TWO-YEAR RESULTS FOR CROP TOLERANCE TESTING OF PRE- AND POST-EMERGENT APPLICATIONS OF GOAL 2XL OVER FIVE HARDWOOD SPECIES. A.W. Ezell, Mississippi State University, Starkville.

INTRODUCTION

Herbaceous weed control in newly established hardwood plantations continues to be a major concern. While this competition results in loss of survival and growth in years with normal precipitation, the growing seasons of 1998 and 1999 have demonstrated the extreme impact of competition during droughty years. Many hardwood plantations without adequate weed control suffered mortality in excess of 60 percent.

OBJECTIVES

The objectives of this study was to evaluate the crop tolerance of five species of hardwoods to pre- and post-emergent applications of Goal 2XL and to document treatment efficacy on herbaceous weed control.

STUDY SITE

The study site was located in Winston Co., Mississippi approximately 16 miles north of Louisville, MS. Soils were of a clay loam texture with a pH=5.5. The area was abandoned agricultural land, which had received annual mowing for more than 10 years.

METHODS

A total of 8 herbicide treatments were installed over recently planted hardwood seedlings (Table1). An untreated check was evaluated for comparison. Each treatment was replicated three times with a CRD plot layout in each replication. Each treatment was applied as a six-foot swath over-the-top of the planted seedlings with a CO2-powered backpack sprayer using a 4-nozzle boom with 8002 tips. Total spray volume was 20 gpa.

Ten seedlings of each of the five crop species were planted in each linear plot and formed the center line of the plot. The five species were yellow poplar (*Liriodendron tulipfera*), sycamore (*Platanus occidentalis*), sweetgum (*Liquidambar styraciflua*), cherrybark oak (*Quercus pagoda*), and Nuttall oak (*Quercus nuttallii*). Seedlings were planted Feb. 4, 1999 and pre-emergent treatments were applied Feb. 23rd. Post-emergent treatments were applied April 27th after full leaf out.

Plots were evaluated at 30, 60, 90, and 120 days after pre-emergent treatment (DAT). During each evaluation, percent coverage for different vegetation categories was estimated ocularly and each seedling was assessed for any signs of damage. Total seedling height and groundline diameter (GLD) were recorded for each seedling at the time of planting and again in November 1999.

RESULTS

Crop Tolerance – There were no signs of any herbicide damage to any trees at any time (Table 2). Yellow poplar suffered severe (almost total) mortality due to breaking dormancy early combined with the occurrence of a late freeze in March. A review of survival in Table 3 indicates the untreated yellow poplar suffered mortality equal to that in treated plots. Most, if not all, of the mortality in this study can be attributed to the severe drought which persisted on the study site from April until December. Other than yellow poplar, there was little or no mortality in mid-summer, but many seedlings died as the drought persisted. Thus, survival results varied more by microsite variations and species drought hardiness than by treatment influence.

Competition Control – All pre-emergent treatments worked very well on the herbaceous competition (Table 4). As early as late March, the site was being occupied by herbaceous vegetation, and while not much changed between 30 and 60 DAT (late April) competition pressure steadily increased in May and June. Overall, the pre-emergent applications were more efficacious as can be seen in Treatments 4 and 5, where post-emergent only applications failed to generate the clear ground as the pre-emergent treatments had done.

SUMMARY

Overall, the treatments in this study yielded very good results. No phytoxic symptoms were noted from any application. Since yellow poplar suffered severe freeze damage both years of the study, crop tolerance decisions may be reserved, but no damage was apparent.

Pre-emergent treatments were more effective than "post-emergent only" in competition control. Broadleaf species in this study were well controlled, and some control was exhibited in the grass and sedge component.

Overall, Goal 2XL promises to be a useful product in controlling herbaceous competition in hardwood plantations. Its use in cottonwood regeneration, both artificial and natural, may soon be expanded to include a number of other species.

Table 1. List of treatments in 1999 Goal 2XL hardwood field trial

Treatment No.	Pre-emergent Rates (oz/A)	Post-emergent Rates (oz/A)
1	Goal + Gramoxone Extra (64 + 32)	-
2	Goal + Gramoxone Extra (128 + 32)	-
3	-	-
4	-	Goal (32)
5	-	Goal (64)
6	Goal + Gramoxone (64 + 32)	Goal (32)
7	Goal + Gramoxone (64 + 32)	Goal (64)
8	Goal + Gramoxone (128 + 32)	Goal (32)
9	Goal + Gramoxone (128 + 32)	Goal (64)

Table 2. Percent damage to crop species by species and time of observation in 1999 Goal/hardwood field study (all treatments included)

	Time of Observation			
Species	30 DAT	60 DAT	90 DAT	120 DAT
	percent			
Yellow Poplar	90 *	95 *	-	-
Sweetgum	0	0	0	0
Sycamore	0	0	0	0
Cherrybark Oak	0	0	0	0
Nuttall Oak	0	0	0	0

* freeze damage

Table 3. Average survival of crop species in 1999 Goal 2XL hardwood study.

	Treatment Number								
Species	1	2	3	4	5	6	7	8	9
	percent								
Yellow Poplar *	0	0	10	0	10	0	0	0	0
Sweetgum	65	40	30	50	80	90	30	60	70
Sycamore	80	90	10	30	80	20	50	60	30
Cherrybark Oak	90	100	60	100	90	100	100	80	90
Nuttall Oak	100	100	70	90	100	90	90	80	100

* extreme freeze damage

Table 4. Percent clear ground in 1999 Goal/hardwoods field study by time of observation

	Time of Observation			
Treatment No.	30 DAT	60 DAT	90 DAT	120 DAT
	percent			
1	98	85	40	20
2	100	87	60	20
3	50	49	5	5
4	60	50	25	25
5	50	49	25	25
6	99	90	30	15
7	99	92	50	25
8	100	96	50	35
9	99	92	50	35

FOURTH-YEAR TESTS OF DICAMBA TANK MIXTURES FOR FOREST SITE PREPARATION. L.R. Nelson and A.W. Ezell. Clemson University, Clemson, SC, and Mississippi State University, Starkville.

ABSTRACT

Herbicide treatments were installed during the 1999 growing season at two locations to determine the effectiveness of three-way tank mixtures for site brownout and for woody stem control. Study sites included a piedmont site near Abbeville, SC and an upper coastal plain site near Louisville, MS. Dominant hardwood species included sweetgum, water oak, and red maple in SC and sweetgum, red maple, red oak spp. and winged elm in MS. Herbicide treatments included various three-way mixtures of dicamba (Vanquish®) @ 2 qt prod/ac, imazapyr (Arsenal Applicators Concentrate®) @ 10-12 ozprod/ac, glyphosate (Accord®) @ 3 qt prod/ac, triclopyr (Garlon 4®) @ 2 qt prod/ac, fosamine (Krenite UT®) @ 4 qt prod/ac and primisulfuron-methyl + prosulfuron (Exceed®) @ 1 oz prod/ac. Treatments were applied with a CO_2 backpack-pole sprayer in mid-August. A randomized complete block design was used at both locations. Evaluations were conducted 8 WAT. Measurements included ocular estimates of percent foliar brownout