Auburn University Southern Forest Nursery Management Cooperative

Research Report 99-7

APPLICATION AND TIMING TRIALS WITH MANAGE® HERBICIDE

by
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INTRODUCTION

Manage (halosulfuron-methyl) has both pre- and postemergence activity on annual broadleaf weeds and nutsedge. It is classified in the sulfonylureas group of herbicides. A 75% ai dry flowable formulation is currently labeled for nutsedge control in turfgrass. Technical Note 97-1 reported on a series of earlier Coop tests using this product. These earlier tests found that when applied preemergent to pine, halosulfuron stunted seedling development. On the other hand, there was little or no seedling growth loss when applying postemergent with no surfactant 8 weeks after sowing. Experimentation by nursery managers, however, indicated that postemergent applications of halosulfuron did stunt seedlings. The objective of the research reported here was to determine if this stunting was related to rate, timing, or surfactant.

METHODOLOGY

The following treatments were applied to plots one bed wide and 10' long. These plots were replicated four times at each nursery: two loblolly nurseries and two slash nurseries. All rates are in product per acre. All treatments except for 3 and 8 had 0.25% Agridex surfactant in the application mixture. Manage is currently labeled at 0.66 to 1.33 oz/ac product (0.031 to 0.62 lb/ac ai or 0.035 to 0.69 kg/ha ai). Applications were made using a backpack CO_2 sprayer.

Treatment
1. .33 oz/ac applied twice, in mid-June then 4-6 weeks later (total = .66 oz/ac)
2. .66 oz/ac applied once in mid-June
3. .66 oz/ac (same as treatment 2) NO SURFACTANT)
4. .66 oz/ac applied once 4-6 weeks after treatment 1
5. .66 oz/ac applied twice, in mid-June then 4-6 weeks later (total = 1.33 oz/ac)
6. 1.33 oz/ac applied once in mid-June
7. 1.33 oz/ac applied once 4-6 weeks after treatment 6
8. Check no herbicide

All routine applications of Goal® herbicide were conducted by each nursery prior to the application of Manage. Seedlings were sampled in September and December for morphological assessment by lifting rows 1 through 4 in a 4 ft^2 counting frame. The December sampling date is reported here except for nursery 4 where seedlings were harvested before December. Standard ANOVA procedures were used to compare the eight treatments.

RESULTS

Loblolly

Nursery 1 showed no difference between any treatment when comparing total seedling dry weight. These are unusually small seedlings, however. Average root collar diameter for the check was 3.4 mm, which is barely above cull. Perhaps whatever stress caused these seedlings to be small was sufficient to mask any effect of herbicide treatment. Manage applications at the second nursery, however, resulted in treatment affects. The check was the best treatment, with Manage treated seedlings averaging 22% lower in dry weight, 4.6 g versus 3.6 g. Applications made in July generally did better than June applications at this nursery. Manage applied in June without a surfactant was not different than the control.

Table 1. Average total dry weight (grams) of individual loblolly pine seedlings by nursery and herbicide treatment. Letters indicate means separation using Duncan's test at the 0.05 level.

Loblolly						Slash			
Nursery 1		Nursery 2			Nursery 3			Nursery 4†	
0.66 June WS‡	2.2	Check	4.6	a	0.66 June WS	4.5	a	Check	2.5 a
Check	2.1	0.66 July	4.4	ab	Check	4.3	ab	0.66 June WS	2.3 ab
0.66 June/July	2.0	1.33 July	4.3	abc	0.66 June	4.1	ab	1.33 June	2.2 bc
0.33 June/July	1.9	0.66 June WS	3.8	abcd	1.33 June	4.1	ab	0.66 July	2.2 bc
1.33 June	1.9	0.66 June	3.6	bcd	0.33 June/July	3.7	bc	0.66 June	2.2 bc
0.66 July	1.7	0.33 June/July	3.5	cd	0.66 June/July	3.6	bc	1.33 July	2.0 cd
1.33 July	1.7	1.33 June	3.0	d	1.33 July	3.6	bc	0.33 June/July	1.9 d
0.66 June	1.7	0.66 June/July	2.8	d	0.66 July	3.1	c	0.66 June/July	1.8 d

† Data from September sample
‡ WS = Without Surfactant

Slash

Applications of Manage with Agridex at nurseries 3 and 4 resulted in smaller seedlings. The average check seedling at nursery 3 was 4.3g, with Manage treatments averaging 3.8 g. Regarding the timing of application, the results seemed to be just the opposite of Nursery 2, in that the June applications affected seedling development less than July applications. Similar trends were observed in Nursery 4, where June applications tended to do better. Manage applied in June without a crop oil was similar to the check seedlings at both nurseries.

General Trends

Although the effects of Manage on seedling development were not always consistent, there were several general trends observed. First, Manage plus a surfactant did cause stunting in both loblolly and slash pine. Some treatments significantly reduced seedling growth by 39% from the check (Nursery 2). On average, Manage treatments reduced seedling growth by 10 to 20%. Second, the June application with no surfactant was consistently comparable to the check, suggesting that most of Manage's affect on seedlings is through foliar uptake. Third, neither loblolly or slash appeared to be rate sensitive to Manage (at least for the rates tested in this study). In no case did the 0.66 oz/ac rate produce seedlings significantly larger than 1.33 oz/ac rate regardless of application timing. Fourth, it was difficult to find any consistent effect of treatment application timing. June and July applications, split or not split, resulted in the same size seedling at the end of the growing season.

MANAGEMENT IMPLICATIONS

This work indicates that Manage can stunt seedlings, particularly if applied with a surfactant. This research supports previous trials that show Manage without a surfactant has no stunting effect when applied in June. Nursery managers wishing to apply Manage with a surfactant to increase activity on nutsedge should accept some growth reduction as a consequence. In this case, the decision to use this product is a benefit/cost decision where potential seedling growth loss from competition with nutsedge is more severe than potential seedling growth loss from Manage application. This would probably only occur in cases of severe infestation. Application without a surfactant is likely to reduce seedling damage. Rate (within the label recommendation) does not seem to affect seedling morphology.