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Cotton Crop Response and Control of Palmer Amaranth in HPPD-tolerant Systems using Isoxaflutole

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Background and Reasoning



- Palmer amaranth has been a common weed on the Texas High Plains and has now proven itself to be a troublesome weed
- Glyphosate resistance in Palmer amaranth has created challenges in controlling this weed in crop
- New herbicide and seed technologies from BASF could soon allow cotton producers to use isoxaflutole to control this troublesome weed when HPPD-tolerant seed is planted

Objective



- To evaluate crop response and control of Palmer amaranth in isoxaflutole-based cotton systems

Materials and Methods



- Field studies conducted at Texas Tech University New Deal Research Farm
 - 2021 and 2022
 - Randomized complete block design (RCBD)
 - Four replications
 - Subsurface drip irrigation
 - 13.3 by 30 feet plots
 - All four rows sprayed
 - AIXR 11002 nozzles, except for dicamba applications (TTI 11002)
- Data Collection
 - Visual crop response and weed control ratings made after each application timing
 - Lint yields evaluated with on-board scales on cotton stripper and gin data
- Data Analysis
 - SAS 9.4 PROC GLIMMIX ($\alpha= 0.05$)

Materials and Methods



- Herbicides and rates (in oz/A):
 - Alite 27- 3
 - Prowl H2O- 32
 - Engenia- 12.8
 - XtendiMax- 22
 - Roundup PowerMax- 32
 - Roundup PowerMax 3- 30
 - Outlook- 16
 - Brake- 24
 - Cotoran- 32
 - Warrant- 48
 - Warrant Ultra- 48
 - Dual II Magnum- 16
 - Liberty- 43
 - Ammonium Sulfate – 3 lb/A
 - Aegos- 8 (used with all applications containing dicamba)

Treatment Number	Pre-Treatment	Post-Treatment
1	Untreated	Untreated
2	Alite 27 + Prowl H2O	Engenia+ RoundUp PowerMax+ Outlook
3	Alite27+ Brake	Engenia+ RoundUp PowerMax+ Outlook
4	Alite 27 + Cotoran	Engenia+ RoundUp PowerMax+ Outlook
5	Alite 27 + Warrant	Engenia+ RoundUp PowerMax+ Outlook
6	Prowl H2O + Cotoran	Alite 27+ Engenia + RoundUp PowerMax
7	Warrant+ Cotoran	XtendiMax + RoundUp PowerMax + Warrant
8	Cotoran	Engenia+ RoundUp PowerMax+ Outlook
9	Brake	Engenia+ RoundUp PowerMax+ Outlook
10	Alite 27	Engenia+ RoundUp PowerMax+ Outlook
11	1/2x Alite 27 + Cotoran	Engenia+ RoundUp PowerMax+ 1/2x Alite 27
12	Alite 27 + Cotoran	Liberty+ RoundUp PowerMax + Outlook + AMS
13	Alite 27+ Engenia	Liberty+ RoundUp PowerMax + Outlook + AMS
14	Cotoran + Prowl H2O	Liberty+ RoundUp PowerMax+ Alite 27
15	Cotoran	Liberty+ RoundUp PowerMax+ Outlook+ AMS

Treatment list 2022



Treatment Number	PRE-treatment	EPOST-treatment	MPOST-treatment
1	Untreated	Untreated	Untreated
2	Untreated	Engenia+ Roundup PowerMax3	Liberty + Roundup PowerMax 3 + AMS
3	Direx	Engenia + RoundUp PowerMax 3	Liberty + Roundup PowerMax 3 + AMS
4	Cotoran	Engenia + Roundup PowerMax 3+ Outlook	Untreated
5	Prowl H2O	Engenia + Roundup PowerMax 3+ Outlook	Untreated
6	Brake	Engenia + Roundup PowerMax 3+ Outlook	Untreated
7	Cotoran	Liberty + Roundup PowerMax 3+ Outlook + AMS	Untreated
8	Brake	Engenia + Roundup PowerMax 3+ Alite 27	Untreated
9	Cotoran	Engenia + Roundup PowerMax 3+ Outlook + Alite 27	Untreated
10	Alite 27 + Cotoran	Engenia + Roundup PowerMax 3+ Outlook	Untreated
11	Alite 27 + Prowl H2O	Engenia + Roundup PowerMax 3+ Outlook	Untreated

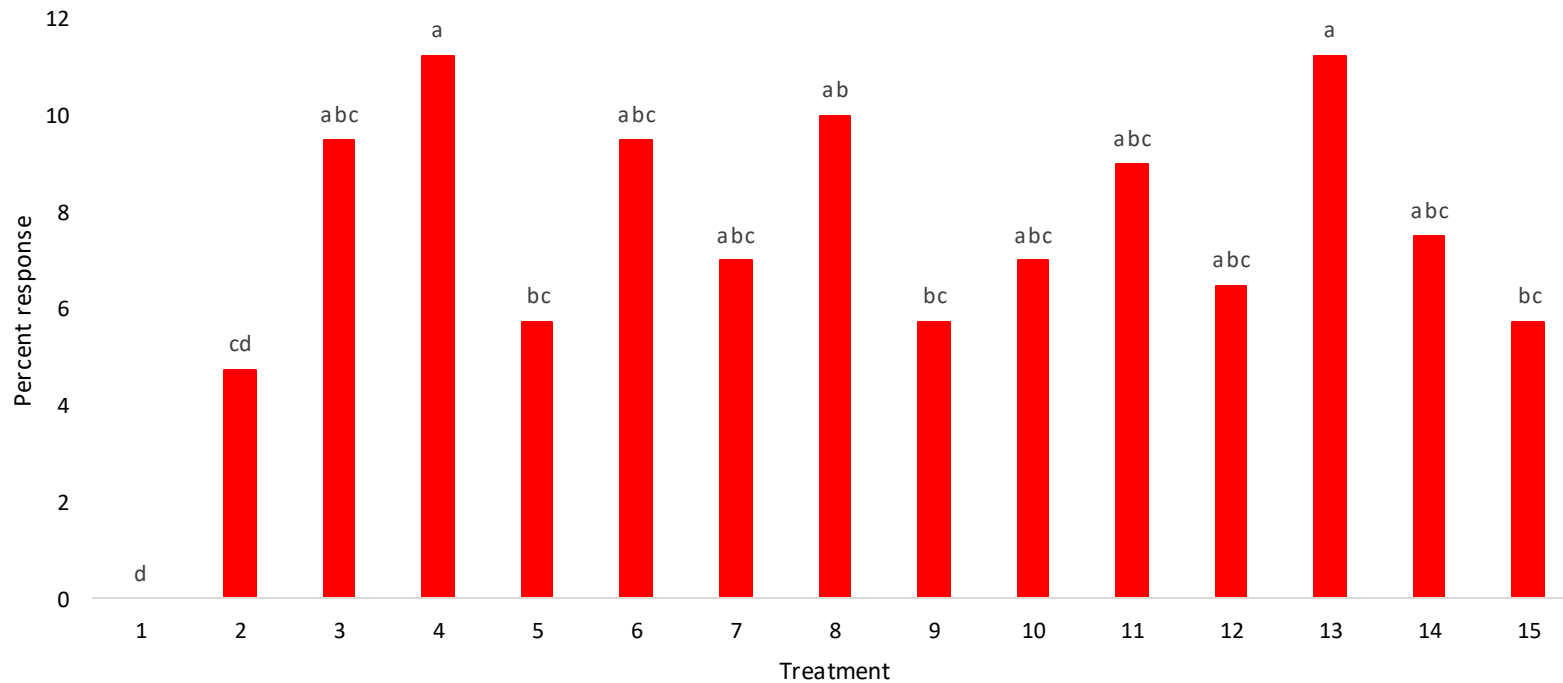
Treatment list 2022 continued



Treatment Number	PRE-treatment	EPOST-treatment	MPOST-treatment
12	Alite 27 + Brake	Engenia + Roundup PowerMax 3+ Outlook	Untreated
13	Alite 27 + Cotoran	Liberty + Roundup PowerMax 3+ Outlook+ AMS	Untreated
14	Warrant Ultra	XtendiMax + Roundup PowerMax 3 + Dual II Magnum + Volt-Edge	Untreated
15	Alite 27 + Warrant	Engenia + Roundup PowerMax 3+ Outlook	Untreated
16	Cotoran + Prowl H2O	Engenia + Roundup PowerMax 3+ Alite 27	Untreated
17	Cotoran + Warrant	XtendiMax + Roundup PowerMax 3 + Warrant	Untreated
18	Alite 27	Engenia + Roundup PowerMax 3+ Outlook	Untreated
19	1/2X Alite 27 + Cotoran	Engenia + Roundup PowerMax 3+ 1/2X Alite 27	Untreated
20	Alite 27 + Engenia	Liberty + Roundup PowerMax 3+ Outlook+ AMS	Untreated
21	Cotoran + Prowl H2O	Liberty + Roundup PowerMax 3+ Outlook+ AMS	Untreated



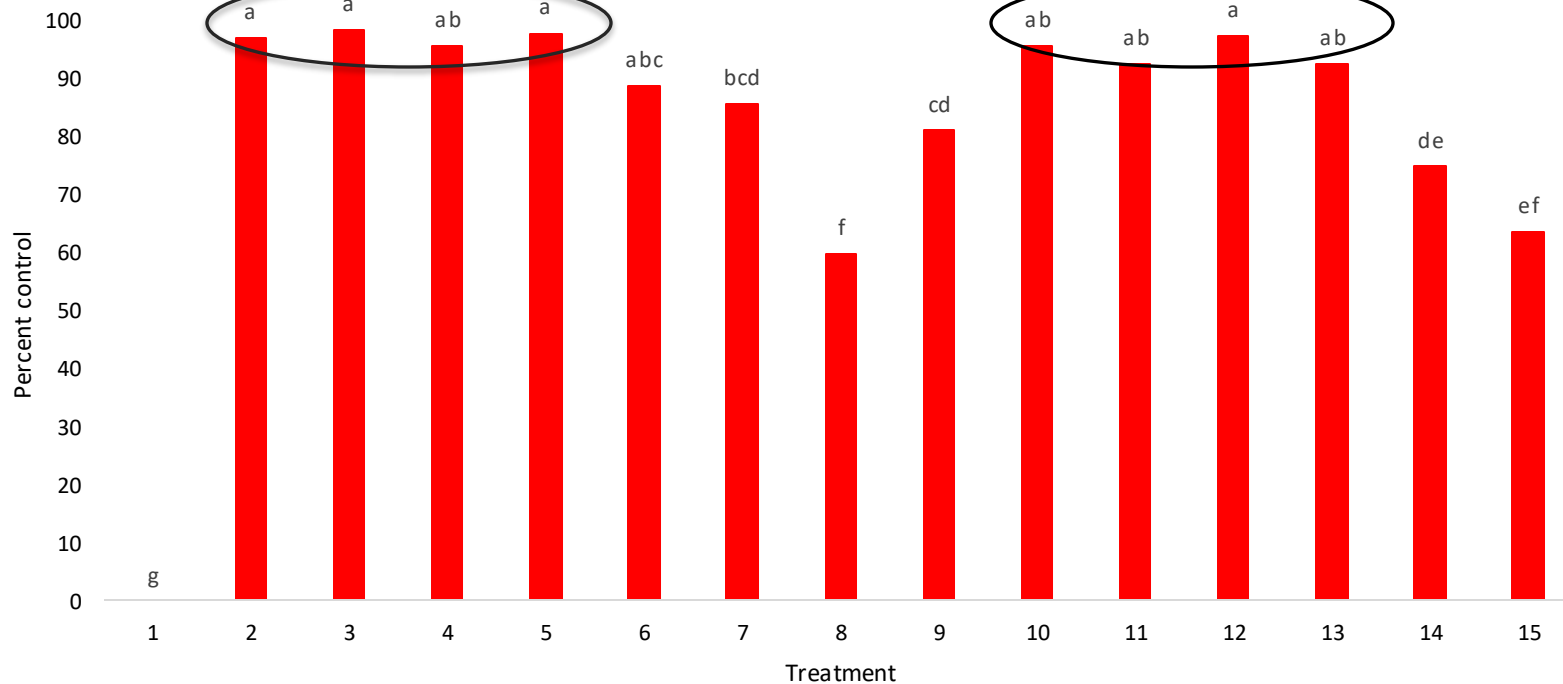
Crop Response on June 14 (14 days after emergence)



Results-2021



Amaranthus palmeri control on June 22 (29 DAA)



Results



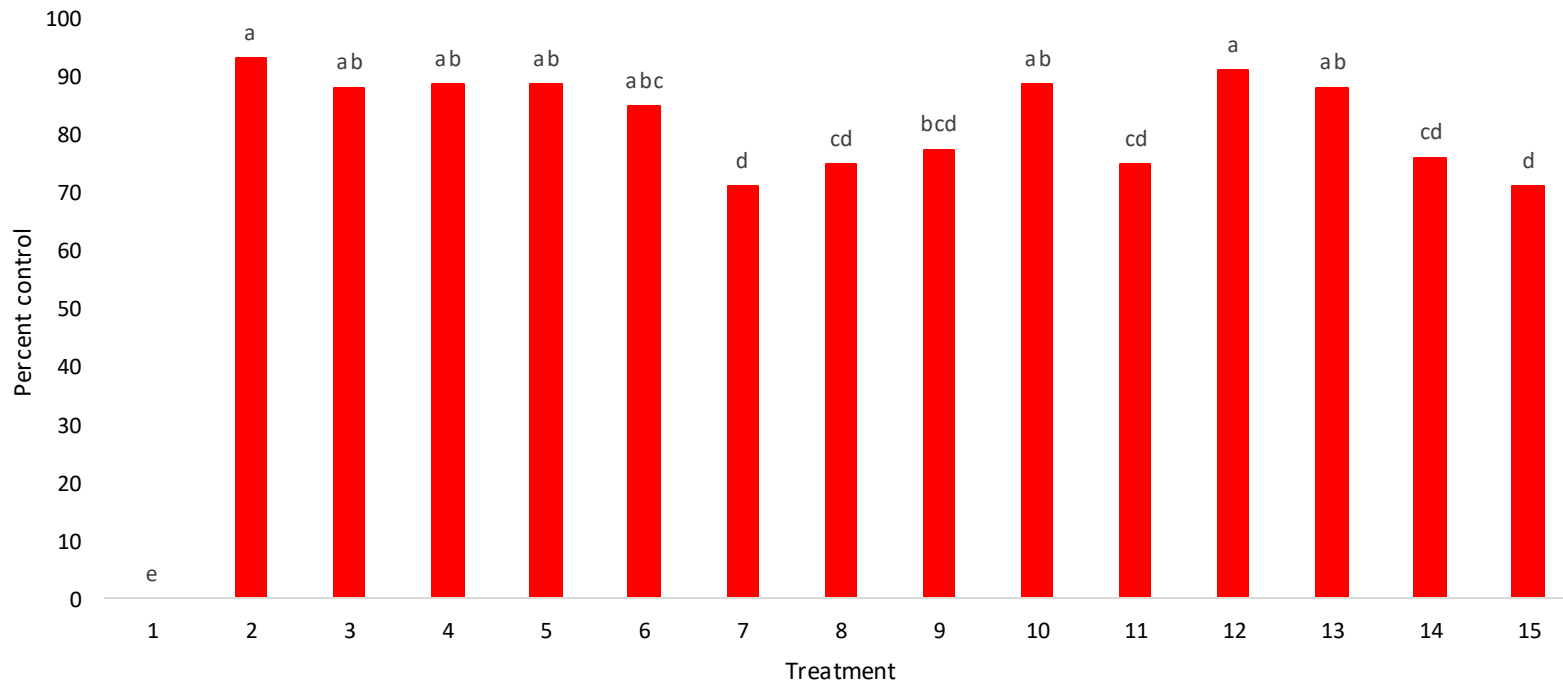
Untreated control 29 days after preemergence application



Alite 27+ Prowl H2O 29 days after preemergence application



Amaranthus palmeri control on July 20 (28 DAB)



Results



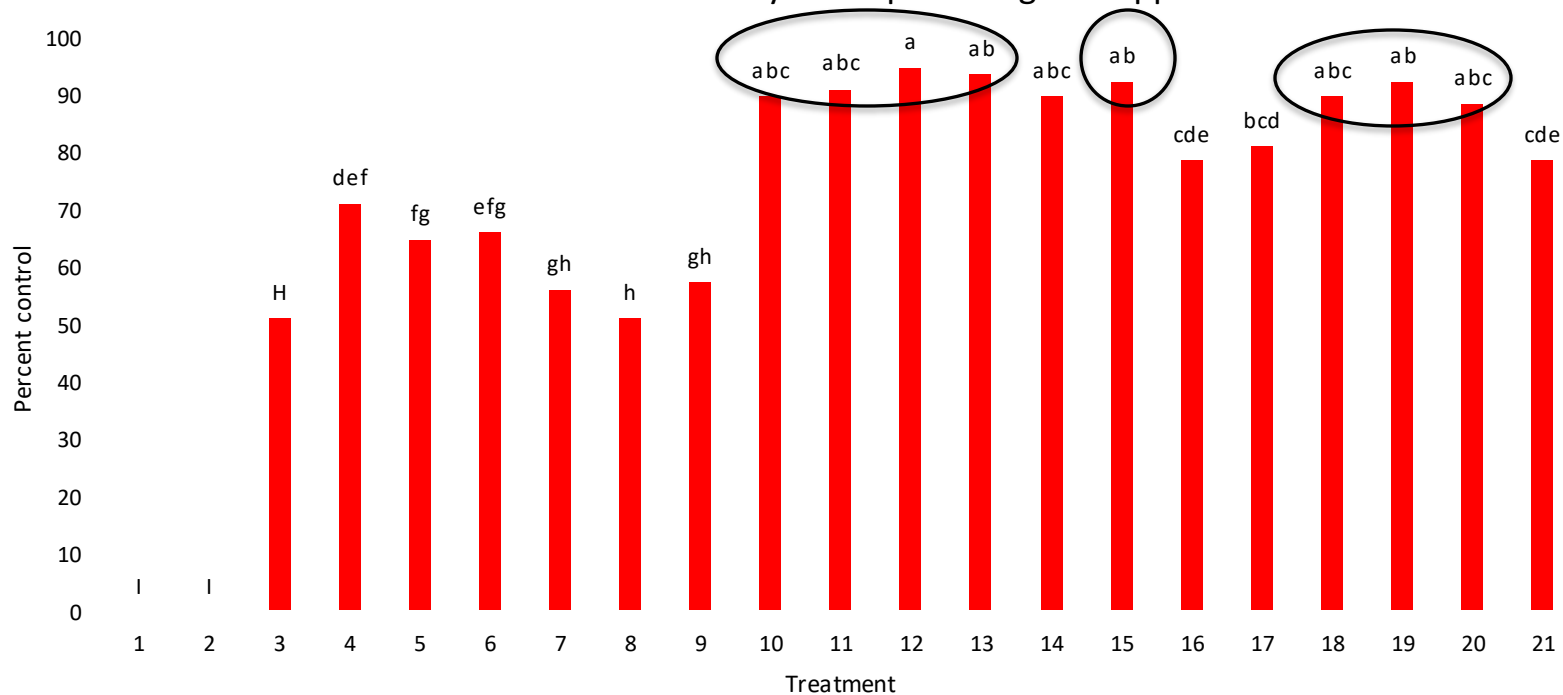
Untreated control - 28 days after postemergence application



Alite 27 + Prowl H2O fb Engenia + Roundup PowerMax + Outlook - 28 days after postemergence application

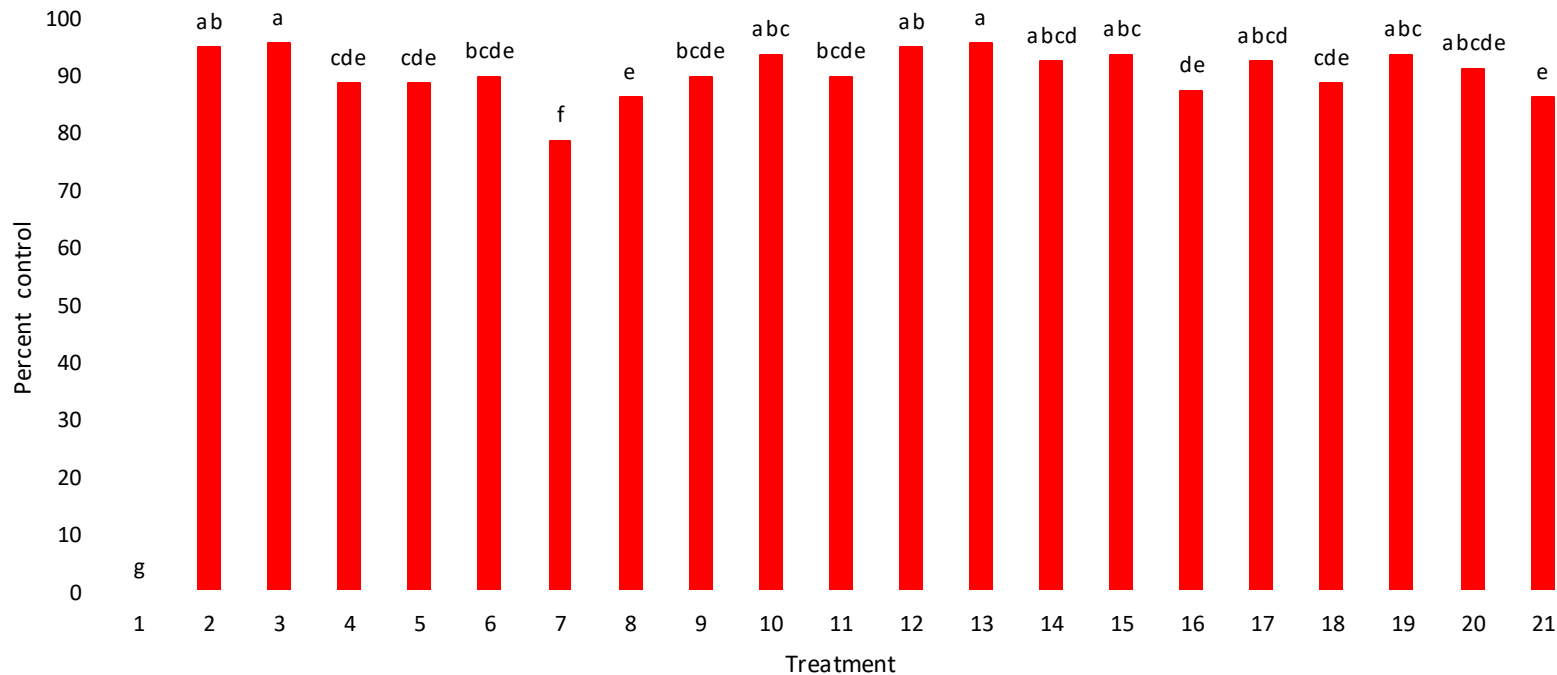


Palmer amaranth control 29 days after preemergence application





Palmer amaranth control 28 days after postemergence application



Conclusions



- Crop response was less than 12 percent in 2021 and was 0 percent in 2022 for all treatments 14 days after emergence
- Control of Palmer amaranth was greater than 92 percent in 2021 and greater than 88 percent in 2022 29 days after the preemergence application for all treatments that included Isoxaflutole in the preemergence treatment
- Control of Palmer amaranth was greater than 71 percent in 2021 and greater than 78 percent 2022 for all treatments except the untreated check 28 days after the early postemergence application

Thank You



Questions?