



Glyphosate Resistant Pigweed Mid-summer Control Trials and Results in Two Old-field Longleaf Planted Sites in Bulloch County, Georgia

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Introduction, objectives, and study description

A number of forest landowners and foresters in Georgia have seen moderate to large populations of glyphosate resistant pigweed (*Amaranthus palmeri*) encroaching into newly planted longleaf old-field sites. The objectives of this study were: (1) to determine if imazapyr @ 4 oz/ac using the 4 lb acid equivalent (ae) per gallon product in a banded application would control 1 ½ feet to 6 feet tall glyphosate resistant pigweed and (2) if the imazapyr treatment would improve longleaf survival over untreated rows of seedlings at the two sites. We installed two trials in Bulloch County, Georgia to test Imazapyr (4 lb ae/gal product as Polaris AC) applied over the top of first year planted longleaf when the pigweed was from 1 ½ feet to 6 feet tall. The first site, off Mill Creek Road east of Statesboro, was treated with 4 oz/ac Polaris AC in a 5 foot band on 20 July 2011 @ 20 GPA over the pigweed and the planted longleaf. The first site was not scalped and longleaf survival as of 20 July was approximately 60 to 70%. The second old-field planted site, at the end of Mag Davis Road site southeast of Nevils, was treated with 4 oz/ac Polaris AC in a 5 foot band on 19 August @ 20 GPA over the pigweed and longleaf seedlings. The Mag Davis Road site was scalped and survival as of mid-August was approximately 70 to 85%. There were 3 sets of 4 rows (120 feet treated length per row) treated with imazapyr and 3 sets of 4 rows of untreated longleaf seedlings at the Mill Creek Road site and 3 sets of 2 rows treated and 3 sets of 2 rows of untreated at the Mag Davis Road site. Ten living seedlings per 120 feet row at the time of applications were wire flagged (orange = imazapyr treated and white = no treatment) just prior to the herbicide treatment. There were a total of 360 living seedlings that comprised the two study area sites. Both sites were re-visited in late October for pigweed control evaluations and 1 December 2011 for an end of the year longleaf survival check.

Results

Control rating of the glyphosate resistant pigweed

The imazapyr (Polaris AC) at 4 oz/ac did not control the pigweed once it was 1 ½ feet to 6 feet tall. Some of the pigweed at both sites was already in the flowering to seed setting stages and appeared to be too well developed for the imazapyr at the 4 oz/ac rate be an effective control option. Agronomists and weed scientists have mentioned that glyphosate resistant pigweed can be controlled by labeled herbicides on annual crop scenarios, but when the plants are no higher than 6 to 9 inches. Once this pigweed species gets higher than 9 inches, it becomes much harder to control.

Longleaf seedling survival at the end of the imazapyr – pigweed control trial

Longleaf survival was not dramatically improved or reduced with the Polaris AC (imazapyr 4 lbs ae/gal product) treatment of 4 oz/ac in July or August at the two sites (Table 1). Longleaf survival, of those seedlings that survived through 20 July or 19 August, was 65.6% with the Polaris AC treatment and 60.8% without the Polaris AC treatment at the Mill Creek Rd site and 91.7% with the Polaris AC treatment and 95% without the Polaris AC treatment at the Mag Davis Rd site (Table 1) as of 1 December 2011.

Table 1. Longleaf survival as of 1 December 2011 (of those seedlings living as of trial initiation – 20 July for the Mill Creek Rd site and 19 August for the Mag Davis Rd site)

Site # 1 off Mill Creek Rd Polaris AC applied 20 July 2011				Site # 2 Meg David Rd Polaris AC applied 19 August 2011			
		# of living seedlings per row of 10				# of living seedlings per row of 10	
Row #	orange	white		Row #	orange	white	
1	10	10		1	10	10	
2	7	7		2	8	10	
3	7	7		3	10	8	
4	6	6		4	9	9	
5	6	8		5	9	10	
6	8	5		6	9	10	
7	10	5		means	9.166667	9.5	
8	6	7					
9	7	3					
10	4	5		% basis:	91.70%	95%	
11	3	4		std dev	± 6.9%	± 7.6%	
12	5	6					
means	6.583333	6.083333					
% basis	65.6 %	60.8%					
std dev	± 21 %	± 19 %					

Summary

These two studies indicate that once glyphosate resistant pigweed grows above 6 to 9 inches tall it is hard to control, even with a labeled herbicide such as imazapyr at the over the top labeled rate. Longleaf survival was not dramatically improved or reduced with the Polaris AC at the 4 oz/ac rate in these two studies. Landowners and applicators need to consider the herbicide modes of action, plant growth stage, and how long it takes for the herbicides to work in eradicating competing vegetation to get the best herbicide results. Scouting fields can be very important in achieving best herbicide timing, in this case for pigweed control.

Recommendations

Apply a herbicide that is labeled for over the top use on longleaf that is also labeled for pigweed control when the pigweed plants are no taller than 6 to 9 inches. Mowing over the longleaf prior to flowering or seed head formation can also be a control option if the pigweed grows to a size larger than most herbicides can effectively control.



Figure 1 and 2. Old-field planted longleaf pine in their first growing season with glyphosate resistant pigweed encroachment (left photo is the non-scalped Mill Creek Rd site and right photo is the Mag Davis Rd site). Photos taken at time of Polaris AC application (20 July and 19 August 2011).



Figure 3 and 4. Solo backpack sprayer and spray wand with three T-Jet nozzles to get a 5 foot band over the longleaf (left photo) and 3 weeks after the Polaris AC at 4 oz/ac treatment at the Mill Creek Rd site (right photo).



Figure 5 and 6. December 1st 2011 photos of the imazapyr pigweed control old-field planted longleaf sites; the Mill Creek Rd site is the left photo (orange flag denotes an imazapyr sprayed row and mowing occurred between the rows) and the Mag David Rd is the right photo (scalped site gave better in row pigweed control; white flag denotes no herbicide treatment in August).

Key words: *Amaranthus palmeri*, pigweed control, longleaf seedlings, herbicides, imazapyr, glyphosate resistant pigweed

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