

# Weed Control and Crop Safety of Preemergence Herbicides Applied to Row Middles after Crop Transplant

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## Summary

Crop tolerance to preemergence herbicides applied to row middles after harvest was initiated was proven for all herbicides tested when a shielded applicator was utilized. Please note that if drift occurs, products such as Chateau will burn berries. This project also verified that Cobra, Dual Magnum, Eptam and Fierce are safe for use in row middles in strawberry and efforts to register these products should continue.

## Methods

An experiment was conducted at the Gulf Coast Research and Education Center in Balm, FL, during the 2018-2019 growing season to evaluate crop safety of preemergence row middle herbicides applied after berries are present on the crop. The trial was set up as a randomized complete block design with four blocks. The soil type at the site is a Myakka fine sand (sandy, siliceous, hyperthermic, Aeric, Alaquods) with 1.5% organic matter, pH of 6.5, and sand, silt, clay content of 96, 3, and 1%, respectively.

Bed formation, fumigation and herbicide application occurred on August 20, 2018. Beds were 12 inches high, and 26 inches wide at the peak with 4 foot centers between beds. Beds were fumigated with Telone® C-35 (300 lbs acre<sup>-1</sup>) using a standard fumigation rig equipped with two backward swept shanks set to deliver the fumigant at the base of the bed. A single drip tape was laid on the peak of the bed with a width of 5/8 inch, emitters every 12 inches and a flow rate of 0.22 gallons per hour. Two rows of strawberry (cv Radiance) were transplanted per bed with 15 inch spacing between plants on October 10, 2018. Beds were covered with virtually impermeable

film (Berry Plastics, Evansville IN) immediately following herbicide application. All plots were irrigated and fertilized throughout the growing season as per industry standards.

A variety of herbicides were applied to the row middles on February 4, 2019 (Table 1). Plots were 2.66ft x 50ft. All herbicides were applied in 20 gallons per acre of water with a backpack sprayer (Bellspray Inc., Opelousa, LA) equipped with a single 8002EVS nozzle (Teejet Technologies, Wheaton, IL) at a pressure of 35 PSI.

**Table 1.** Herbicide treatments applied in row middles with a shielded applicator mid-season after berry harvest had begun at GCREC in 2018-2019.

Treatment	Active Ingredient	Application Rate
		--oz/acre--
Nontreated control	-	-
Chateau	flumioxazin	3
Cobra <sup>a</sup>	lactofen	32
Devrinol 2-XT	napropamide	128
Dual Magnum	S-metolachlor	16
Eptam	EPTC	72
Fierce	flumioxazin + pyroxasulfone	3
Goal 2XL	oxyfluorfen	32
Goal 2XL + Devrinol 2-XT	oxyfluorfen + napropamide	32 + 128
Satellite	pendimethalin	48
Spartan FL 4F	sulfentrazone	4
Spartan FL 4F + Satellite	sulfentrazone + pendimethalin	6 + 48

<sup>a</sup>Herbicides highlighted in blue are not currently registered for use in strawberry.

Data Collection included row middle weed counts using 2, 24cm x 28cm quadrats on January 4 and February 8, 2019. Strawberry yield was collected bi-weekly throughout the season and berry damage after herbicide application was recorded.

## Results

### Berry Yield

None of the herbicide treatments affected berry yield nor was there any consistent herbicide damage observed on the berries. This is not surprising as a shielded applicator was used and herbicides were only applied to the row middle. However, it is important to note that herbicides such as Spartan and Chateau will burn berries if any herbicide drift occurs.

### Weed Counts

Weed density was very low, patchy, and results were inconsistent (Table 2). As a result, we cannot draw any firm conclusions from the weed data. However, we can conclude that Cobra, Dual Magnum, Eptam, and Fierce are safe for use on row middles in strawberries and efforts should continue to obtain registration. These herbicides are desirable because Cobra has pre- and post-emergence activity on ragweed parthenium which is an emerging issue, Dual Magnum is very effective on a many broadleaf weed species, Eptam is highly effective on broadleaf weeds and purple nutsedge, and Fierce is the same active ingredient as Chateau but also has pyroxasulfone which makes it more effective on grass weeds. Additional research is needed to verify crop safety and weed control spectrum.

**Table 2.** Total weed density in row middles following preemergence herbicide applications averaged across multiple counting dates at GCREC in 2019.

Trade Name	Active Ingredient	Weed Density
Nontreated control	-	--#/ft <sup>2</sup> -- 1.6 bcd
Chateau	flumioxazin	2.7 a
Cobra <sup>a</sup>	lactofen	1.6 a-d
Devrinol 2-XT	napropamide	2.7 a
Dual Magnum	S-metolachlor	2.5 ab
Eptam	EPTC	0.9 d
Fierce	flumioxazin pyroxasulfone	+ 1.8 a-d
Goal 2XL	oxyfluorfen	1.9 a-d
Goal 2XL +	oxyfluorfen	+ 1.3 dc
Devrinol 2-XT	napropamide	
Satellite	pendimethalin	2.1 abc
Spartan FL 4F	sulfentrazone	2.0 abc
Spartan FL 4F +	sulfentrazone	+ 2.0 abc
Satellite	pendimethalin	

<sup>a</sup>Herbicides highlighted in blue are not currently registered for use in strawberry.

<sup>b</sup>Means followed by the same letter are not significantly different at p<0.05.

## Disclaimer

The use of trade names in this publication is solely for the purpose of providing specific information. UF/IFAS does not guarantee or warranty the products named, and reference to them in this publication does not signify our approval to the exclusion of other products of suitable composition.

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