

Row Middle Herbicides for Florida Strawberry Production

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Summary

A variety of preemergence herbicides were evaluated for use in strawberry row middles before transplant and after overhead irrigation was complete. Chateau, Goal, and Satellite all reduced weed density in row middles when applied alone. Efficacy tended to be higher when herbicides were applied pre-transplant. Care should be taken to avoid herbicide application where run-off occurs when overhead irrigation is used for plant establishment.

Methods

Experiments were conducted during the 2016/2017 and 2017/2018 growing seasons in Hillsborough County, FL. Four sites were selected for the study, three of which were located on commercial farms and the fourth at the Gulf Coast Research and Education Center in Balm, FL (27°N, 82°W). The experimental design was a 5x2 factorial arranged as a randomized complete block with four blocks. Treatments are described in Table 1. Plot size was 100 ft of a single row middle. The first factor was herbicide selection and the products evaluated included Goal, Devrinol, Chateau, Satellite, and an untreated check. The second factor was application timing, with the first occurring prior to strawberry transplant and the second after the overhead irrigation period for strawberry establishment was over. Beds were 26 in wide at the top, 12 in tall and 4 ft centers. Strawberry plants were transplanted into the bed in two rows with a plant spacing of 2 ft. Strawberry plants were irrigated, fertilized and managed for foliar pests according to industry standards for Florida production. Spray volume was

20 gallons per acre at 35 PSI. Aim, Select, and Activator 90 (Loveland Products Inc. PO Box 1286 Greenley CO 80632) were applied to row middles later in the season to control emerging weeds.

Weed counts were conducted on November 15, 2016, November 29, 2016, and December 28, 2016 at site 1. November 15, 2016, November 29, 2016, and January 3, 2017 for site 2. October 20, 2017 and December 1, 2017 for site 3. October 26, 2017, November 21, 2017, and November 29, 2017 for Balm (site 4).

Data were analyzed in SAS using the GLIMMIX procedure. Block was considered a random variable. Means were compared using the least square means statement in SAS, specifying for Tukey's honest significant difference. Model assumptions of normality and constant variance were checked.

Results

Weed species varied considerably between sites, and common species included goosegrass, crabgrass, common purslane, common ragweed, purple nutsedge, and Carolina geranium. For total weed density, there was a significant effect of herbicide treatment ($p=0.0002$) and time of application ($p=0.0027$) but no interaction ($p=0.8078$). Chateau, Goal, and Satellite reduced the number of weeds but none of the treatments provided complete control (Table 2). Applying preemergence products after overhead irrigation was complete increased control in row middles across all weeds (Table 3).

Goosegrass and crabgrass were affected by herbicide selection ($p=0.0035$) and application timing (0.0017), but there was no interaction ($p=0.3025$). Goosegrass and crabgrass were completely controlled by Chateau, Goal, and

Satellite at the first emergence flush (Table 2). Across all herbicide treatments, herbicides control goosegrass and crabgrass better when applied after the overhead irrigation as opposed to prior to transplant (Table 3).

Neither herbicide selection nor application timing affected common ragweed, purple nutsedge, or Carolina geranium densities. These species were patchy and only prevalent enough at one site to

permit statistical analysis. Further research is needed.

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Table 1. Experimental herbicide treatments under evaluation at four locations during the 2016 and 2017 growing seasons.

Herbicide	Timing	Rate oz acre ⁻¹	Application dates			
			Site 1	Site 2	Site 3	Site 4
Untreated	Pre-transplant	0	Sept. 21	Sept. 27	Sept. 28	Oct. 4
Chateau	Pre-transplant	3				
Goal	Pre-transplant	32				
Satellite	Pre-transplant	48				
Devrinol 2XT	Pre-transplant	256				
Chateau	Post-transplant	3	Oct. 20	Nov. 6	Nov. 1	Nov. 1
Goal	Post-transplant	21				
Satellite	Post-transplant	48				
Devrinol 2XT	Post-transplant	256				
UTC	Post-transplant	0				

Table 2. Affect of preemergence herbicide selection on weed density averaged across sites.

Herbicide	All weeds	Goosegrass and crabgrass	Common purslane
	no. m ⁻²	no. m ⁻²	no. m ⁻²
Untreated	11 a	2 a	9 a
Chateau	1 b	0 b	1 ab
Goal	1 b	0 b	0 b
Satellite	2 b	0 b	0 ab
Devrinol 2XT	4 ab	1 ab	8 ab
Number of Sites	4	4	1

Table 3. Affect of preemergence herbicide application timings on weed density averaged across sites.

Application timing	All weeds no. m ⁻²	Goosegrass and crabgrass no. m ⁻²
Prior to transplanting	5 a	1 a
After overhead irrigation	2 b	0 b
Number of sites	4	4