

Developing Postemergence Weed Control Strategies for Nonturf Groundcovers in Florida

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ABSTRACT

Ten postemergence herbicides were evaluated for use on Asiatic jasmine ‘Minima’ and Perennial Peanut ‘Golden Glory’. Herbicides including Lontrel (clopyralid), Sceptor T/O (imazaquin), Fusilade II (fluazifop-P-butyl), Basagran T/O (bentazon), Certainty (sulfosulfuron), Dismiss (sulfentrazone), Finale (glufosinate), Ranger Pro (glyphosate), SedgeHammer (halosulfuron), and Segment (sethoxydim) were all generally applied

at 2× their maximum labeled rate to newly planted liners. After two applications, Fusilade II, Segment, Dismiss, and SedgeHammer caused no significant injury on either groundcover species. Basagran T/O also caused no significant injury on Perennial peanut and Sceptor T/O no noticeable injury on asiatic jasmine. Ranger Pro, Finale, Lontrel, and Certainty caused unacceptable injury on both species.

OBJECTIVES AND METHODS

Turfgrass is the most widely planted irrigated crop in the United States and occupies the vast majority of most residential and commercial landscapes in Florida. However, the common mantra of landscape design is “right plant right place”. In many neighborhoods, parks, and other areas containing significant tree canopy, turfgrass is not suitable due to limited sunlight. Additionally, many homeowners may opt for more low maintenance groundcovers if they do not want to install irrigation, mow, or make regular fertilizer applications. Topography, drainage, soil health, and other factors may also make it difficult for some to have healthy and sustainable lawns in all or part of their landscape. While these groundcovers offer many advantages over turfgrass in certain scenarios, the biggest disadvantage is that there are few labeled options for weed control in non-turf groundcovers. Over the past two years, we have been working to develop preemergence and postemergence control options for non-turf groundcovers in landscapes. Funds from FNGLA allowed us to first test postemergence herbicides to try to find safe, effective options for landscape professionals trying to manage weeds in these groundcovers. The objective of this research is to evaluate the safety of common postemergence herbicides for use in groundcovers including Asiatic jasmine ‘Minima’ (*Trachelospermum asiaticum* ‘Minima’) and perennial peanut (*Arachis glabrata* ‘Golden Glory’).

Methods

All experiments were conducted at the Mid-Florida Research and Education Center in Apopka, FL in 2019. Asiatic jasmine and perennial peanut liners (2 inch) were obtained from a local nursery and potted into 3 L nursery containers on April 5 using an pinebark:peat:sand (80:20:10 v:v:v) substrate with incorporated fertilizer and amendmments. Pots were placed on a nursery container pad in full sun and received 0.5 inches of overhead irrigation daily. On April 12, herbicides (**Table 1**) were applied using a CO₂ backpack sprayer calibrated to deliver 50 gallons per acre application volume. Herbicides were generally applied at twice the highest manufacturer labeled rate to determine tolerance in a worst-case scenario. Approximately six weeks later on May 20, a second application was applied following the same experimental procedures.

A second experimental run was conducted following the same protocol with the first treatment being applied on May 20 and the second application applied on July 1.

The trial was a completely randomized design with 8 single pot replications per treatment for both species. Data collected including injury ratings at 2, 4, and 6 weeks after the first herbicide treatment (WAT) and at 2, 4, and 8 weeks after the second herbicide treatment. Injury ratings were taken on a 0 to 10 scale with 0 indicating no injury or similar to non-treated controls, and 10 indicating complete death and no visible green tissues. Ratings of 3.0 or higher were considered commercially unacceptable. At 8 weeks after the second application, shoots were collected for dry weight determination by clipping shoots and the soil line and drying shoots in a forced air oven until reaching constant weight. Data were subjected to analysis of variance using JMP (SAS Institute) and differences between treatment means were determined using Fisher’s Protected LSD (0.05).

RESULTS

Asiatic jasmine. Finale (glufosinate) caused the highest injury ratings at 2 WAT followed by Lontrel (clopyralid), while some minor injury was noted with Sceptor T/O (imazaquin), Basagran T/O (bentazon), and Dismiss (sulfentrazone) (**Table 1**). Only Finale treated plants were considered unacceptable. Similar results were observed at 4 WAT, with some recovery noted in the Finale treatment. At 6 WAT, injury ratings increased in many treatments and unacceptable injury was noted in plants treated with Lontrel, Basagran T/O, Finale, Ranger Pro (glyphosate), and also Certainty (sulfosulfuron). It is important to note that Certainty is labeled for use on Asiatic jasmine but only on established plants in the landscape.

Following the second application at 2 WAT2, Lontrel, Basagran T/O, Certainty, Finale, and Ranger Pro all resulted in unacceptable injury. This trend continued at 4 and 8 WAT with the highest injury being observed in plants treated with Basagran T/O (ratings of 7.8) followed by plants treated with Lontrel and Finale (ratings of 5.3 and 5.1, respectively). Unacceptable injury was also noted with Certainty and Ranger Pro. Throughout all evaluations, only minor injury was observed with Sceptor T/O and Dismiss. While some minor injury was noted in some cases, plants were considered marketable/ acceptable throughout the trial. Segment, SedgeHammer, and Fusilade II also caused no noticeable injury on any evaluation date (injury ratings of 0 throughout the trial).

Dry weight (biomass) data showed that all treatments with the exception of Segment, Fusilade II, and Sceptor T/O caused some growth reduction. Growth reduction was most evident in plants treated with Basagran T/O, Finale, and Ranger Pro. While SedgeHammer caused no injury or visible growth reduction, dry weight data indicated that plants were stunted in comparison with non-treated plants. Similar to SedgeHammer, only minor injury was noted in plants treated with Dismiss, but some minor growth differences were observed.

Perennial Peanut. At 2 WAT, unacceptable injury was noted in plants treated with Lontrel (4.1), Certainty (3.5), Finale (7.8) and Ranger Pro (7.3) (**Table 2**). Minor injury with mean ratings below 3.0 was observed in all other treatments. At both 4 and 6 WAT, unacceptable injury was noted again in plants treated with Lontrel (10.0), Certainty (9.6), Finale (9.5) and Ranger Pro (10.0). Sceptor T/O also caused unacceptable injury at 6 WAT (4.1).

Following the second application, all plants treated with Lontrel, Certainty, Finale, or Ranger Pro had injury ratings of 9.9 to 10.0 on all evaluation dates, indicating complete plant death. Sceptor T/O did not result in plant death but plant foliage was severely distorted and stunted, typical of an ALS inhibiting herbicide. At 8 weeks after the second application, no noticeable injury was observed in plants treated with Fusilade II, Basagran, Dismiss, SedgeHammer, or Segment.

Dry weight data showed that all treatments with the exception of Segment and Basagran T/O caused some stunting.

While dry weight data showed that Fusilade II Sedgehammer resulted in minor stunting, reducing growth by 9.6% and 21.7%, respectively, no stunting could be observed by visually inspecting plants and all plants in these treatments remained aesthetically acceptable throughout the trial.

CONCLUSIONS

A summary of trial results are included in **Table 2** and examples of plant injury at 8 weeks after the second application are included in **Figures 1 and 2**. Graminicides including Fusilade II and Segment were found to be safe on both species with no reductions in plant growth and no noticeable injury. These herbicides could be used to control a broad range of annual and perennial grasses in these groundcovers.

Sceptor T/O is currently a labeled option for use in Asiatic jasmine beds. We observed no significant injury or growth reduction on Asiatic jasmine following two applications at twice the labeled rate to young, newly planted liners. This herbicide would be a good option in jasmine beds to control some sedges and certain broadleaf weed species. Sceptor T/O caused unacceptable injury on perennial peanut and would not be recommended. While Basagran T/O caused unacceptable injury on Asiatic jasmine, only minor injury and full recovery was observed in perennial peanut. Similar to Sceptor use in jasmine, Basagran could be used in perennial peanut for sedge control and to control certain broadleaf weed species.

Certainty would likely be a safe option for mature and fully established jasmine beds, but we observed injury following two application at twice the labeled rate. Further, unacceptable injury was noted after only one application. We would advise applicators to use caution with this product in jasmine and to only spot-spray weeds, avoiding broadcast applications. Dismiss (sulfentrazone) is not currently labeled for use in either groundcover but we found only minor injury following two applications. This could potentially be a future option for sedge control in these beds. Dismiss would also provide control of certain broadleaf species. Similarly, SedgeHammer caused no noticeable injury to either groundcover. It could be used in a similar manner as Dismiss for sedge and control of certain broadleaf species. Lontrel caused unacceptable injury to both species. As expected, Ranger Pro and Finale also caused unacceptable injury.

Based on results from this trial, Sceptor T/O, Fusilade II, and Segment would be safe for use in Asiatic jasmine and are currently labeled options in Asiatic jasmine in landscape beds. In addition to these three products, we found a high degree of Asiatic jasmine tolerance to Dismiss and SedgeHammer. Similarly, perennial peanut showed a high degree of tolerance to Segment, Fusilade II, Basagran, Dismiss, and SedgeHammer.

For products in which safety was noted but the herbicide does not list Asiatic jasmine or perennial peanut on product labels, applicators should note that they would assume all liability if injury occurred in a landscape setting. All trials were conducted in Florida during the summer months under a worst-case scenario setting, but injury could still be observed in some instances under different environmental conditions or if plants were stressed due to abiotic or biotic factors. We will continue to assess tolerance of these groundcovers to both preemergence and postemergence herbicides with the goal of adding these species to herbicide labels in the future.

Table 1. Tolerance of Asiatic jasmine 'Minima' and Perennial Peanut 'Golden Glory' to sequential applications of selected postemergence herbicides in Florida in 2019.

Herbicide (active ingredient)	Rate ^d	First application ^a			Second application ^b			Dry Weight (g) ^f
		2 WAT ^c	4 WAT	6WAT	2 WAT	4 WAT	8 WAT	
		Asiatic jasmine injury ratings (0 to 10) ^e						
Lontrel (clopyralid)	2.7 pts.	2.0 b ^g	2.4 b	3.4 bc	3.5 b	5.4 ab	5.3 b	10.6 def
Sceptor T/O (imazaquin)	22.6 fl. oz.	0.4 c	0.4 c	0.5 d	0.4 c	0.0 d	0.0 d	13.1 abc
Fusilade II (fluazifop-P-butyl)	48 fl. oz.	0.0 c	0.3 c	0.0 d	0.0 c	0.0 d	0.0 d	14.0 ab
Basagran T/O (bentazon)	64 fl. oz.	1.1 bc	2.1 b	4.0 ab	6.0 a	6.0 a	7.8 a	8.6 g
Certainty (sulfosulfuron)	4 oz.	0.0 c	2.6 b	4.6 a	3.6 b	3.3 c	3.8 bc	10.0 efg
Dismiss (sulfentrazone)	24 fl. oz.	1.1 bc	0.5 c	0.0 d	0.4 c	0.6 d	0.0 d	12.4 bcd
Finale (glufosinate)	8 qts.	4.3 a	3.5 a	3.4 bc	4.5 b	5.1 abc	5.1 b	8.2 g
Ranger Pro (glyphosate)	6 qts.	0.0 c	2.3 b	2.9 c	3.3 b	3.6 bc	3.4 c	9.7 fg
SedgeHammer (halosulfuron)	2.7 oz.	0.0 c	0.3 c	0.0 d	0.0 c	0.0 d	0.0 d	11.9 cde
Segment (sethoxydim)	7.5 pts.	0.0 c	0.0 c	0.0 d	0.0 c	0.0 d	0.0 d	14.8 a
Control	NA	0.0 c	0.0 c	0.0 d	0.0 c	0.0 d	0.0 d	15.1 a
Perennial Peanut injury ratings (0 to 10)								
Lontrel (clopyralid)	2.7 pts.	4.1 b	5.6 b	10.0 a	10.0 a	10.0 a	10.0 a	0.0 e
Sceptor T/O (imazaquin)	22.6 fl. oz.	0.3 e	2.6 c	4.1 b	4.1 b	4.9 b	5.6 b	28.2 d
Fusilade II (fluazifop-P-butyl)	48 fl. oz.	1.0 de	0.4 d	0.0 c	1.4 c	1.5 c	0.0 c	39.6 b
Basagran T/O (bentazon)	64 fl. oz.	1.3 de	0.8 d	0.0 c	0.0 d	0.0 d	0.0 c	40.3 ab
Certainty (sulfosulfuron)	4 oz.	3.5 bc	6.1 b	9.6 a	9.9 a	10.0 a	10.0 a	0.0 e
Dismiss (sulfentrazone)	24 fl. oz.	2.6 bcd	0.9 d	0.1 c	0.1 d	0.0 d	0.0 c	39.5 b
Finale (glufosinate)	8 qts.	7.8 a	9.8 a	9.5 a	10.0 a	10.0 a	10.0 a	0.0 e
Ranger Pro (glyphosate)	6 qts.	7.3 a	9.9 a	10.0 a	10.0 a	10.0 a	10.0 a	0.0 e
SedgeHammer (halosulfuron)	2.7 oz.	1.6 cde	0.5 d	0.0 c	0.0 d	0.0 d	0.0 c	34.3 c
Segment (sethoxydim)	7.5 pts.	0.1 e	0.1 d	0.0 c	0.0 d	0.0 d	0.0 c	41.8 ab
Control	NA	0.0 e	0.0 d	0.0 c	0.0 d	0.0 d	0.0 c	43.8 a
^a The first application was applied on 11 Apr. and 20 May for experimental runs 1 and 2 respectively.								
^b The second application was applied on 20 May and 1 June for experimental runs 1 and 2, respectively.								
^c WAT = weeks after treatment.								
^d Rate is expressed in amount of formulated product applied on a per acre basis. Surfactants were added to Lontrel, Sceptor, Fusilade II, Basagran, Certainty, and Segment based on manufacturer recommendations. All rates are approximately 2 × the maximum labeled rate.								
^e Injury ratings were taken on a 0 to 10 scale, 0 = no injury, 10 = dead plant and no visible living tissue.								
^f Shows shoot dry weights collected at 8 weeks after the second application.								
^g Means within a column and species followed by the same letter are not significantly different according to Fisher's Protected LSD (0.05).								

Table 2. Results summary for herbicide tolerance of Asiatic jasmine and perennial peanut to selected postemergence herbicides.

Herbicide	Asiatic jasmine	Perennial peanut
Lontrel	Unacceptable injury after one application, severe injury after two applications.	Severe injury/death after one application.
Sceptor T/O	Very minor injury after two applications. Labeled option for established jasmine in the landscape.	Unacceptable injury after one application. Leaf distortion and stunting was observed.
Fusilade II	No injury after two applications. Labeled option for jasmine.	Only minor injury after two applications, complete recovery observed. Minor growth reduction.
Basagran T/O	Unacceptable injury after one application, severe injury after two applications.	Only minor injury and full recovery observed. No growth reduction.
Certainty	Unacceptable injury observed. Labeled option for established plants in the landscape.	Severe injury/death after one application.
Dismiss	Only minor injury and stunting after two applications. Complete recovery observed.	Only minor injury and stunting after two applications. Complete recovery observed.
Finale	Unacceptable/severe injury after two applications.	Unacceptable/severe injury after one application.
Ranger Pro	Unacceptable injury after two applications and significant stunting observed.	Unacceptable/severe injury after one application.
SedgeHammer	No injury observed observed. Some stunting was evident from dry wt. data but not noticed visually.	No injury observed observed. Some stunting was evident from dry wt. data but not noticed visually.
Segment	No injury or growth reduction observed.	No injury or growth reduction observed.

***Red cells show where unacceptable injury was observed and applications would not be recommended. Green cells show where only minor injury or growth reductions were observed. Yellow cells indicate more research is likely needed due to differences between trial results and product label instructions. These differences are likely due to the fact that trials were performed in containers using young plant liners and were not conducted on mature landscape plants as instructed on product labels. For safety, applicators should avoid making applications to newly planted areas.



Figure 1. Asiatic jasmine injury at 8 weeks after the second application. A = Lontrel, B = Sceptor T/O, C = Fusilade II, D = Basagran T/O, E= Certainty, F = Dismiss, G = Finale, H = Ranger Pro, I = SedgeHammer, J = Segment, K = handweeded Check.



Figure 2. Perennial peanut injury at 8 weeks after the second application. A = Lontrel, B = Sceptor T/O, C = Fusilade II, D = Basagran T/O, E= Certainty, F = Dismiss, G = Finale, H = Ranger Pro, I = SedgeHammer, J = Segment, K = handweeded Check.