Preventing Rhizoctonia Rot of Tolmiea

Progress Report

Arthur H. McCain, Extension Plant Pathologist, Berkeley;
Janet L. Anderson, Staff Research Associate, and
Kathryn E. Welch, Graduate Student and Research Assistant, Department of Plant Pathology, Berkeley

Piggy-back plant, *Tolmiea menziesii*, is native to western North America from Alaska to California. It occurs in California in woods along the coast in Mendocino County to western Siskiyou County. Most of us know it as a popular house plant. The usual propagation method is to insert a shortened petiole of a leaf with attached plantlet in a rooting-potting mixture, commonly 60 percent peat and 40 percent perlite. The plants root readily if they are not allowed to desiccate.

The ubiquitous fungus *Rhizoctonia solani* can cause necrotic spots or a complete rot of the rooting leaf. Petiole and tender stem tissues are also attacked. Some infected plants may root, but they become stunted plants and may succumb later.

Rhizoctonia is easily killed by heat and chemical fumigation of rooting and potting mixtures. However, recontamination frequently occurs unless particular attention is paid to sanitation.

Fungicides are helpful in preventing infection. PCNB (pentachloronitrobenzene) is still widely used to control diseases caused by *Rhizoctonia*. Several newer fungicides also are effective and were evaluated in this trial.

MATERIALS AND METHODS

Leaves collected from a greenhouse in Half Moon Bay were trimmed to fit 9-cm glass petri dishes containing a rooting-potting mixture composed of 60 percent peat and 40 percent perlite naturally infested with *Rhizoctonia solani*. The leaves were dipped in the fungicide suspensions for 30 seconds, dried with the top surface up, and then placed with lower leaf surface down on the peat-perlite mixture and enclosed in the petri dishes. A suspension of a *Bacillus* species (a bacterium) that was antagonistic to the fungus on potato-dextrose-agar medium was included in the trial.

The dishes were placed on a counter in a fluorescent-lighted room at a temperature of 21° to 22° C. *Rhizoctonia* lesions developed rapidly, and disease evaluations were made seven days after placing the leaves in the dishes.

The fungicides were not evaluated at the same concentrations, because it was already known that higher levels of PCNB and chlorothalonil than of benomyl and thiophanate-methyl are necessary for disease control. Each fungicide treatment included a noninoculated control to observe phytotoxicity; none was observed.

RESULTS

Benomyl at 100 ppm, chlorothalonil at 1,000 ppm, and PCNB at 500 ppm provided excellent control of *Rhizoctonia* leaf rot of *Tolmiea*. Thiophanate-methyl was not effective at the concentrations used in this experiment. The *Bacillus* species was also ineffective.

DISCUSSION

Both benomyl and PCNB are known to intensify *Pythium* root rot (Gibson, Ledger, and Boehm, 1961, and Prillwitz, 1972), but chlorothalonil has not been reported to do so. *Pythium* species are apt to be present when *Rhizoctonia solani* is present. Therefore, when benomyl or PCNB is applied to soil in which plants are known to be damaged by *Pythium*, a fungicide such as ethazol (Truban®, Terrazole®) or diazoben (Dexon®) should be included in the treatment. This would not be as important when chlorothalonil is used.

Thiophanate-methyl must be converted to methylbenzimidazole carbamate before it is active (Selling, Vonk, and Sijpesteijn, 1970). This conversion takes place in the plant. If there had been a delay before inoculation, the rate of the thiophanate used in this experiment might have been effective.

LITERATURE CITED

Gibson, I. A. S., M. Ledger, and E. Boehm
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Prillwitz, H. G.
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RHIZOCTONIA DISEASE RATINGS OF TOLMIEA UNDER VARIOUS FUNGICIDE TREATMENTS

Treatment*	Concentration	Rating†
water	—	3.8
water non-inoculated	—	0
Bacillus sp.	10^8 cells/ml	3.6
benomyl (1)	100 ppm	1.4
benomyl	50 ppm	2.8
thiophanate-methyl	200 ppm	3.4
thiophanate-methyl	100 ppm	3.6
chlorothalonil	1,000 ppm	1.0
chlorothalonil	500 ppm	2.2
PCNB	1,000 ppm	1.0
PCNB	500 ppm	1.4

* Benomyl is sold as Benlate®. Thiophanate-methyl is sold as Topsin-M® and Fungo® and in combination with ethazol as Banrot®. PCNB is sold as Terraclor®. Chlorothalonil is sold as Daconil® 2787.

† Amount of leaf rot: 4 = severe; 3 = moderately severe; 2 = moderate; 1 = light; 0 = none. Averages of five replications.