

Interactions of Foliar Applied Herbicides with Residual Herbicides and Fungicides

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Introduction

- Adequate weed control in peanut requires control of emerged weeds and residual weed control by herbicides(Leon et al., 2019)
- Herbicides that control emerged weeds and herbicides that provide residual weed control are often co-applied (Leon et al., 2019)
- Information on residual weed control when paraquat plus bentazon is applied with pyraoxosulfone plus carfentrazone (Anthem Flex) or pyraoxosulfone (Zidua) is limited compared with control by residual herbicides commonly used in peanut
- Determining the most effective residual herbicide to apply with paraquat plus bentazon is important in developing weed control recommendations in peanut

Introduction

- The effect of residual herbicides or more recently registered fungicides on grass control by clethodim has not been determined in peanut
- Timing of application of fungicides to control leaf spot and stem rot disease and clethodim to control emerged grasses often coincides (Jordan et al., 2020)
- Adepydin (Miravis) applied with either azoxystrobin plus benzovindiflupyr (Elatus) or flutolanil (Convoy) is a relatively new fungicide treatment that provides control of leaf spot and stem rot for approximately 4 weeks
- Defining compatibility of pesticides in terms of pest control and crop injury is important in developing pest management strategies for peanut production in North Carolina

Objective 1 - Paraquat plus bentazon applied with residual herbicides

To determine effectiveness of pyroxasulfone plus carfentrazone in controlling weeds in peanut compared with S-metolachlor, dimethenamid-*P*, acetochlor, and pyroxasulfone when these herbicides were applied with paraquat plus bentazon

Objective 2 – Clethodim applied with residual herbicides

- To determine effectiveness of clethodim applied alone or with pyroxasulfone plus carfentrazone in controlling annual grasses weeds in peanut compared with S-metolachlor, dimethenamid-*P*, acetochlor, and pyroxasulfone

Objective 3 – Clethodim applied with adepydin alone or with fungicides used for stem rot control

To determine effectiveness of clethodim applied alone or with adepydin, adepydin plus azoxystrobin plus benzovindiflupyr, or adepydin plus flutolanil

Pesticide active ingredients, tradenames, and product rates

Pesticide	Active ingredient	Tradename	Product rate
Herbicide	Paraquat	Gramoxone SL	8 oz/A
Herbicide	Bentazon	Basagran	8 oz/A
Herbicide	S-metolachlor	Dual Magnum	16 oz/A
Herbicide	Dimethenamid- <i>P</i>	Outlook	13 oz/A
Herbicide	Acetaclor	Warrant	48 oz/A
Herbicide	Pyroxasulfome	Zidua	2.5 oz/A
Herbicide	Pyroxasulfone plus Carfentrazone	Anthem Flex	2.7 oz/A
Herbicide	Clethodim	Clethodim	16 oz/A
Fungicide	Adepadyne	Miravis	3.4 oz/A
Fungicide	Azoxystrobin plus Benzovindiflupyr	Elatus	9.4 oz/A
Fungicide	Flutolanil	Convoy	32 oz/A

Material and Methods

Objective 1 - Paraquat plus bentazon applied with residual herbicides

Experimental Design:

- Randomized Complete Block Design
- 4 replications
- Peanut Belt Research Station, Lewiston-Woodville, NC
- 2020

Materials and Methods

- **Objective 1 - Paraquat plus bentazon applied with residual herbicides**
- Variety: Bailey
- No residual herbicides at planting
- 15 GPA, 31 psi
- 11002 Flat Fan Nozzles
- **Weeds 3 inches or less**

Treatments

1. Untreated Check,
2. Gramoxone SL plus Basagran,
3. Gramoxone SL plus Basagran plus Dual Magnum,
4. Gramoxone SL plus Basagran plus Warrant,
5. Gramoxone SL plus Basagran plus Outlook,
6. Gramoxone SL plus Basagran plus Zidua,
7. Gramoxone SL plus Basagran plus Anthem Flex.

nonioninc surfactant at 1 pint/100 gallons spray solution was applied with all mixtures of paraquat plus bentazon

Data Collected

Peanut Injury

- 1 week after treatment
- 3 weeks after treatment

Weed Control Rating

- 3 weeks after treatment
- 6 weeks after treatment

Peanut yield

Peanut response and weed control with Gramoxone plus Basagran plus nonionic surfactant alone or with residual herbicides

Residual	Rate	1 WAT	3 WAT				
	oz/a	Peanut	RW	LQ	TP	ELMG	Eclipta
Control	-	0 c	0 d	0 d	0 c	0 c	0 c
None	-	28 ab	80 b	76 c	89 b	85 a	84 b
Dual Magnum	16	33 ab	87 ab	85 bc	95 a	86 a	93 ab
Warrant	48	24 b	86 ab	93 ab	95 a	86 a	97 a
Outlook	13	34 a	95 a	98 a	97 a	89 a	97 a
Zidua	2.5	28 ab	91 ab	96 ab	97 a	80 a	88 ab
Anthem Flex	2.7	31 ab	94 a	93 ab	97 a	88 a	97 a

**Peanut response and weed control with Gramoxone plus Basagran
plus nonionic surfactant alone or with residual herbicides**

Residual	Rate	3 WAT	6 WAT				
	oz/a	Peanut	RW	LQ	TP	ELMG	Eclipta
Control	-	0	0 b	0 c	0 d	0 b	0 c
None	-	0	75 a	78 b	80 c	85 a	84 b
Dual Magnum	16	0	76 a	88 ab	90 abc	80 a	90 ab
Warrant	48	0	83 a	85 b	81 bc	81 a	91 ab
Outlook	13	0	86 a	97 a	88 abc	88 a	95 ab
Zidua	2.5	0	79 a	97 a	91 a	85 a	90 ab
Anthem Flex	2.7	0	83 a	97 a	93 a	99 a	97 a

Results

- Peanut injury was greater when residual herbicides were applied with contact herbicides compared with contact herbicides alone but did not differ among residual herbicides 1 week after treatment (WAT) and no injury was observed 3 WAT.
- Relatively minor differences in common ragweed, common lambsquarters, eclipta, entireleaf morningglory, and Texas panicum control was observed 3 and 6 WAT.
- In some instances, weed control was greater when residual herbicides were applied with Gramoxone plus Basagran compared with control by contact herbicides applied alone.
- These results suggest that residual herbicides applied with Gramoxone plus Basagran in most cases will provide similar weed control and crop injury.
- Peanut yield was similar following all treatment (including Gramoxone plus Basagran alone) and greater than non-treated peanut.