2014 Herbicide and Weed Control Update

Rich Zollinger
NDSU Extension Weed Specialist

New Herbicides for 2014 – Major announcement…..

New Herbicides - Historic

aminocyclopyrachlor (Dupont) – Growth reg.

- Perspective - for pasture/rangeland

florasulam / pyroxulam (Dow/Syngenta) – ALS

- GoldSky, Orion, PowerFlex, Huskie Complete

pyrasulfotole (Bayer) – HPPD inhibitor

- Huskie Complete

pyroxasulfone (Kumiai) – Group 15 (a.i. Harness)

- Zidua, Anthem, Fierce

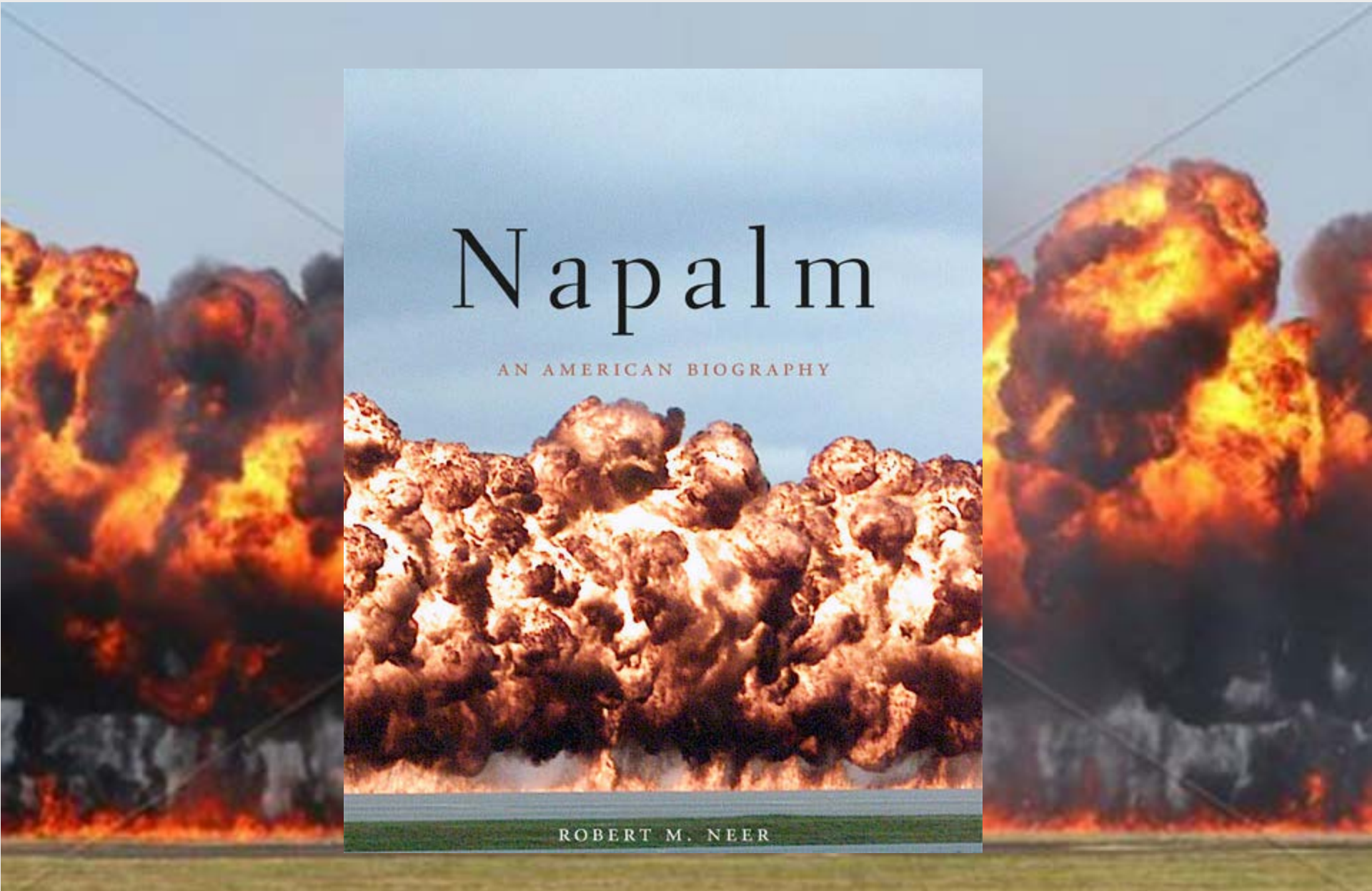
saflufenacil (BASF) – PPO inhibitor

- Sharpen, Verdict, OpTill

thiencarbazone (Bayer) – ALS inhibitor

- Huskie Complete, Capreno, Corvus

New Herbicide for 2014



2014 generic brand names

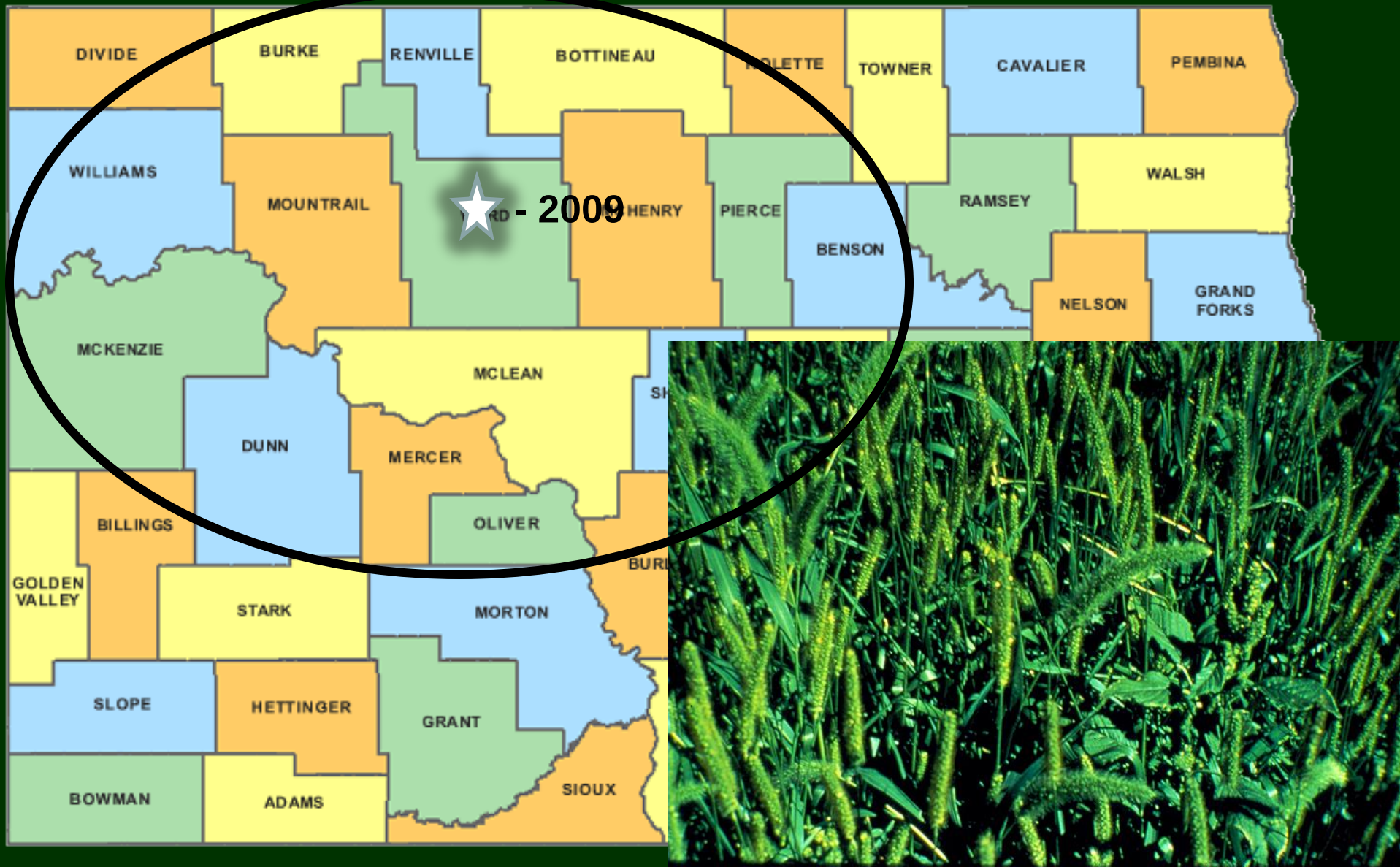
Alluvex (Dupont)	= 1:1 Resolve+Harmony
FullDeck (Helena)	= MCPA+Starane+Stinger
Gramoxone SL 2.0 (Syng)	= new formulation
Metribuzin (CPS/MANA	= same ai as Sencor
Panoflex (Dupont)	= 4:1 Express+Harmony
Panther (Nufarm)	= same ai as Valor
Paraquat (Willowood)	= same ai as Gramoxone
Pummel (MANA)	= same ai Dual + Pursuit
Rumble (MANA)	= same ai as Reflex
Tailwind (MANA)	= same ai as Boundary
Torment (MANA)	= same as Reflex+Pursuit
Tuscany (Nufarm)	= same ai as Valor
Vise (MANA)	= same ai as Prefix

Herbicide resistant weeds – historic perspective

ACCase R Wild oat

ALS R kochia

ACCase resistant green foxtail

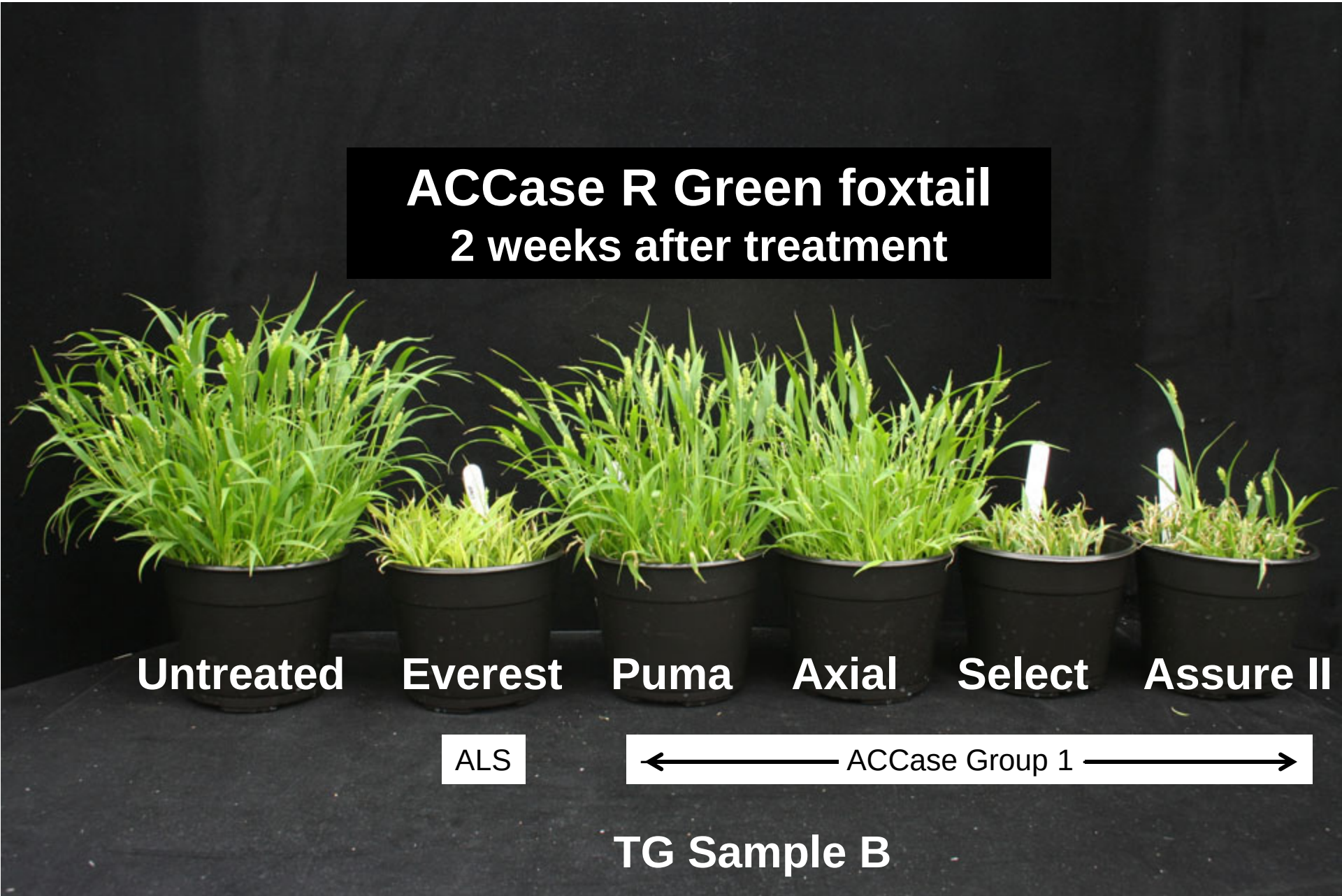


ACCase/Group 1 Chemistry

Group 1 Chemistry (ACCASE INHIBITORS)		
FOPS	**DIMS**	**DENS**
Puma/Wolverine (fenoxaprop)	**Poast / Rezult (sethoxydim)**	**Axial (pinoxaden)**
Discover (clodinafop)	**Shadow / Select / Arrow / Section / Volunteer / Trigger (clethodim)**	
Assure II / Targa (quizalifop)		
Fusilade / Fusion (fluazifop)		

Clethodim is the last line of Group 1 (ACCase) defense.
When resistant to clethodim then resistant to all.

Overuse of ACCase herbicides



How do you control ACCase R grasses in:

- Sunflower
- Peas
- Lentils
- Drybeans
- Flax
- Barley
    - Group 1 is often your only option!

Recommendations

- Tankmix Group 1 + Group 2 in broadleaf crops where affordable (Beyond+clethodim)
- Rotate Group 1 and Group 2
- If use Group 1 in 1st year then plant wheat in 2nd year:
  - Everest has been effective but for how long?
  - Everest in wheat - can rotate to RR or LL soy or canola the next year
  - Will give 2 years of alternate chemistry.

Dr. Brian Jenks, NorthCentral R&E Center, Minot

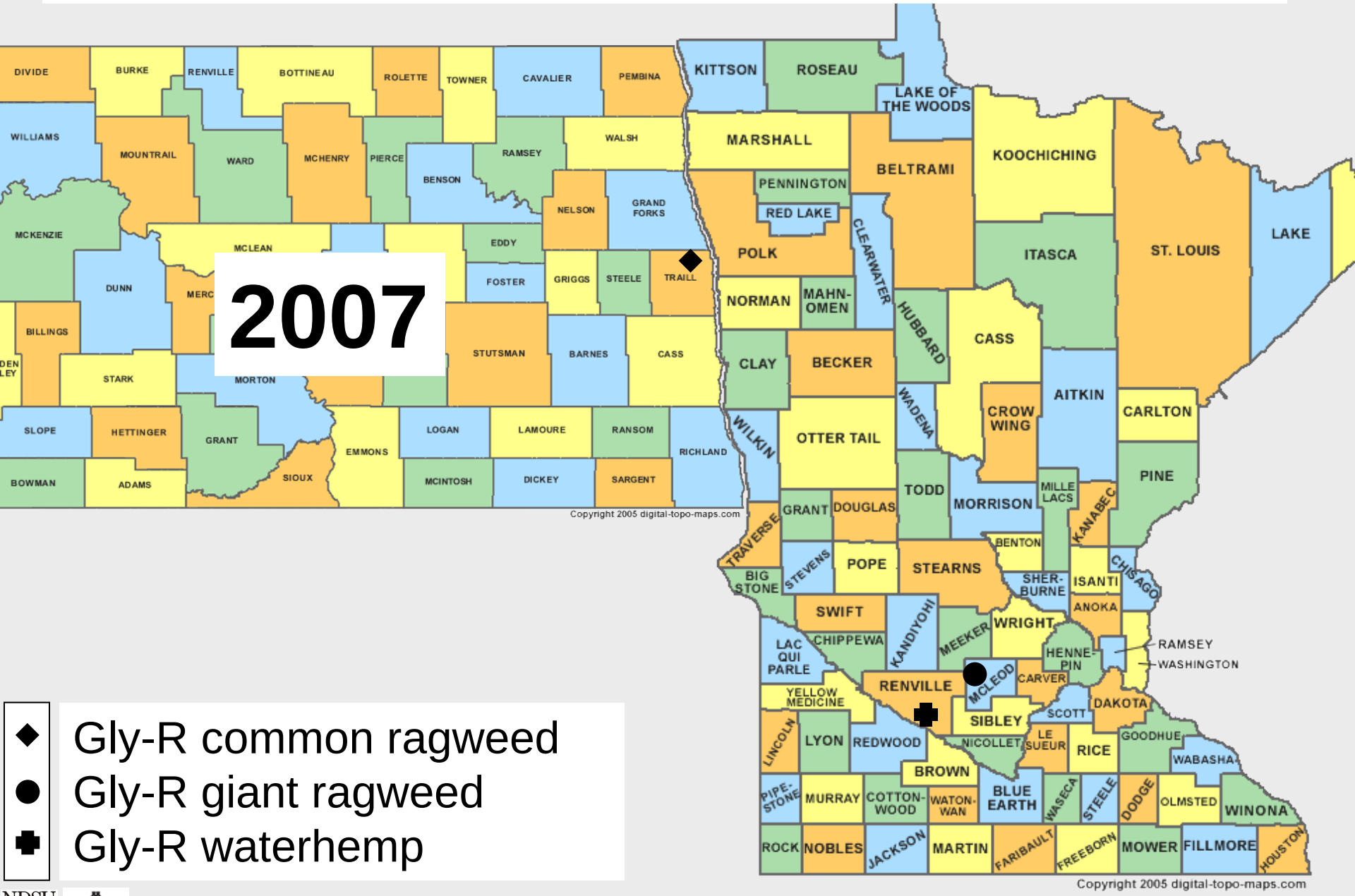
ND is loosing crop diversity

Corn	⬆ ~4 m acres	Illinois
Soy	⬆ ~5 m acres	Indiana
Wheat	⬇	Iowa
Dry beans	⬇	N. Ikota
Field pea	⬇	
Lentil	⬇	
Sunflower	⬇	
Canola	⬇	
Flax	⬇	
Sugarbeet	-	

Over use of glyphosate

Corn	RR = > 97% ND acres
Soy	RR = > 97% ND acres
Wheat	
Dry beans	
Field pea	
Lentil	
Sunflower	
Canola	RR = > 75% ND acres
Flax	
Sugarbeet	RR = > 98% ND acres

Glyphosate-resistant weeds in ND and MN



- ◆ Gly-R common ragweed
- ● Gly-R giant ragweed
- ✚ Gly-R waterhemp

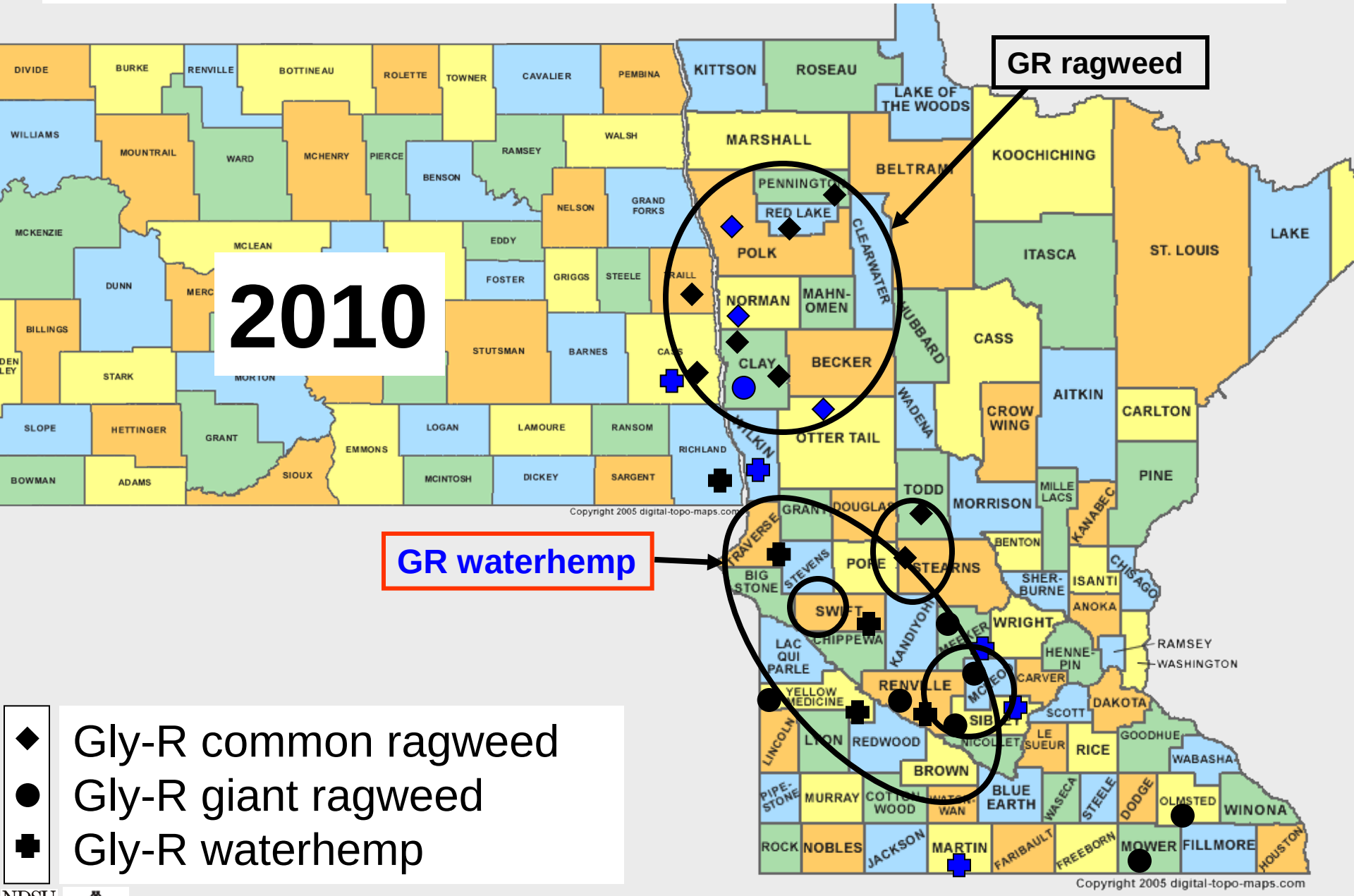
NDSU Extension Service North Dakota State University

University of Minnesota EXTENSION

Provided by: Drs. Jeff Stachler and Mike Christoffers

Black symbols: confirmed resistant cases; Blue: highly suspected

Glyphosate-resistant weeds in ND and MN



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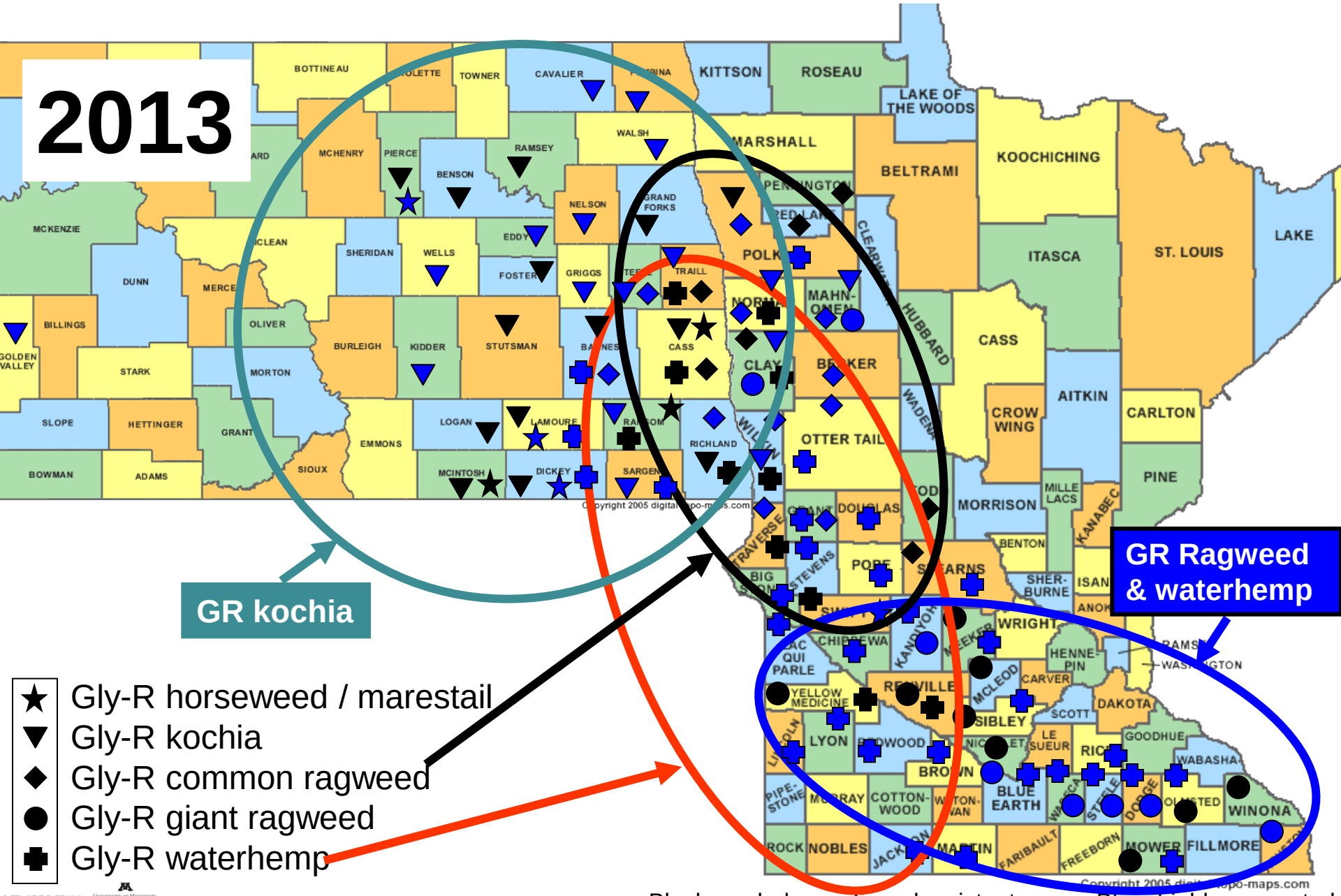

NDSU EXTENSION SERVICE | UNIVERSITY OF MINNESOTA EXTENSION
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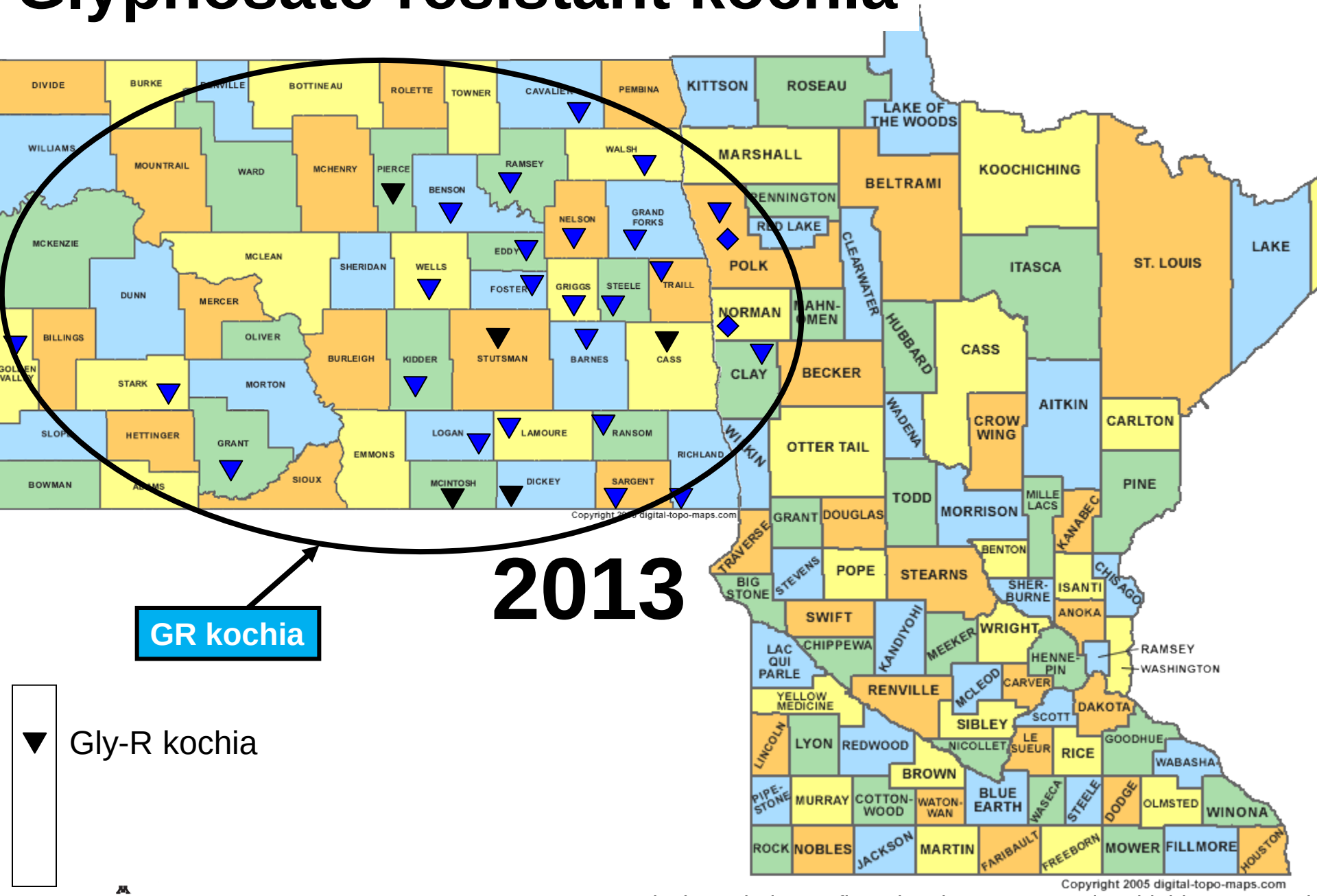
Glyphosate-resistant kochia



2013

GR kochia

▼ Gly-R kochia

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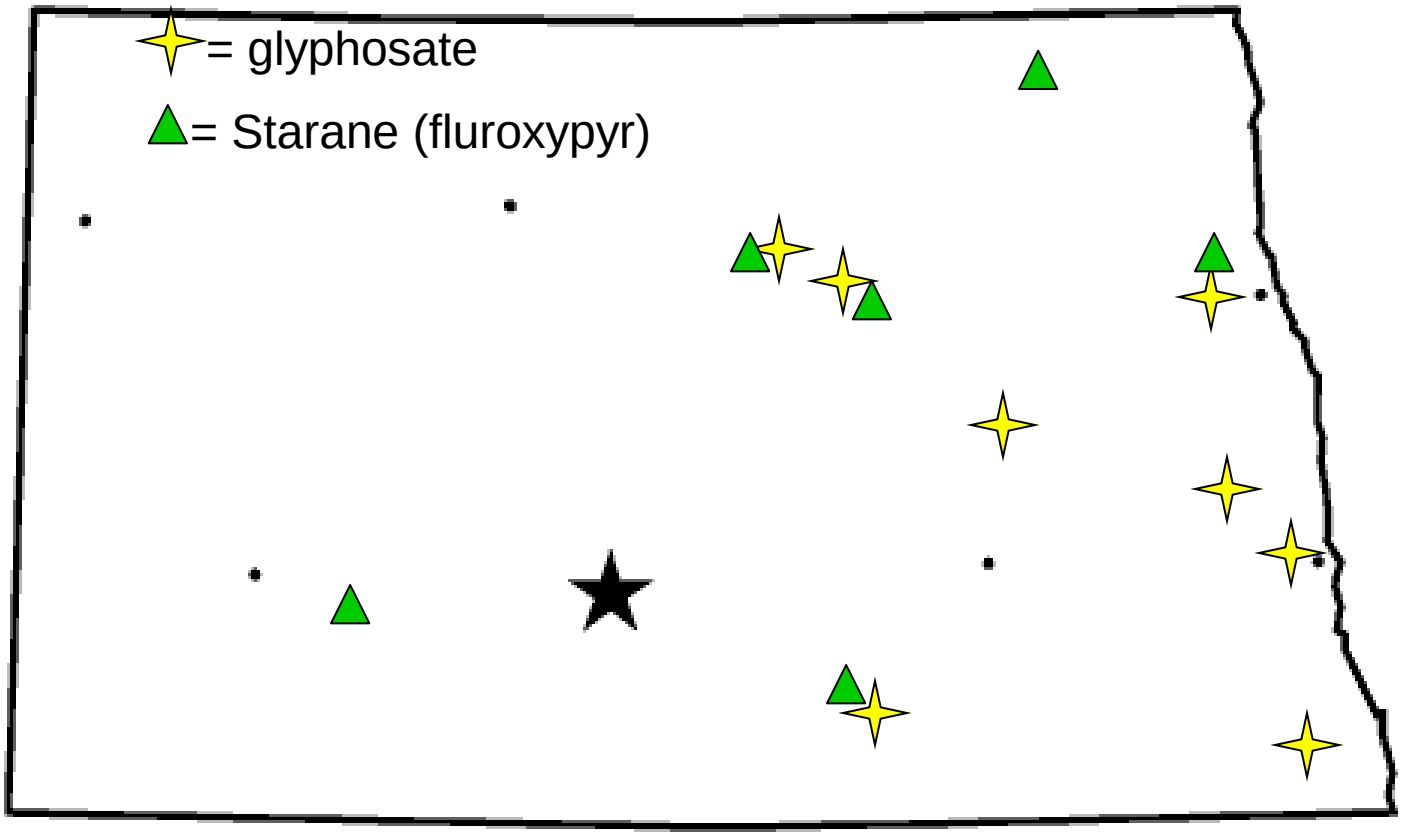
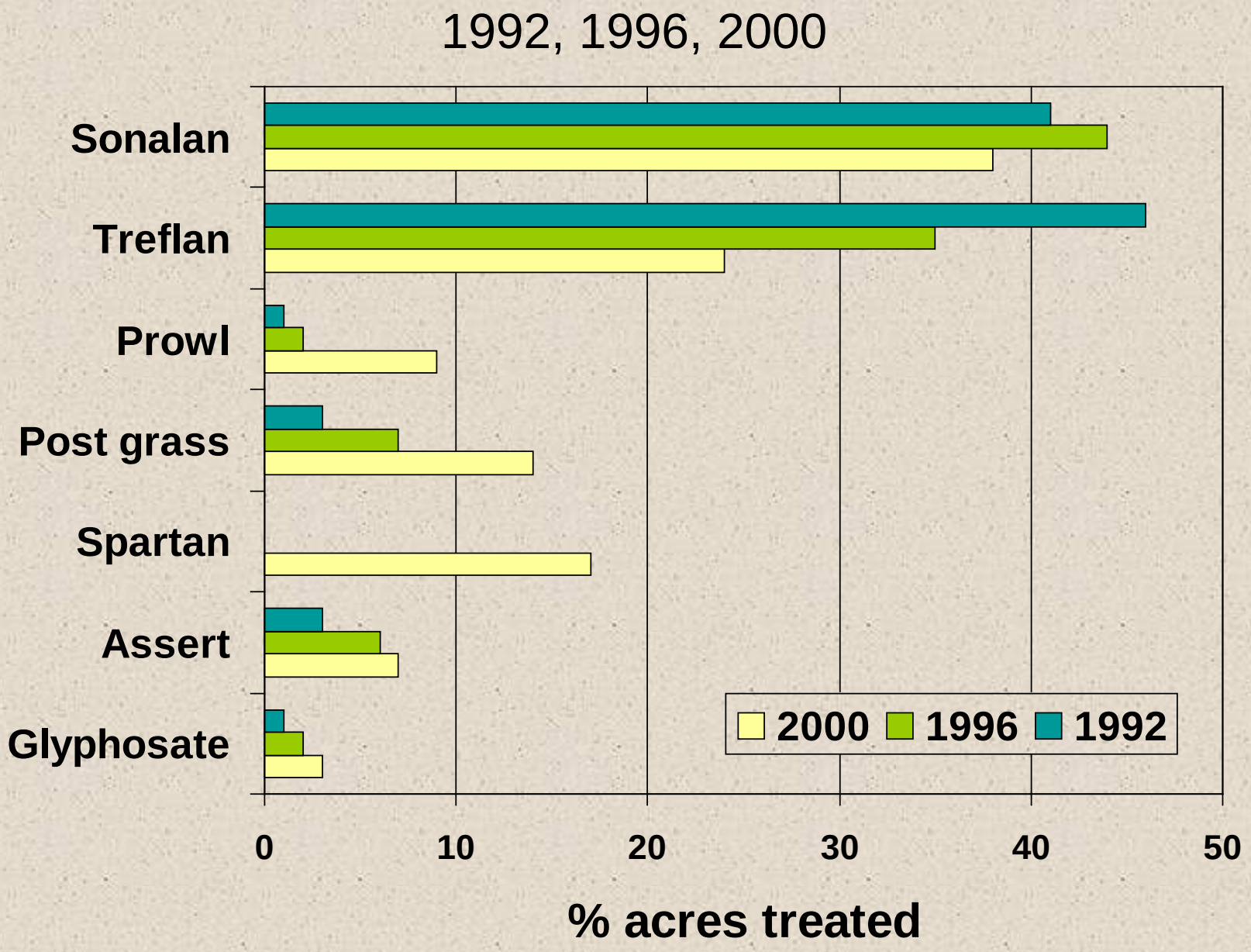
Glyphosate and Starane R Kochia



Sunflower acreage treated with herbicides



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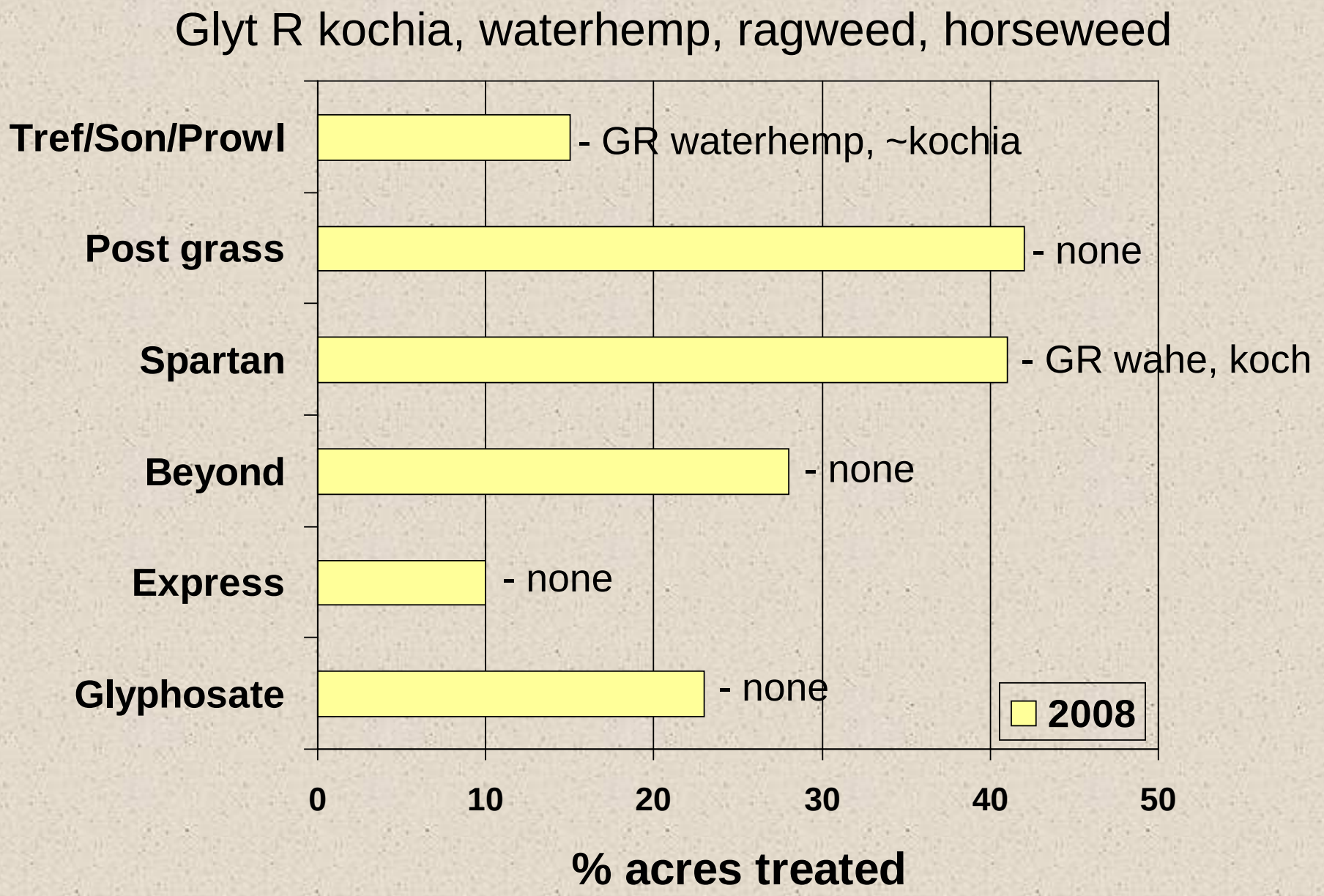


Kochia Biology

Length of seed viability:

% seeds viable after 1 yr = 5%

% seeds viable after 2 yr = 1%

Implications – ????

Bury the seed

Handweeding

Build a fence on SD/ND border

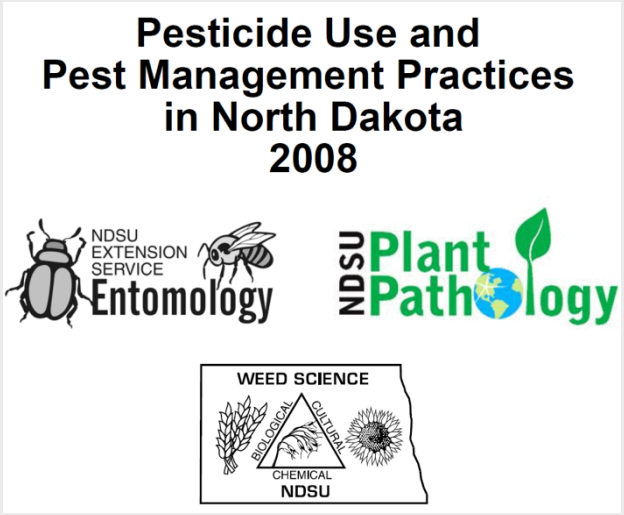
Build a fence around field

Fundamentals of Weed Management

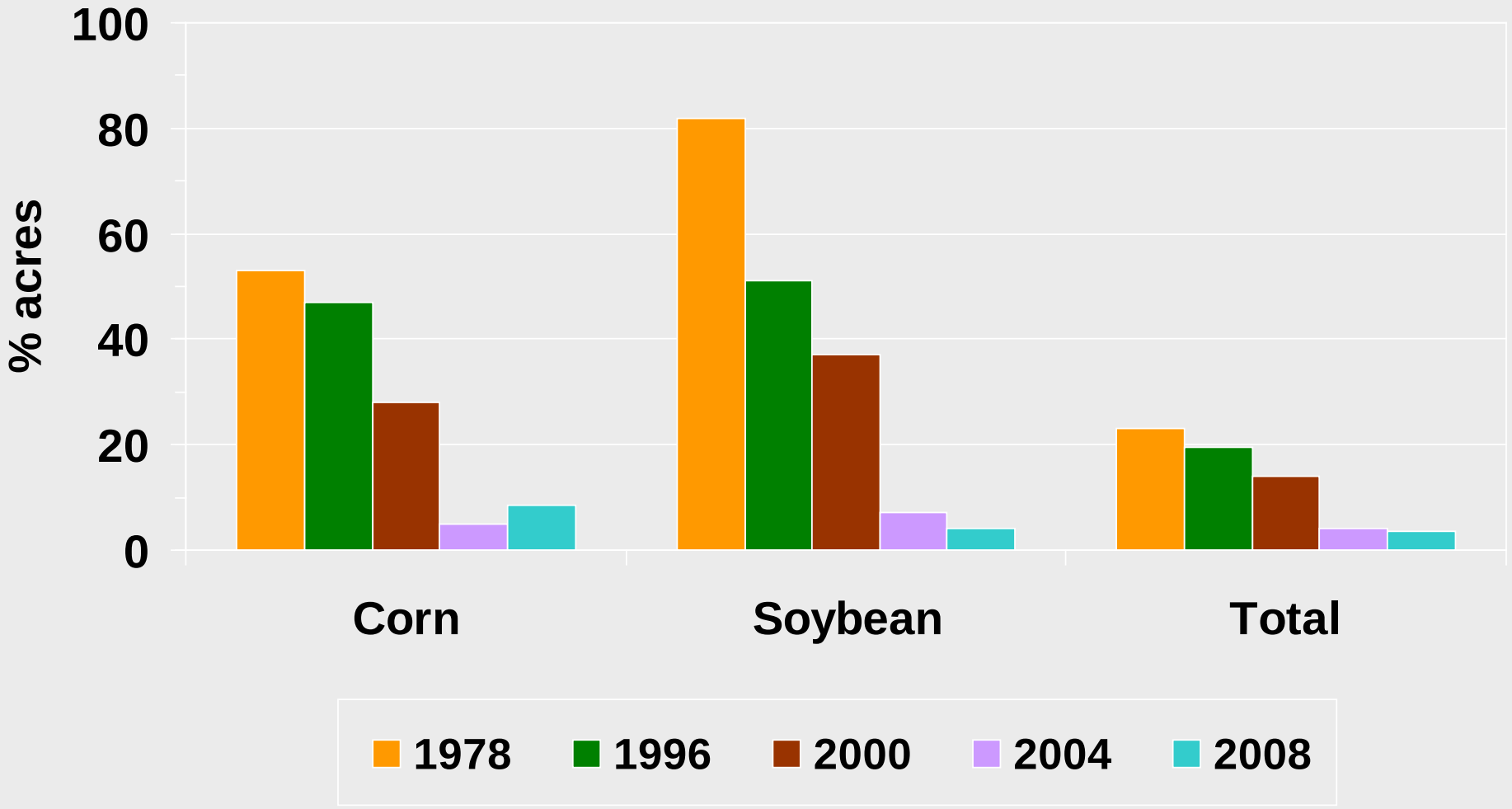
ND crop acres that received a soil-applied herbicide?

Canola	0%
Flax	3%
Wheat	3%
Soybean	4%
Corn	8%
Sugarbeet	13%
Lentil	13%
Field pea	16%
Dry beans	37%
Sunflower	66%

2008 ND Pesticide Use Survey



PRE herbicide preference – 1978 to 2008



What % of ND acres received a soil-applied herbicide?

	Corn	Soybean
	----- (ND acreage) -----	
2008	8%	4%
2012	?	?

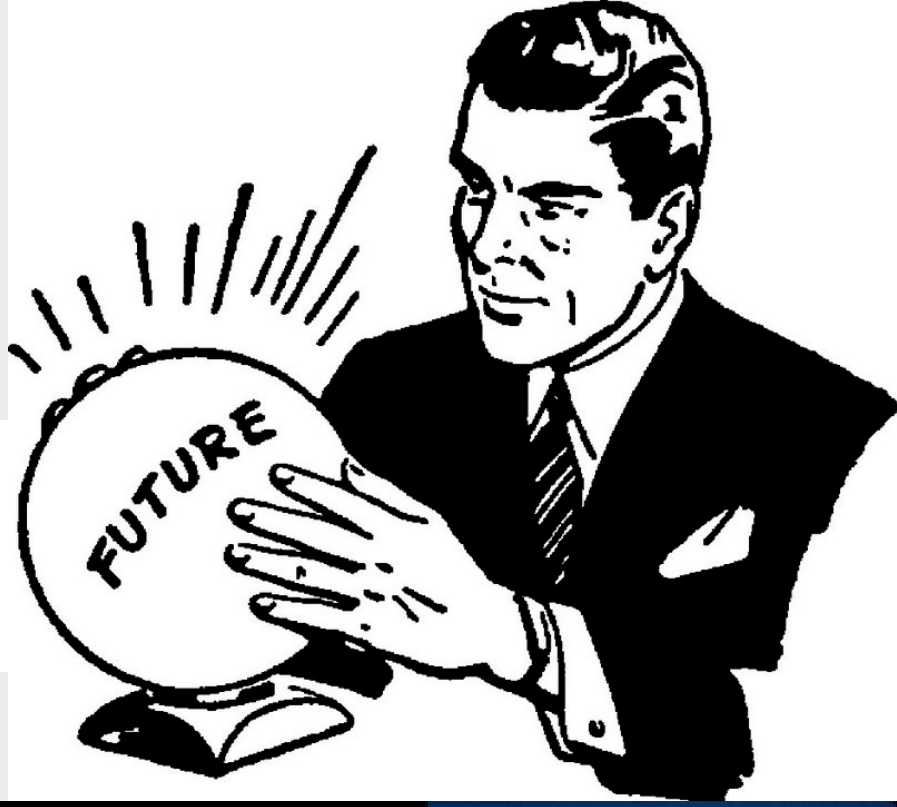
What % of ND acres receives a soil-applied herbicide?

	Corn	Soybean
	----- (ND acreage) -----	
2008	8%	4%
2012	11%	4%

Data from the ND Pesticide Use Surveys


Glyphosate
resistant
weeds?

Then next glyphosate resistant weed in ND?



Weed of the Year – 2008-2014

2009 = Dandelion

2010 = Lambsquarters

2011 = Common ragweed ⟶

2012 = Waterhemp

2013 = Foxtail barley ⟶

2014 = ?

Weed of the Year - 2014

2014 =

Weed of the Year – 2014

2014 = “Satan”

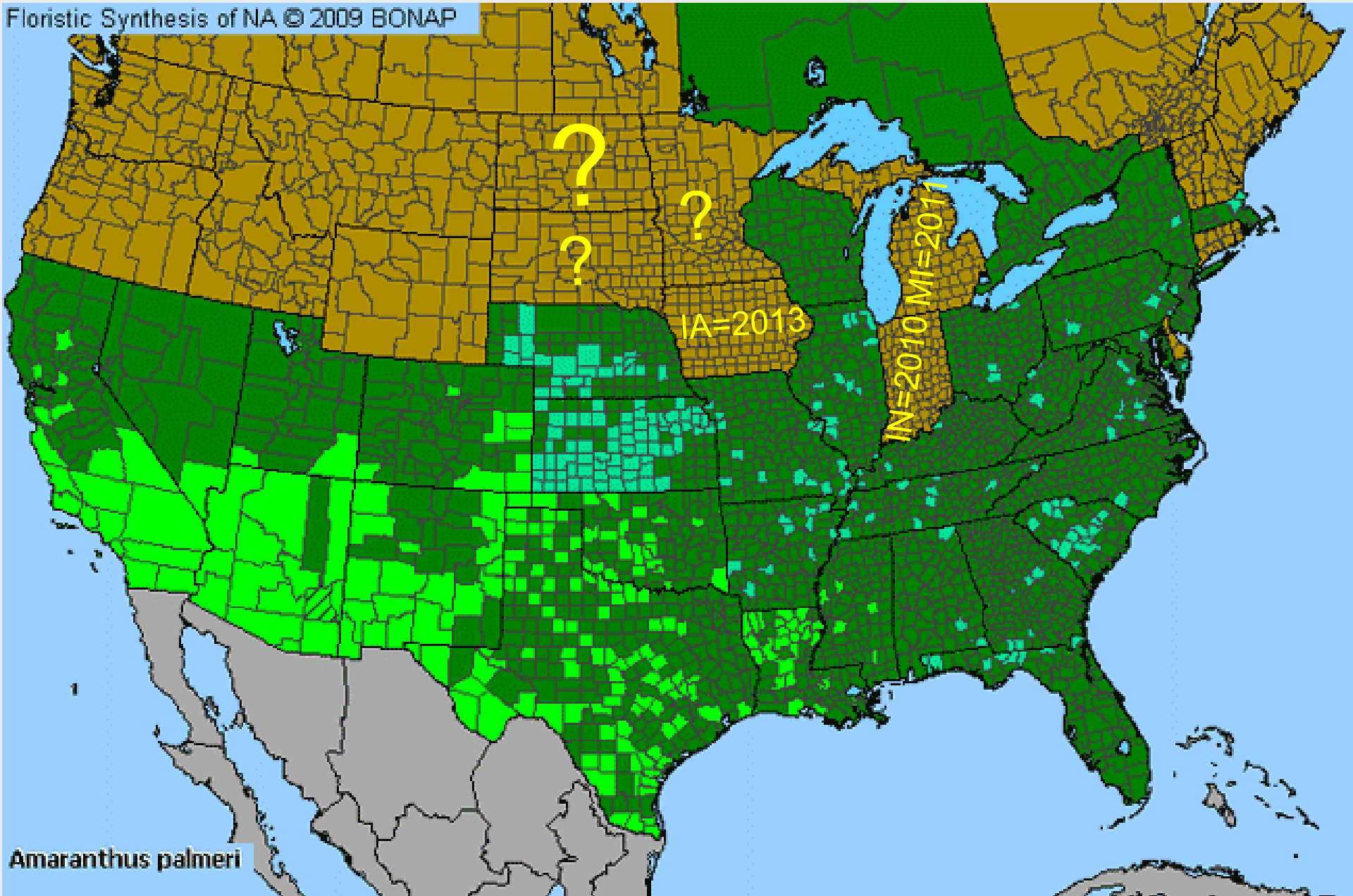
Dr Aaron Hagar, U of IL

Weed of the Year – 2014

Palmer amaranth

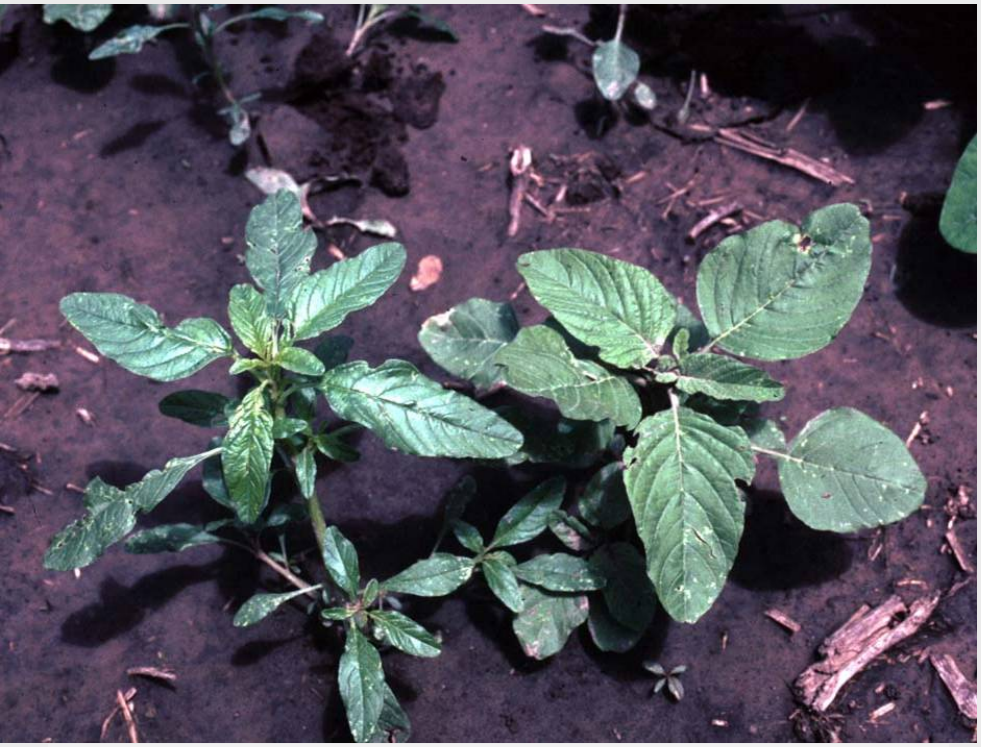
The ‘baddest’ relative of redroot pigweed

Distribution of Palmer amaranth – 2009



Pigweed identification

Deception in appearance –
looks like “pigweed”



Waterhemp / RR pigweed

Palmer amaranth

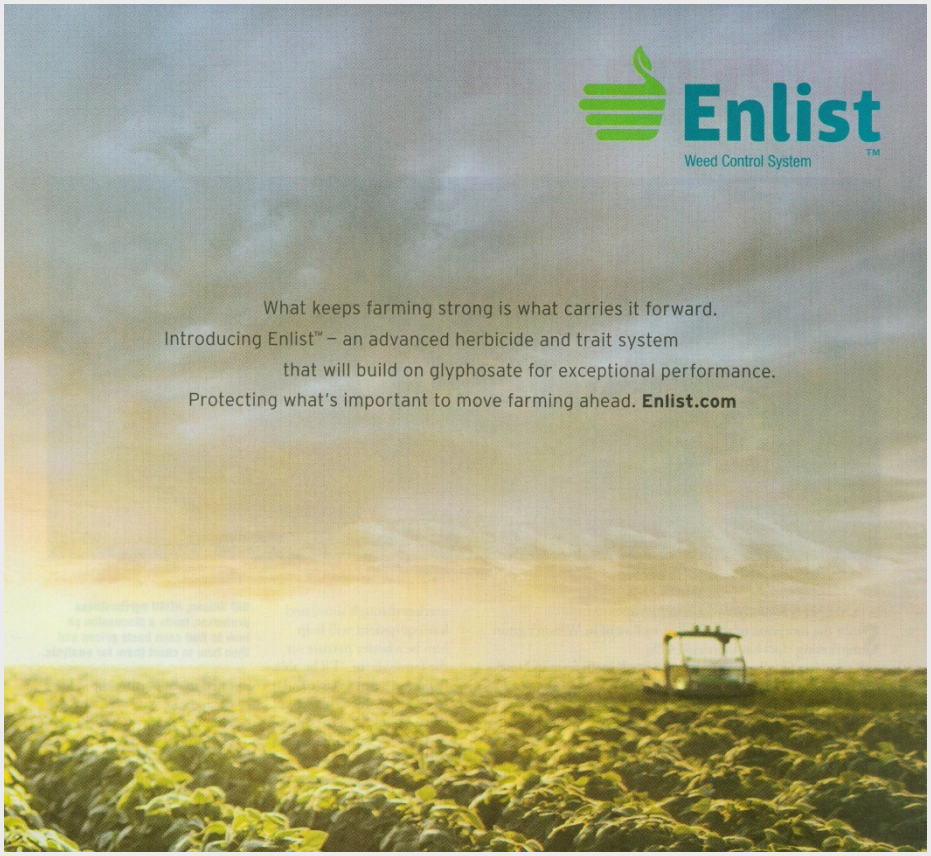
Palmer amaranth ID

Dr Bill Johnson -
Weed Scientist
Purdue University

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

ZERO TOLERANCE


Successful Farming
2013-2014
MARKETING ISSUE
What's next in weed control technology?
ROUNDUP READY 2 XTEND SOYBEANS
An advanced soybean product with tolerance to dicamba and glyphosate.
Xtend Your Control
Pending regulatory approvals.
Not available for sale or commercial planting.


Enlist
Weed Control System
What keeps farming strong is what carries it forward.
Introducing Enlist™ – an advanced herbicide and trait system
that will build on glyphosate for exceptional performance.
Protecting what's important to move farming ahead. Enlist.com

Emerging Weed Mngt Traits

	Projected launch
Enlist (Dow)	
DHT-1 = 2,4-D and ‘fop’ resistant corn	2015
DHT-2 = 2,4-D resistant soybean	2015
Roundup 2 Xtend (Monsanto)	
Dicamba resistant soybean	2015
HPPD resistant soybean (Bayer/Syngenta)	2015-16

- FG72 – Balance (isoxaflutole) resistant soybean
- MGI – Callisto+Liberty+Balance resistant soybean

Enlist and RU Xtend = New Technology
Cant use sloppy application

- Particle drift (including inversions)
- Volatilization

- Sprayer cleanout - contamination
- Misapplication

NDSU NORTH DAKOTA STATE UNIVERSITY

Emerging Weed Mngt Traits

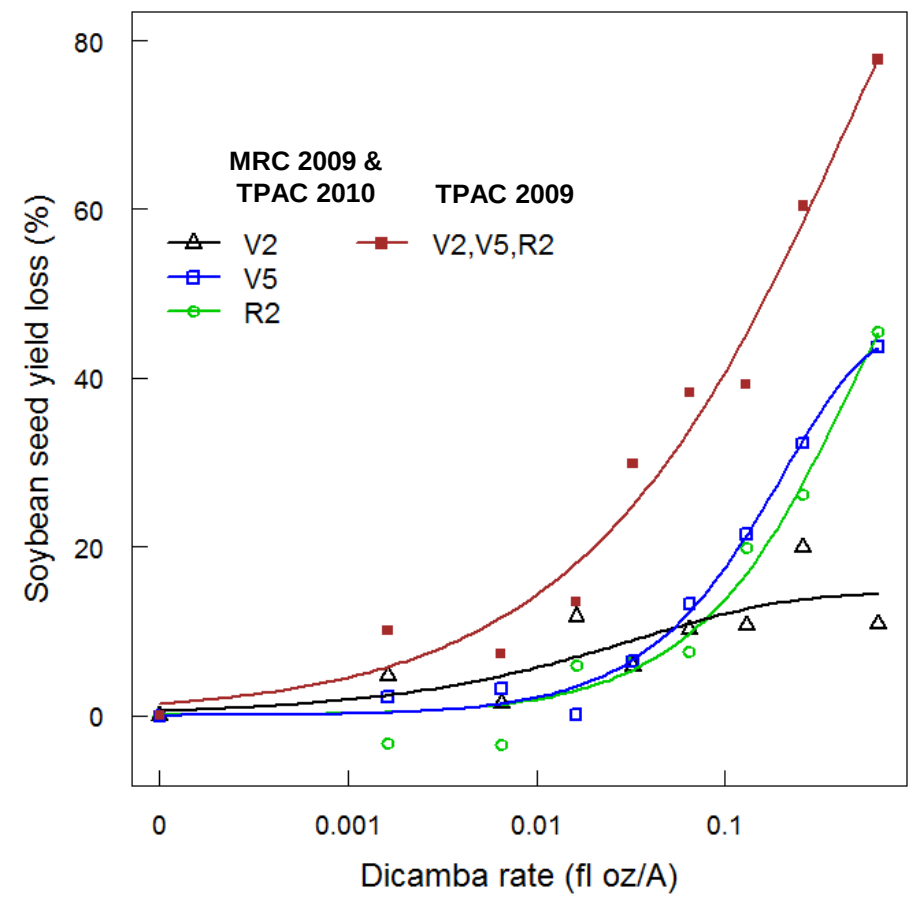
Enlist Duo herbicide = 2,4-D-choline salt =
quaternary NH_3 salt

Engenia (BASF) = dicamba-BAPMA salt
(Bis(3-amonopropyl)methylamine)

Volatility potential:

- Banvel (dicamba-dma) = Base line comp.
- Clarity (dicamba-dga) = Low
- Engenia (dicamba-BAPMA) = Very low

Soybean Injury and Yield Loss from Dicamba



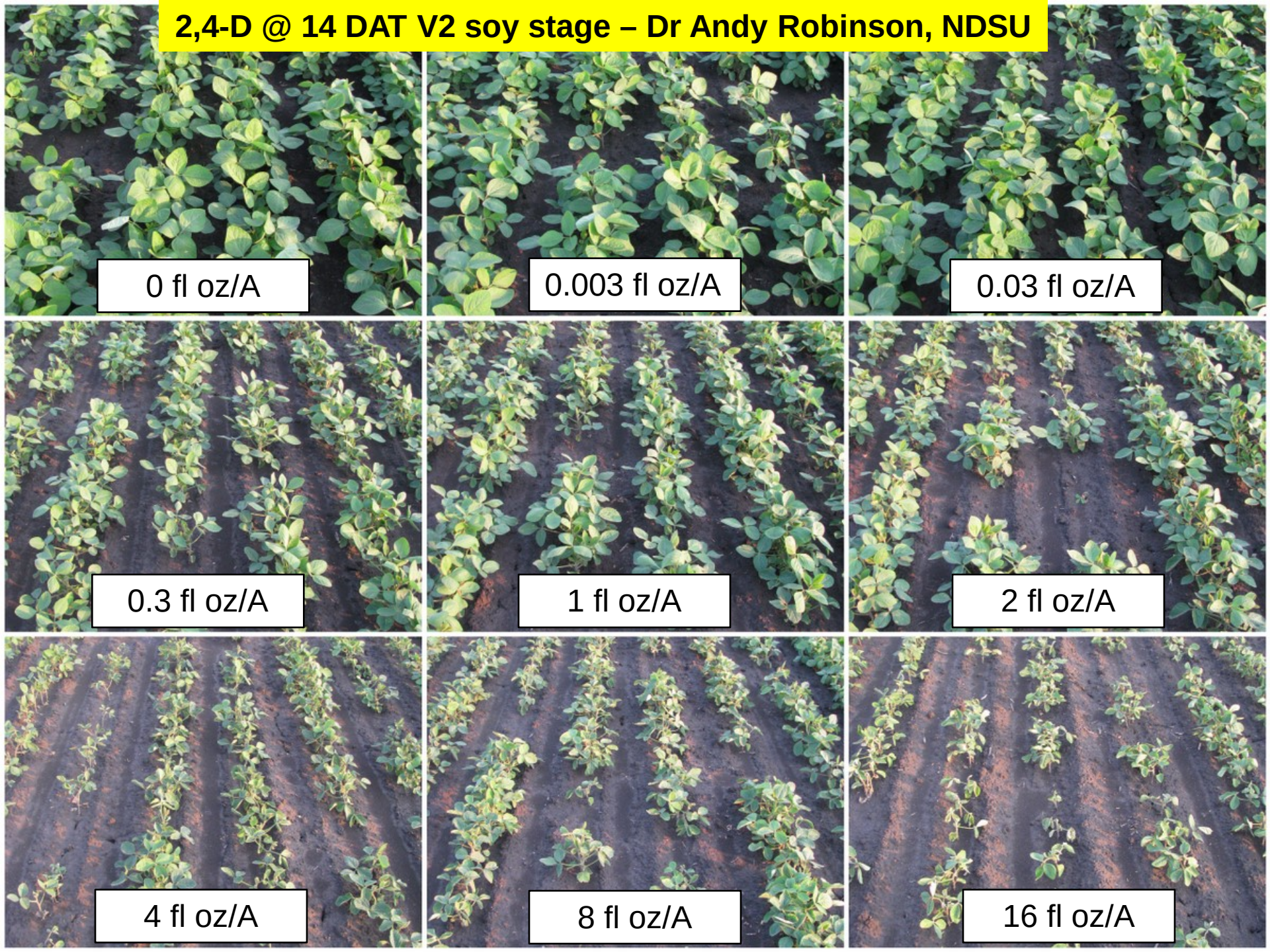
Estimated dicamba dose (ED) that caused soybean yield loss.

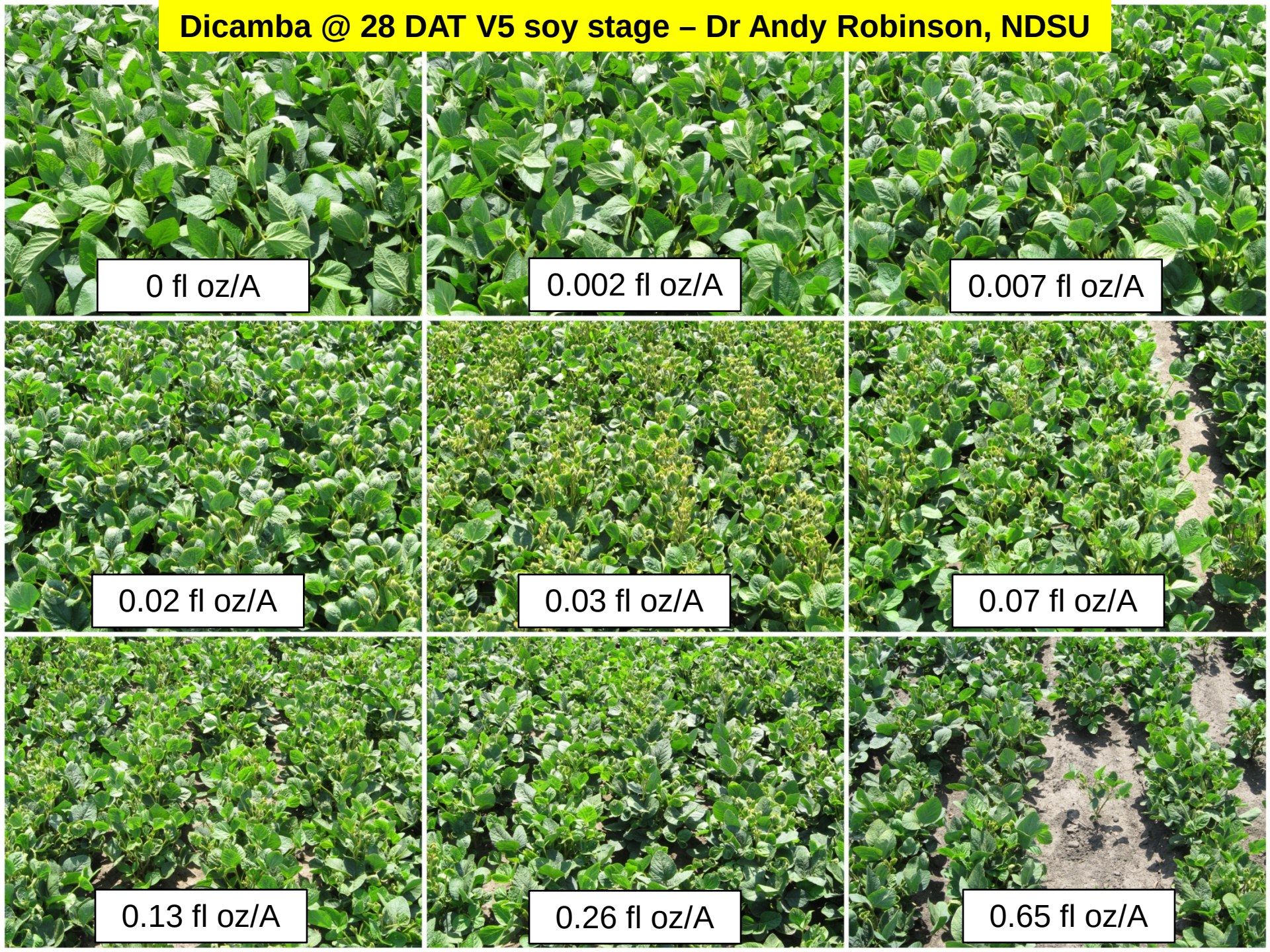
	Soybean growth stage			
	MRC 2009 & TAPC 2010			TPAC 2009
ED %	V2	V5	R2	V2, V5, R2
	---------- fl oz/A ----------			
ED_{10}	0.02	0.31	0.02	0.005
ED_{20}	-	0.07	0.03	0.02

<u>Dicamba</u>

- 20% soybean injury = 0.1 to 0.3% of 16 fl oz/A solution drift.

- 10% soybean yield reduction = 0.03 to 1.9% of 16 fl oz/A drift.


2,4-D @ 14 DAT V2 soy stage – Dr Andy Robinson, NDSU
0 fl oz/A
0.003 fl oz/A
0.03 fl oz/A
0.3 fl oz/A
1 fl oz/A
2 fl oz/A
4 fl oz/A
8 fl oz/A
16 fl oz/A


Dicamba @ 28 DAT V5 soy stage – Dr Andy Robinson, NDSU
0 fl oz/A
0.002 fl oz/A
0.007 fl oz/A
0.02 fl oz/A
0.03 fl oz/A
0.07 fl oz/A
0.13 fl oz/A
0.26 fl oz/A
0.65 fl oz/A

Tank Contamination

- Dicamba concentration to cause soybean injury
  - 0.01% of 8 fl oz/A dicamba
  - 0.01% = 0.05 oz or 1.5 mL Clarity in 500 gal tank

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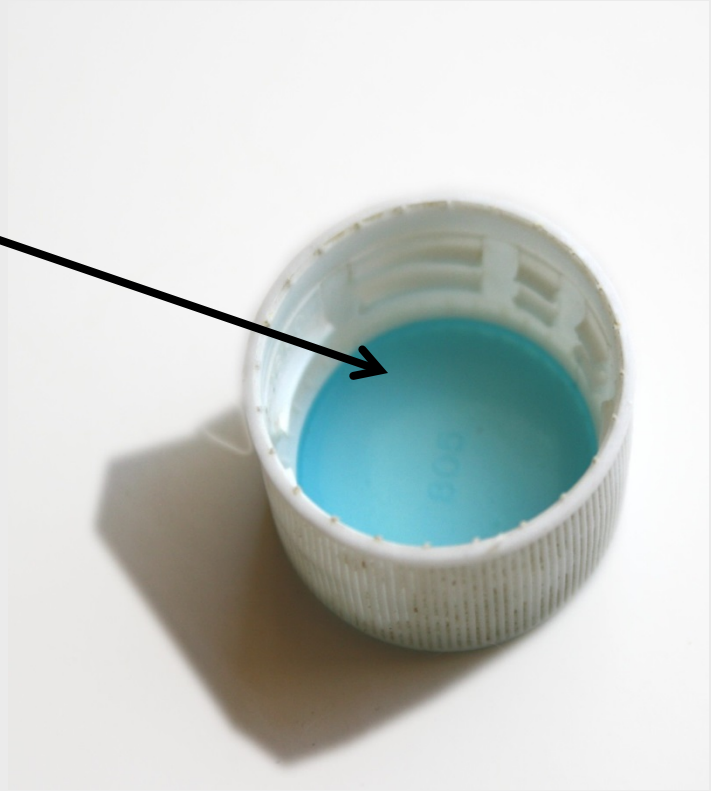

Tank Contamination

- Dicamba concentration to cause soybean injury
  - 0.01% of 8 fl oz/A dicamba
  - 0.01% = 0.05 oz or 1.5 mL Clarity in 500 gal tank

- Incomplete clean-out
  - 0.01% = ~3/4 cup left after 1 pt/A Clarity in 500 gal tank
  - 0.1% = 2 qts left after 1 pt/A Clarity in 500 gal tank

Emerging Weed Mngt Traits

Dicamba resistant soybean (Monsanto/BASF)

- Follow Best Management Practices (BMPs)
  - Do not add AMS
  - Nozzles = extreme-ultra coarse droplets (>450 microns)
  - <15 mph travel speed
  - 3-10 wind speed
  - <24 inch boom height
  - Observe buffer zones
  - Add drift reducing agent
  - Sprayer clean out using triple rinse + alkaline agent + detergent.


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