

# Control of Arizona Cypress Blight in Nurseries

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## INTRODUCTION

Arizona cypress (*Cypressus arizonica* Greene) has been utilized for Christmas tree production in the South with some success. Recently, this species has not been available from most southern nurseries because of disease and insect problems that hinder seedling production. Damage has varied from slight to severe, the latter resulting in reduced numbers of salable seedlings. These studies were conducted to evaluate insecticides for control of the lesser corn stalk borer and

fungicides for control of various fungi that cause foliar diseases.

## MATERIALS AND METHODS

Similar experiments were performed in two consecutive years. Split-plot designs were used with insecticides assigned to main plots and fungicides to sub-plots. Insecticides tested the first year were Dieldren and BHC at 1 pound and 2 pounds active ingredient (a.i.) per acre, respectively. Dieldren was applied in granular form and mixed into the top 4 inches of soil with a rototiller prior to planting. BHC was applied as a mixture of 11 percent emulsifiable concentrate with water (1 gallon per 45 feet of nursery bed). A CO<sub>2</sub> pressurized hand

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sprayer at 40 psi (pounds per square inch) was used to apply BHC. BHC applications were made every other week from the first week in June until mid-July and weekly thereafter until sample collection in the fall.

Fungicides tested during both years were Difolatan 4-F and Benlate 50WP at 2.5 and 0.4 pounds a.i. per acre, respectively. Both were mixed with water and applied at 1 gallon of water per 45 feet of nursery bed. Applications were made every other week with the same equipment as used for BHC from mid-June until evaluation. Each treatment combination and untreated control plot was replicated four times the first year and six times the second year. Insecticidal treatments the second year were BHC at 1, 2, and 3 pounds a.i. per acre. Application methods and spraying schedules were approximately the same as in the first year.

Samples were collected during early September the first year and during mid-October the second. A less severe blight incidence during the second year was the reason for delayed sampling. Four random samples of 25 seedlings each were collected from each sub-plot. Seedlings were examined individually for damages caused by lesser cornstalk borers and fungi. Borer damage was classified as root damage, top damage, or both. Damage by fungi, expressed as percentage of dead crown, was placed arbitrarily in one of the following classifications: 0 to 33

percent, 34 to 67 percent, and 68 to 100 percent. In addition to the main classification, seedlings with less than 5 percent dead crown were called "perfect" and completely dead seedlings were given another sub-category.

Separate statistical analyses were made for each year because additional levels of insecticides were used the second year. Duncan's New Multiple Range Test was used to detect real differences among treatment means within years.

## RESULTS AND DISCUSSION

Results of the first year's study have been published previously, but they are included here for ease of comparison.<sup>1</sup> Table 1 shows that seedling mortality was not significantly reduced by the application of insecticides. Dieldren was not significantly different from the control in reduction of seedling damage by the lesser corn stalk borer. BHC, however, significantly reduced root damage in both years and top damage the second year. There was no significant difference in damage when the levels of BHC varied from 1 to 3 pounds a.i. per acre. It appears that the lower levels of BHC were as effective in reducing borer damage as were higher levels. No toxicity to

<sup>1</sup> Davis, T. C., J. F. Goggans, and R. J. Meier, 1974. Pest Control Problems Encountered in Seedling Production of Arizona Cypress in Alabama. USDA Forest Service Tree Planter's Notes 25(2):7-10.

TABLE 1. INSECTICIDAL TREATMENT MEANS OF BORER DAMAGE AND MORTALITY. MEANS GIVEN IN PERCENT OF SEEDLINGS SAMPLED

Insecticide	a.i. lb./acre	Mortality		Top damage		Root damage		Both root and top damage	
		1st yr.	2nd yr.	1st yr.	2nd yr.	1st yr.	2nd yr.	1st yr.	2nd yr.
BHC	1		14a		36a		12a		3a
	2	22a	12a	59a	34a	25a	10a	6a	2a
	3		12a		33a		10a		2a
Dieldrin	1	19a	11a	60a	54b	37b	26b	14b	11b
	2		14a		50b		26b		11b
Control	--	24a	11a	59a	51b	35b	28b	11b	12b
Mean		22	12	60	43	33	19	10	7

Values followed by the same letter do not differ significantly at the .05 level of testing.

seedlings was noted at any of the insecticide levels used in these studies.

Application of either fungicide significantly reduced mortality in both years, Table 2. In the first year Benlate was significantly better than Difolatan in reducing the amount of dead crown and Difolatan was significantly better than the control in all crown classes except perfect. In the second year both fungi-

cides were significantly better than the control but there was no significant difference between the two fungicides. The reason for the difference between years was probably the less severe blight incidence observed during the second year.

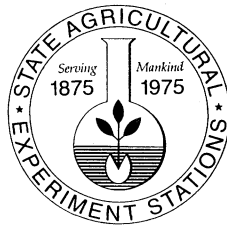
In the two-year study, mortality was reduced greatly by application of fungicides and visible insect damage was lowered by treatments with BHC.

TABLE 2. FUNGICIDAL TREATMENT MEANS OF FOLIAGE CONDITION AND MORTALITY GIVEN IN PERCENT OF SEEDLINGS SAMPLED

Fungicide	Mortality		Perfect		Amount of dead foliage					
					0-33%		34-67%		68-100%	
	1st yr.	2nd yr.	1st yr.	2nd yr.	1st yr.	2nd yr.	1st yr.	2nd yr.	1st yr.	2nd yr.
Benlate	2a	6a	82a	65a	92a	83a	5a	10a	3a	7a
Difolatan	13a	8a	10b	63a	42b	82a	34b	9a	24b	9a
Control	50b	24b	1b	22b	8c	43b	20c	19b	72c	38b

Values followed by the same letter do not differ significantly at the .05 level of testing.

ON THE COVER. Typical lower branch feeding damage caused by the lesser corn stalk borer.



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