

2019 Weed Control Update

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Axial Bold

- Axial XL + Puma
- Full rate of Axial + reduced rate of Puma
- 15 fl oz product (16.4 fl oz Axial + 0.21 pt Puma)

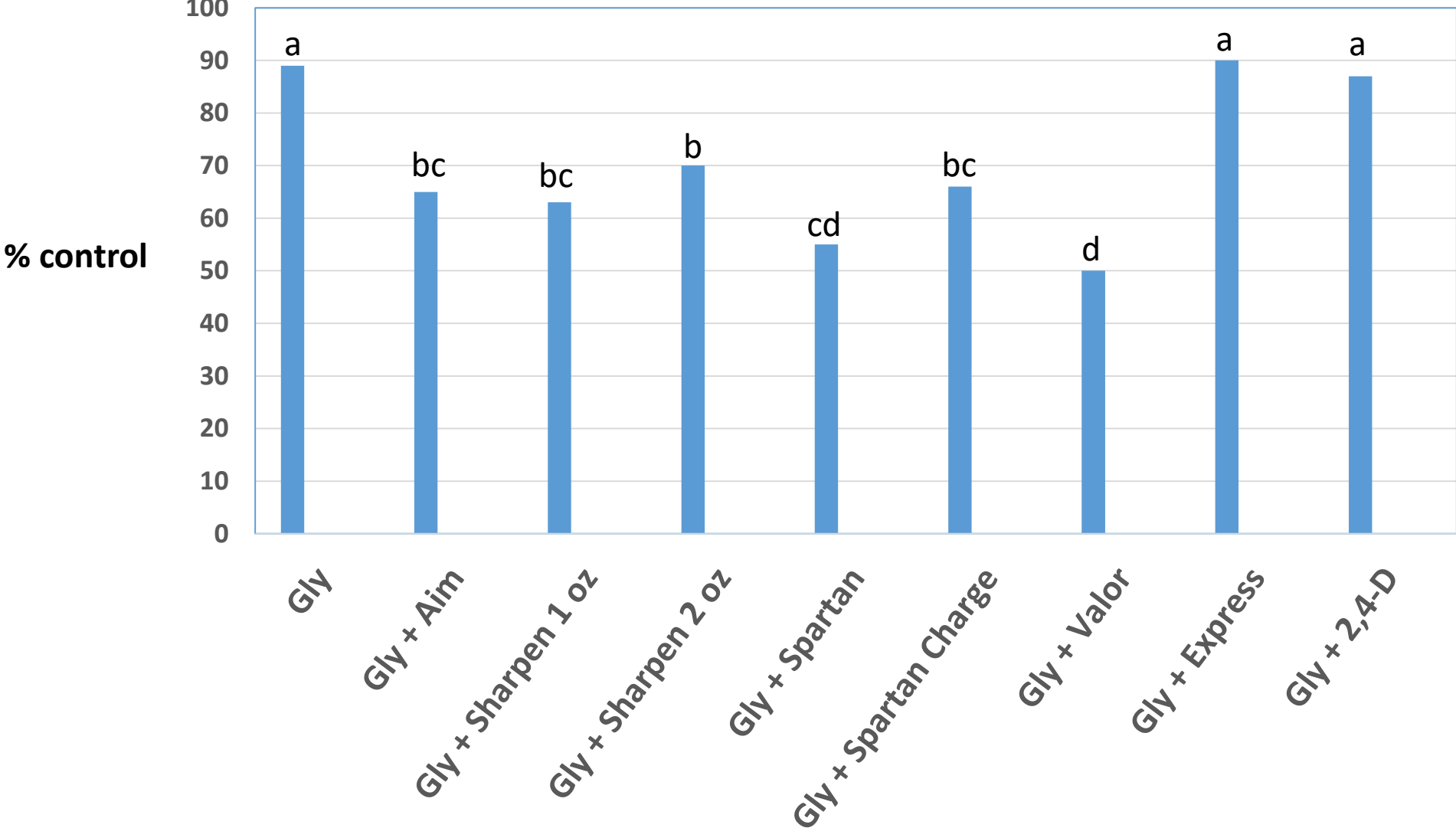
- Wheat and barley, not for durum
- Wheat: Emergence to pre-boot
- Barley: Emergence to prior to jointing

Authority Supreme

- **Spartan + Zidua**
- **Soybean, sunflower, dry pea, chickpea**

Authority Supreme	Spartan	Zidua
(fl oz)	(fl oz)	(oz)
5	2.6	1.5
7.7	4	2.35

Spring dandelion control with Glyphosate and Group 14 herbicides



Fall dandelion control with Glyphosate and Group 14 herbicides

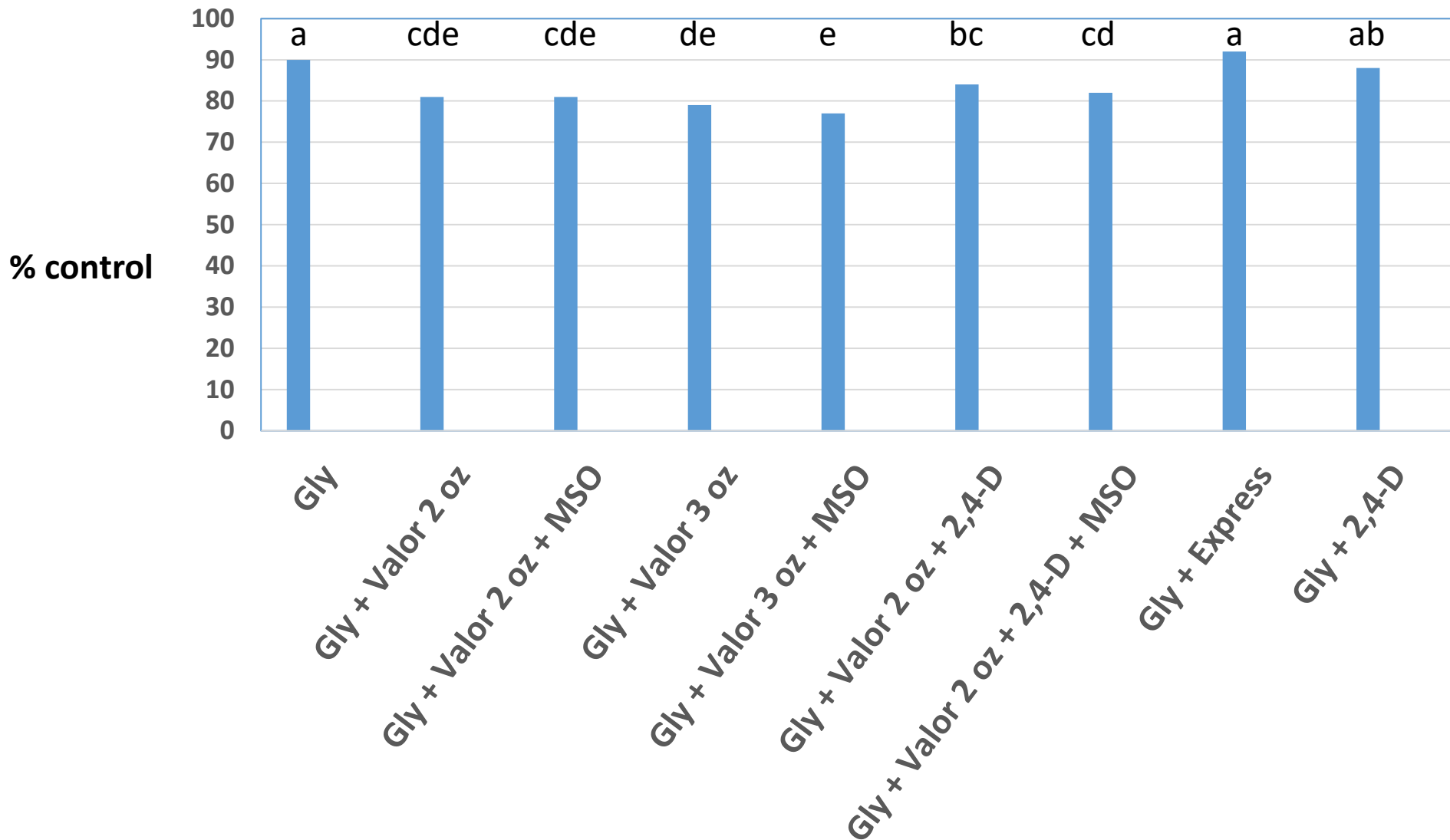




Photo courtesy: Dr. Phil Stahlman, KSU

Kochia control with fall-applied herbicides (2007)

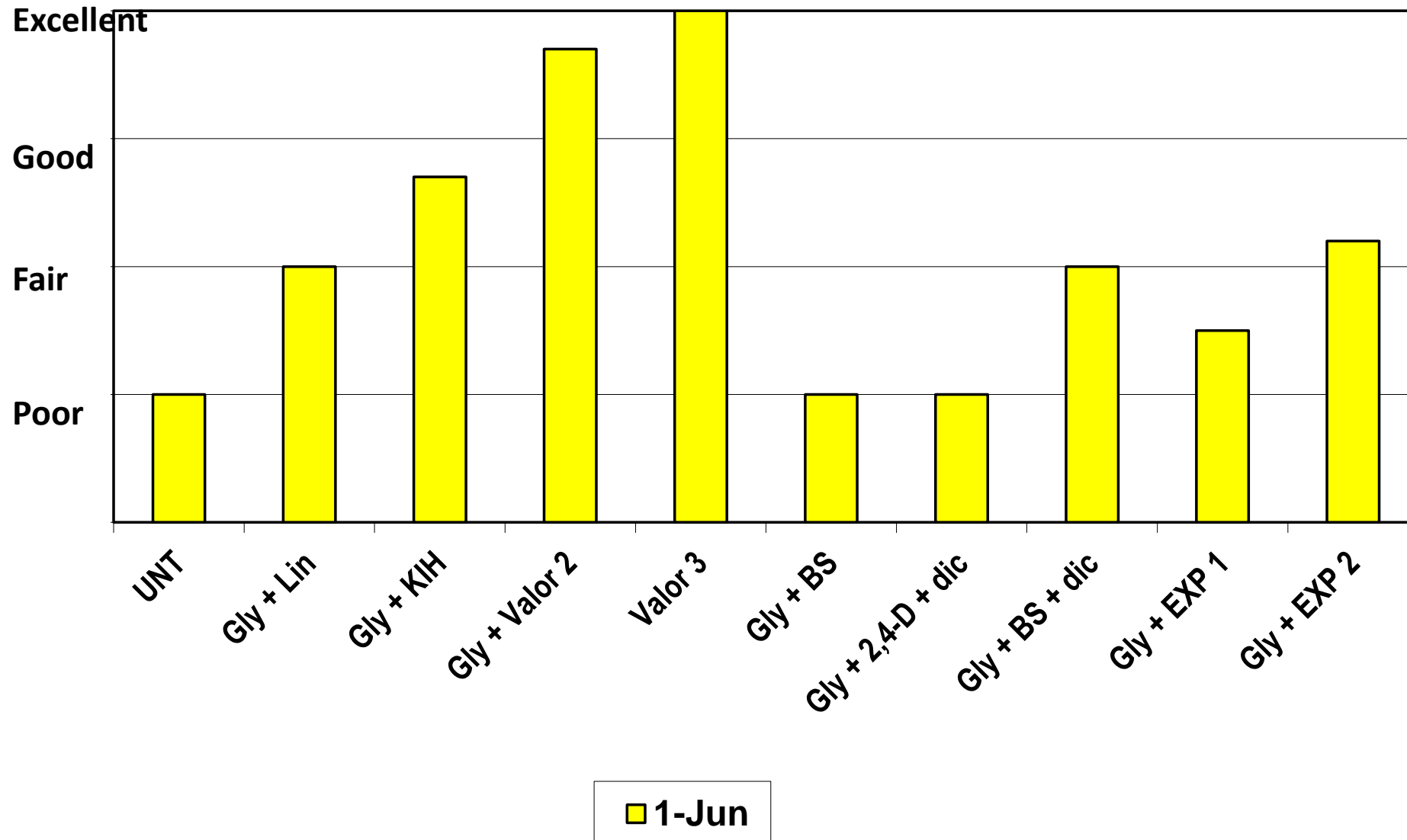


Table. Fall vs. spring applications for control of emerged glyphosate-resistant kochia.

Treatment ^a	Rate	Timing ^b	Kochia control
			May-29
Untreated			0
Fierce	3 oz	Fall	90
Valor	3 oz	Fall	91
Metribuzin	0.5 lb	Fall	30
Spartan	5 fl oz	Fall	55
Glyphosate	22 fl oz	Spring	50
Gramoxone + Metribuzin + NIS	2 pt + 0.5 lb + 0.25%	Spring	99
Authority MTZ	12 oz	Spring	68
Fierce + Metribuzin	3 oz + 0.5 lb	Spring	80
LSD (0.05)			5.4

^aAll treatments applied with Glyphosate + AMS (22 oz + 2.5 gal/100 gal); Glyphosate = 4.5 lb ae formulation

^bApplied Oct 8, 2014 (kochia 8-12 inches) and May 21, 2015 (kochia 0.5-4 inches)



June 10

Valor 3 oz +
Roundup 22 oz +
2,4-D ester 1 pt

Untreated



Kochia

Valor + Metribuzin + 2,4-D

4 oz + 4 oz + 12 oz

Applied Nov 16, 2016

Picture June 5, 2017



Photo: Tom Gardner, Valent



Horseweed
Valor 3 oz +
PowerMax +
2,4-D/dicamba
Fall-applied

Kochia regrowth following Starane Ultra application



Foxtail barley control



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**

Wild oat resistance test

Herbicide	Field 1	Field 4
Puma	MR	R
Axial XL	R	R
Assure II	R	R
Select	S	MR
Everest	R	R
GoldSky	R	R
Huskie Complete	R	R
Raptor	R	R

S = Susceptible

SR = Slightly Resistant

MR = Moderately Resistant

R = Resistant

Recent wild oat and green foxtail resistance testing

Wild oat (27 samples)

Puma: 23

Axial: 14

Assure II: 21

Select: 0

Everest: 26

GoldSky: 27

Varro: 27

Raptor: 12

Green foxtail (16 samples)

Puma: 14

Axial: 10

Assure II: 11

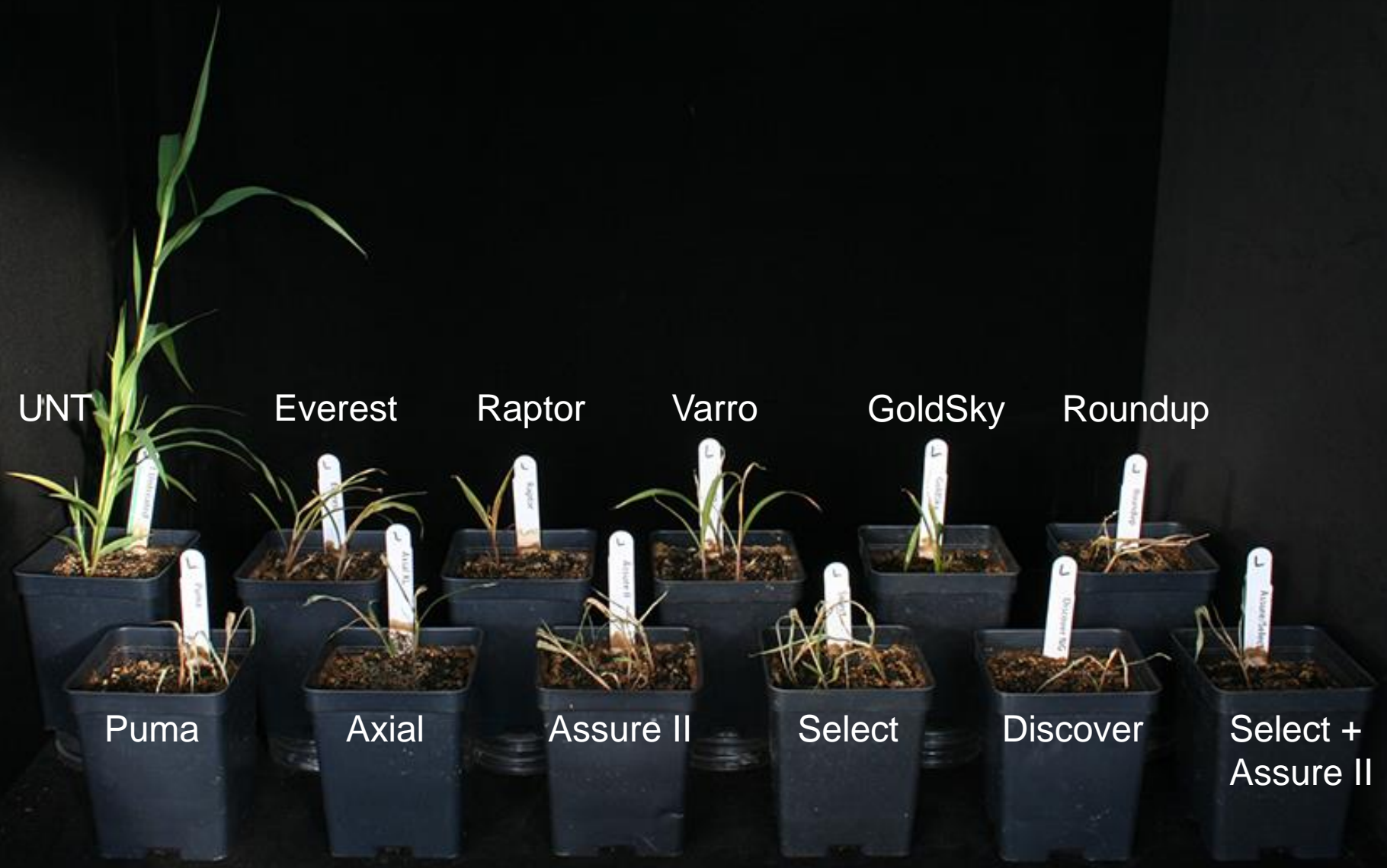
Select: 1

Everest: 2

GoldSky: 2

Varro: 2

Raptor: 0



UNT

Everest

Raptor

Varro

GoldSky

Roundup

Puma

Axial

Assure II

Select

Discover

Select +
Assure II

UNT

Discover

Puma

Axial

Assure II

Select

Everest

Raptor

Varro

GoldSky

Roundup

Select +
Assure II



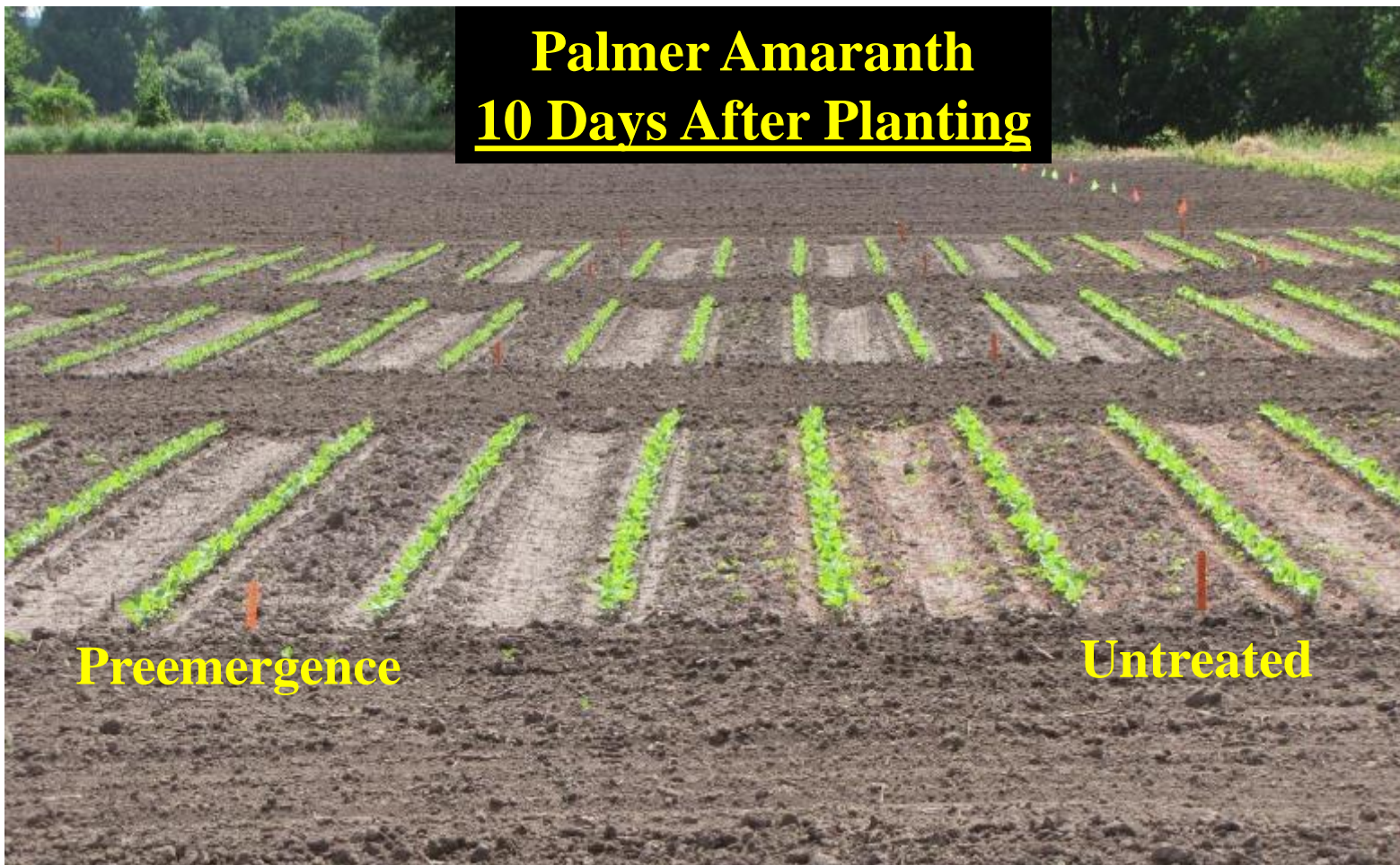
Palmer amaranth:

It's now in ND, but why should we care?

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)**

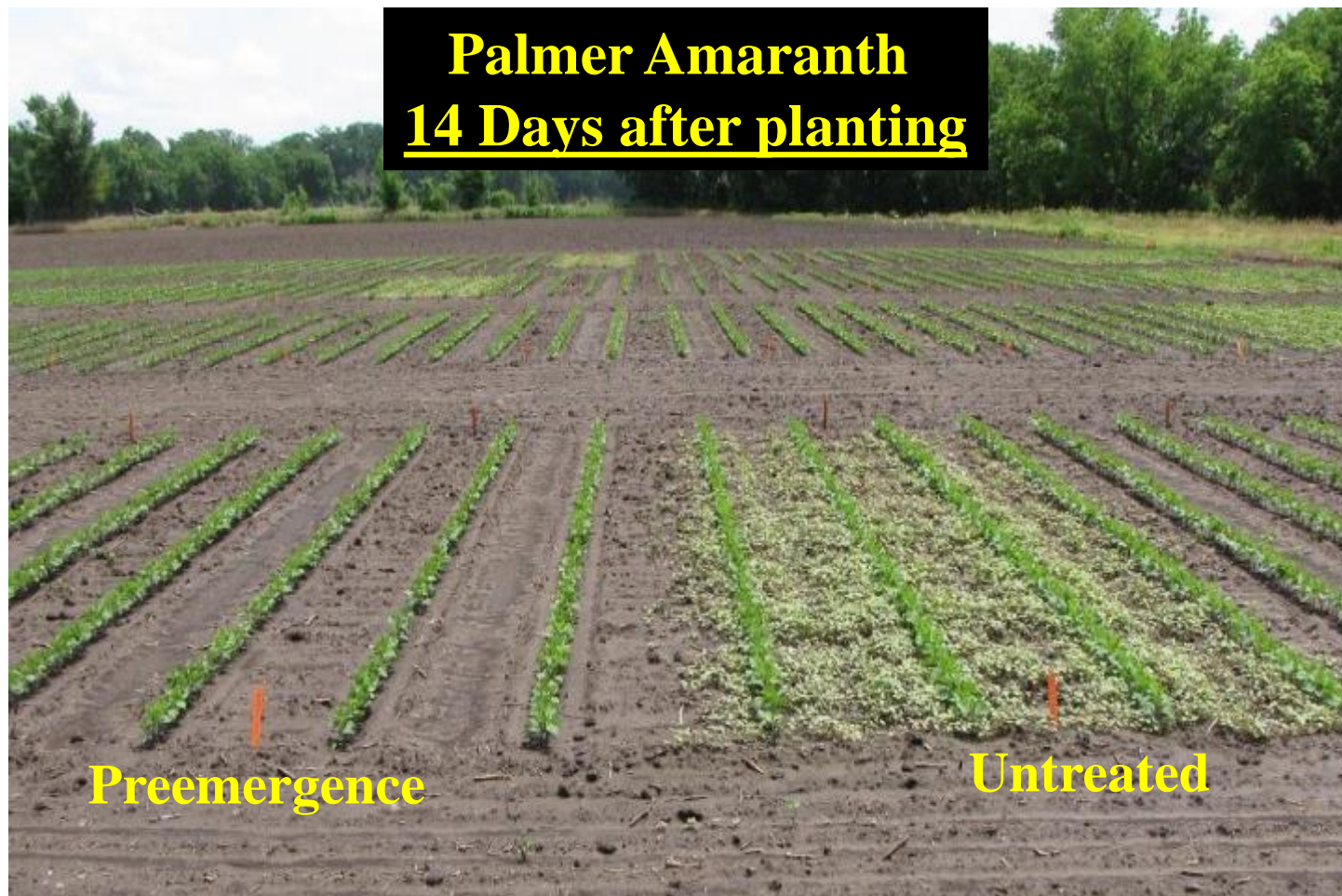
**Palmer Amaranth
10 Days After Planting**



Preemergence

Untreated

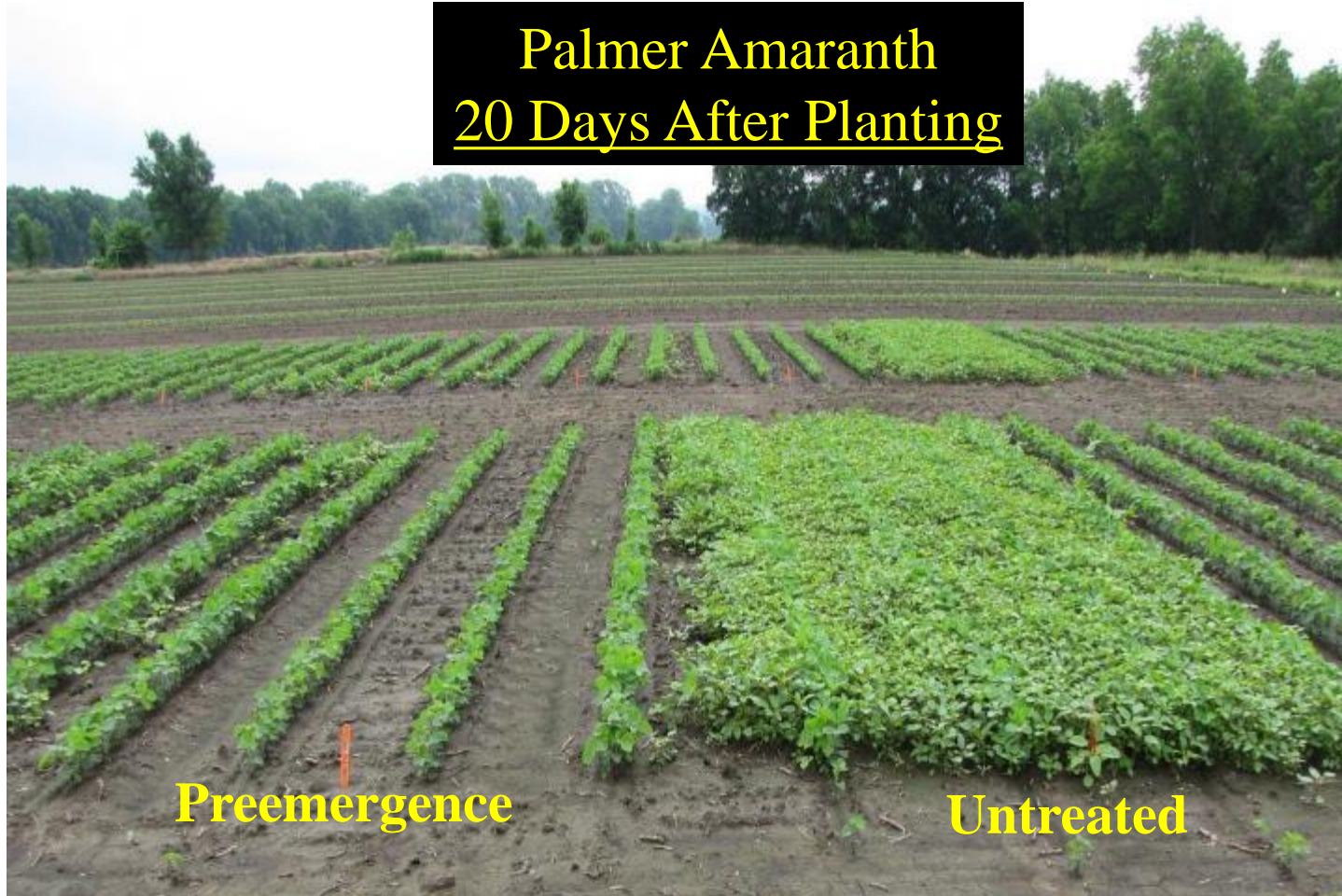
Palmer Amaranth
14 Days after planting



Preemergence

Untreated

**Palmer Amaranth
20 Days After Planting**




Preemergence

Untreated



Photo courtesy
Dr. Larry Steckel



Flexstar on 6" Palmer

Flexstar on 3" Palmer

Photo courtesy
Dr. Larry Steckel

The Difference of 2 Days!

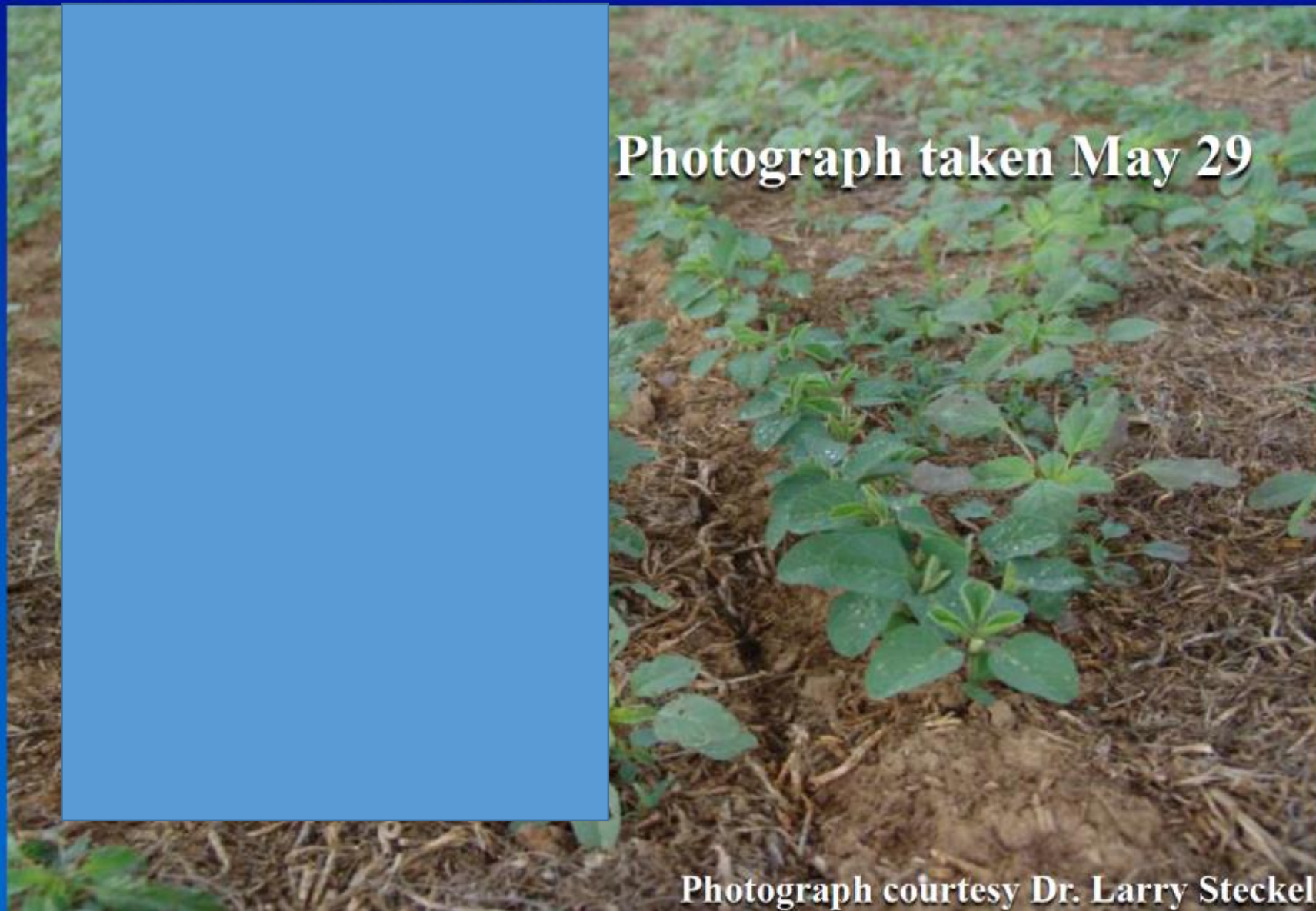
Flexstar on 6" Palmer

Flexstar on 3" Palmer



Photo courtesy
Dr. Larry Steckel

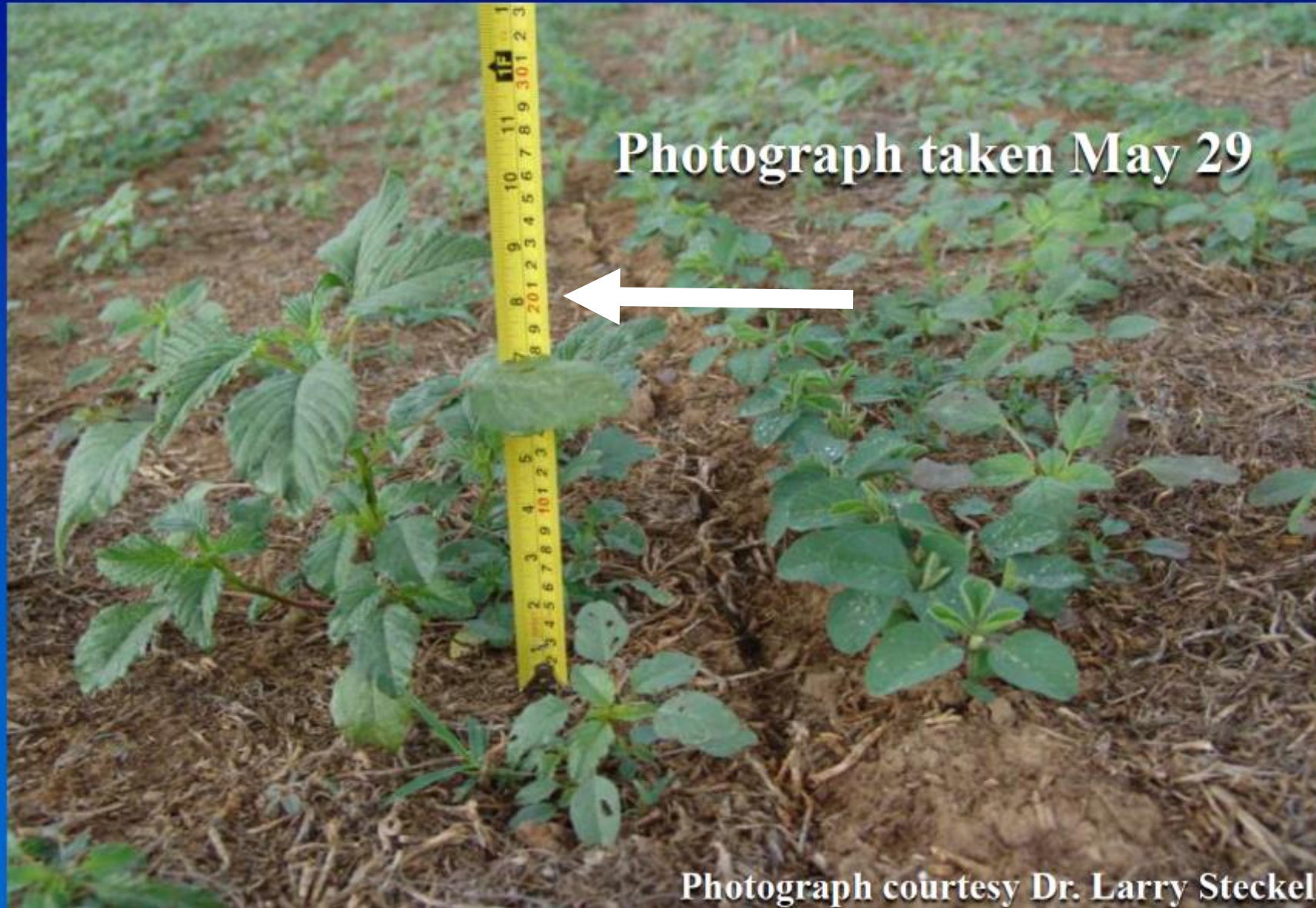
Soybean planted into weed-free soil May 16



Photograph taken May 29

Photograph courtesy Dr. Larry Steckel

Soybean planted into weed-free soil May 16











5 Counties in ND

- Combine from Midwest
- Custom combines
- Railroad car
- Sunflower screenings
- Millet seed?









Redroot pigweed



Smooth pigweed



ell amar



Waterhemp



Palmer amaranth

Palmer amaranth identification



Smooth stem



Symmetrical leaf arrangement



May have spike on leaf tip



Long leaf petiole



Female plant spiny bracts



Poinsettia-like appearance

Female



Male











Palmer amaranth and Waterhemp

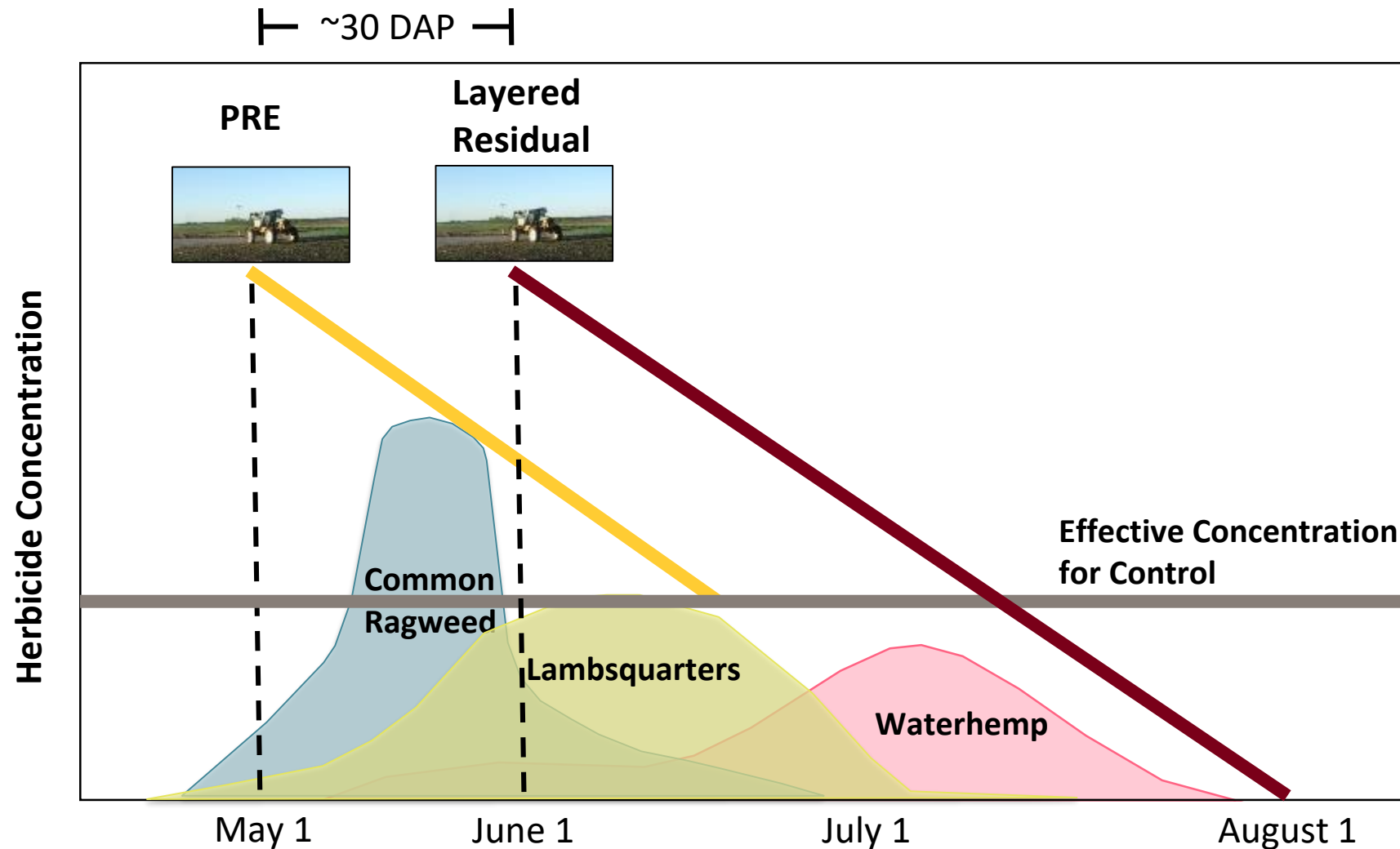
- **Need good crop competition**
- **PREs are a must**
- **Multiple modes of action**
- **Layered applications**
- **Don't let anything go to seed**

Labor – hand-weed
2010 – 110 hrs
2011 – 5 hrs
2012 – 2 hrs

ZERO TOLERANCE



LAYERED RESIDUALS FOR LATE-EMERGING WEEDS



Goal =
Prevent
Seed
Production

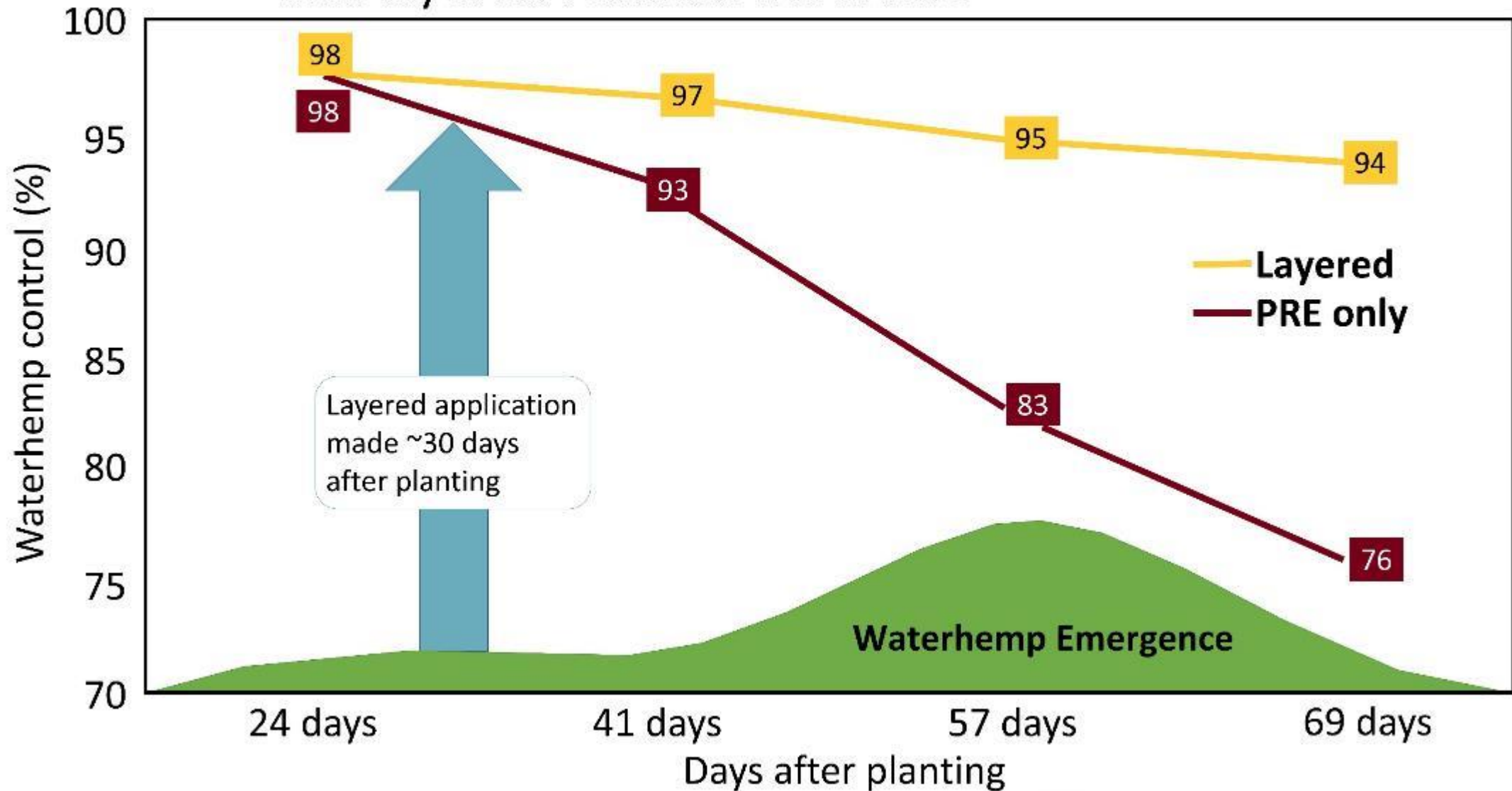
Photo 7/14/15



PRE only application of Outlook

Layered PRE/POST applications of Outlook (May 5 and June 8)

Waterhemp control over time with residual and layered residual herbicide



Herbicide	Group
Classic	2
2,4-D	4
Atrazine	5
Roundup	9
Flexstar	14
Callisto	27

- Liberty
- Dicamba

Missouri Weeds: Waterhemp Confirmed with 6-Way Resistance

FROM THE WEED SCIENCE SOCIETY OF AMERICA

SHARE



Like 40

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A study featured in the journal [Weed Science](#) is certain to keep many corn and soybean growers up at night. Researchers have identified a waterhemp population in Missouri that is resistant to a record-breaking six herbicide mechanisms of action.

It all started when growers in Randolph County, Missouri, reported a population of waterhemp that appeared to be resistant to 2,4-D. Researchers from the University of Missouri conducted field

 Search

Excellent below-ground burndown, even in cool weather

GET TO THE ROOTS

Nufarm BurnMaster

From our sponsor...

Directly Contact Nufarm's Field Staff:
 Troublesome Weeds? No Trouble At All.



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PALMER AMARANTH

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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