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PRELIMINARY TRIALS WITH A DIRECTED APPLICATION OF HALOSULFURON METHYL IN OAK SEEDBEDS

by
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INTRODUCTION

The herbicide halosulfuron-methyl (Sedgehammer®) is sold by the Gowan Company and is labeled for use in turf, landscaped areas and fallow ground. Typical rates vary from 0.66 to 1.33 ounces of product (by weight) per acre (0.031 to 0.062 pounds active ingredient per acre) after nutsedge has developed 3 to 8 leaves.

In 1992, the Nursery Coop began testing halosulfuron in pine seedbeds (South 1997). Ten years later, Ted Webster (USDA Agricultural Research Service) indicated that halosulfuron could provide 85 to 95 percent control of nutsedge (*Cyperus rotundus* and *Cyperus esculentus*). He said that "once methyl bromide applications have ceased, nutsedges have become significant problems due to their tolerance of many herbicides..." (Webster 2003). Although the Nursery Coop has tested this herbicide at a number of pine nurseries (South 1997; McNabb and Bergstrom 1999; Bergstrom 2002) testing in hardwood nurseries has been limited.

Due to the potential loss of methyl bromide as a soil fumigant, nursery managers need information on how to effectively reduce nutsedge populations. The easiest way is to apply multiple applications of glyphosate in fallow fields. However, when escape tubers grow in hardwoods, directed applications of glyphosate might cause injury if the spray comes into contact with green foliage. Other nutsedge herbicides might result in chlorosis when applied "over-the-top" of nursery stock (Derr and Wilcut 1993). There is a need to determine if hardwoods can tolerate newer selective herbicides.

METHODOLOGY

An experiment was installed at the East Tennessee Nursery at Delano. Water-willow oak (*Quercus* spp.) seed were sown on November 23, 2004 and herbicides were applied on September 7, 2005. The study was installed on a sandy loam (72% sand; 23% silt) with an organic matter content of 1.4% in an area with short seedlings (pH = 3.8) and where nutsedge was present. The study design was a randomized complete block design with four replications. Plot size was 10-feet long and one bed wide. The study involved two herbicide treatments plus an untreated control. Herbicides were applied using a single-nozzel, CO_2-backpack sprayer calibrated to apply 30 gallons per acre. The herbicide was directed between hardwood drills (4 drills per bed). Seedling densities (i.e. number of seedlings per square foot) were recorded on December 2, 2005 using a 1' x 4' counting frame. Seedling samples were hand-lifted from the center of each plot and were transported to Auburn for

analysis. Heights and root-collar diameters were measured on all seedlings in each plot. Oven-dry weights of shoots and roots were recorded. Treatment differences were tested using orthogonal contrasts.

RESULTS

No seedling injury was observed. In fact, shorter and smaller trees occurred on control plots. The herbicide application resulted in an increase in heights, shoot and root mass.

MANAGEMENT IMPLICATIONS

Although Sedgehammer® can be applied to fallow land at a rate of 0.66 to 1.33 ounces of product per acre, the herbicide glyphosate is typically more effective on nutsedge in fallow land. Sedgehammer® can be applied to fallow ground 4 weeks prior to transplanting woody ornamentals. These preliminary results indicate that at some locations, oaks may tolerate halosulfuron when applied as a directed spray between drills. In some cases, even an early fall application might increase seedling size.

REFERENCES

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Table 1. Analysis of Variance for oak seedlings as affected by halosulfuron.

Source	df	Density	RCD	Height	Shoot	Root
		------ Probability of a greater F-value ----------				
Replication	3	0.0746	0.3392	0.0075	0.0205	0.0007
Treatment	2	0.1678	0.3798	0.0589	0.0423	0.0314
Error	11					

Table 2. Morphological characteristics for loblolly pine seedlings lifted in October at the Delano Nursery.

Halosulfuron Rate g ai/ha	Density (#/ft^2)	RCD (mm)	Height (cm)	Shoot (g)	Root (g)
0	5.8	5.1	17.0	3.32	1.08
35	7.9	5.8	19.9	5.99	1.93
70	7.9	5.8	20.3	5.53	1.74
Linear	0.1063	0.2361	0.0299	0.0205	0.0007
Quadratic	0.3023	0.4856	0.2809	0.0423	0.0314
(LSD)	*2.8*	*1.4*	*4.3*	*0.51*	*0.61*