Goosegrass Management in Strawberry

Nathan S Boyd, Kshitij Khatri, and Emily Witt

Summary

Goosegrass is the most common weed in strawberry production in the state of Florida. It will significantly reduce berry yields and increase labor associated with field management. Most populations are resistant to paraquat and alternative burndown options are needed for row middles. Dr. Boyd's research team found that flumioxazin, S-metolachlor, oxyfluorfen, and napropamide were the most effective preemergence herbicides for goosegrass control in row middles. Diquat and glufosinate were both effective post-emergence options.

Goosegrass Competition with Strawberry

Goosegrass is a common weed of commercial strawberry farms. It grows in the row middles and in transplant holes. Emergence typically peaks early in during the growing season, but goosegrass can germinate and emerge throughout the year. Goosegrass grows rapidly and if not controlled will overtop strawberry plants by mid December. It is also a prolific seed producer with seed production in Florida strawberry fields ranging from 135,000 to 469,000 seeds per plant. As a result, if seed production is not prevented the goosegrass populations will rapidly increase.

Research at the Gulf Coast Research and Education Center found that berry yield decreased significantl as goosegrass density increased (Figure 1). The effects were more pronounced in February than January or December. However, it is important to note that the earlier that goosegrass emerges, the earlier it competes with the crop and as a result earlyt emerging populations can have a negative effect on early yields as well. The data in figure 1 does not consider that berries can be missed by pickers due to them not seeing the fruit beneath the weeds. Our data also does not consider that goosegrass can be a host for other pests. The overall impact of goosegrass on yield varied with year, season, and weed density; but, our results clearly indicate that goosegrass left growing in transplant holes will significantly reduce berry production.

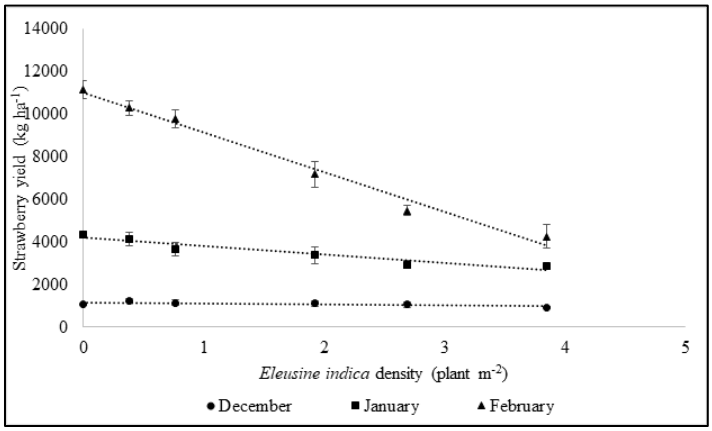

Figure 1. The effects of goosegrass density on strawberry yield in December, January, and February at the GCREC.

Preemergence Herbicides

A variety of preemergence herbicides were tested for efficacy on goosegrass in greenhouse experiments (Table 1). All herbicides were applied to the soil surface to replicate what occurs in row middles. Flumioxazin, S-metolachlor, oxyfluorfen, and napropamide were the most effective at killing emerging goosegrass seedlings. Flumioxazin and S-metolachlor also caused the greatest damage on the seedlings that survived.

Post-Emergence Herbicides

The Weed Science team evaluated glufosinate and disquat as burn-down herbicides for use in

strawberry row middles. **Please note, glufosinate is not currently registered for use in strawberry but Dr. Boyd is conducting the research needed to obtain registration.** At label rates (22 oz/acre) of glufosinate, 99% goosegrass kill was achieved by 14 days after application (DAA) with 79% kill 7 DAA (Table 2). The product was less effective at lower rates and we recommend the current label rate be registered for use in strawberry.

Diquat was slightly less effective 14 DAA than glufosinate at label rates although the difference is not significantly different. The rate of kill was similar between the two products. Overall, we conclude that both herbicides are viable options for goosegrass control.

Takeaways

Goosegrass is highly competitive with strawberry and will significantly reduce berry yields, lower berry quality, hinder the harvest, and increase overall management costs. It is a prolific seed producer and if allowed to produce seed will cause long-term management issues. In fields where goosegrass is a problem, we recommend preemergence applications of flumioxazin or oxyfluorfen beneath the plastic mulch and flumioxazin or S-metolachlor in the row middle. Post-emergence grass herbicides such as clethodim were not evaluated in this study but remain effective options if applied prior to goosegrass flowering. Glufosinate and diquat effectively controlled goosegrass when used as a post-emergence burn-down. If applying the row middle herbicide prior to turning on the overhead irrigation, we recommend the use of flumioxazin.

Table 1. Effect of different pre-emergence herbicides on goose grass growth and development in the greenhouse trial at Gulf Coast Research and Education Center in Wimauma, FL.

Herbicide	Rate	Damage		Motality	
	oz/acre	----------%		----------	
NTC	-	0	e[2]	0	e
Flumioxazin[1]	3	49	bc	95	bc
S-metolachlor	16	96	a	100	a
Oxyfluorfen	8	96	a	100	a
Sulfentrazone	4	46	c	90	d
Napropamide	128	68	b	98	ab
Pendimethalon	24	46	c	94	cd
Flumioxazin + *S*-metolachlor	3 + 16	90	a	100	a

[1]Trade names were as follows; flumioxazin (Chateau), S-metolachlor (Dual Magnum), oxyfluorfen (Goal 2 XL), sulfentrazone (Spartan 4F FL), Napropamide (Devrinol), and Pendimethalin (Prowl).
[2]Means within columns followed by different letters are significantly different.

Table 2. Effect of post-emergence application of glufosinate and diquat on goosegrass growth and development in greenhouse trials at Gulf Coast Research and Education Center in Wimauma, FL.

Herbicide	Rate	Damage							
		2 DAA		7 DAA		14 DAA		28 DAA	
	oz/acre	----------%							
Glufosinate[1]	0	0	f[2]	0	e	0	f	0	
Glufosinate	5	4	de	53	d	66	d	61	
Glufosinate	11	6	cde	54	d	73	cd	79	
Glufosinate	22	5	cde	79	c	99	a	100	
Glufosinate	44	6	cde	83	abc	100	a	99	
Diquat	0	0	f	0	e	0	f	0	
Diquat	8	4	e	41	d	49	e	53	
Diquat	16	6	bcd	74	c	85	bc	84	
Diquat	32	6	bcd	82	bc	93	ab	92	
Diquat	64	8	ab	96	ab	99	a	99	

[1]Trade names were as follows; glufosinate (Rely) and diquat (Reglone).
[2]Means within columns followed by different letters are significantly different.

Contact

Dr. Nathan S Boyd
UF/IFAS Gulf Coast Research and Education Center
P: 813-419-6613
E: nsboyd@ufl.edu