

**TITLE:** Evaluation of Herbicides for Yellow and Purple Nutsedge (*Cyperus esculentus* and *C. rotundus*) in Blackberry Fields.

## **PROGRESS REPORT**

**SRSFC 2007-15**

## **RESEARCH PROPOSAL**

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**OBJECTIVE / JUSTIFICATION:** There approximately 800 acres of blackberries (*Rubus* spp.) grown in the state of Georgia, and planted acreage in the Southeast continues to rise. As with many of the other small fruit growers, the weeds from the sedge family (Cyperaceae) continue to plague growers. Many blackberry growers throughout Georgia (and the Southeast) have experienced heavy infestations of yellow and purple nutsedge (*Cyperus esculentus* and *C. rotundus*). At present, there are no herbicides are labeled for postemergent nutsedge and annual sedge control in blackberries. There are, however, several postemergent herbicides that are known to be safe to plants in the blackberry family (Rosaceae) that control sedges (e.g. halosulfuron and sulfentrazone). Although none of these herbicides has been labeled for use in blackberries, many could possible be registered for use on non-bearing and bearing blackberry plants.

**PROCEDURE / METHODOLOGIES:** Two blackberry experiments were conducted. Experiment #1 was a preemergent study, and experiment #2 was a postemergent study. Treatments in both experiments were identical and included sulfentrazone (Spartan) at 6.0 and 12.0 ounces of product per acre (oz pr/A), and halosulfuron (Sanda) at 0.5 and 1.0 oz pr/A (Table #1). Both experiments were conducted in Lakeland, GA at the farm of Mr. Ben Strickland. Experiment #1 was conducted on the Owatchata blackberry (*Rubus* x 'Owatchata') and was initiated on April 3, 2007. Experiment #2 were also conducted on Owatchata blackberry and was initiated on May 7, 2007. Both experiments contained 4 replication and were designed as a randomized complete block. Herbicides were applied with a CO<sub>2</sub> backpack sprayer calibrated to deliver 20 gallons per acre. All treatments in experiment 2 contained the adjuvant Kinetic® at 0.25% volume to volume. A list of treatments is represented in table 1.

Ratings for nutsedge (*Cyperus esculentus* and *C. rotundus*) control and blackberry injury were taken on the pre study at 2, 4, 8, and 12 weeks after treatment (WAT), and 3, 4, and 8 WAT on the post study. Blackberry injury and nutsedge control was taken on a (0-100 scale) and numbers are represented in table 2.

**Table #1.** Treatment list for both pre- and postemergent experiments.

Treatment #	Treatment	Formulation	Formulation Rate
1	Sandea	75 DF	1.0 oz/A
2	Sandea	75 DF	2.0 oz/A
3	Sandea	75 DF	4.0 oz/A
4	Spartan	4 L	6.0 oz/A
5	Spartan	4 L	12.0 oz/A
6	Control		

**RESULTS AND CONCLUSION:**

**Experiment #1 (Table #3):** Control of yellow and purple nutsedge was significantly better with both treatments of halosulfuron and sulfentrazone during all rating periods. By 12 WAT, control with all treatments was  $\geq 97\%$ . Injury to blackberries was significant, but didn't exceed 18% during the 2, 4, and 8 WAT ratings. No blackberry injury was noted at the 12 WAT rating.

**Experiment #2 (Table #4):** Control of yellow and purple nutsedge was significantly better with both treatments of halosulfuron and sulfentrazone during all rating periods. By 8 WAT, control with all treatments was  $\geq 99\%$ . No significant injury to blackberries was recorded during the duration of the study.

**Table #2.** Blackberry injury and nutsedge control scale.

Value	Plant Symptoms
0	No visual injury present
10-30	Minimal injury to desirable plant. Less than 10% of the plant leaf service area showing chlorosis and necrosis.
40-70	More noticeable plant injury or stunting. Greater than 50% of the leaf area showing symptoms of chlorosis and/or necrosis.

80-90	Plants severally injured. Most of the leaves and leaf surface showing signs of chlorosis and necrosis.
100	Plant appears dead. No signs of regrowth.

**Significance to the industry:** Both Sandea (halosulfuron) and Spartan (sulfentrazone) herbicides provided less than 20% injury to Owatchata blackberry, and provided fair to excellent control of yellow and purple nutsedge during most rating periods. Currently, these herbicides are being evaluated for possible label expansion into several small fruit crops – including blackberries.

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**Table 3. Experiment #1 - Preemergent nutsedge (*Cyperus esculentus* and *C. rotundus*) control and safety to Owatchata blackberries (*Rubus* x 'Owatchata') with Sandea (halosulfuron) and Spartan (sulfentrazone) at 2, 4, 8, and 12 Weeks After Treatment (WAT).<sup>1,2</sup>**

			Blackberry Injury 0-100	Nutsedge Control 0-100	Blackberry Injury 0-100	Nutsedge Control 0-100	Blackberry Injury 0-100	Nutsedge Control 0-100	Blackberry Injury 0-100	Nutsedge Control 0-100
#	Treatment	Rate	2 WAT		4 WAT		8 WAT		12 WAT	
1	Sandea 75DF	0.5 oz pr/A	18 a	60 ab	14 a	80 a	4 ab	98 a	0 a	99 a
2	Sandea 75DF	1.0 oz pr/A	14 ab	41 b	13 a	75 a	1 b	97 a	0 a	98 a
3	Sandea 75 DF	2.0 oz pr/A	15 ab	50 ab	13 a	81 a	5 ab	99 a	3 a	99 a
4	Spartan 4L	6.0 oz pr/A	11 ab	68 ab	10 a	76 a	8 a	98 a	4 a	99 a
5	Spartan 4L	12.0 oz pr/A	9 b	70 a	11 a	80 a	1 b	97 a	0 a	97 a
6	Check		0 c	0 c	0 b	0 b	0b	23 b	0 a	23 b
LSD			6.7	27.1	5.2	10.4	5.3	28.2	3.9	28.2

<sup>1</sup>Means followed by same letter do not significantly differ (P=0.05, LSD).

<sup>2</sup>Data was subjected to analysis of variance, and means were exposed to Fisher's Least Significant Difference Test with p=0.05.

**Table 4. Experiment #2 – Postemergent nutsedge (*Cyperus esculentus* and *C. rotundus*) control and safety to Owatchata blackberries (*Rubus* x ‘Owatchata’) with Sandea (halosulfuron) and Spartan (sulfentrazone) at 2, 4, and 8 Weeks After Treatment (WAT).<sup>1,2</sup>**

			Blackberry Injury 0-100	Nutsedge Control 0-100	Blackberry Injury 0-100	Nutsedge Control 0-100	Blackberry Injury 0-100	Nutsedge Control 0-100
#	Treatment	Rate	3 WAT		4 WAT		8 WAT	
1	Sandea 75DF	0.5 oz pr/A	0 a	99 a	0 a	100 a	0 a	100 a
2	Sandea 75DF	1.0 oz pr/A	4 a	100 a	0 a	99 a	0 a	99 a
3	Sandea 75 DF	2.0 oz pr/A	3 a	100 a	1 a	100 a	1 a	100 a
4	Spartan 4L	6.0 oz pr/A	4 a	98 a	0 a	99 a	0 a	99 a
5	Spartan 4L	12.0 oz pr/A	3 a	100 a	1 a	78 a	1 a	100 a
6	Check		0 a	0 b	0 a	0 b	0 a	0 b
	LSD		3.9	3.2	1.9	27.6	1.9	2.2

<sup>1</sup>Means followed by same letter do not significantly differ (P=0.05, LSD).

<sup>2</sup>Data was subjected to analysis of variance, and means were exposed to Fisher’s Least Significant Difference Test with p=0.05.