

EVALUATION OF FUNGICIDES FOR CONTROL OF BOTRYTIS BLIGHT OF CONTAINER-GROWN REDWOOD SEEDLINGS

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Botrytis blight caused by *Botrytis cinerea* (Fr.) Pers., is a common and damaging disease of container-grown coast redwood, *Sequoia sempervirens* (D. Don) Endl. The disease also can be severe in field-grown redwood, giant sequoia, *Sequoiadendron giganteum* (Lindl.) Buchholz, Douglas-fir, *Pseudotsuga menziesii* (Mirb.) Franco, and other tree seedlings (1). Benomyl provided excellent control of the disease (2) but this fungicide is no longer effective in many locations because tolerant forms of the fungus have developed. However, there are other contact fungicides that will provide protection and that are useful in controlling the disease on other crop plants. This trial was designed to test the efficacy of these fungicides in controlling the disease on redwood seedlings.

Materials and Methods

Seeds were planted April 15, 1977 in a peat-vermiculite planting mixture in 1- by 4-inch Leach containers. Fertilization was applied with irrigation through the overhead sprinklers. The plants were maintained in an unheated plastic greenhouse. Temperature during the experiment varied from 7° C to 30° C. The trial was conducted at Korb, Calif., where the climate is conducive to the disease because of

fog and high humidity. No air circulation was provided in the plastic structure and this also contributed to the high humidity. Each treatment consisted of 4 replications of 200 plants. The replications were arranged in complete randomized blocks. The seedlings were sorted for uniformity at the time of the first fungicide application on June 17.

Fungicides were applied to run-off using a Hudson garden sprayer operated at 20 to 30 psi. A total of 9 applications were made at 14-day intervals commencing on June 17. The fungicides and concentrations are reported in table 1.

The seedlings were inoculated on July 27 by atomizing the plants with a suspension of 1.7×10^6 conidia per 1 ml of water. Conidia were produced on potato-dextrose-agar medium.

Results

The number of lesions on the main stem were recorded in the first disease evaluation on September 8. Lesions on the needles or side shoots that did not reach the stem were not included. The final evaluation was made on November 4, when the seedlings were large enough for planting in the ground and 4 weeks after the last fungicide application. The results are presented in table 1.

Both dicloran and chlorothalonil provided excellent control of the disease at the first evaluation. The other fungicides also reduced the disease but were not as effective. When the fungicide applications were discontinued the disease became very severe and only dicloran and chlorothalonil had any lasting effect, with dicloran providing superior control.

Table 1.—The effect of fungicides on botrytis blight of redwood seedlings

Product	Composition (percent)	Amount per liter	Equivalent per 100 gal	Evaluation	
				Sept. 8 ¹	Nov. 4 ²
Botran	75 dicloran	180 g	1.5 lb	1.0 a ³	6.75 a ³
Daconil 2787	54 chlorothalonil	1.25 ml	1.0 pt	7.3 a	102 b
Fore	80 mancozeb	1.80 g	1.5 lb	57 b	165 c
Orthocide	50 captan	2.40 g	2.0 lb	77 bc	169 c
Tri-basic	53 copper	3.60 g	3.0 lb	73 bc	172 c
Thylate	65 thiram	1.80 g	1.5 lb	77 bc	182 c
Control				90 c	172 c

¹ Average number of plants with lesions on main stem.

² Average number of cull plants.

³ The small letters indicate Duncan's multiple range groupings of treatments which do not differ significantly at the 0.05 level.

Discussion

in this trial, applications were started in mid-June; however, in view of the excellent and lasting control of dicloran it appears that applications of this fungicide could be deferred until such time as the disease's early stages are manifest. The lasting control of dicloran also suggests that the interval between applications could be lengthened to 3 or possibly 4 weeks. This would further reduce the number of applications during the growing season.

The rate of chlorothalonil used (1 pint per 100 gallons) is less than recommended by the manufacturer (2 pints per 100 gallons) and it is likely that additional control would be achieved at the higher concentration.

Literature Cited

1. Peace, T. R.
1962. Pathology of trees and shrubs. 753 p. Oxford, London.
2. Smith, R. S., et. al.
1973. Plant Disease Reported 57:67-69.