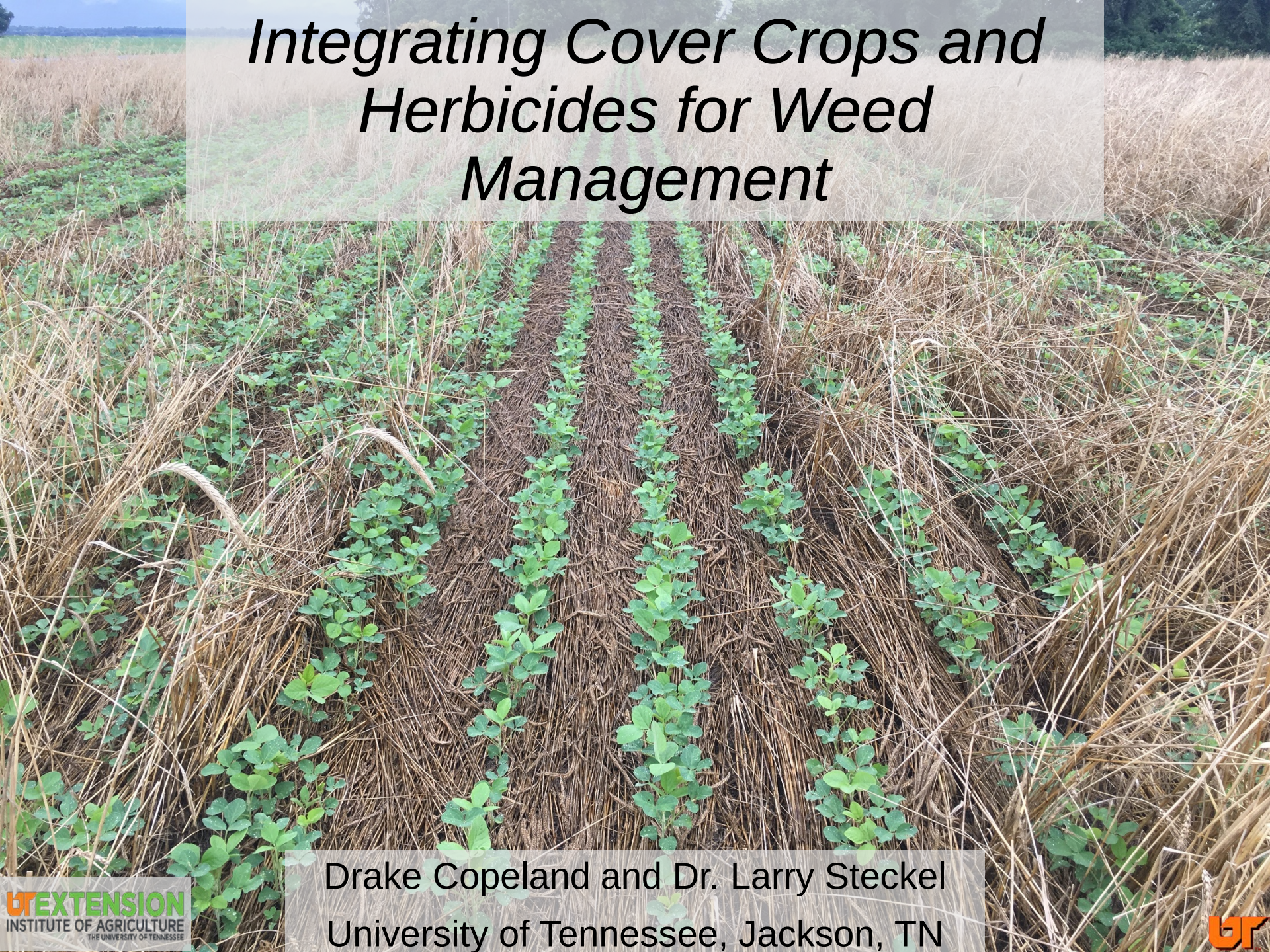
Integrating Cover Crops and Herbicides for Weed Management



Drake Copeland and Dr. Larry Steckel

University of Tennessee, Jackson, TN

UTEXTENSION
INSTITUTE OF AGRICULTURE
THE UNIVERSITY OF TENNESSEE

Why are Growers Adopting Cover Crops?

Increased inquiries and adoption of cover crops in Tennessee	• **Cover crops alone and herbicides alone have not been sustainable**
Suppression of GR (glyphosate resistant) weeds.	• **Don't forget Winter Weeds: Italian ryegrass and horseweed control**
New herbicide traits helping cover crops become a better part of weed mgt.?	• **i.g. crops tolerant to auxins, HPPDs, Super PPOs??**

Cover Crops to Mitigate Sand Blasting

Weed Control using Cover Crops

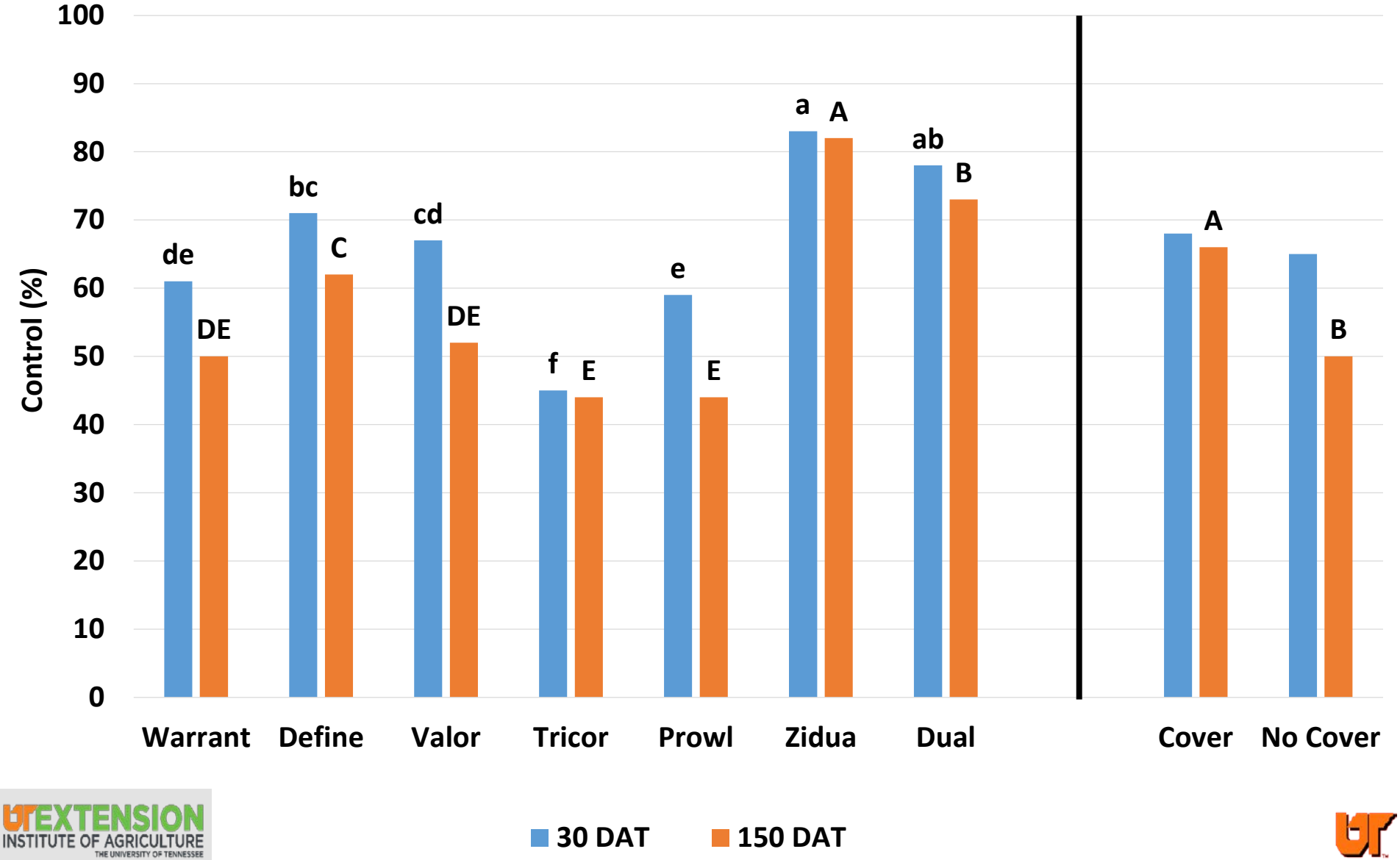
Goal

- Uniformity
- Biomass
- Easy to terminate

Species

- Cereal Rye – 60 lbs/A
- Wheat – 60 lbs/A
- Crimson Clover – 15 lbs/A
- Hairy Vetch – 20 lbs/A

Italian ryegrass control: Cereal rye

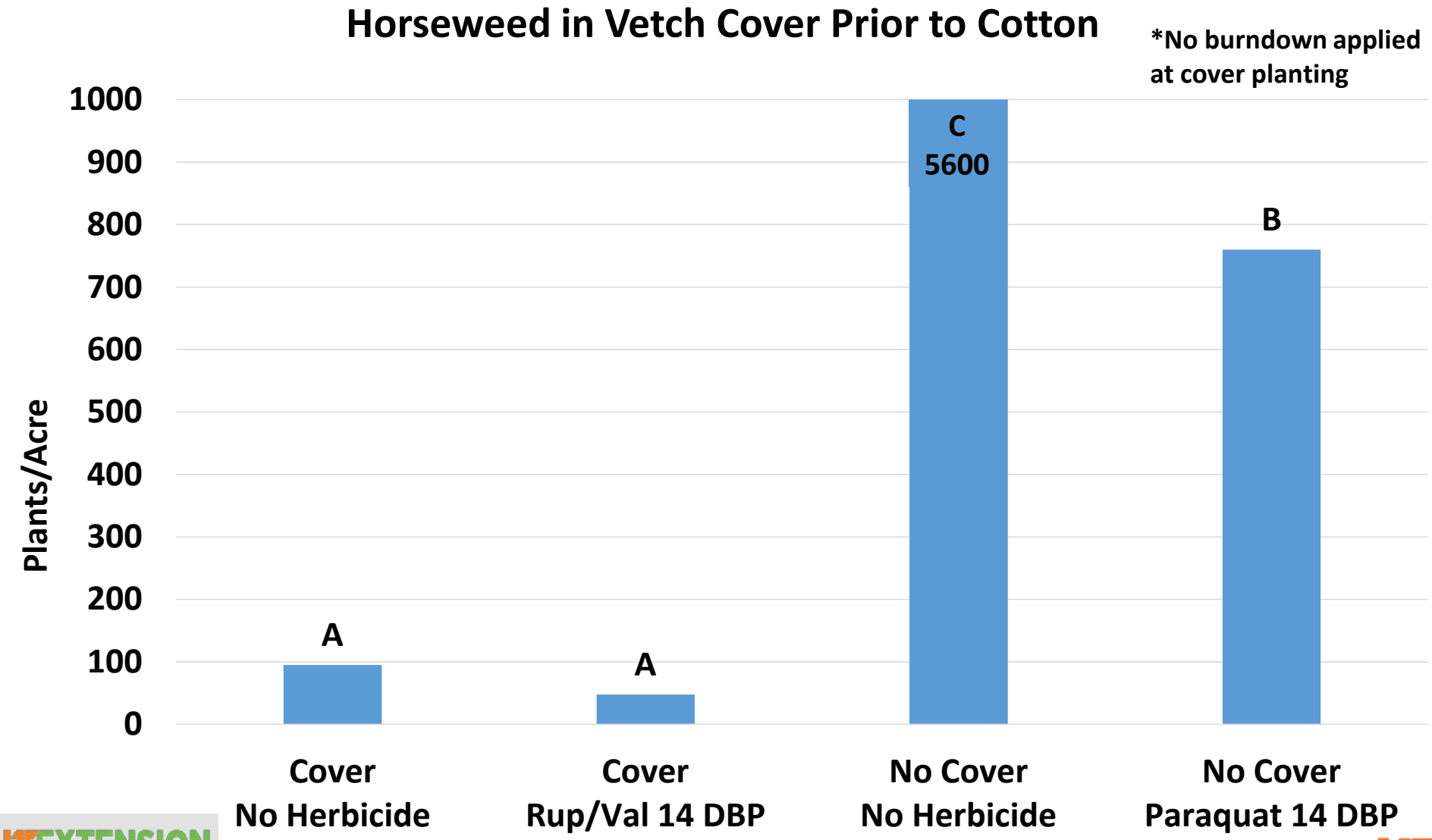


Italian ryegrass control: Cereal rye

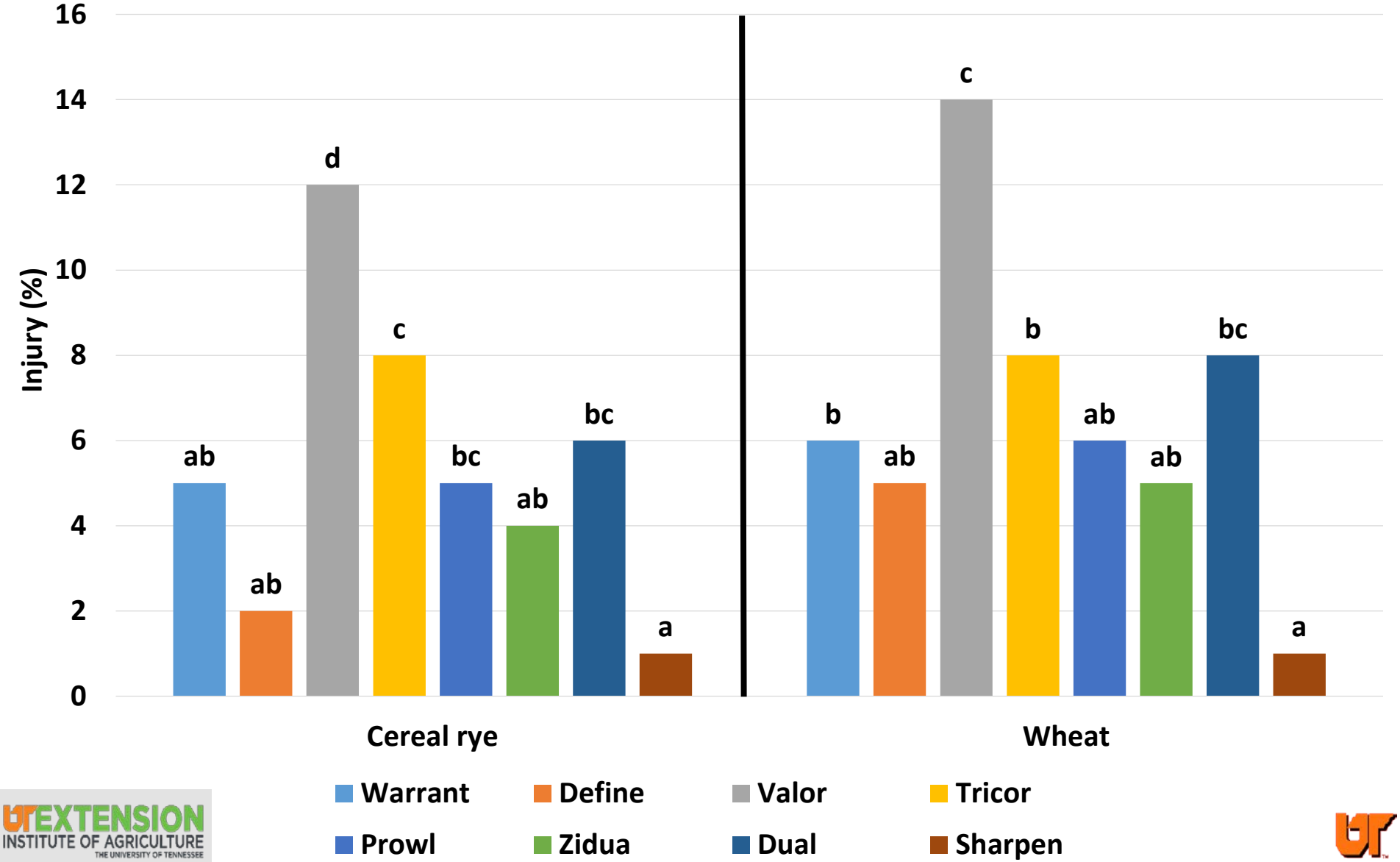
Cereal rye cover

No cover

Horseweed Control

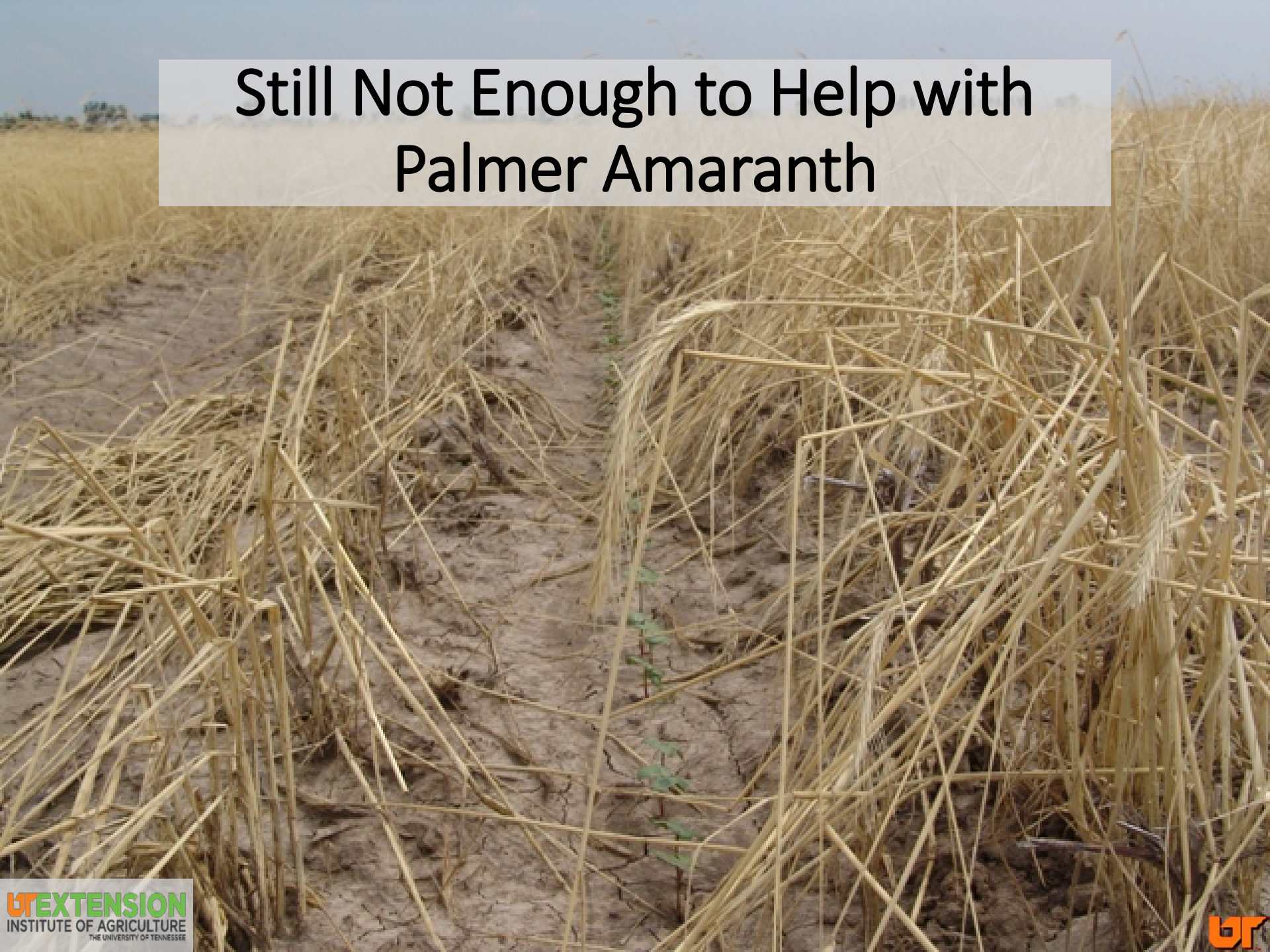


Injury – 10 DAT



UTEXTENSION INSTITUTE OF AGRICULTURE THE UNIVERSITY OF TENNESSEE

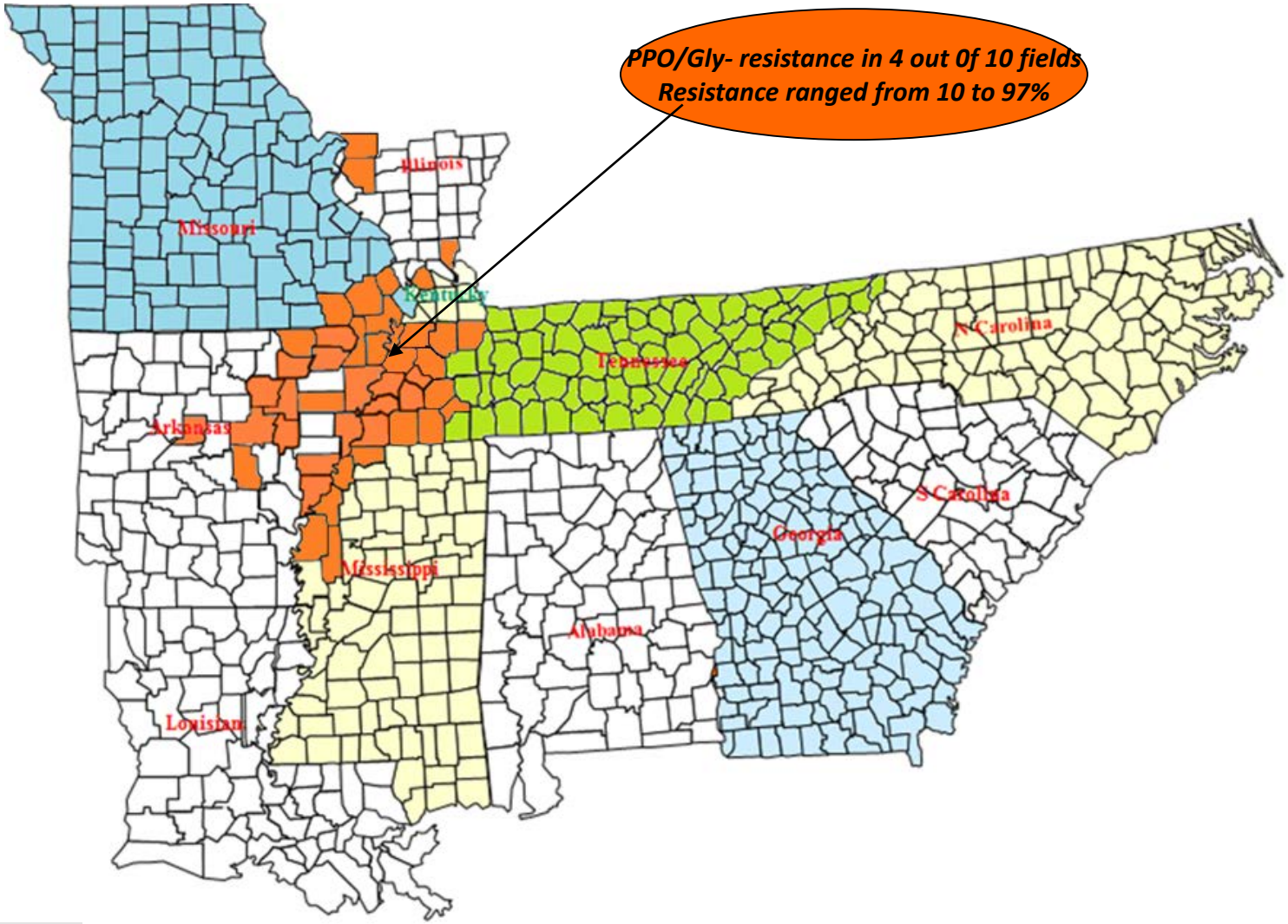
Still Not Enough to Help with Palmer Amaranth



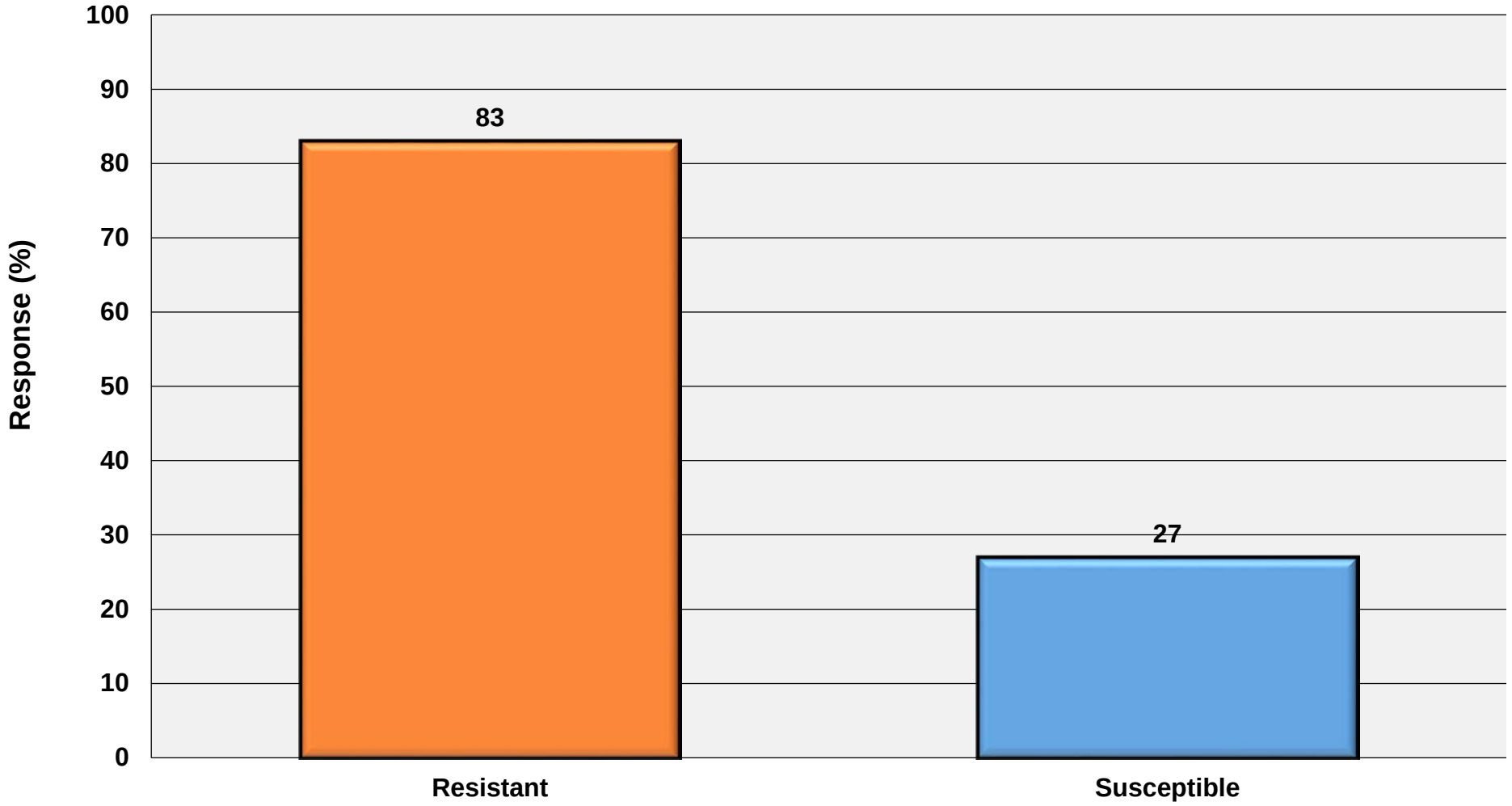
22 oz of XtendiMax on Large Palmer Amaranth

Steckel 2013

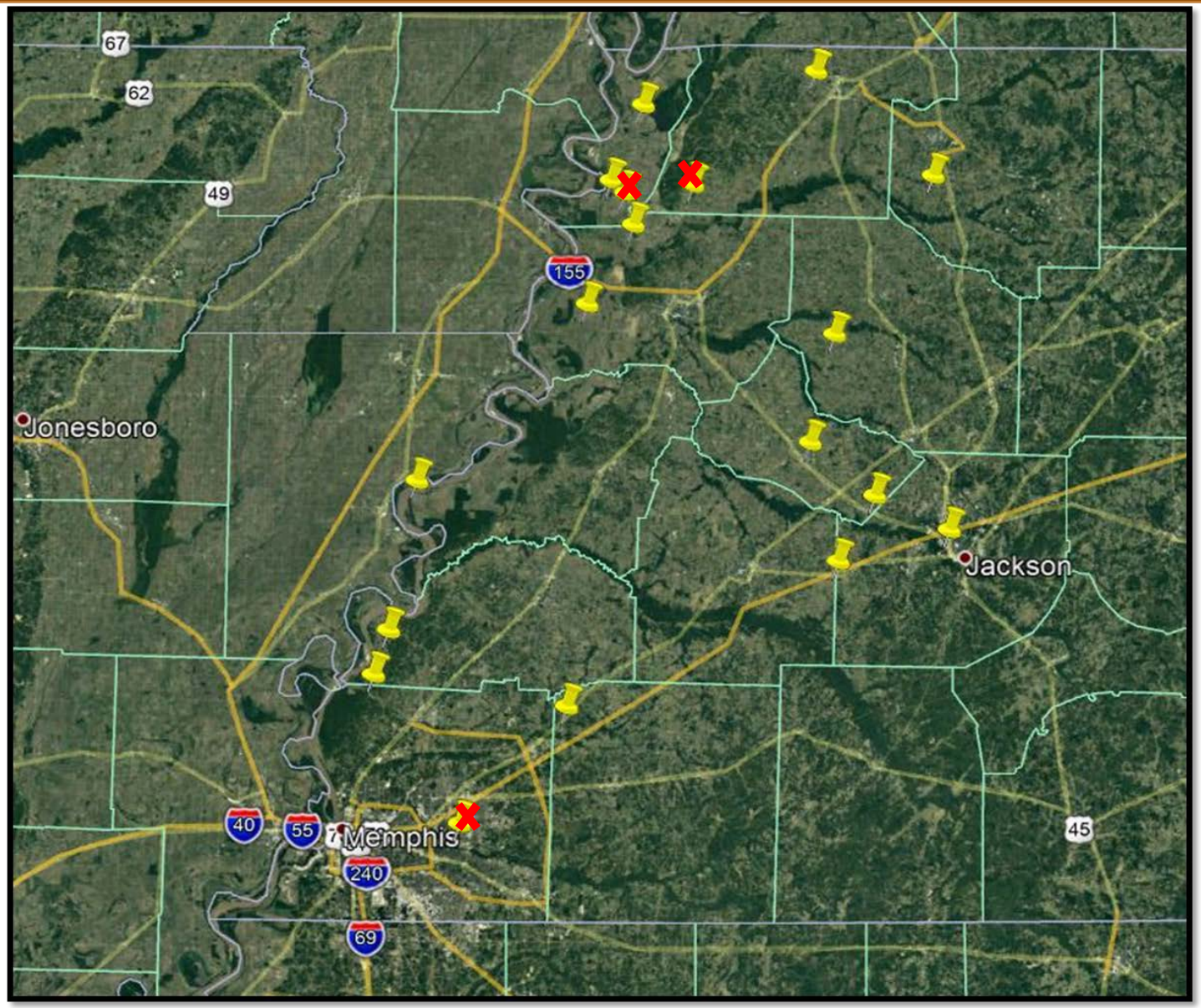
Glyphosate and PPO-Resistant Palmer amaranth



2017 Response of Palmer amaranth from Survey of West Tennessee



2017 Response of Palmer amaranth from Survey of West Tennessee



PPO-Resistant Palmer amaranth

Roundup Ready System

Termination

Cereals	• Glyphosate (Roundup)
Legumes	• Paraquat (Gramoxone), Liberty*, Dicamba*, 2,4-D* • *Crop technology specific
Terminating big cereal/legume mixes	• Roundup + 2,4-D or dicamba (+PRE) best one pass program • Roundup 7-10 DPP → Plant → Gramoxone (+PRE)

Hairy Vetch Termination

60 DAT

Gramoxone 48 oz/ac + NIS

Roundup Powermax 32 oz/ac

Hairy Vetch Termination

14 DAT

Gramoxone 48 oz/ac + NIS

Roundup Powermax 32 oz/ac

Weed Control using Cover Crops

Goal

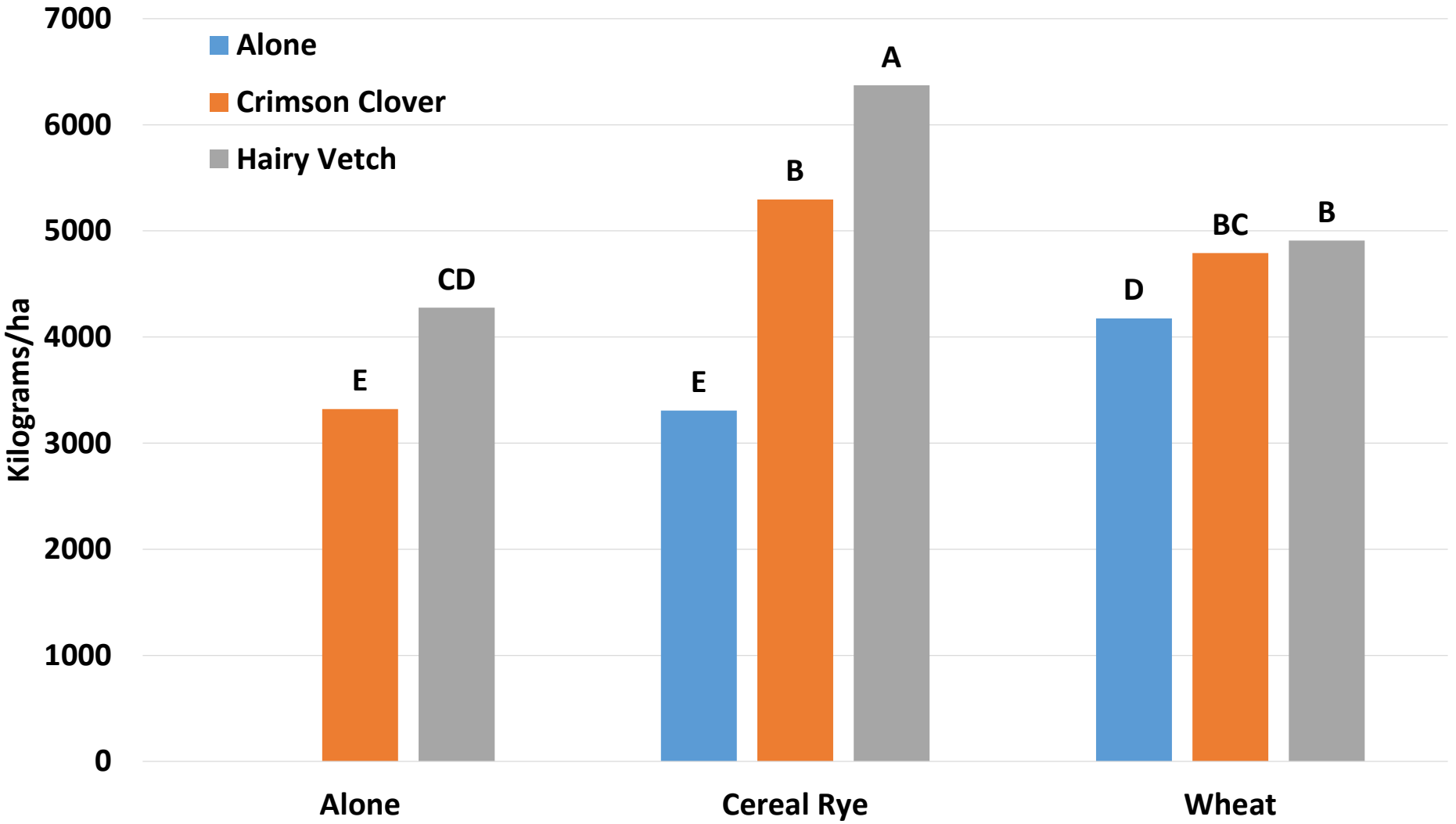
- Uniformity
- Biomass
- Easy to terminate
- Select cover crop specific for the following cash crop

Species

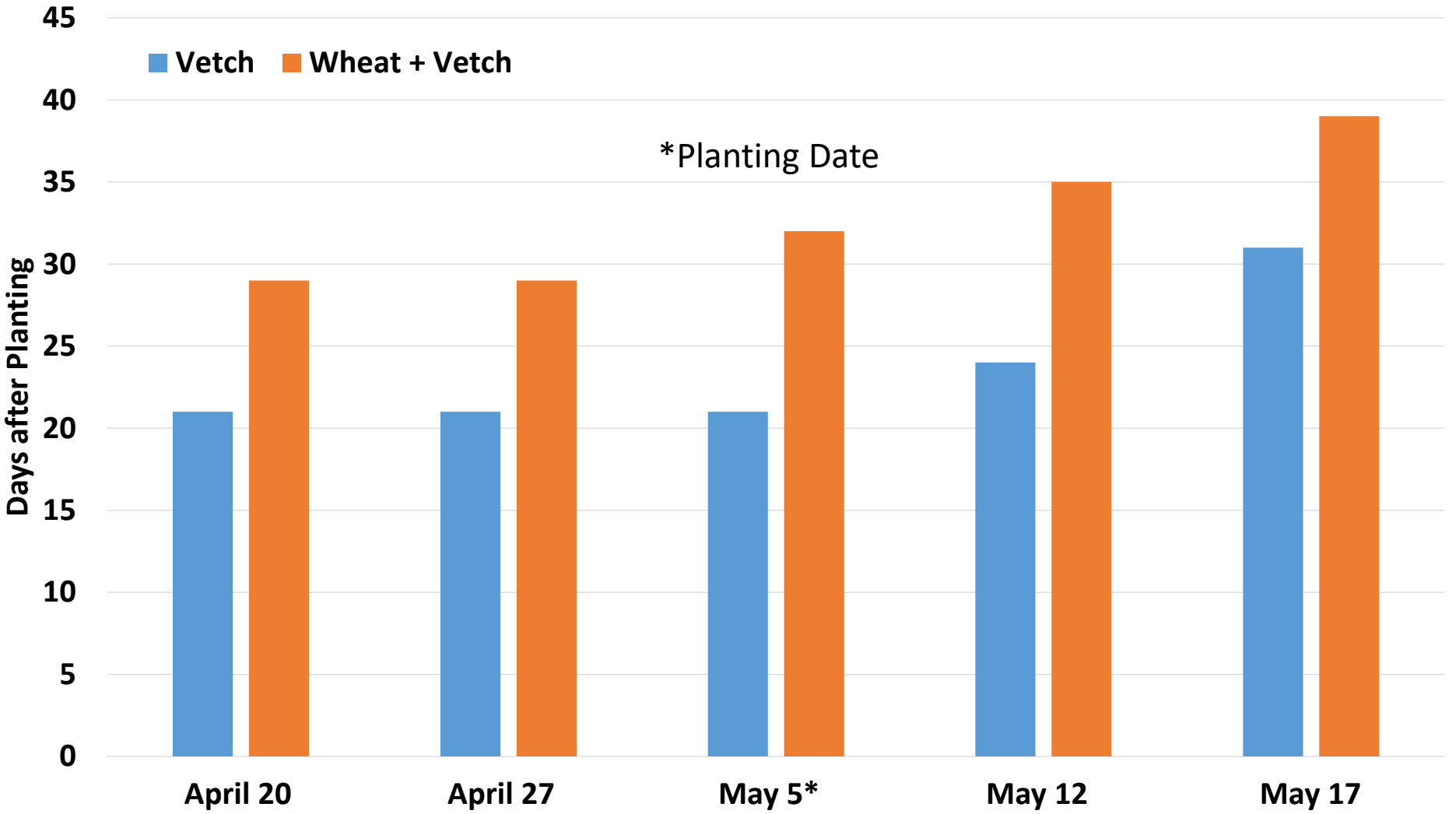
- Cereal Rye – 60 lbs/A
- Wheat – 60 lbs/A
- Crimson Clover – 15 lbs/A
- Hairy Vetch – 20 lbs/A

Robust Cover Crop Needed for Pigweeds

Cover Crop Biomass

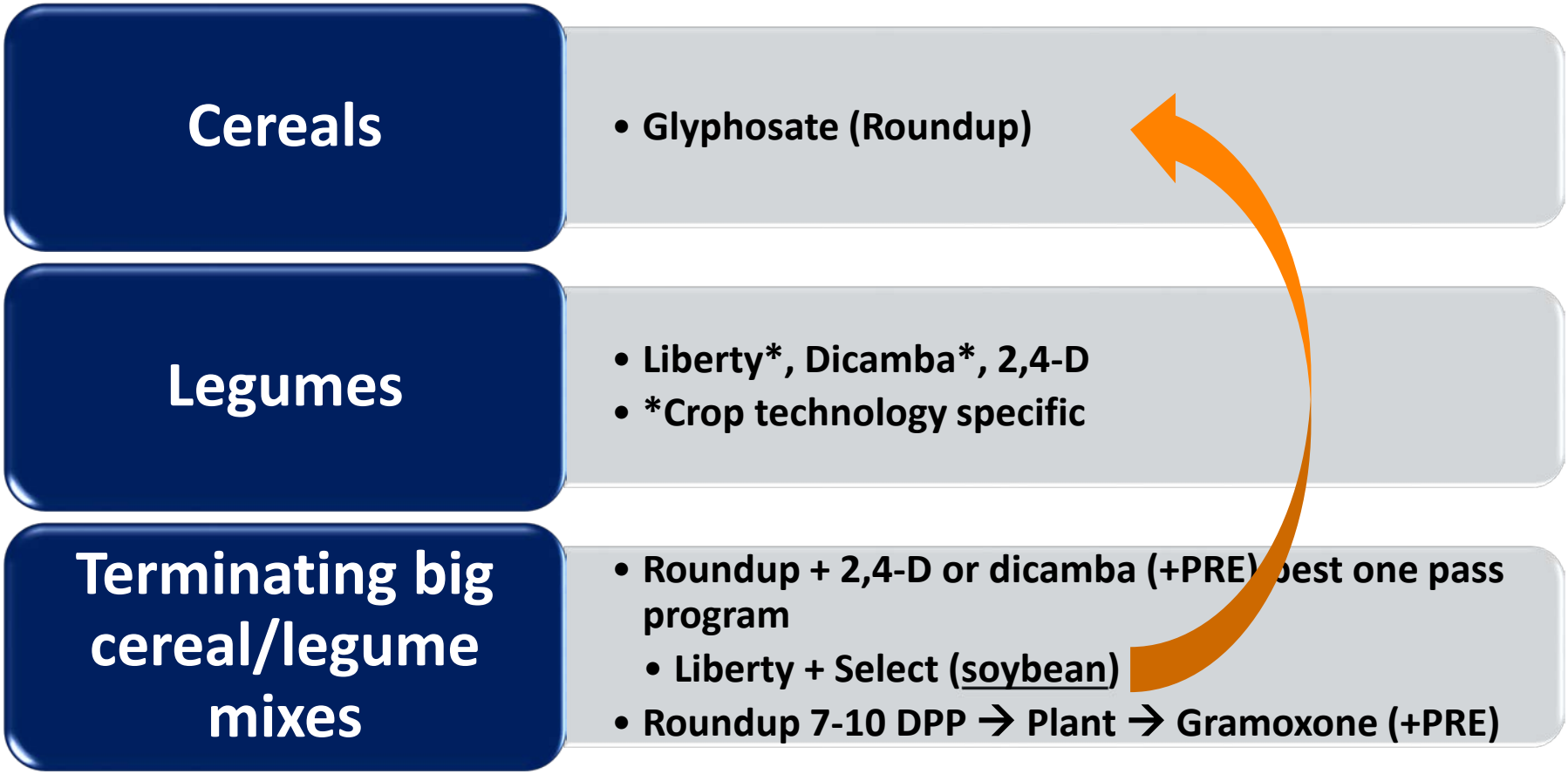


Days Until 4” Palmer amaranth



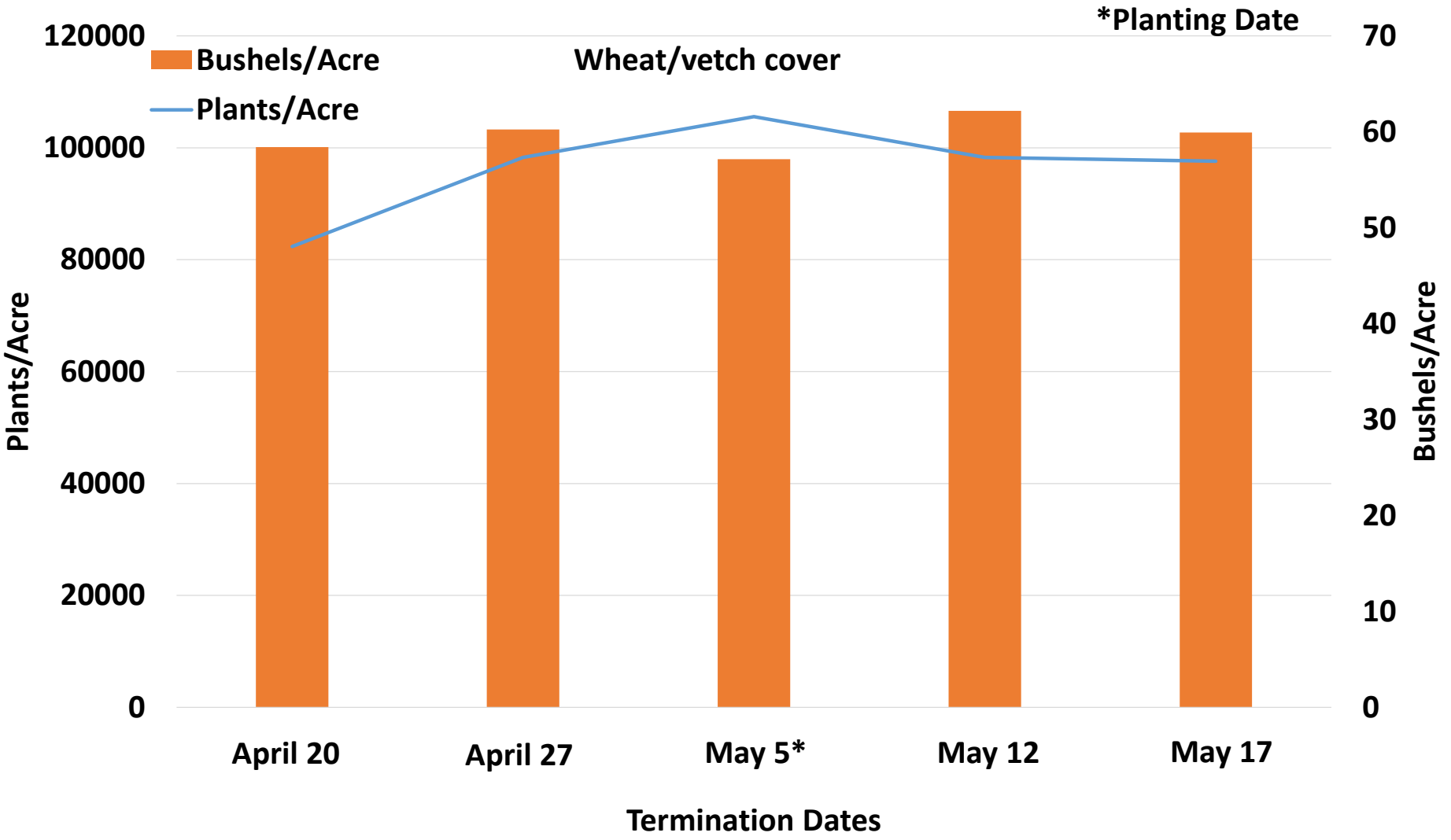
“Planting Green”

Delayed Termination Options

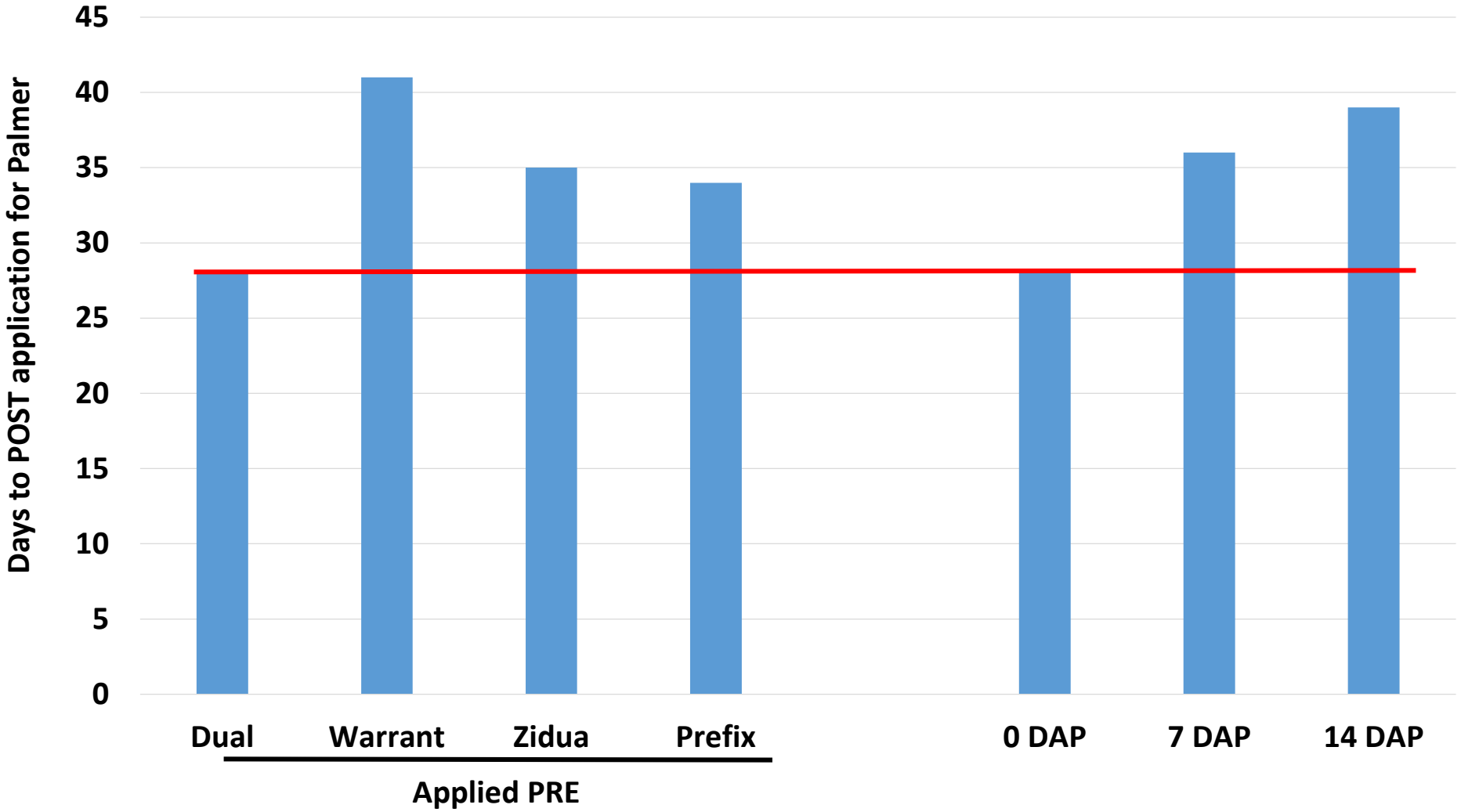



Cover Terminated 14 DAP
Roundup Xtend Soybeans
Steckel 2015

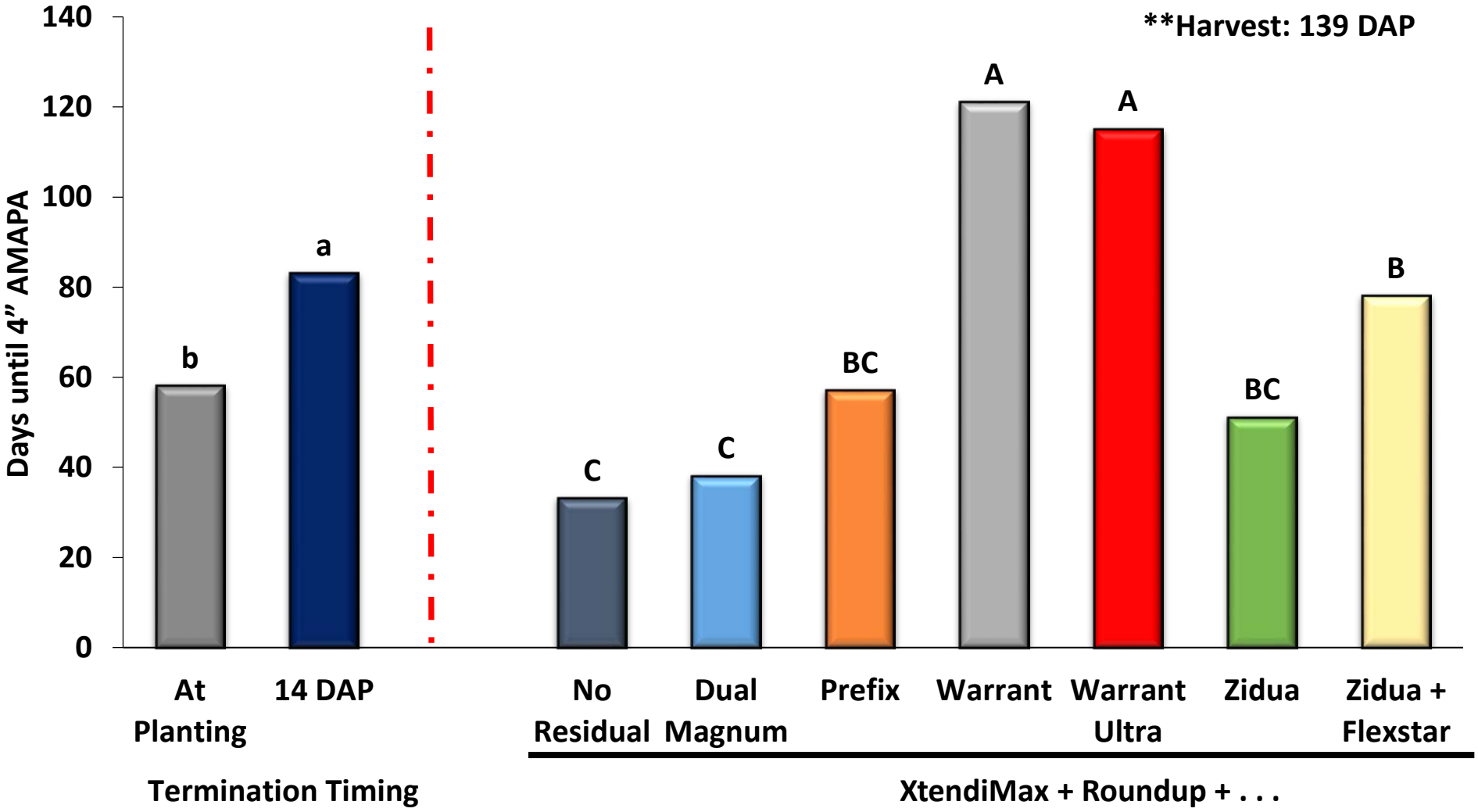
Soybean Response to Delayed Termination



Herbicide Performance

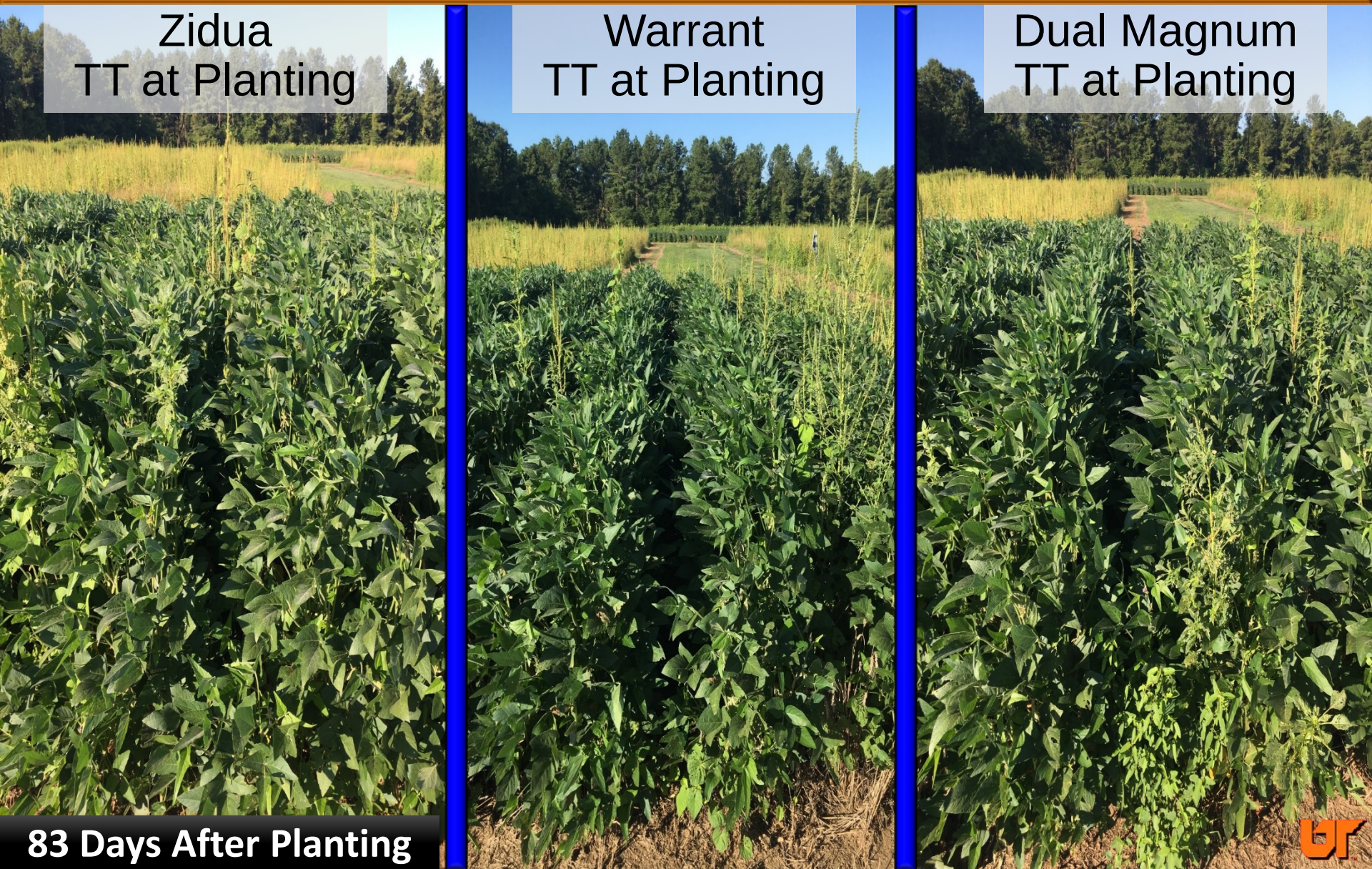


Main effects of Termination Timing and Herbicide on Days until 4” AMAPA

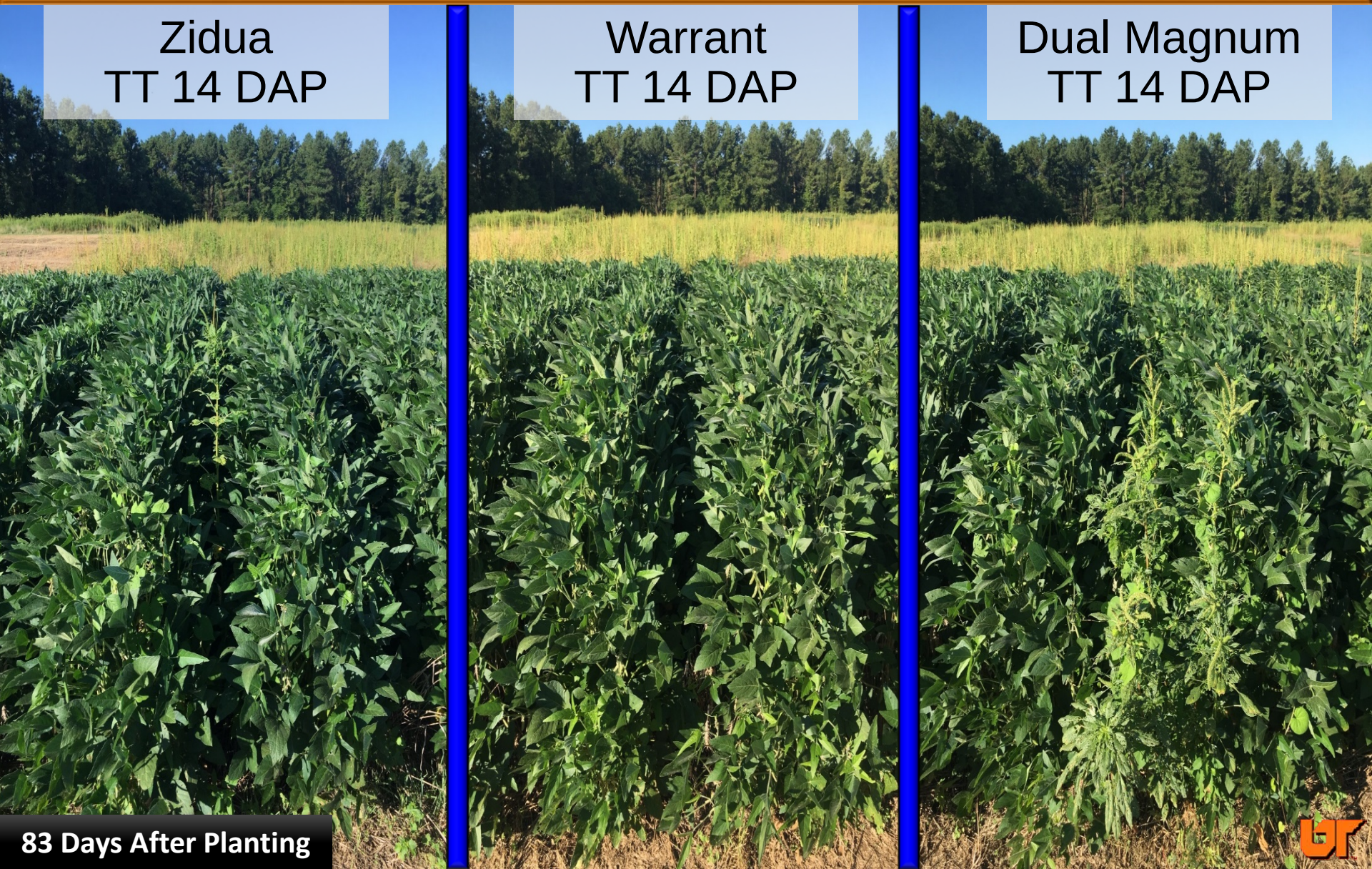


XtendiMax + Roundup + . . .

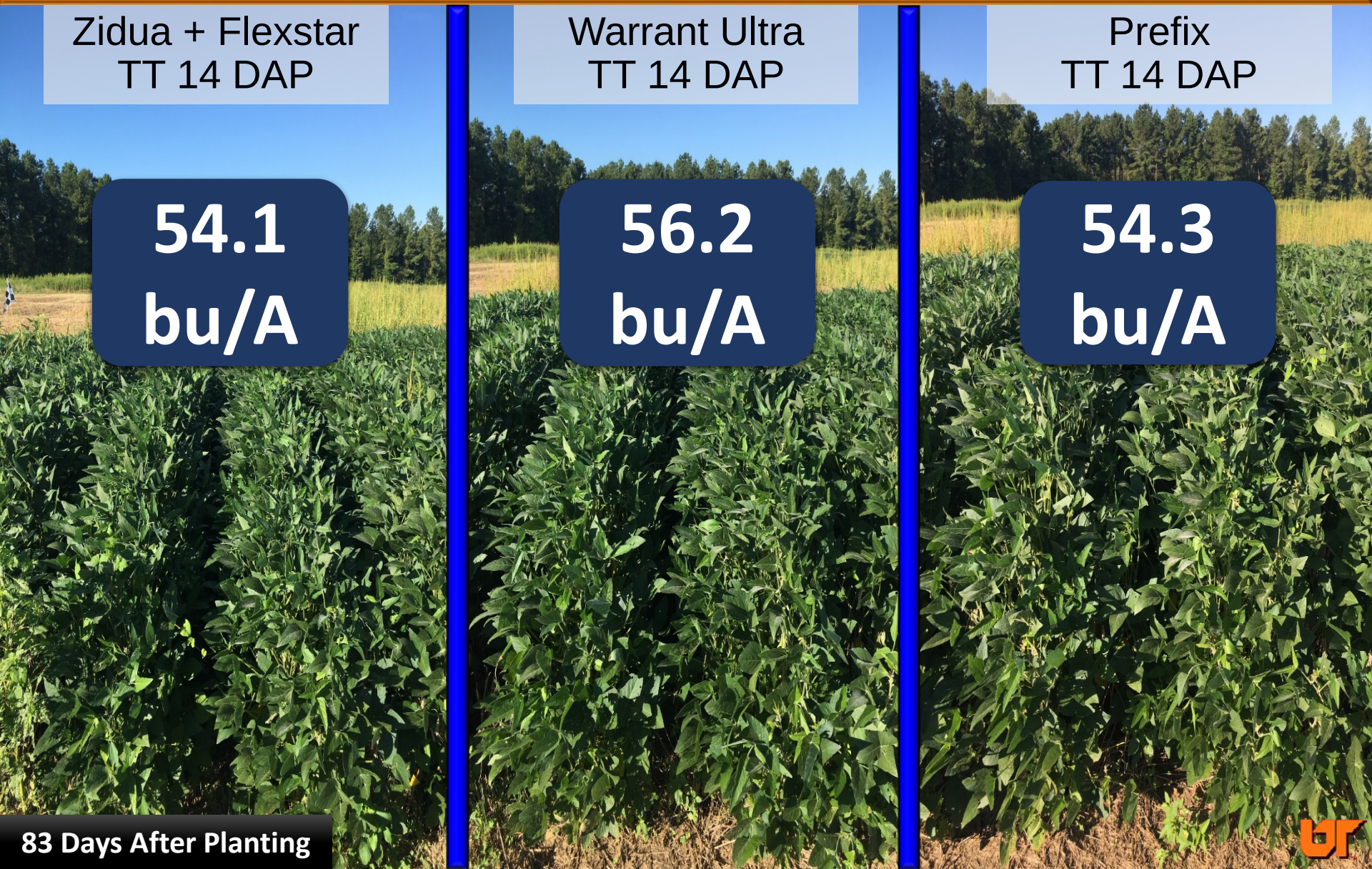
XtendiMax + Roundup + . . .



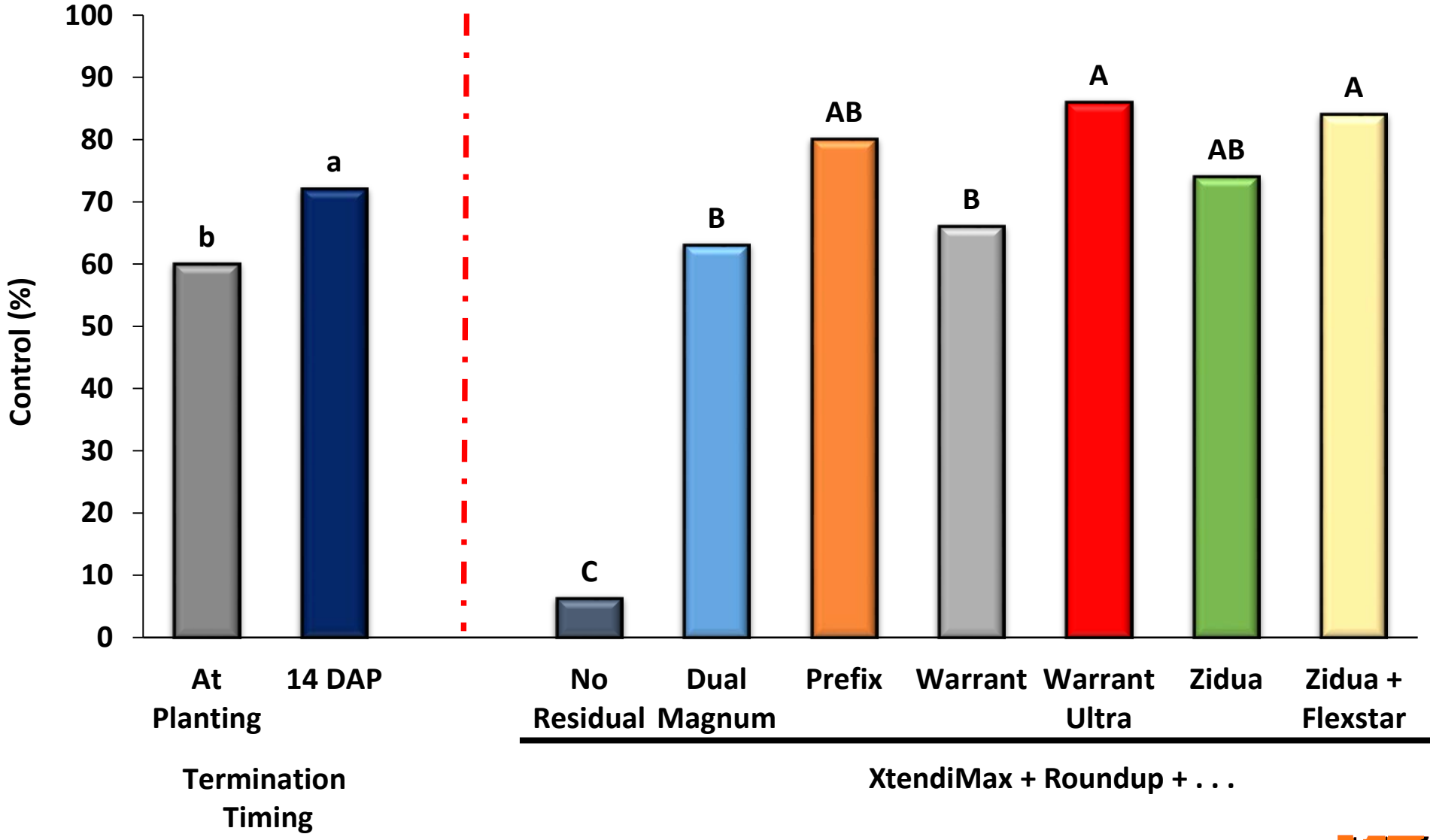
XtendiMax + Roundup + . . .



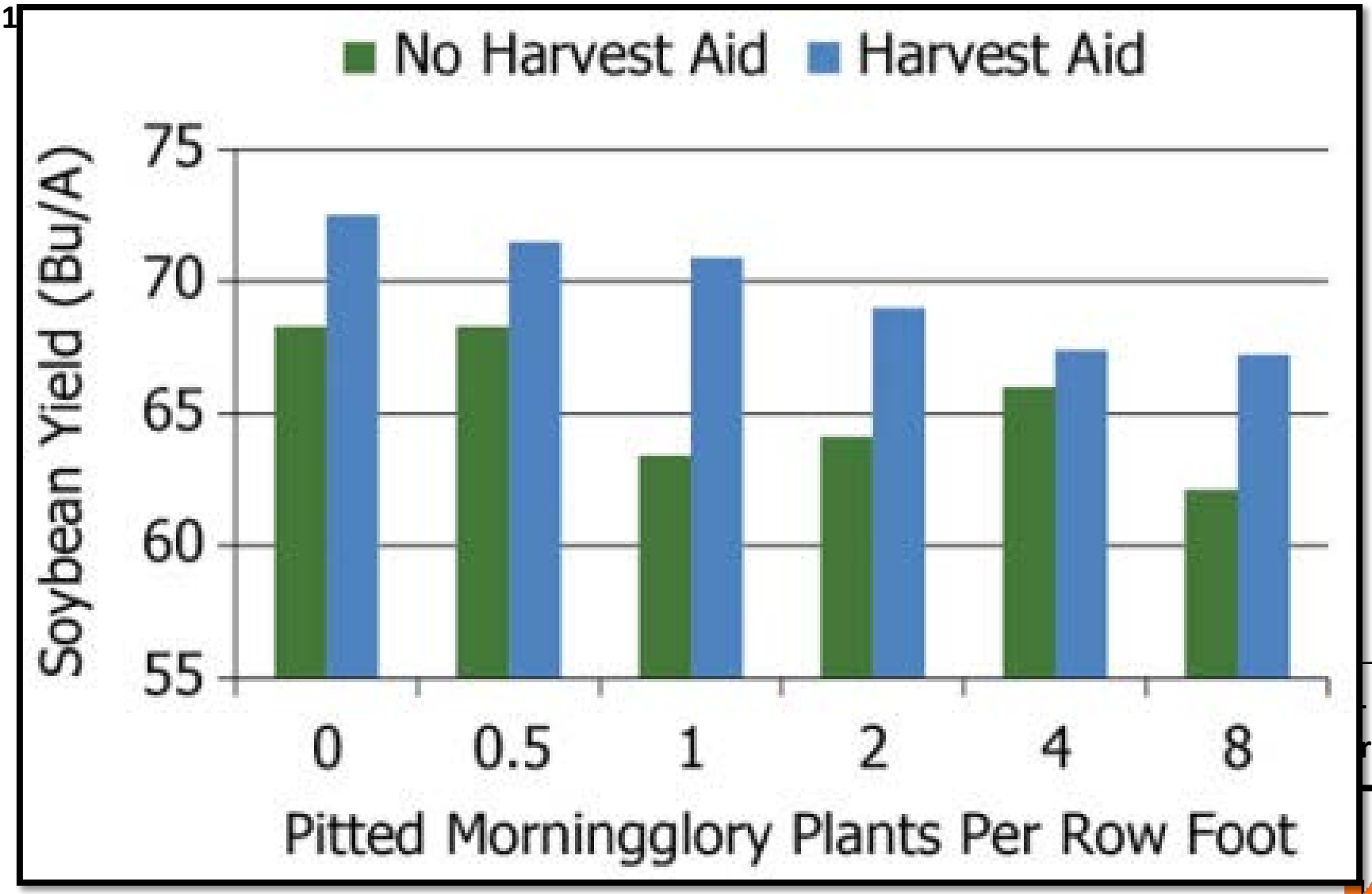
XtendiMax


Zidua + Flexstar
TT 14 DAP
54.1
bu/A
Warrant Ultra
TT 14 DAP
56.2
bu/A
Prefix
TT 14 DAP
54.3
bu/A
83 Days After Planting

Main effects of Termination Timing and Herbicide on ELEIN Control At R1



Main effects of Termination Timing and Herbicide on IPOLA Control 62 DAP



Control (%)

Termination Timing

Corn

- Cereal covers ≥ 14 days before planting
- Legume or cereal+legume 7-10 days before planting
- Delayed termination (+/-7 day) ≠ Greater weed suppression

Cotton

- Legumes +/- 14 days of planting*
- Seed to soil contact imperative (seeds in furrow)
- Delayed termination = Greater weed suppression

Soybean

- Cereal and/or legume covers +/- 14 days of planting*
- Delayed termination = Greater weed suppression

*Delayed termination (i.e. Planting Green)

Termination Timing

Costs in Soybeans

Timing	Conventional	Cover Crop "Planting Green"			
	----	Cereal Rye	Cereal Rye + Vetch	Wheat	Wheat + Clover***
Cover Crop Planting	----	$26.40	$74.40	$8.00	$15.75
Prior to Planting	$17.00 (RPM + Sterling Blue + Verdict + MSO)	----	----	----	----
At Planting	$28.00 (Gramoxone + Boundary + NIS)	----	----	----	----
EPOST	$32.00 (RPM + Xtendimax + Warrant Ultra)	$32.00 (RPM + Xtendimax + Warrant Ultra)	$32.00 (RPM + Xtendimax + Warrant Ultra)	$32.00 (RPM + Xtendimax + Warrant Ultra)	$32.00 (RPM + Xtendimax + Warrant Ultra)
MPOST	$20.00 (Select+ COC + First Rate)	$20.00 (Select + COC + First Rate)	$20.00 (Select + COC + First Rate)	$20.00 (Select + COC + First Rate)	$20.00 (Select + COC + First Rate)
LPOST	$16.00 (RPM + Xtendimax)	----	----	----	----
Total Costs	**$113.00**	**$78.40**	**$126.40**	**$60.00**	**$67.75**

****Based on 30 inch Row Spacing**

Potential Issues

Planting concerns

- Seed-Soil Contact
- Row Cleaners

Insects

- ex. pea leaf weevil

Other weeds besides Pigweeds

Things to Keep in Mind

Removes cost of early burndown(s)

- Italian ryegrass and horseweed suppression

Likely will remove 1 in-season herbicide application

- Burndown(s) & Late POST application(s)

Extremely effective in newer technologies

- Enlist, Xtend & LibertyLink

NOT a silver bullet

- Must integrate herbicides to obtain consistent Palmer control. Other weeds (besides Palmer) are less sensitive to cover crop management tactics