RESEARCH REPORT 07-01

A SPURGE TRIAL IN ALABAMA

by
David B. South and Tommy Hill

INTRODUCTION

Spurge (Chamaesyce maculate) is a troublesome weed in southern pine nurseries, container-grown horticultural crops and turf. Oxyfluorfen (e.g. Goal) provides some level of preemergence control but once spurge germinates and becomes established, the weed is difficult to control with selective postemergence herbicides. Spurge is listed on a number of herbicide labels but listing the weed on a label does not mean the herbicide effectively controls spurge. For example, in turf, only two herbicides (carfentrazone and triclopyr) are listed as providing excellent control of prostrate spurge (Anonymous 2007).

In 2006, an opportunity to test various postemergence herbicides occurred when spurge germinated on a limited number of seedbeds. The objective of the study was to determine if selected herbicides might be able to control established spurge plants without injuring loblolly pine seedlings.

METHODOLOGY

A study was installed at the Pine Hill Nursery during the 2006 growing season. Loblolly pine seeds were sown in April and the seedlings were treated on June 29th. Plot size was one bed wide and 10-feet long. This study was installed after germination of spurge and involved various herbicide treatments plus an untreated control (replicated two times). Treatments are listed in Table 1. Treatments were applied using a CO_2-backpack sprayer calibrated to apply 22 gallons per acre. Operational applications of oxyfluorfen were made on June 16 and July 5.

Visual estimates of spurge control (i.e. excellent, good, fair, poor, none) were made on July 12. Seedling densities (i.e. number of seedlings per square meter) were recorded on November 9 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. However, only one plot was sampled for the fomesafen treatment. Heights and root-collar diameters were measured on 25 seedlings per plot. Oven-dry weights of shoots and roots were recorded for each 25-seedling sample. Data were subjected to ANOVA and treatment effects were compared using Duncan's Multiple Range Test.

RESULTS

Due to low statistical power, none of the seedling attributes differed significantly ($\alpha = 0.10$) from untreated seedlings (Table 2). Photos of plots were taken on July 12. At this time, spurge plants treated with MSMA (either alone or with lactofen) had turned red. No adverse effect of MSMA on

seedling growth was observed (Table 3). The addition of lactofen did not appear to increase control of spurge at this nursery. However, the lactofen plus MSMA treatment is a popular tank-mix for cotton.

Spurge treated with sulfometuron were beginning to turn brown and were not growing as well as untreated seedlings. However, pine seedlings appear to be adversely affected by sulfometuron. The seedlings in this treatment were numerically shorter, fewer and had smaller roots (although the power of the test was too low to detect any significant differences). Spurge appeared to be resistant to postemergence applications of clopyralid (Anonymous 2007), fomesafen and lactofen.

The original intent of this study did not involve evaluating seedling morphology. (Most of the treatments had been tested previously). For this reason, only two replications were employed in this test. However, it was later decided to take stocking and morphology measurements even though the power of the test would be low with only two replications.

MANAGEMENT IMPLICATIONS

These findings indicate that, when trying to suppress established spurge, metsulfuron provided the most effective control. This herbicide may be used on non-cropland, in loblolly pine and slash pine plantations, and in hardwood plantations. However, it is not registered for use on seedbeds.

REFERENCES

Anonymous. 2007. Commercial turf and lawns: chemical weed control recommendations for 2007. Alabama Cooperative Extension System.
http://www.aces.edu/pubs/docs/I/IPM-0022/commturf.pdf

Table 1. Herbicide treatments and visual assessment of weed control on July 12, 2006.

Trade Name	Common Name	Product/acre	g a.i./acre	Spurge control
Control	--	--	--	--
Oust	sulfometuron	1.33 ounce	28.3	F
Escort	metsulfuron	0.3 ounce	5.1	E
Cobra	lactofen	12.5 ounce	88.7	N
912 Herbicide	MSMA	16 ounce	340.5	G
912 + Cobra	MSMA + lactofen	16 + 12.5	88.7 + 340.5	G
Stinger	clopyralid	8 ounce	85.1	N
Reflex	fomesfen	24 ounce	170.2	N

E=excellence; G=good; F=fair; N=no control

Table 2. Analysis of Variance for loblolly pine seedlings as affected by herbicide treatments.

Source	df	Density	RCD	Height	Root	Shoot
		---------- Probability of a greater F-value ----------				
Replication	1	0.0765	0.6741	0.5998	0.7845	0.5516
Treatment	6	0.3680	0.7236	0.4581	0.4714	0.8228
Error	6					

Table 3. Morphological characteristics for loblolly pine seedlings at Pine Hill Nursery.

Treatment	Density (#/m^2)	RCD (mm)	Height (cm)	Shoot (g)	Root (g)
Control	194	4.2	25.8	2.6	0.41
sulfometuron	160	4.1	22.3	2.4	0.33
metsulfuron	195	4.5	23.7	2.8	0.51
lactofen	191	4.4	28.6	2.8	0.46
MSMA	195	4.6	24.1	2.3	0.55
MSMA + lactofen	203	4.4	22.9	2.5	0.47
clopyralid	204	4.0	22.7	2.2	0.41
(LSD)	*44.5*	*0.96*	*7.32*	*1.22*	*0.25*