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CONTROLLING MYROTHECIUM PETIOLE ROT OF *SYNGONIUM PODOPHYLLUM*

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Abstract. **Control of Myrothecium petiole rot of *Syngonium podophyllum* was attempted with fungicides and temperature. Excellent control was achieved with weekly applications of iprodione (Chipco 26019 50WP at 1.5 lb/100 gal) or captan (Captan 50WP at 1.5 lb/100 gal). In addition, triflumizole (Terraguard 50WP) gave excellent disease control when applied weekly at 0.5 lb/100 gal but caused severe stunting when used at 1.0 lb/100 gal. Benomyl (Benlate 50DF at 1.0 lb/100 gal), mancozeb (Manzate 200 80WP at 1.5 lb/100 gal), and chlorothalonil (Daconil 2787 75WP at 1.5 lb/100 gal) each gave a lesser degree of control. Optimum temperature range for disease development was 15 to 27°C (59 to 81°F) which was much wider than previously found for Myrothecium leaf spot of dieffenbachia. These results may explain the current difficulty growers have found in controlling Myrothecium petiole rot on syngoniums throughout the year, with previously recommended fungicides.**

Introduction

One of the most common diseases of foliage plants is caused by *Myrothecium roridum* Tode ex Fr. This fungus causes leaf spots on many plants including aglaonema, aphelandra, dieffenbachia, ficus, peperomia, pilea, spathiphyllum, syngonium, and xanthosoma (1). Previous research has demonstrated the optimal temperatures for disease development on *Dieffenbachia maculata* (Lodd.) G. Don. 'Perfection' to be 21 to 27°C (70 to 81°F) (5). Although these temperatures are most common during the spring and fall in Florida, the disease appears throughout the year on some plants.

During the past three or four years, a disease of tissue-cultured plants, especially *Syngonium podophyllum* Schott, has become increasingly important. The symptoms appear within a few days to weeks of planting and are typified by petiole rot and loss of lower leaves and complete rot. Many times disease progress is slow with a lower leaf lost as often as a new leaf develops, giving the plants a spindling, stunted appearance without killing it. Sometimes leaf spots will develop on infected plants with petiole rot although not always. Close examination of these plants shows the characteristic black and white fruiting bodies of *M. roridum*. Healthy syngoniums were inoculated with *M. roridum* and developed typical symptoms of petiole rot within four weeks depending upon the temperature conditions. Attempts to control Myrothecium petiole rot on anthurium, calathea, dieffenbachia, spathiphyllum and syngonium with the fungicides known to control Myrothecium leaf spot on foliage plants (2, 3, 4, 6) have been unsuccessful. The following research was conducted to determine whether or not currently available fungicides could control Myrothecium petiole rot of syngonium and to determine the optimum temperature range for disease development.

Materials and Methods

Syngonium podophyllum plants were obtained from commercial growers and planted in 10 cm (4 in) plastic pots containing Vegro potting medium. Pots were top-dressed with 1.5 g Sierra 17:6:12 and irrigated as needed. Naturally infected plants were used for fungicide tests while temperature tests were performed with healthy plants which were inoculated with *M. roridum*.

Fungicide tests. Sixteen plants per treatment were used to test efficacy of various fungicides for control of Myrothecium petiole rot. 'White Butterfly' were used for tests 1, 2 and 4 and 'Lemon Lime' was used for test 3. Tests were performed in a greenhouse receiving 1800 to 2000 ft-c and temperatures between 19 and 32°C (65 and 90°F). Plants were misted intermittently (15 sec/30 min for 12 hr/day) except for 2 to 4 hours after each fungicide application. The following fungicides were used in at least 3 tests: chlorothalonil (Daconil 2787 75WP) at 1.5 lb/100 gal; mancozeb (Manzate 200 80WP) at 1.5 lb/100 gal; benomyl (Benlate 50DF) at 1 lb/100 gal; iprodione (Chipco 26019 50WP) at 1.5 lb/100 gal; captan (Captan 50WP) at 1.5 lb/100 gal; and triflumizole (Terraguard 50WP) at 0.5 lb/100 gal (tests 2 and 4) and 1.0 lb/100 gal (test 1). Fungicides were sprayed to drip weekly for a total of four applications and the number of dead leaves (due to petiole rot) was recorded 3 days after the final application. Three tests were performed between November 1989 and April 1990.

Temperature tests. Ten plants per treatment were used to test the effect of continuous temperatures on development of Myrothecium petiole rot of 'White Butterfly'. Plants were placed in Percival Plant Growth Chamber E 30B's the day of inoculation. Inoculum was prepared using a 2-wk-old culture of *M. roridum* on potato-dextrose agar medium. Conidia were collected and diluted in water to a concentration of about 1 x 10^6 per ml. Plants were sprayed with this conidial suspension to drip and sealed in polyethylene bags to maintain a high humidity throughout the test. Light levels from 0800 to 2000 hr/day were about 800 ft-c. Temperatures were set at 15°C (59°F), 18°C (64°F), 21°C (70°F), 24°C (75°F), 27°C (81°F), 30°C (86°F), or 33°C (91°F). Temperatures were recorded twice daily and the number of dead leaves was recorded 4 weeks later. Three tests were performed between February and June 1990.

Results and Discussion

The most effective fungicides for control of Myrothecium petiole rot of syngonium were different than those previously identified for Myrothecium leaf spot of several foliage plants. In the majority of the tests, tri-

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Table 1. Efficacy of fungicides for Myrothecium petiole rot of *Syngonium podophyllum* cultivars.

Treatment[z]	Rate 100 gal	Mean number dead leaves/plant[y] Test 1	Test 2	Test 3	Test 4
Water	--	1.1 b[x]	2.6 b	5.9 b	1.8 bc
Daconil 2787 75WP	1.5 lb	0.7 ab	1.9 ab	2.6 a	1.7 bc
Manzate 200 80WP	1.5 lb	0.8 ab	2.1 ab	3.9 a	1.8 bc
Benlate 50DF	1.0 lb	--	2.3 ab	2.6 a	3.0 c
Chipco 26019 50WP	1.5 lb	0.2 a	1.1 a	2.6 a	2.6 c
Captan 50WP	1.5 lb	0.2 a	1.6 ab	3.3 a	0.9 ab
Terraguard 50WP[w]	0.5-1.0	0.2 a	1.4 a	--	2.5 c

[z]Treatments were applied four times on a weekly interval.
[y]Mean number of dead leaves for 16 plants per treatment.
[x]Means in the same column followed by a different letter are significantly different at the 5% level (DNMRT).
[w]In Test 1, 1 lb was used in Tests 2 and 4, 0.5 lb was used for this fungicide.

flumizole, captan and iprodione gave the best control of petiole rot (Table 1). Neither mancozeb nor chlorothalonil gave a high level of control of Myrothecium petiole rot although they have consistently given the best control of Myrothecium leaf spot on other plant species (2, 3, 5, 6). In the first test, triflumizole was used at a 1 lb/100 gal rate which resulted in severe stunting of plants. This problem appeared to be alleviated in tests 2 and 4 by using only 0.5 lb/100 gal which continued to give excellent control of Myrothecium petiole rot (Table 1).

Further differences between Myrothecium leaf spot and Myrothecium petiole rot were found in their optimum temperature ranges. While the optimum range for Myrothecium leaf spot on dieffenbachia is 21 to 27°C (70 to 81°F) (5), the range for petiole rot on syngonium was 15 to 27°C (59 to 81°F) (Table 2). This helps explain why this disease seems to be present the majority of the year in Florida. Since high and low temperatures are managed more carefully during the time required to establish tissue-cultured plantlets in potting media, the temperatures which they receive are likely those which are optimal for disease. This may be one reason growers can expect a year-round problem due to Myrothecium petiole rot.

Table 2. Effect of constant temperature on severity of Myrothecium petiole rot of *Syngonium podophyllum* 'White Butterfly' in growth chambers.

Temperature °C (°F)	Mean number of dead leaves/plant[z] Test 1	Test 2	Test 3
15 (59)	1.2**[y]	2.6**	2.4*
18 (64)	2.3	2.7	2.5
21 (70)	2.3	3.0	3.1
24 (75)	2.8	0.2	4.4
27 (81)	4.1	0.3	3.4
30 (86)	0.7	0.2	2.0
33 (91)	0	0.9	1.4

[z]Mean number of dead leaves for 10 plants per treatment.
[y]Significant at the 1% (**) or 5% (*) level.

Myrothecium petiole rot of tissue-cultured foliage plants has been found causing losses in Florida, California, and Hawaii and is suspected to occur in the eastern Atlantic states as well. Since the disease is nearly impossible to avoid once the pathogen becomes established in a greenhouse, preventative fungicides may be the only way to minimize losses. Applications should start the day the plantlets are placed in the potting medium since the plantlets are most susceptible at this time. Timing sprays to coincide with those periods when temperatures are within the 15 to 27°C (59 to 81°F) will probably result in spraying year-round in some areas producing these plants. Since the pathogen which causes petiole rot can also cause leaf spot and visa versa, control strategies must include both diseases and all susceptible plants.

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