

Improving Herbicide-Resistant Weed Management in Maryland Soybean

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Introduction

- Herbicide-resistance continues to drive weed management decisions.
- Future management practices should aim to abate further resistance development in order to preserve effective herbicides.
- Tank mixing different herbicides can delay the onset of herbicide resistance.
- However, in order for herbicide tank mixes to prevent further resistance:
 - Each herbicide must target a different site-of-action, and
 - Each herbicide in the mix must be effective by itself.
- A herbicide is not effective if the population already has significant resistance.
- The objectives of this study were to:
 - Demonstrate the efficacy of herbicide tank mixtures for resistance mitigation, and
 - Evaluate the efficacy of early and late POST applications for full season weed control.

Methods and Materials

- A study was conducted in 2024 at the UMD Wye Research and Education Center.
- The study area was conventionally tilled prior to planting and received preemergence application of 1 pt Dual Magnum per acre.
- Enist E3 Soybeans (DynaGro 540EN54) were planted on June 4, 2024.
- Postemergence treatments were made either 2 or 4 weeks (WAP) after planting and consisted of:
 1. Reflex (1.5 pt/A)
 2. Reflex (1.5 pt/A) + Dual Magnum (1.5 pt/A)
 3. Reflex (1.5 pt/A) + Enlist One (2 pt/A)
 4. Reflex (1.5 pt/A) + Enlist One (2 pt/A) + Dual Magnum (1.5 pt/A)
 5. Axxe (13% v/v)
 6. Homeplate (6% v/v)
 7. Axxe (13% v/v) + Homeplate (6% v/v)
- A glyphosate check was included for comparison and applied 2 WAP.

Figure 1. Weed Control Plots on 07/23/2024



Axxe + Homeplate E-Post



Axxe + Homeplate L-Post



Reflex E-Post



Reflex L-Post



Reflex + Enlist E-Post



Reflex + Enlist L-Post



Reflex + Enlist + Dual Magnum E-Post



Reflex + Enlist + Dual Magnum L-Post

Table 1. Effect of early postemergence treatments on weed control in soybean.^a

Treatment	Lambsquarters		Morningglory		Grasses	
	2 WAT ^b	4 WAT	2 WAT	4 WAT	2 WAT	4 WAT
	Control (%)					
Roundup	82ab	99a	92a	94ab	100a	100a
Reflex	80ab	66bc	52b	5cd	92ab	53bc
Reflex + Dual	86ab	92ab	100a	61bcd	86b	26c
Reflex + Enlist	100ab	100a	100a	97ab	88b	77ab
Reflex + Enlist + Dual	100ab	100a	100a	99ab	89b	86ab
Axxe	51b	43c	1c	30d	87b	70abc
Homeplate	52b	80abc	12c	72a-d	83b	82ab
Axxe + Homeplate	60b	71bc	13c	82abc	89b	89ab

a. Means followed by the same letter are not significantly different according to Fisher's LSD ($\alpha=0.05$)
b. Abbreviation: WAT, weeks after treatment

Table 2. Effect of late postemergence treatments on weed control in soybean.^a

Treatment	Lambsquarters		Morningglory		Grasses	
	2 WAT ^b	4 WAT	2 WAT	4 WAT	2 WAT	4 WAT
	Control (%)					
Roundup	98ns	90a	94ns	60ns	99ns	72ns
Reflex	66ns	61b	49ns	53ns	38ns	45ns
Reflex + Dual	74ns	70b	77ns	63ns	50ns	29ns
Reflex + Enlist	94ns	100a	94ns	97ns	47ns	13ns
Reflex + Enlist + Dual	99ns	98a	94ns	94ns	77ns	72ns
Axxe	76ns	64b	70ns	50ns	71ns	66ns
Homeplate	44ns	63b	83ns	61ns	59ns	38ns
Axxe + Homeplate	43ns	64b	75ns	65ns	55ns	55ns

a. Means followed by the same letter are not significantly different according to Fisher's LSD ($\alpha=0.05$)
b. Abbreviation: WAT, weeks after treatment

Results and Discussion

- Treatments that contained Reflex + Enlist were comparable to Roundup in controlling broadleaf weeds and were consistently better than other herbicide treatments (Tables 1, 2)
- Applications of OMRI herbicides Axxe and Homeplate did not provide satisfactory control compared to conventional herbicides.
- Without an effective POST grass herbicide, a second application of Dual Magnum was needed to provide additional grass suppression (Figure 1).
- These results show Reflex + Enlist to be an effective combination for controlling lambsquarters and morning-glory species, but additional research is needed to determine the effectiveness of this mixture on other broadleaf weeds.