

2020 Weed Control Update

Brian Jenks
North Dakota State University

Fierce MTZ (Valent)

- **Crops: Corn, Soybean**
- **Tillage system: No-till or minimum till**
- **Herbicides: Valor + Metribuzin + Zidua**
- **Rate: 1-1.5 pt**
- **Weeds controlled: kochia, lambsquarters, horseweed, nightshades, mustards, pigweeds, common ragweed, barnyard grass, foxtails, others**
- **Weeds suppressed: wild buckwheat, biennial wormwood**
- **Do not apply to coarse soils with <1.5% OM**
- **Corn: Do not apply to soils with pH \geq 7.0**
- **Soybean: Injury may occur on soils with pH \geq 7.5, seed depth > 1.5 in, heavy rain soon after application in poorly drained areas**

Fierce MTZ (Valent)

- **Corn**
 - **7 to 30 days preplant**
 - **May be tank mixed with 2,4-D, atrazine, dicamba, glyphosate, clopyralid, or paraquat**
- **Soybean**
 - **Early preplant, prior to planting, or PRE (3 DAP)**
 - **May be tank mixed with Prowl, Pursuit, 2,4-D, glyphosate, others**

Fierce MTZ (Valent)

- **Crop rotation restrictions (months)**

Crop	1 pt	1.25 pt	1.5 pt
Alfalfa	10	10	10
Corn (conv till)	1	1	1
Corn (min, no-till)	7 days	1	1
Edible peas/beans	11	11	11
Grasses for seed	18	18	18
Lentil	8	8	8
Small grains other than wheat	11	12	12
Soybean	0	0	0
Wheat	8	8	8
Other crops not listed	18	18	18

Authority Edge

- **Authority Supreme: Spartan + Zidua (1:1)**
 - 2.08 + 2.08 lb ai/gal
- **Authority Edge: Spartan + Zidua (1.8:1)**
 - 2.73 + 1.52 lb ai/gal
- ❖ **Authority Edge intended for soils that can handle higher Spartan rate, primarily Eastern ND.**

Pixxaro EC herbicide (Corteva)

- **Crops: Wheat, durum, barley, triticale**
- **Halauxifen + fluroxypyr (Elevore + Starane)**
- **Rate: 6 fl oz**
- **Weeds: kochia, horseweed, pigweeds, wild buckwheat, others**
- **Timing: 2-leaf up to flag leaf, weeds up to 4 inches**
- **Apply with 2,4-D or MCPA to increase weed spectrum**

TruFlex Roundup Ready Canola

- **Total for all Preplant, At-Planting, PRE applications** **3.3 qt**
- **Total for emergence through harvest** **44 fl oz**
- **Total for emergence through 6-leaf** **44 fl oz**
- **Total for 6-leaf through first-flower** **22 fl oz**

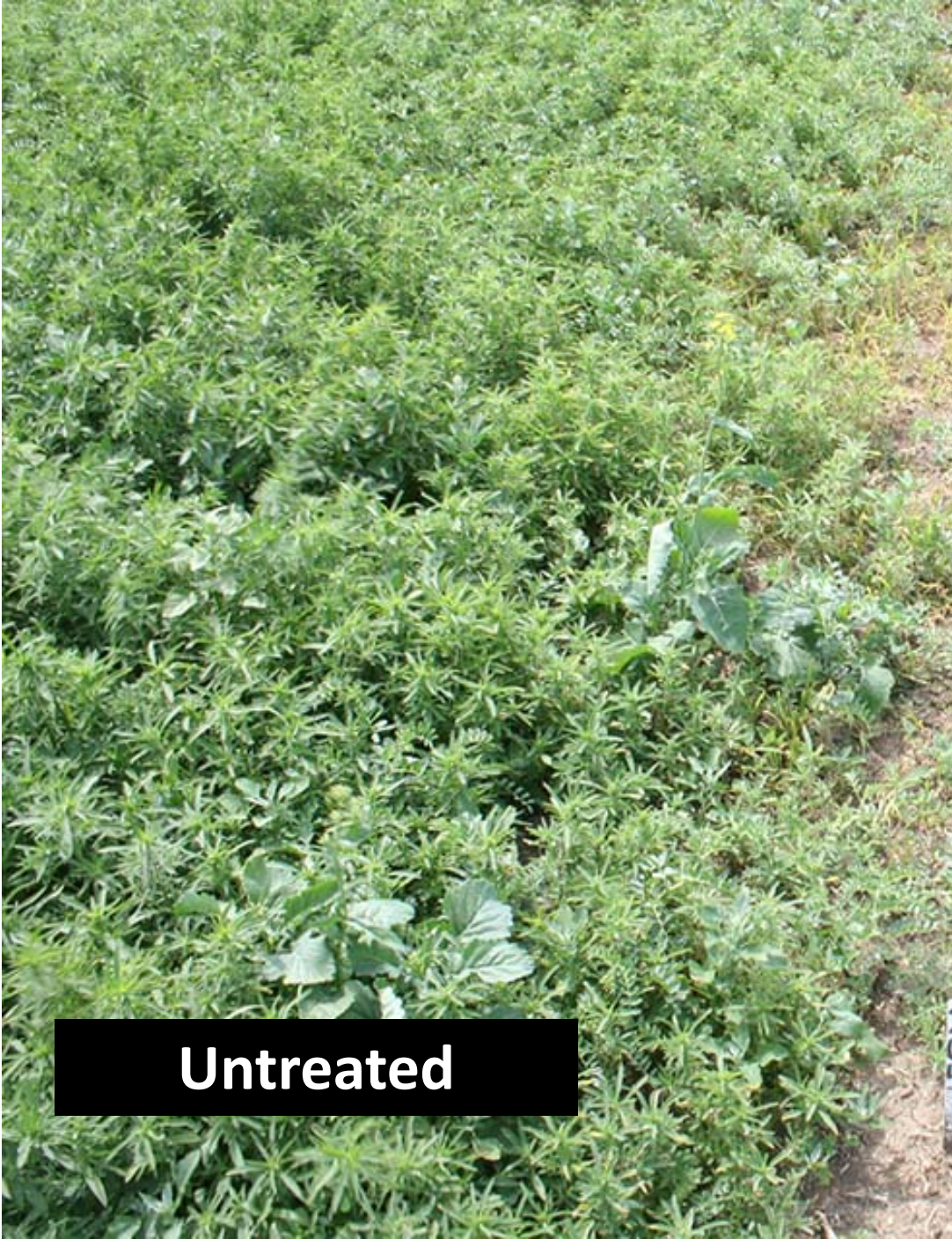
Stacked canola trait: RR + LL

Pros:

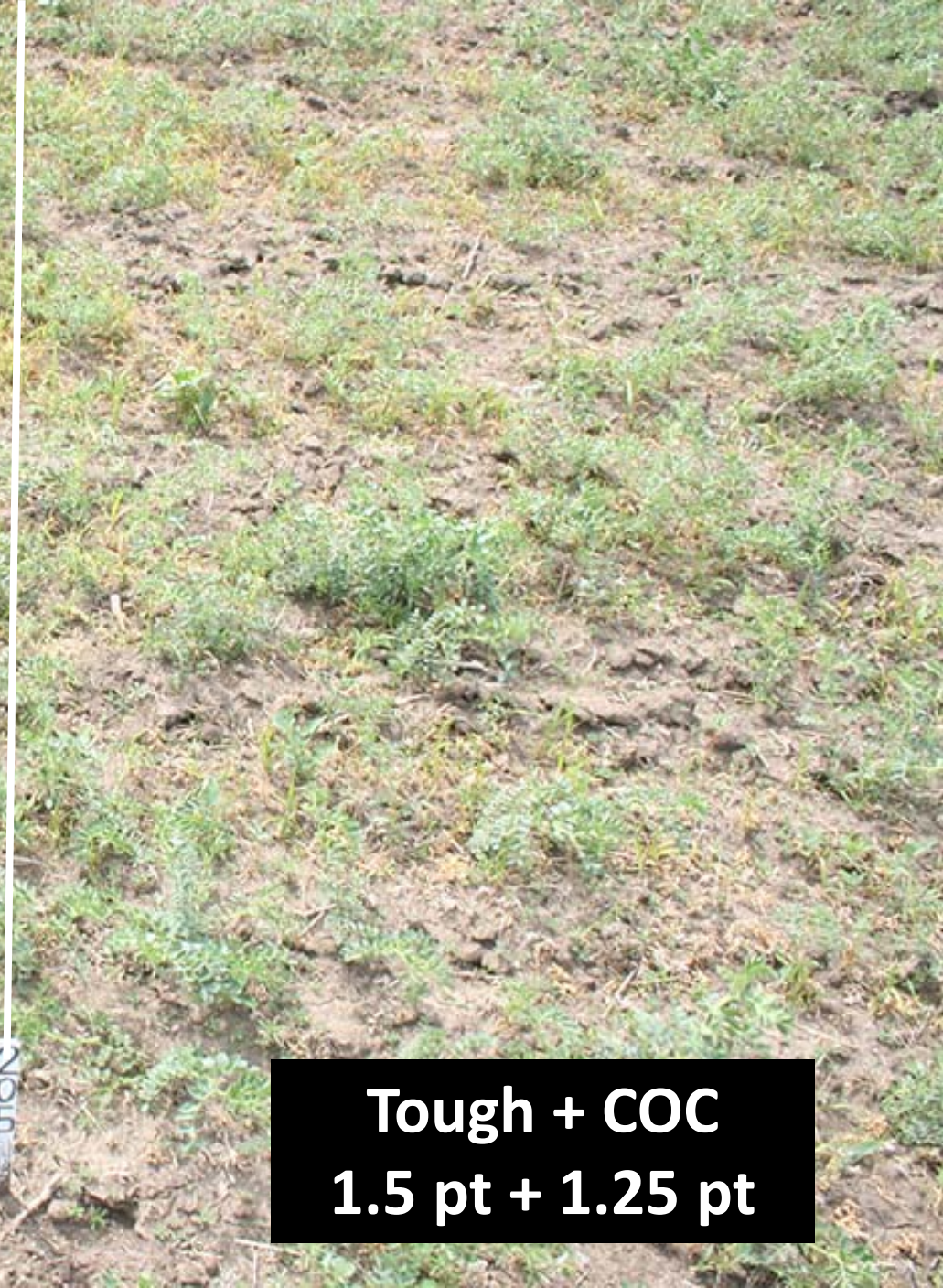
- **Spray Liberty one pass, Roundup the next pass**
- **Roundup weaknesses: Roundup-resistant kochia, horseweed, mallow, wild buckwheat**
- **Liberty weaknesses: Grasses, especially larger grasses, lambsquarters, larger broadleaves, low sunlight, low humidity, low temps**

Cons:

- **RR volunteers**



Untreated

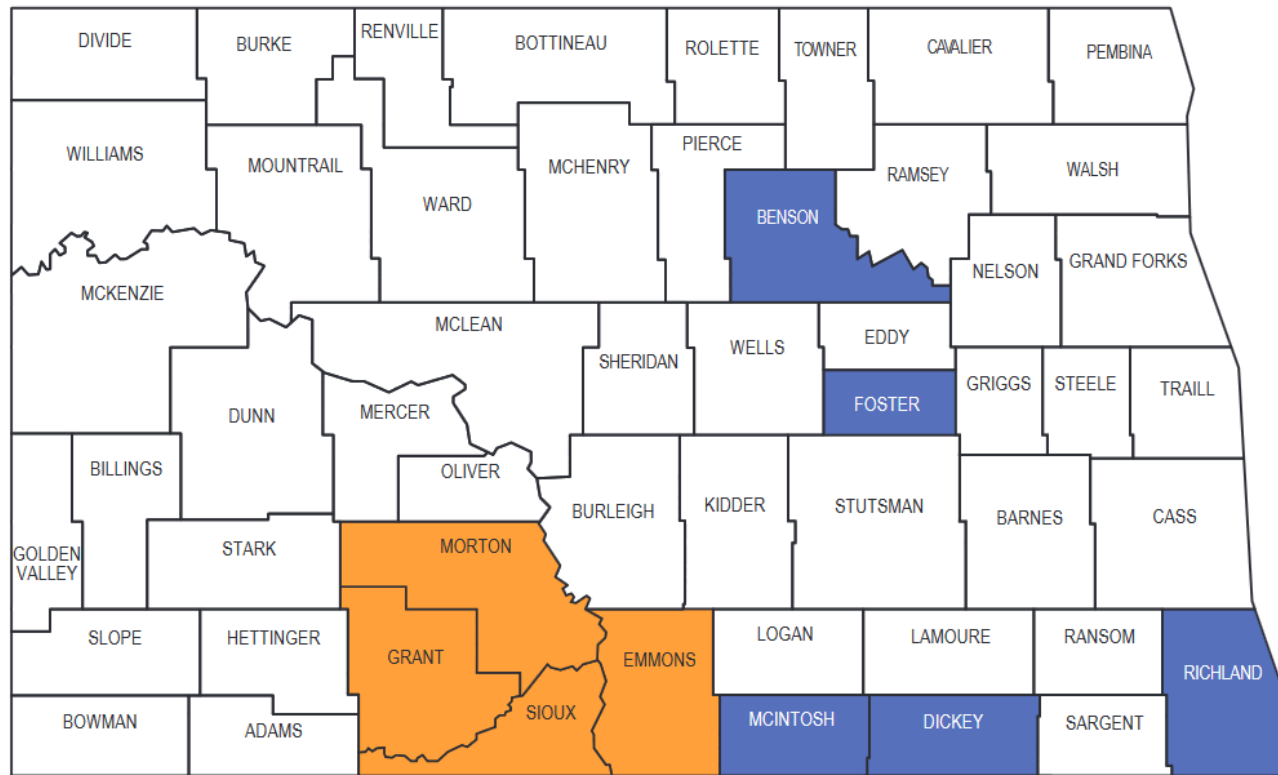


**Tough + COC
1.5 pt + 1.25 pt**

Palmer amaranth:

Don't treat this weed like redroot pigweed

North Dakota Department of Agriculture Palmer Amaranth Distribution



Lab confirmed positive for Palmer amaranth

- 2018
- 2019

As of 10/15/19



9 Counties in ND

- McIntosh
 - Dickey
 - Richland
 - Foster
 - Benson
 - Grant
 - Emmons
 - Morton
 - Sioux
-
- Combine from Midwest
 - Millet seed
 - Sunflower screenings
 - Custom combines
 - Railroad car
 - Sunflower field



How Will It Get Here?

Many ways!

1. Custom combines
2. Used equipment from other states
3. Contaminated seed
4. Bird feed and/or bird migration
5. Water movement
6. Hay or livestock feed
7. Manure
8. Anything that moves seed







Redroot pigweed



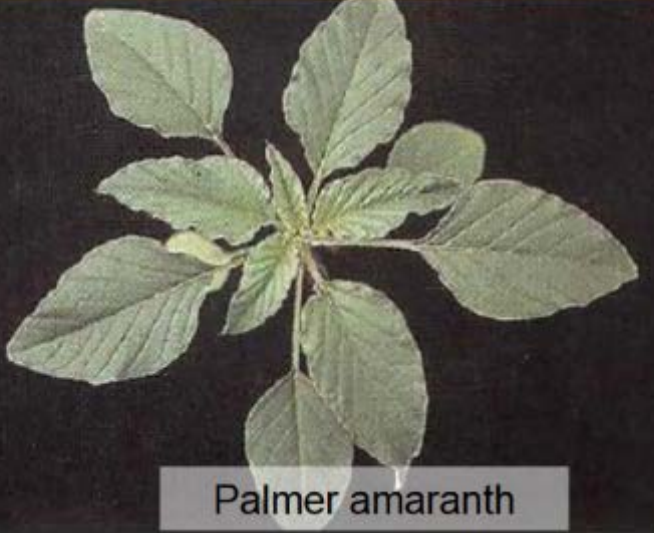
Smooth pigweed



Waterhemp



Waterhemp



Palmer amaranth







What makes Palmer amaranth a “Game Changer”?

- **Grows aggressively: Can grow 2 to 3 inches per day in optimum conditions**
- **Can grow to 6-8 feet tall**
- **Has reduced yield up to 91 percent in corn and 79 percent in soybean**
- **Prolific seed producer: Up to 1 million seeds per plant**
- **Emerges throughout the growing season**
- **Very prone to herbicide resistance (multiple modes of action)**

Prevention and early detection
are essential!!



PALMER AMARANTH

Google Custom Search



NDSU > Palmer Amaranth

Palmer Amaranth

News

Identification

Palmer Amaranth



Palmer Amaranth (NDSU Photo)

Latest Update

The #1 weed problem in the country is not in North Dakota -- YET.

We need to keep it that way. Palmer amaranth is a type of pigweed that has devastated crops in the South and Midwest. It has now been identified in South Dakota, Iowa and Minnesota. We need to establish a zero tolerance for this weed.

[MORE NEWS](#)

Potential Impact

"Palmer amaranth's prolonged emergence period, rapid growth rate, prolific seed production, and propensity to evolve herbicide resistance quickly makes this the most pernicious, noxious, and serious weed threat that North Dakota farmers have ever faced." - Rich Zollinger, Retired NDSU Extension Weed Scientist

Palmer amaranth is a competitive and aggressive pigweed species that poses a major threat to North Dakota crop production. Here's why:

- Grows aggressively: Can grow 2 to 3 inches per day in optimum conditions
- Can grow to 6-8 feet tall
- Has reduced yield up to 91 percent in corn and 79 percent in soybean
- Prolific seed producer: Up to 1 million seeds per plant
- Emerges throughout the growing season
- Very prone to herbicide resistance (multiple modes of action)

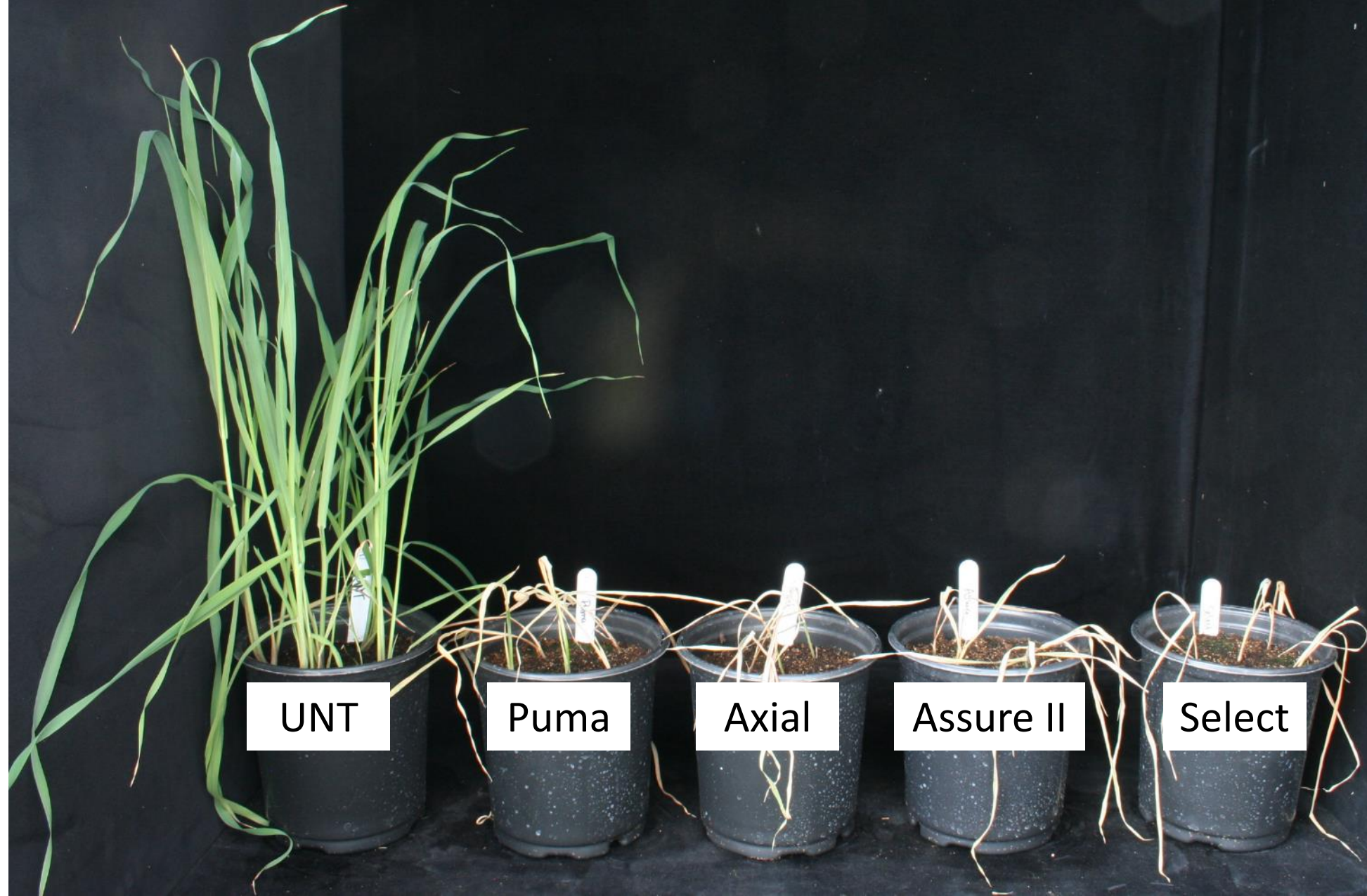
"It's the only weed I've seen that can drive a farmer out of business." - Bill Johnson, Purdue University Extension Weed Specialist

Identification



Stutsman County Extension agent Alicia

Wild oat / Green foxtail resistance



UNT

Puma

Axial

Assure II

Select



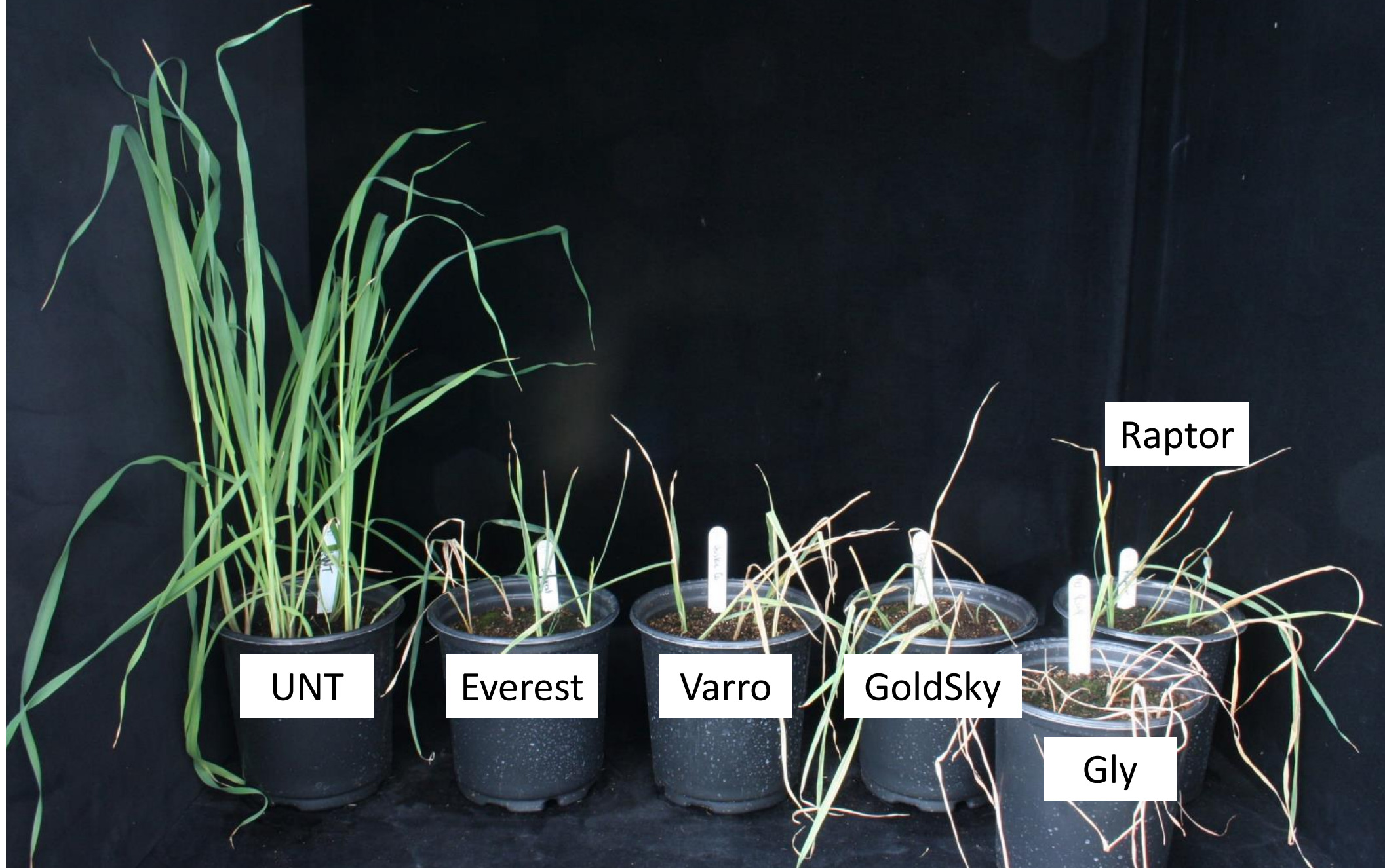
UNT

Puma

Axial

Assure II

Select



UNT

Everest

Varro

GoldSky

Raptor

Gly



UNT

Puma

Axial

Assure II

Select



UNT

Everest

Varro

GoldSky

Raptor

Gly

67 Wild oat samples

Herbicide	% resistant
Puma	85
Axial XL	48
Everest	76
GoldSky	87
Varro	96
Raptor	45
Assure II	78
Select	7

19 Green foxtail samples

Herbicide	% resistant
Puma	79
Axial XL	58
Discover	79
Everest	21
GoldSky	21
Varro	21
Raptor	0
Assure II	63
Select	0
Assure II + Select	0
Roundup	0

Wild oat and green foxtail collected in 2018.



Photo courtesy: Dr. Phil Stahlman, KSU



Kochia regrowth following Starane Ultra application





Kochia

Valor + Metribuzin + 2,4-D

4 oz + 4 oz + 12 oz

Applied Nov 16, 2016

Picture June 5, 2017



Photo: Tom Gardner, Valent

Kochia control with fall-applied Fierce (2019)

Treatment ^a	Rate (oz)	Timing	Kochia control			
			May 14	May 23	Jun 5	Jul 3
			-----%-----			
Untreated			0	0	0	0
Glyphosate	32	Fall (Oct 18)	0	0	0	0
Fierce + Glyphosate	3.75 + 32	Fall	96	91	85	78
Fierce + Glyphosate	4.5 + 32	Fall	79	78	71	56
Fierce + Glyphosate	6 + 32	Fall	97	97	92	82
Spartan + Glyphosate	4 + 32	Fall	83	78	74	64
Fierce + Gly / Spartan Charge + Gly ^b	4.5 + 32 / 5 + 32	Fall / Spring	93	100	99	96
LSD			16.0	16.4	16.6	23.2

^a Glyphosate (Roundup Powermax) applied with AMS 2.5 gal/100 gal

^b Applied with MSO (1%)

Narrowleaf Hawksbeard Control



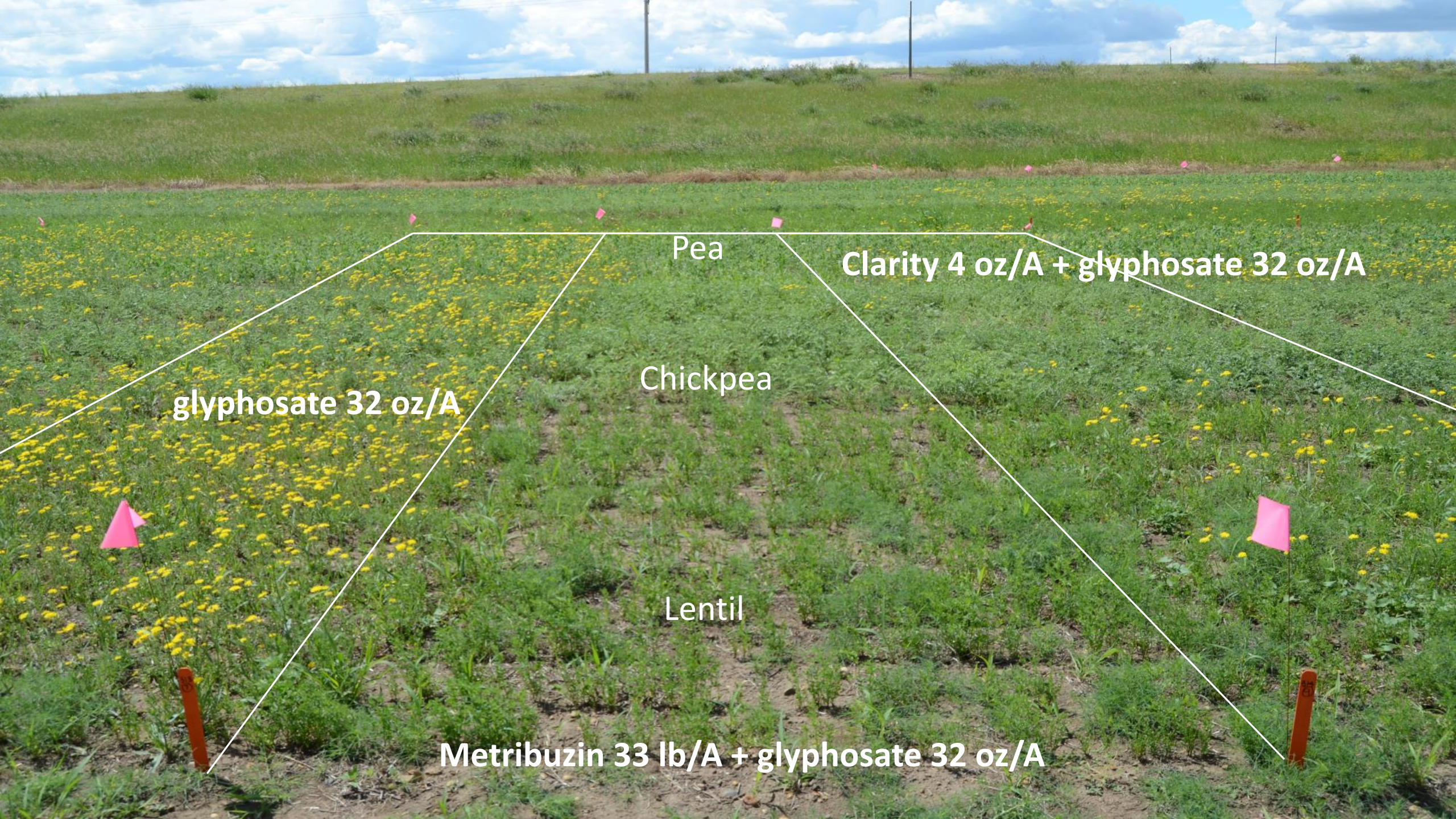
Narrowleaf hawksbeard control

Fall:

1. Glyphosate + Express (or Panoflex) + (2,4-D)
2. Glyphosate + Sharpen + (2,4-D)
3. Glyphosate + (2,4-D)
4. Glyphosate + dicamba (be aware of rotation restrictions)
5. Glyphosate + Valor + (2,4-D)

Spring:

1. Glyphosate + Sharpen (rosette stage)
2. Glyphosate
3. In-crop wheat: Affinity BS + 2,4-D, GoldSky, Starane Flex + 2,4-D
- WideMatch + 2,4-D not sufficient



glyphosate 32 oz/A

Pea

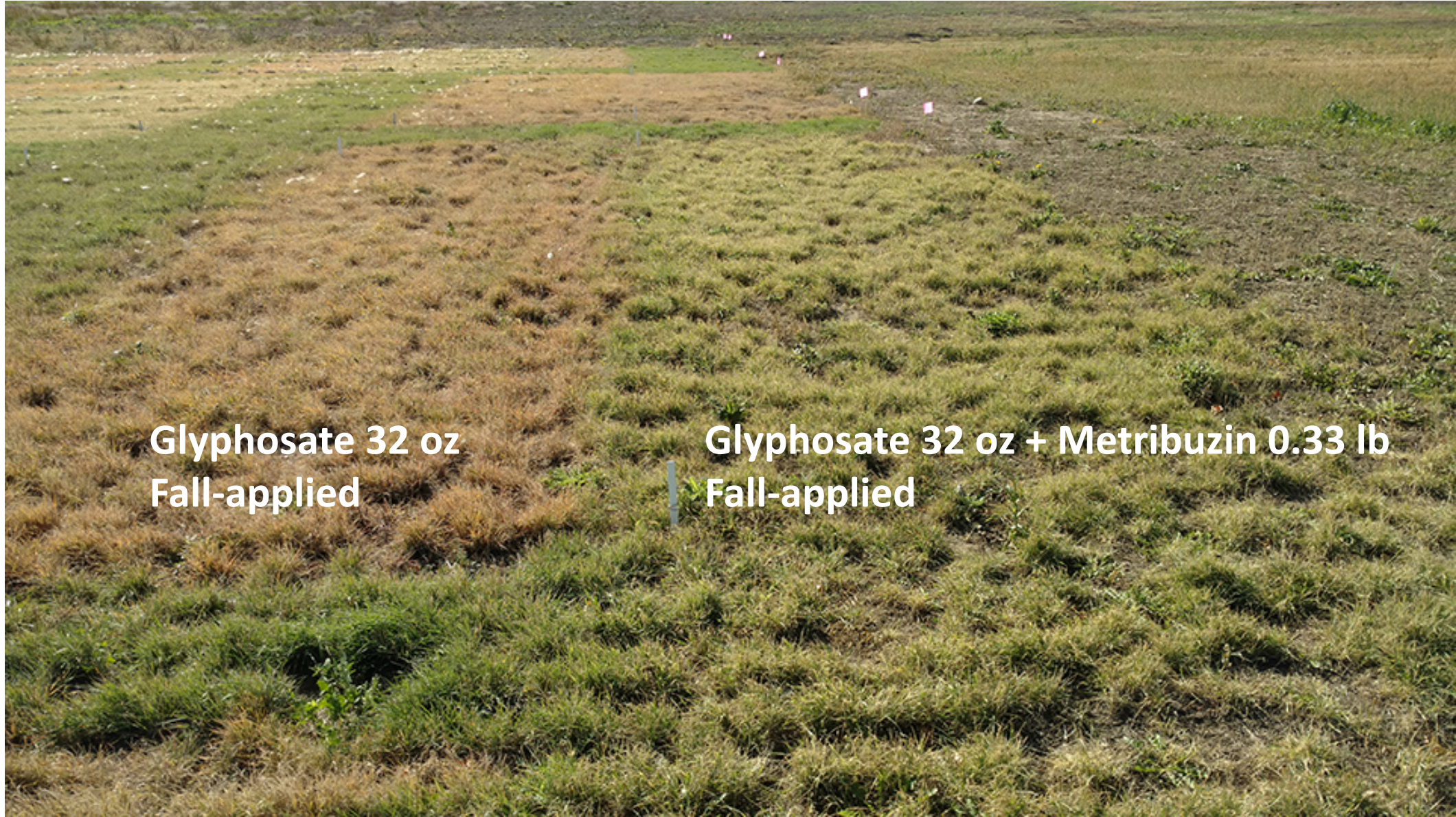
Clarity 4 oz/A + glyphosate 32 oz/A

Chickpea

Lentil

Metribuzin 33 lb/A + glyphosate 32 oz/A

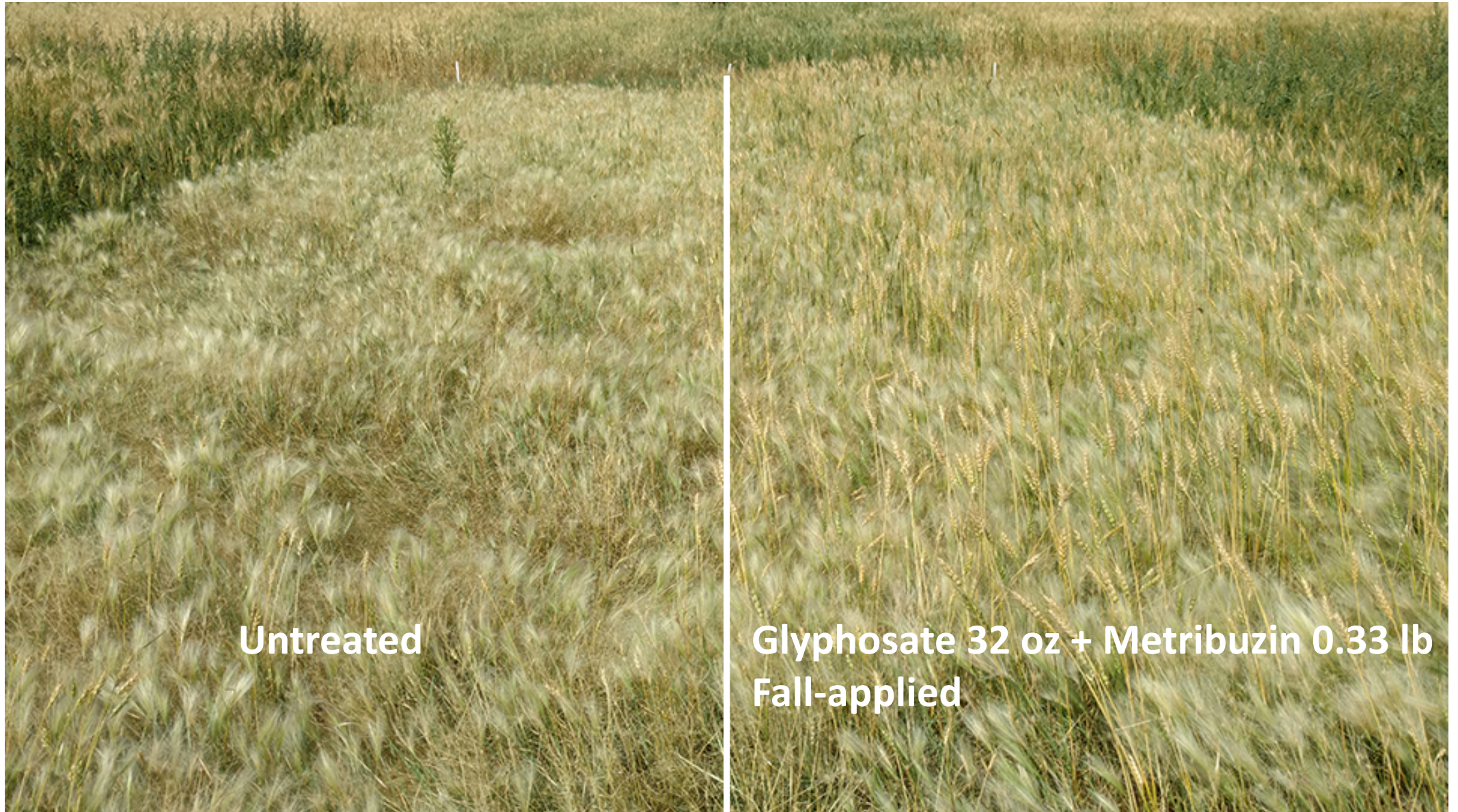
Foxtail barley control



**Glyphosate 32 oz
Fall-applied**

**Glyphosate 32 oz + Metribuzin 0.33 lb
Fall-applied**

Foxtail barley control



Untreated

**Glyphosate 32 oz + Metribuzin 0.33 lb
Fall-applied**

A photograph of a Faba bean field. The plants are green and have white flowers. The ground is dark brown soil. The text "Weed control in Faba bean" is overlaid at the bottom of the image.

Weed control in Faba bean

Herbicides registered in Faba bean

Soil-applied

Spartan Charge

Spartan Elite

Prowl H2O

Dual Magnum

Sonalan

Treflan

POST-applied

Basagran

Varisto

Select

Assure II

Desiccants

Gramoxone

Roundup

Not registered in Faba bean:

Sharpen, Metribuzin, Authority MTZ, Valor, Fierce, Raptor

Faba bean tolerance to PRE and POST herbicides.

Treatment	Rate	Timing	Injury		
			Jun-14	Jul-16	Aug-2
			—————%—————		
Untreated			0	0	0
Sharpen	2 oz	PRE	0	0	0
Spartan	4 oz	PRE	0	0	0
Spartan + Sharpen	4 oz + 1 fl oz	PRE	0	0	0
Authority MTZ	12 oz	PRE	30	25	26
BroadAxe	25 oz	PRE	0	0	0
Metribuzin	0.5 lb	PRE	60	51	52
Prowl H2O	3 pt	PRE	0	0	0
Valor	2 oz	PRE	0	0	0
Fierce	3 oz	PRE	0	0	0
Prowl H2O / Basagran + COC	2 pt / 2 pt + 1.5 pt	PRE / POST	9	8	8
Prowl H2O / Raptor ^a	2 pt / 4 fl oz	PRE / POST	35	22	24
Prowl H2O / Basagran + Raptor ^b	2 pt / 1 pt + 4 fl oz	PRE / POST	9	6	6
Tough	1.5 pt	POST	65	49	53
LSD (0.05)			6.2	12.0	12.1

^aApplied with MSO (1.5 pt) and 28% N (2.5%)

^bApplied with MSO (1.5 pt)

Crop rotation intervals for Faba bean

Sprayed 2018
Faba planted 2019

Table. Rotation Intervals for Faba Bean. (1821)							
		Injury			Height	Yield	Test wt.
Treatment	Rate	13-Jun	12-Jul	26-Jul	26-Jul	6-Sep	6-Sep
		-----%-----			cm	lb/A	lb/bu
Untreated		0	0	0	78.1	1760	65.8
Everest 3.0	2 oz	23	21	17	78.7	2032	66.4
Ally XP	0.1 oz	12	9	6	78.3	1876	66.5
Widematch	1 pt	18	20	18	77.9	1783	66.1
Huskie	11 oz	12	11	4	80.5	2038	65.8
Talinor	13.7 oz	1	0	0	81.4	2009	66.3
Quelex	0.75 oz	0	0	0	82.1	1850	66.5
LSD		14.8	15.3	13.3	NS	NS	0.53

Yield CV=8.7

Canola tolerance to Spartan (sulfentrazone)

Brian Jenks, NDSU

Bryan Hanson, NDSU

Mike Ostlie, NDSU

Ed Davis, MSU

Dave Grafstrom, MN

Canola tolerance to Spartan (sulfentrazone)

- 1) Determine if Spartan would be safe to apply to canola PRE or early POST**
- 2) Provide justification for reducing the crop rotation interval from 24 months to 9-12 months.**

Some canola growers want to plant canola following soybean. Right now, if they use Spartan in soybean, the label requires a 24 month rotation interval.

Canola tolerance to Spartan (sulfentrazone)

While some treatments showed minimal yield loss, overall, the study showed low to moderate potential for significant yield loss with some treatments, depending on rainfall soon after application and organic matter content.

Yield losses of 15-40% would be considered unacceptable, which was seen in some treatments.

This study shows that 24 months is likely too long.