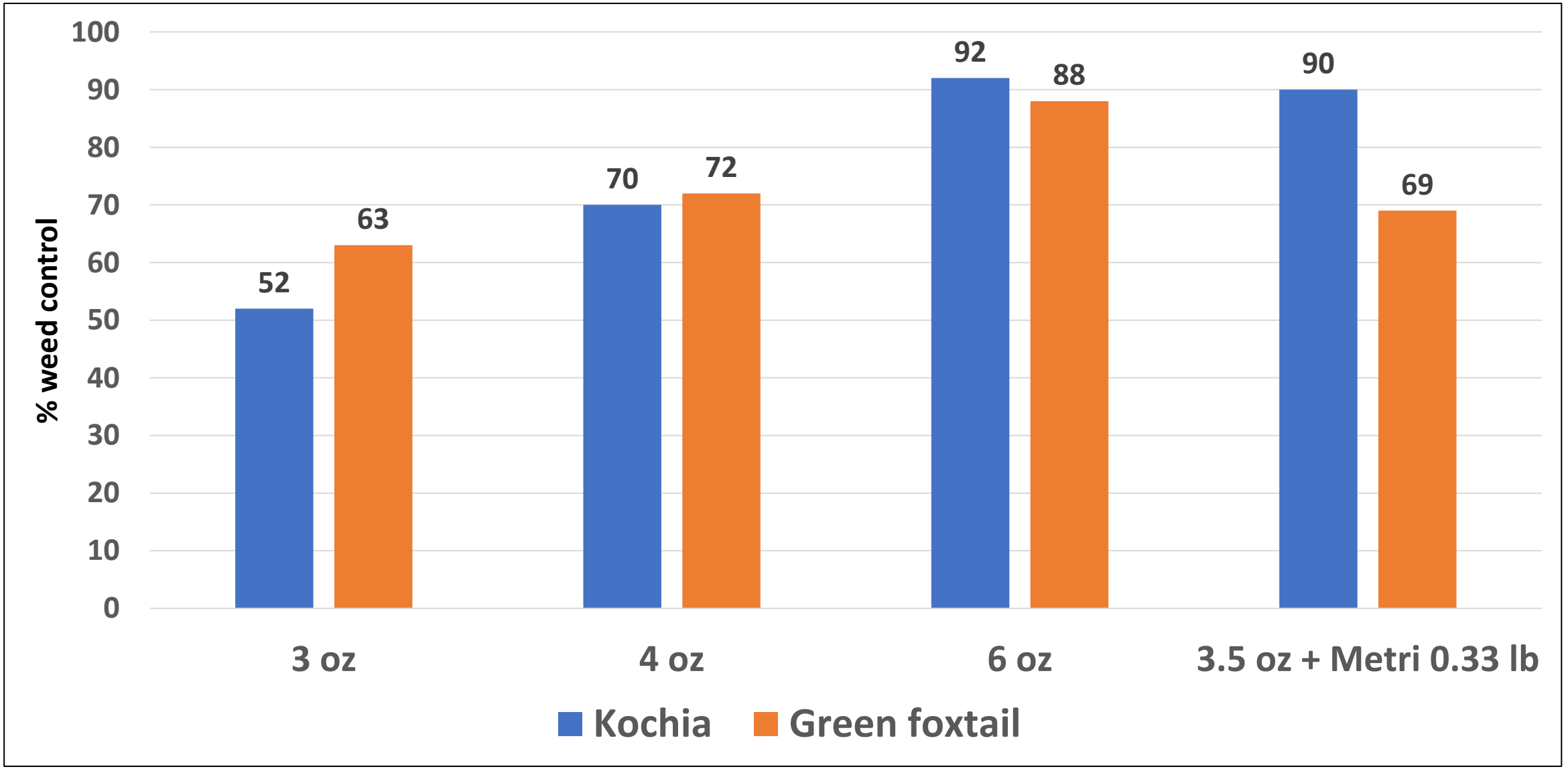
Tolvera (6,27)

Spring residual:

Zidua* (15) (not durum)

Anthem Flex* (15) (not durum)

Weed control with fall-applied Anthem Flex



*Treatments applied Oct 16, 2023. Evaluation June 27, 2024.

Anthem Flex = Zidua + Aim

Why fall Anthem Flex?

Weeds Suppressed:

Barnyardgrass
Bromes
Foxtail
Wild oat

Lambsquarters
Kochia
Pigweeds
Wild buckwheat

Where might fall Anthem Flex help the most?

- Group 14-resistant kochia
- Group 1, 2-resistant foxtail, wild oat
- Heavy weed densities
- Areas that don't typically receive activating May rains.

***Fall-applied Anthem Flex does not provide season-long weed control. Still need spring herbicide for season-long control.**

Targeting Kochia

Wheat

Fall:

Valor (14)

Anthem Flex (15)

Spring burndown:

Glyphosate (9)

Sharpen (14)

Aim (14)

Gramoxone (22)

Dicamba (4)

Spring residual:

Zidua* (15) (not durum)

Anthem Flex* (15) (not durum)

3-inch kochia Max

POST:

Starane + Brom (4,6)

Huskie FX (4,6,27)

Talinor + Starane (6,27,4)

Tolvera + Starane (6,27,4)

*Effective burndown is critical, influences weed size and density in POST application

New Express label

INDIVIDUAL COMMODITIES OF THE FOLLOWING CROP SUBGROUPS:

- **6-22E (Pulses, dried shelled bean, except soybean, subgroup including African yam bean; American potato bean; Bean (*Lupinus* spp.; including, but not limited to Andean lupin, blue lupin, grain lupin, sweet lupin, white lupin, white sweet lupin, and yellow lupin); Bean (*Phaseolus* spp.; including, but not limited to black bean, cranberry bean, dry bean, field bean, French bean, garden bean, great northern bean, green bean, kidney bean, lima bean, navy bean, pink bean, pinto bean, red bean, scarlet runner bean, tepary bean, and yellow bean); Bean (*Vigna* spp.; including, but not limited to adzuki bean, asparagus bean, blackeyed pea, catjang bean, Chinese longbean, cowpea, crowder pea, moth bean, mung bean, rice bean, southern pea, urd bean, and yardlong bean); broad bean (fava bean); guar bean; goa bean; horse gram; jackbean; lablab bean; morama bean; sword bean; winged pea; velvetbean; cultivars, varieties, and/or hybrids of these commodities.**
- **6-22F (Pulses, dried shelled pea subgroup including Pea (*Pisum* spp.; including, but not limited to dry pea, field pea, green pea, yellow pea, wrinkled pea, marrowfat pea, and garden pea); chickpea; grass pea; lentil; pigeon pea; cultivars, varieties, and/or hybrids of these commodities).**

APPLICATION TIMING

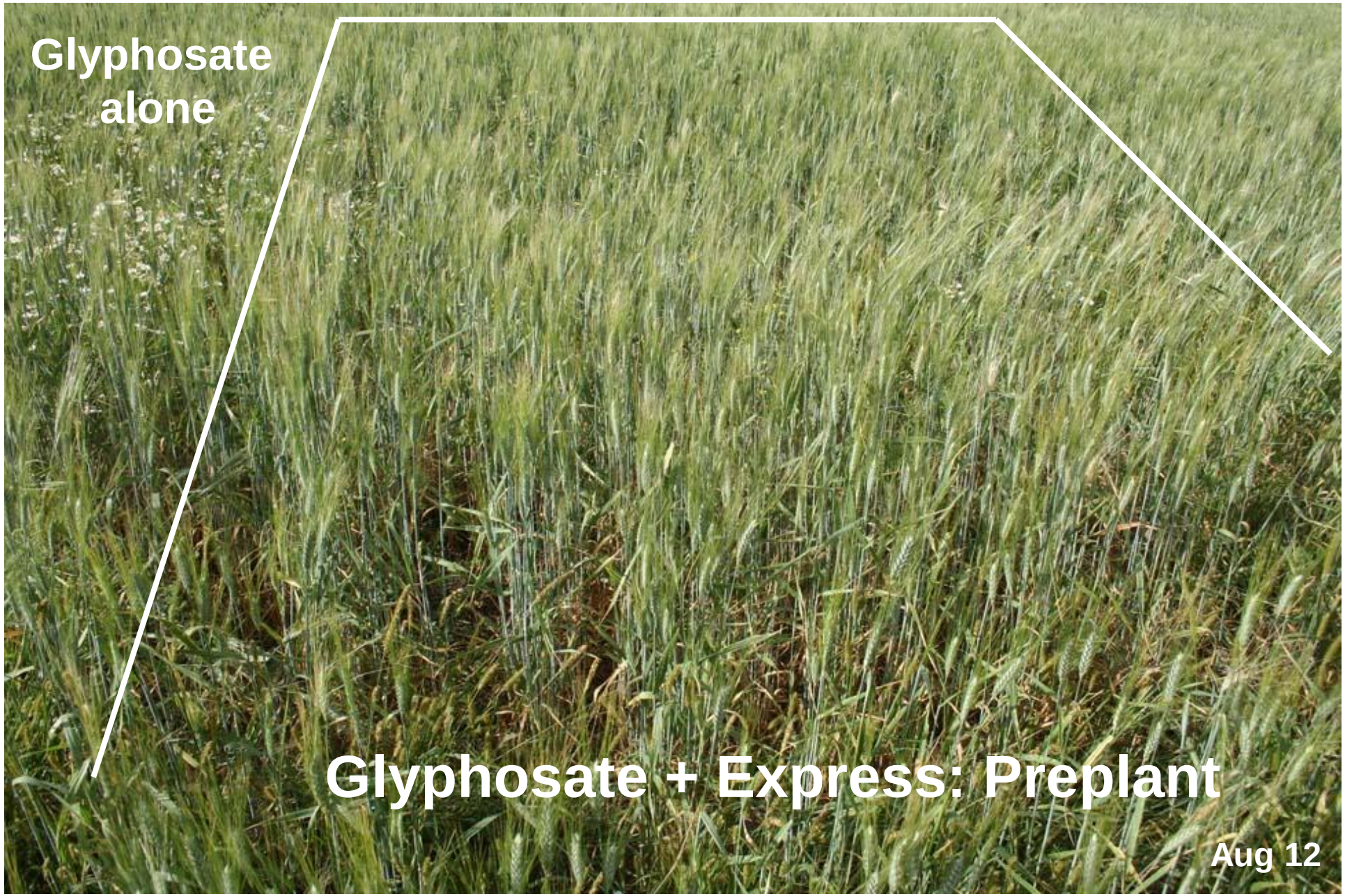
EXPRESS herbicide may be applied as a pre-plant burndown prior to planting any crop including dry beans and dry peas and the individual commodities of crop subgroups 6-22E and 6-22F

Narrowleaf hawksbeard

False chamomile

Prickly lettuce


Glyphosate + Express
(preplant)
Glyphosate
July 6


Glyphosate alone
Glyphosate + Express: Preplant
Aug 12

Express preplant before pulses/dry bean

- Intended for no-till
- Use 0.25 oz product of Express 50 SG.
- Don’t use Harmony or Harmony-containing product!
- Label indicates preplant only.
- Mustards, Prickly lettuce, Narrowleaf hawksbeard, False chamomile, others.
- Expect essentially no injury to dry pea and chickpea.
- You could see some injury to lentil, but risk is low at 0.25 oz rate.
- Seeding depth of 1.5-2 inches reduces injury risk.

Targeting Kochia

Dry bean

Fall:

Sonalan (3)
Treflan (3)
Prowl (3)
Valor (14)

Spring burndown:

Glyphosate (9)
Sp Ch / Sp Elt / BrAxe / Aim (14)
Gramoxone (22)

POST:

Basagran (6)
Varisto (2,6)
Reflex (14)
Varisto + Reflex (6,14)

Spring residual:

Sonalan (3)
Treflan (3)
Prowl (3)
Spartan Charge (14)
BroadAxe, Spartan Elite (14)

24C for Spartan Charge in dry bean

Spartan Charge Use Rate Table (Dry Shelled Beans) Early Pre-Plant and Preemergence Applications					
Broadcast Rate	**Ounces Spartan Charge per acre Soil Texture**				
% Organic Matter	**Coarse**	**Medium** pH >7.0	**Medium** pH <7.0	**Fine** pH>7.0	**Fine** pH<7.0
1.6 - 3.0 %	Do not use	3.75	5.0	5.0	5.75
3.0+ %	Do not use	5.0	5.75	5.75	5.75
Refer to the Spartan Charge section 3 label for information on soil types under the COARSE, MEDIUM, and FINE categories **Do not use on coarse soils.** **Do not use on soils with less than 1.5% organic matter**					

SC	Sp
3.5	3.0
5.0	4.0
5.75	4.5

Targeting Kochia,Wioa,Grft

Dry bean

Fall:

Sonalan (3)
Treflan (3)
Prowl (3)
Valor (14)

Spring burndown:

Glyphosate (9)
Gramoxone (22)
Spartan product (14)

Spring residual:

Eptam (15)
Sonalan (3)
Treflan (3)
Prowl (3)
Dual (15)
Outlook (15)
Spartan product (14)

POST:

Basagran (6)
Varisto (6)
Reflex (14)
Varisto + Reflex (6,14)

Select (1)
Assure II (1)

- Fall Valor (min till)
- Fall Group 3 (min till)
- Why is Raptor/Beyond/Select not working?
    - Drought stress?
    - Thicker cuticle in field compared to GH?
    - Grasses too big?
    - Antagonism with broadleaf herbicide?
        - Split grass and broadleaf applications?
    - Low water volume?
- 15-20 gpa > better coverage > better weed control
- Spray Gramoxone/Roundup just before crop emergence

- **Green foxtail:**
    - **Everest (2)**
    - **Raptor/Beyond/CL (2)**
    - **Tolvera (27)**
    - **Select (1)**
    - **Group (3)**
    - **Fall Anthem Flex (15)**
- **Wild oat**
    - **Axial (1)**
    - **Far-Go (15)**
    - **Eptam (15)**

Canola

Fall:

Sonalan (3)

Treflan (3)

Spring burndown:

Glyphosate (9)

Gramoxone (22)

Aim (14)

Spring residual:

Sonalan (3)

Treflan (3)

POST:

Liberty + Select (10,1)

Roundup (9)

Select (1)

Assure II (1)

Wild oat seed longevity

- Seed buried at various depths
- Fargo and Williston
- Weed Tech. 1990

Depth (in)	% Viability (Fargo)		
	2 yr	5 yr	9 yr
0-4	14	2	0
6-10	15	7	0
12-16	19	9	0
24-28	27	15	4

Depth (in)	% Viability (Williston)		
	2 yr	5 yr	9 yr
0-4	7	5	1
6-10	12	11	9
12-16	12	16	10
24-28	17	17	15

Seed viability decreases faster at 0-4 inches compared to 6-28 inches.

Green foxtail seed longevity

- Seed buried on surface to 6 inches
- Viability after 5 and 10 years
- Saskatchewan
- Can. J. Plant Sci. 1986

Depth (in)	% Viability	
	5 yr	10 yr
Surface	1	<1
0.5	3	1
1	7	2
4	11	2
6	19	1

Table 2. Wild oat resistance to postemergence herbicides in 2022. Random plants were seed collected from random state-wide roadside survey. Targeted plants were seed collected from suspected resistant plants.

Herbicide	Random	Targeted
	Wild oat (n=98)	Wild oat (n=48)
	% resistant	% resistant
Puma[1]	40	92
Axial[1a]	10	73
Everest[2]	27	96
pyroxsulam[2b]	23	94
Varro[2]	21	100
Beyond Xtra[2]	17	88
Assure II[1]	30	88
Select[1]	4	33

[a]Random samples were treated with Axial Bold, Targeted samples were treated with Axial XL.

[b]Random samples were treated with PerfectMatch, Targeted samples were treated with GoldSky.

Wild oat control:

Here are some options, not in any specific order.

1. RR crops: corn, soybean, canola
2. LL crops: corn, soybean, canola
3. With extremely high densities stay out of wheat for 3 years?
4. Barley is very competitive. Take out early flush or two with tillage or Roundup.
5. Far-Go can be used in small grains, dry pea, sugarbeet
6. Axial still works for some growers, not all.

6. Zidua, Anthem Flex may work in some situations.
7. Later planting date to remove 1-2 weed flushes
8. Higher seeding rate to provide more competition
9. Taller variety
10. In no-till, spray glyphosate PRE as late as possible before crop emergence.
11. Always tank mix full rate Select with Liberty in LL canola (spray wild oat no later than 2-3 leaf stage of wild oat)
12. Consider peas where you can use Select
13. Eptam labeled in dry bean, sugarbeet, potato, sunflower, safflower, alfalfa

- **Delayed planting**
- **Water volume**
- **Philly: Never know where the heat is coming from**
- **Valor every year**
- **Spray big weeds late vs maybe allowing a late flush**
- **Palmer/Waterhemp: EDRR**
- **Roundup got us in the mindset we can spray 6-inch weeds**
- **Clean up fields in years prior to dry bean…not what can I get by with this year, but what can I do to clean up the field for dry bean?**