

Performance of Herbicides for Pumpkins, Plateau Experiment Station, 2001

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Interpretative Summary

Halosulfuron (Sempra) pre-emergence + clethodim (Select 2EC) post-emergence caused too much crop injury for use on pumpkins. Halosulfuron (Sempra) + ethalfluralin pre-emergence (Curbit 3EC) controlled grasses and broadleaf weeds well, while only showing little crop injury, Clamazone (Command 4EC) was weak for broad leaf control.

Introduction

Pumpkins are grown in large commercial acreage for the Halloween market in Tennessee. An estimated 3500 acres of pumpkins are produced in Tennessee, with over half on the Cumberland Plateau. Pumpkins have been a profitable crop in recent years, and acreage grown seems to expand each year. Weed control with hand labor is expensive, and labeled chemicals are not completely effective, especially for broadleaf weeds and nutsedge. Several new chemicals have been screened in trials, and show potential for use on pumpkins. An experiment was conducted at the Plateau Experiment Station at Crossville, TN in 2001 to evaluate performance of 6 herbicide treatments on pumpkins.

Materials and Methods

The site was prepared for planting using conventional tillage in mid-May. Fertilizer was broadcast at 400 lb/A of 15-15-15 before final disking on May 31. Plots were direct seeded with 'Magic Lantern' on June 1. Plot size was 12 by 20 ft. One row, 20 ft long with 5 hills (3 seeds/hill) spaced 4 ft apart in the row was seeded down the middle of each plot. Experimental plot design was a randomized complete block with four replications. Each 12 by 20 ft plot was treated with the selected herbicide treatment. Incorporated treatments were applied on May 31. Preemergence treatments were applied on June 4. Post emergence treatments were applied on June 29. Herbicide treatments were applied in 227 gal of solution/A using a shielded backpack sprayer with a 3 ft boom equipped with 8004 flat fan nozzles. Compressed air was the pressure source and application pressure was 40 psi. Weed control treatments, source of herbicides, and herbicide lot numbers are presented in Table 1.

Insect control was by carbaryl (Sevin 4XLR) at 1 qt./A on a 7 to 10 day frequency. Fungicides applied with the Asana were azoxystrobin (Quadris) at 0.25 lb ai/A alternated with a combination of chlorothalonil (Bravo) at 2.0 lb ai/A and myclobutanil (Nova) at 0.125 lb ai/A. Crop injury and weed control ratings by percentage were made on July 3 and August 16. All data were analyzed by analysis of variance methods, and means were separated by Duncan's multiple range tests at the 0.05 level.

Results and Discussion

The plot had been planted in pumpkins several times in recent years, but was in an annual rotation with other crops. The last pumpkin crop was grown in 2000. Prefar and Command had been used on the pumpkin crops, and redroot pigweed was one of the major weeds in the plot area. Prefar and Command do not control redroot pigweed well.

Evaluations on July 3 found that no significant differences could be found with grass control (Table 3). Halosulfuron + ethalfluralin pre-emergence (Tmt. 04) and clamazone ppi + ethalfluralin post-emergence (tmt. 02) had the greatest amount of control of broad leaf species. Evaluations on August 16 found that clamazone ppi (Tmt 01), clamazone ppi + ethalfluralin post-emergence (Tmt. 02), and halosulfuron + ethalfluralin pre-emergence (Tmt 04), were among the highest rates of control for grass. Halosulfuron + ethalfluralin pre-emergence (Tmt. 04) had the highest rate of control for broad leaf species.

Halosulfuron pre-emergence + clethodim post-emergence (Tmt. 06) was rated as causing 42% crop injury (Table 2). Halosulfuron pre-emergence + sethoxydim post-emergence (Tmt. 05) was rated at causing 10% crop injury while clamazone ppi + ethalfluralin post-emergence (Tmt. 02) crop injury was rated at a5%, and halosulfuron + ethalfluralin pre-emergence (Tmt 04) was rated at a 3% crop injury. The majority of the injury was burn, and stunting of the plants. Other herbicide treatments did not injure the pumpkin plants.

No harvest was taken due to a pollination failure in all treatments.

Table 1. Weed control treatments, source of herbicides, and herbicide lot number for pumpkin herbicide trials at The University of Tennessee Plateau Experiment Station at Crossville, 2001.

Tmt No	Herbicide- chemical name - followed by trade name	Rate - lb ai/A and time of application	Source	Lot number
01	clamazone-Command 4EC	0.375 pre plant	FMC	PL01-0:
02	clamazone - Command 4EC + ethalfluralin - Curbit 3EC	0.375 pre plant 1.12 pre emergence	FMC Platte	PL01-0: TO8P9:
03	halosulfuron - Sempra 75% DF	0.024 pre emergence	Gowan	GWN 3

04	halosulfuron-Sempra 75%DF + ethalfluralin - Curbit 3EC	0.024 pre emergence 1.12 pre emergence	Gowan Plaatte	GWN-3060 T08P99
05	halosulfuron-Sempra 75%DF +sethoxydim-Poast 1.5E	0.024 pre emergence 0.2 post emergence	Gowan BASF	GWN 3060
06	halosulfuron-Sempra 75%DF + clethodim-Select 3EC	0.024 pre emergence 0.1 post emergence	Gowan Valent	GWN-30060 1034007007C-H
07	untreated check			

Table 2. Effect of herbicides on crop injury of pumpkin plants on July 3 and August 16 at The University of Tennessee Plateau Experiment Station at Crossville, 2001.

Tmt No.	Herbicide - chemical name	Crop injury - % on July 3	Crop injury - % on August 16
01	clamazone	0 b	0 d
02	clamazone +ethalfluralin	5 b	5 c
03	halosulfuron	0 b	0 d
04	halosulfuron - + ethalfluralin	3 b	3 c
05	halosulfuron - + sethoxydim	3 b	10 b
06	halosulfuron - + clethodim	20 a	42 a
07	untreated check	0 b	0 d

Table 3. Effect of herbicide treatments on weed control on July 3 and August 16 in pumpkin herbicide trials at The University of Tennessee Plateau Experiment Station at Crossville, 2001.

Herbicide - chemical name	Grass control -	Broad leaf	Grass control -	Broad leaf control -% Aug

Tmt No		% July 33	control -% July 3	% Aug 16	16
01	clamazone	98 a	53 d	93 a	21 d
02	clamazone +ethalfluralin	100 a	90 a	93 a	63 b
03	halosulfuron	98 a	73 c	83 b	43 c
04	halosulfuron+ethalfluralin	98 a	100 a	95 a	96 a
05	halosulfuron-sethoxydim	99 a	84 bc	83 b	61 b
06	halosulfuron+clethodim	95 b	83 bc	86 ab	54 b
07	untreated check	0 b	0 c	0 b	0 e

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This research represents one season's data and does not constitute recommendations. After sufficient data is collected over the appropriate number of seasons, final recommendations will be made through research and extension publications.