

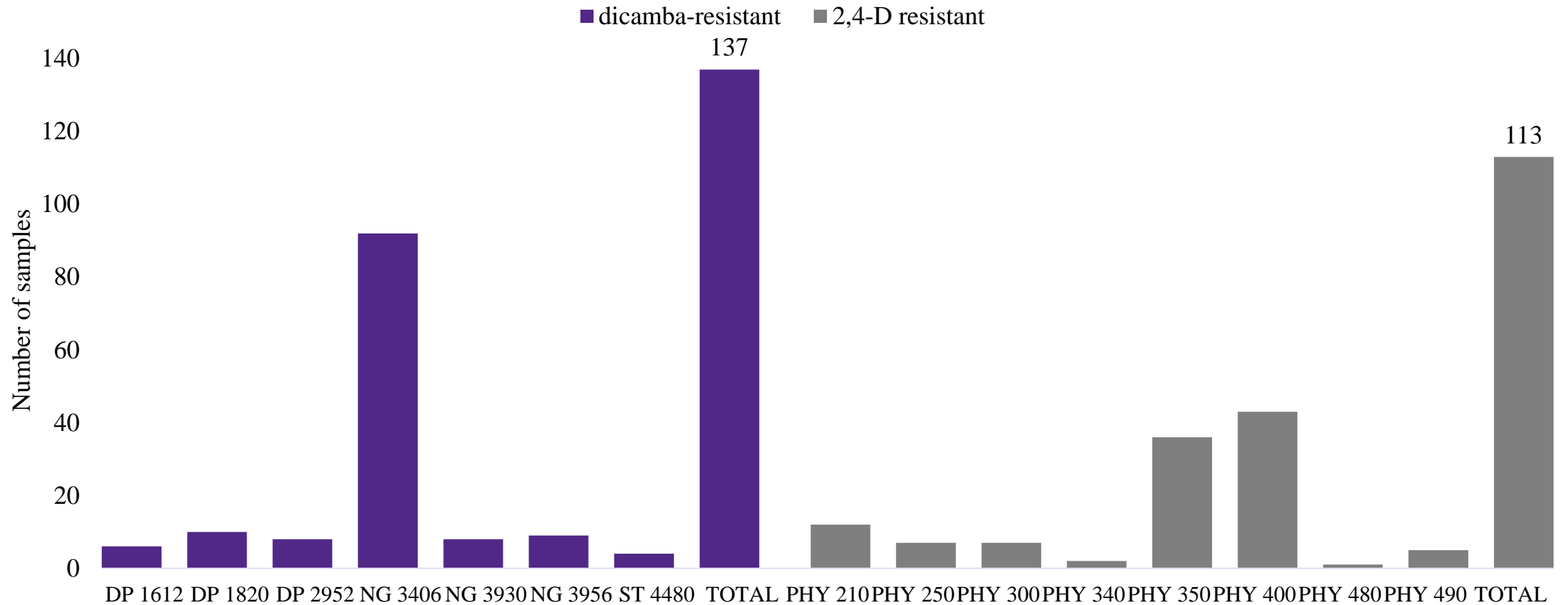
WEED MANAGEMENT: PROPER PLANNING PREVENTS POOR PERFORMANCE

Sarah Lancaster

Assistant Professor and Extension Specialist

K-STATE
Research and Extension

Variety selection

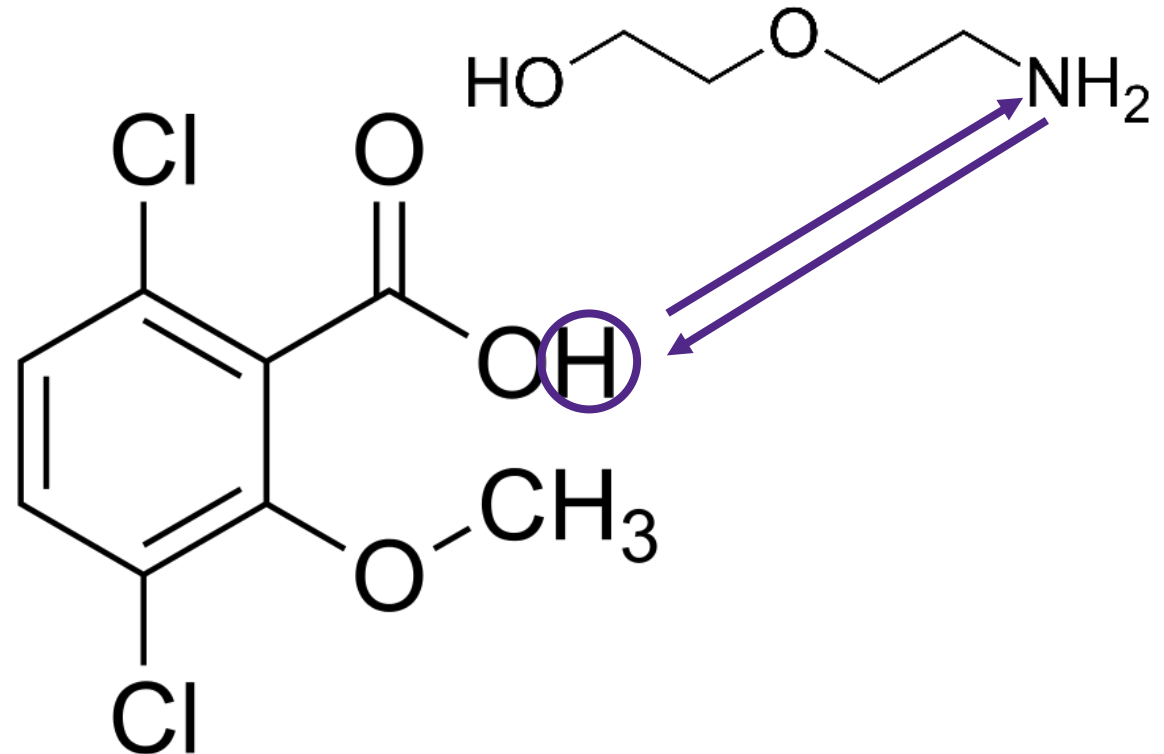


Dicamba update – restrictions

	XtendiMax	Engenia	Tavium
Application cutoff	Through July 30 in cotton Through June 30 or R1 soybean	Through July 30 in cotton Through June 30 in soybean	Through July 30 or 6-leaf cotton Through June 30 or V ₄ soybean
Downwind buffer (unless endangered species)	240 ft 110 ft with approved hooded sprayer	240 ft 110 ft with approved hooded sprayer	240 ft 110 ft with approved hooded sprayer
Drift reduction adjuvant	Check website for tankmix requirement	Check website for tankmix requirement	Check website for tankmix requirements
Volatility reduction agent	Required	Required	Required
Forecast	48 hours no runoff producing event	48 hours no runoff producing event	48 hours no runoff producing event

Why pH matters

- Weak acid herbicides associate/dissociate as function of pH
 - pKa varies for each molecule
 - pH 5 for dicamba
- This influences
 - Absorption
 - Translocation
 - Binding at active site
 - Behavior in spray solution
 - Volatility



Volatility reduction agents / pH buffers

2/24/21

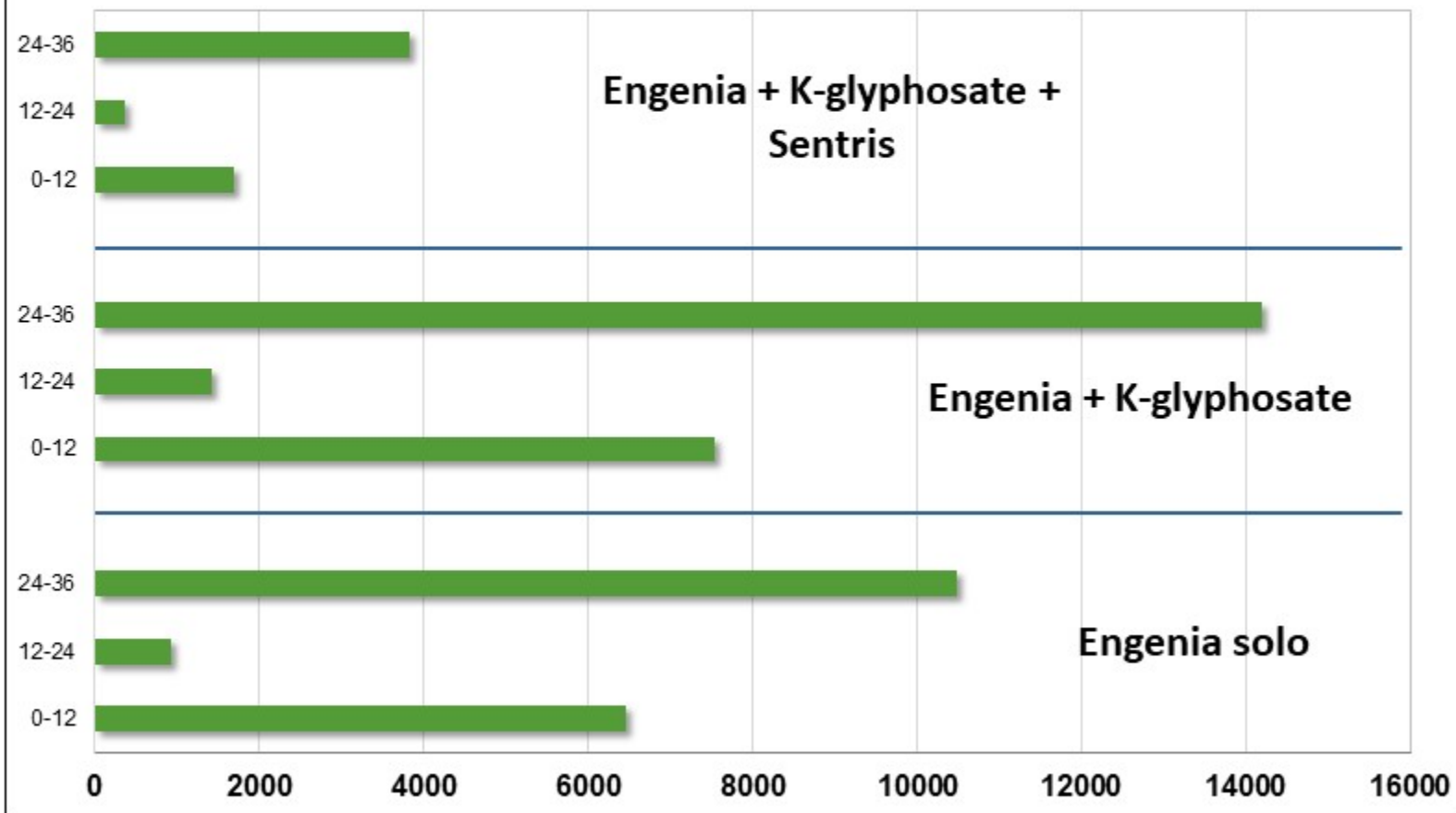
<p>VRA</p> <p>AQUADRAFT™ VRA, a VaporGrip® Xtra Agent Manufacturer/Distributor: Meristem Crop Performance Group, LLC Application Rate: 20 oz/A</p>	<p>VRA</p> <p>ChemPro VRA, a VaporGrip® Xtra Agent Manufacturer/Distributor: Chemorse, LTD Application Rate: 20 oz/A</p>	<p>VRA</p> <p>Corbett® Vapor-Shield™, a VaporGrip® Xtra Agent Manufacturer/Distributor: Van Diest Application Rate: 20 oz/A</p>
<p>VRA</p> <p>DELTA LOCK™, a VaporGrip® Xtra Agent Manufacturer/Distributor: Loveland Products, Inc. Application Rate: 20 oz/A</p>	<p>VRA</p> <p>EclipseUS™ VRA, a VaporGrip® Xtra Agent Manufacturer/Distributor: Direct Enterprises Inc. Application Rate: 20 oz/A</p>	<p>VRA</p> <p>FRONT-RUNNER™ VRA, a VaporGrip® Xtra Agent Manufacturer/Distributor: Advanced Yield Application Rate: 20 oz/A</p>
<p>VRA</p> <p>FS Dissension™, a VaporGrip® Xtra Agent Manufacturer/Distributor: GROWMARK, Inc Application Rate: 20 oz/A</p>	<p>VRA</p> <p>LEVY™, a VaporGrip® Xtra Agent Manufacturer/Distributor: Rosen's Inc Application Rate: 20 oz/A</p>	<p>VRA</p> <p>PLACEHOLDER™, a VaporGrip® Xtra Agent Manufacturer/Distributor: Exacto Application Rate: 20 oz/A</p>
<p>VRA</p> <p>PROPELL™ VRA, a VaporGrip® Xtra Agent Manufacturer/Distributor: New Dawn Crop Performance Application Rate: 20 oz/A</p>	<p>VRA</p> <p>Sentris™, Buffering Technology Manufacturer/Distributor: BASF Application Rate: 8 oz/A</p>	<p>VRA</p> <p>SETTLE™, a VaporGrip® Xtra Agent Manufacturer/Distributor: EGE Products Application Rate: 20 oz/A</p>
<p>VRA</p> <p>Suralta™, a VaporGrip® Xtra Agent Manufacturer/Distributor: CHS Inc. Application Rate: 20 oz/A</p>	<p>VRA</p> <p>TIE DOWN™, a VaporGrip® Xtra Agent Manufacturer/Distributor: Wilbur-Ellis Company, LLC Application Rate: 20 oz/A</p>	<p>VRA</p> <p>Vapex™, a VaporGrip® Xtra Agent Manufacturer/Distributor: KALO, Inc. Application Rate: 20 oz/A</p>
<p>VRA</p> <p>Verified™, a VaporGrip® Xtra Agent Manufacturer/Distributor: Helena Agri-Enterprises, LLC Application Rate: 20 oz/A</p>	<p>VRA</p> <p>VOLACEPT™, a VaporGrip® Xtra Agent Manufacturer/Distributor: Innvictis Crop Care, LLC Application Rate: 20 oz/A</p>	<p>VRA</p> <p>Volimate™, a VaporGrip® Xtra Agent Manufacturer/Distributor: Precision Laboratories, LLC Application Rate: 20 oz/A</p>
<p>VRA</p> <p>Volt-Edge™, a VaporGrip® Xtra Agent Manufacturer/Distributor: Winfield United, LLC Application Rate: 20 oz/A</p>	<p>VRA</p> <p>WINNERS VRA, a VaporGrip® Xtra Agent Manufacturer/Distributor: Wells AG Supply LLC Application Rate: 20 oz/A</p>	

UTN Quantitative Humidome Study # 39 - 2019

Engenia +/- K-glyphosate & Sentriss - Air Sampling

Researcher: Dr. Tom Mueller
University of Tennessee

Dicamba Conc. (ng/trt.) at 0-12, 12-24, and 24-36 HAT



Test Conditions:

Greenhouse conditions (see below)

Humidome Temp & RH (see below)

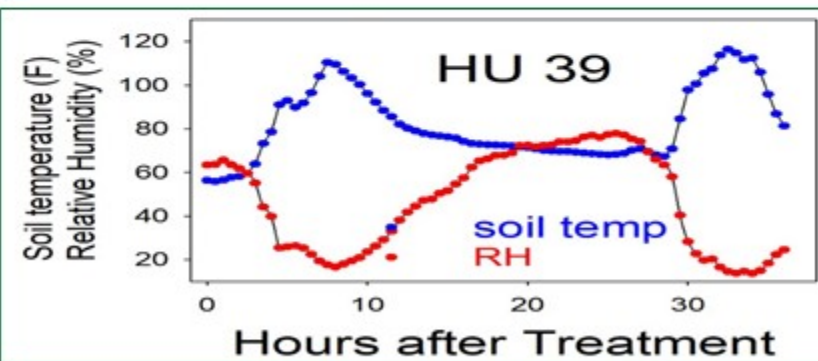
Air Sampling Duration: 0-12, 12-24, 24-36

Air flow rate: 56 l/min

Filter: cellulose + PUF

Substrate: Dry soil

- Engenia (12.8 fl oz/A) = BAPMA-Dicamba (0.5 lb ae/A)
- K-glyphosate (32 fl oz/A or 1.125 lb ae/ha)
- Sentriss buffer (4 fl oz/A)
- Induce (0.25% v/v)



Clear benefit with Tank Mix Buffer in reducing the secondary loss.

BASF
We create chemistry

Dicamba Faces Legal Battlefield

EPA Faces Multiple Dicamba Lawsuits in 2021

2/5/2021 | 12:10 PM CST



By [Emily Unglesbee](#), DTN Staff Reporter

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EPA is facing four separate lawsuits challenging its 2020 dicamba registration, from both the agricultural industry and environmental groups. (DTN photo by Pamela Smith)

ROCKVILLE, Md. (DTN) -- EPA is facing a tangle of lawsuits over its 2020 registration of three over-the-top dicamba herbicides, XtendiMax, Engenia and Tavium.

Given the many legal steps ahead for them, these lawsuits are unlikely to immediately affect the legal availability of dicamba in 2021, but they could threaten the chemical's use in spray seasons to come.

The lawsuits have been brought by two different groups of plaintiffs with two very different complaints. On one side, agricultural commodity groups are arguing the new dicamba labels are too restrictive; on the other, environmental groups argue they are too permissive.

Some of these cases are frozen for 60 days, as President Joe Biden's newly appointed EPA reviews all regulations created by the agency since 2017. But for now, here's a breakdown of the existing lawsuits, and what actions are expected ahead.

Palmer amaranth escapes

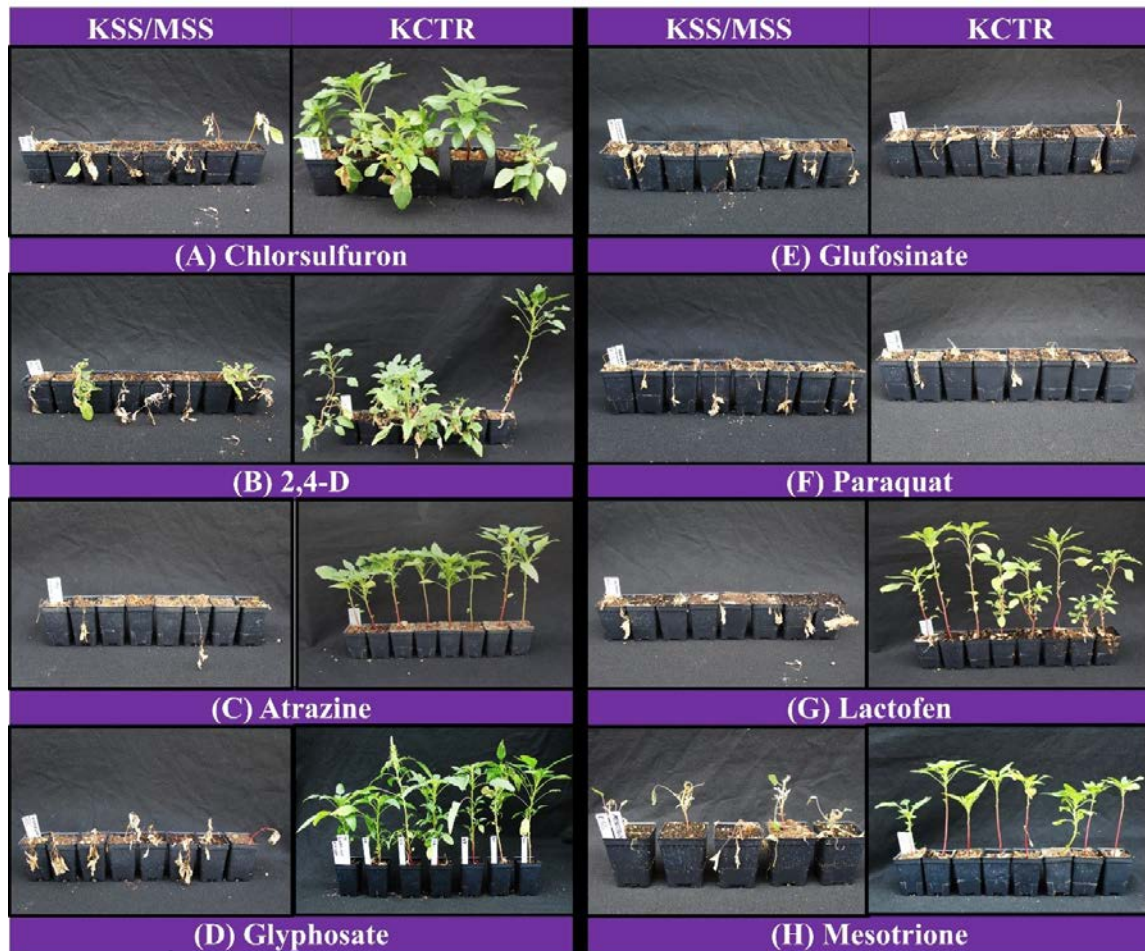
- Texas cotton production fields
- 364,225 to 6,960,744 seeds per acre
- 2.4 to 9.4% of field area
- 130 to 748 plants per acre



Is 95% control enough? Palmer amaranth example

Seed rain year 1	$350,000 \frac{\text{seeds}}{\text{acre}} \times 20\% = 70,000 \frac{\text{viable seeds}}{\text{acre}}$
Plants emerged year 2	$70,000 \text{ seeds} \times 40\% = 28,000 \frac{\text{plants}}{\text{acre}}$
Plants escaped year 2	$28,000 \text{ plants} \times 95\% = 1,400 \frac{\text{plants}}{\text{acre}}$
Resistant plants year 2	$1,400 \text{ plants} \times 84\% = 1,176 \frac{\text{plants}}{\text{acre}}$
Seed rain from resistant plants year 2	$1,176 \text{ plants} \times 487 \frac{\text{seeds}}{\text{plant}} = 572,712 \frac{\text{seeds}}{\text{acre}}$

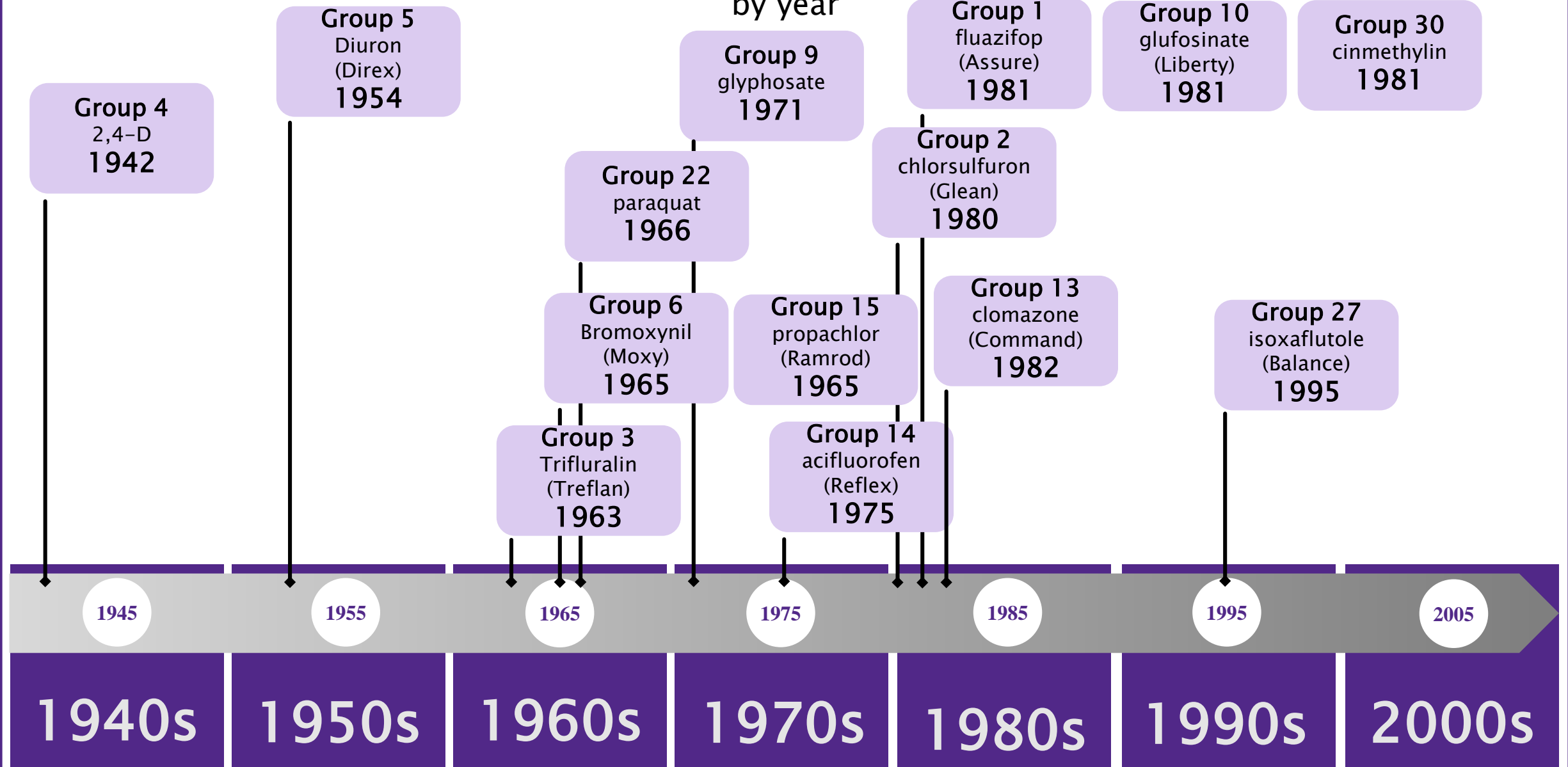
Metabolic resistance



Herbicide group	Resistance type ¹	Suspected mechanism
2	MBR	Cytochrome P ₄₅₀
4	MBR	Cytochrome P ₄₅₀
5	MBR	Glutathione GST
9	TSBR	Gene amplification
14	MBR	Cytochrome P ₄₅₀
27	MBR	Cytochrome P ₄₅₀

¹MBR = Metabolism-based resistance; TSBR = Target site-based resistance

Herbicide site of action introductions by year



Proper Preparation

- Spring
 - Cultural control
 - Preemergence herbicides
- Summer
 - Scouting
 - Consider late-post application with residual
 - Consider hand removal
- Fall
 - Scouting

S-METOLACHLOR GROUP 15 HERBICIDE
Dual II Magnum[®]
Herbicide

BRAKE[®]

Direx[®] 4L

FLURIDONE GROUP 12 HERBICIDE

Outlook[®]
Herbicide

DuPont[™]

Cotoran[®] 4L

GROUP 7 HERBICIDE

FOR WEED CONTROL IN COTTON

Staple[®] LX

herbicide

WARRANT
HERBICIDE

ACETOCHLOR GROUP 15 HERBICIDE

PULL HERE TO OPEN ▶

PROMETRYN GROUP 5 HERBICIDE



Caparol[®] 4L



Zidua[®]
Herbicide

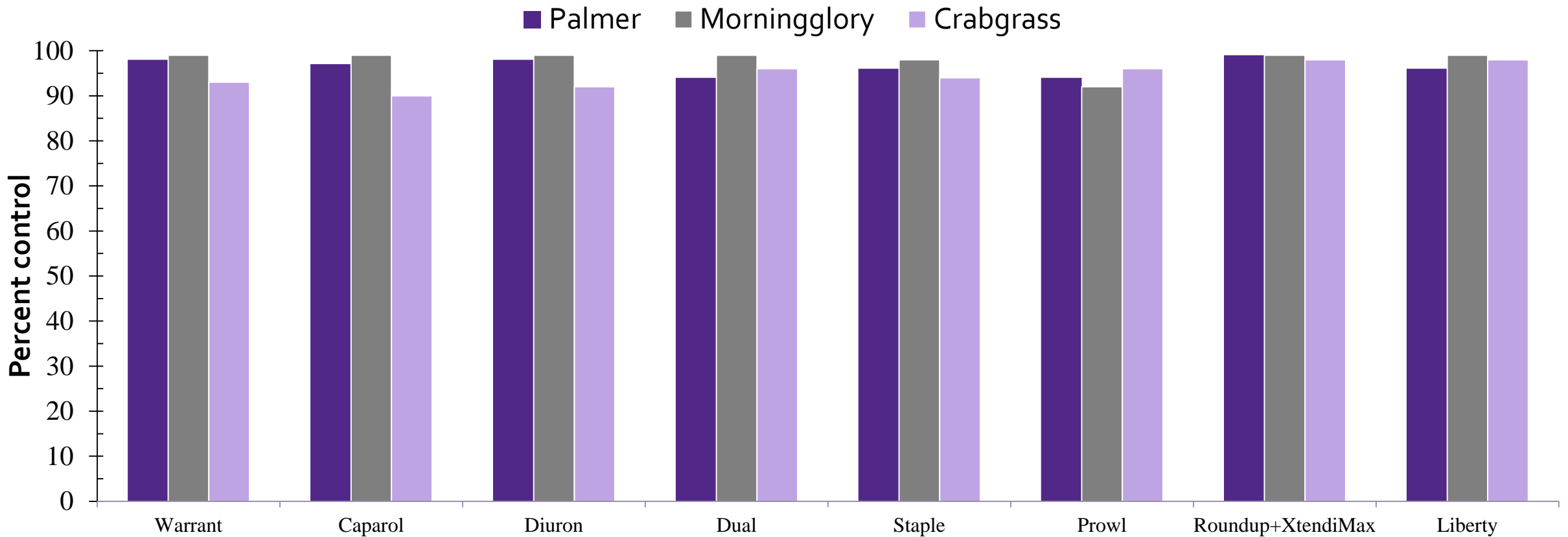
FOMESAFEN GROUP 14 HERBICIDE



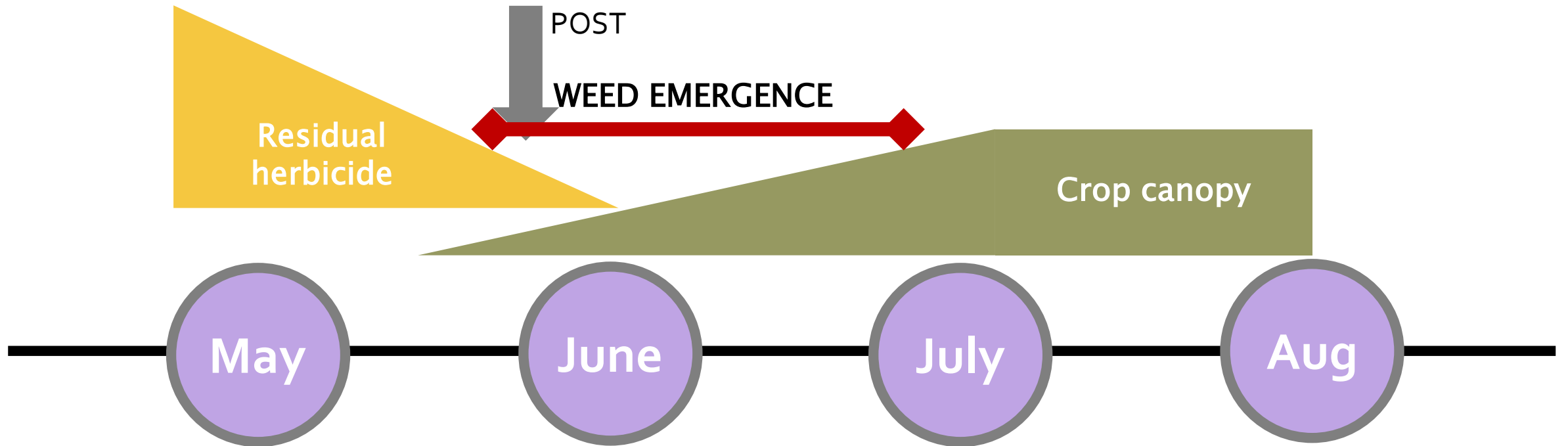
Reflex[®]
Herbicide

PRE vs POST in high residue

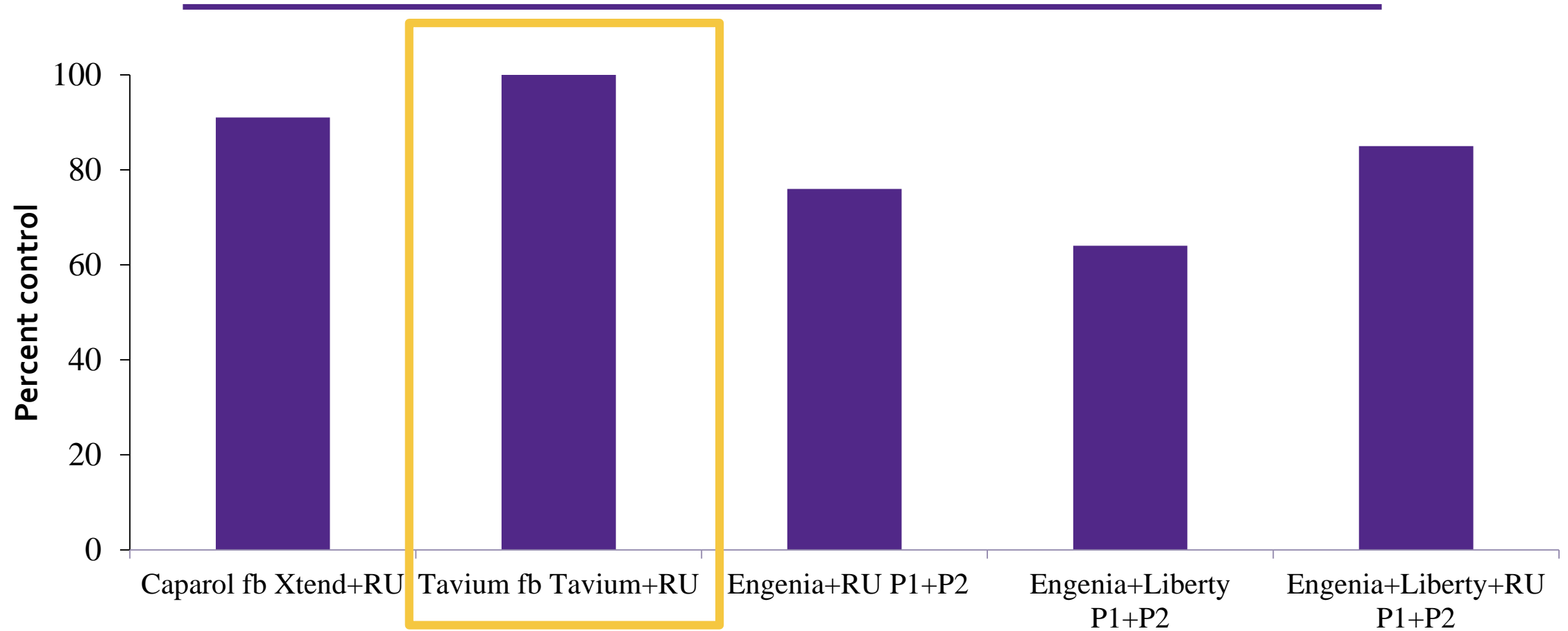
5 WAA PRE, 1 WAA POST



Residual herbicide activity

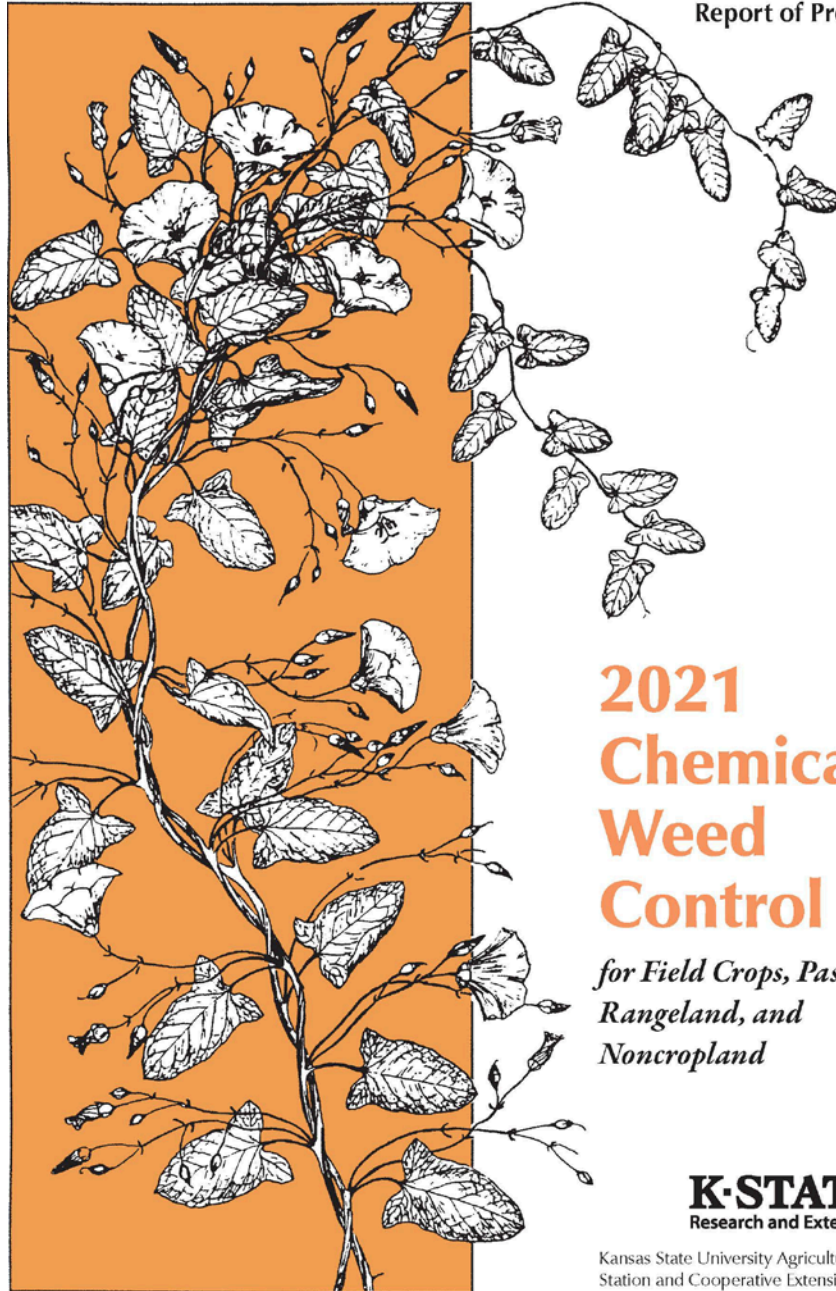


2-pass weed control



Residual herbicide carry over potential

Herbicide (group)	Corn	Sorghum	Soybean	Wheat
Cotoran (5)	8 mos	9 mos	9 mos	3 mos
Staple (2)	9–10 mos	Do not plant following season	10 mos	4 mos
Caparol (5)	12 mos	12 mos	12 mos	12 mos
Direx (5)	Next spring	Next spring	12 mos	12 mos
Brake (12)	12–18 mos	12–18 mos	2–12 mos	8–12 mos
Sinister (14)	10 mos	18 mos	0 days	4 mos
Dual (15)	None	None	None	4.5 mos
Outlook (15)	None	None	None	4 mos
Warrant (15)	None	None	None	4 mos
Zidua (15)	None	6–12 mos	0–4 mos	1–6 mos



2021 Chemical Weed Control

*for Field Crops, Pastures,
Rangeland, and
Noncropland*

K-STATE
Research and Extension

Kansas State University Agricultural Experiment
Station and Cooperative Extension Service

WAR



AGAINST

WEEDS

SILVER BULLETS ARE FOR WEREWOLVES





Sarah Lancaster



slancaster@ksu.edu



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