CONTROL OF TYPHULA SNOW MOLD ON COLD-STORED STRAWBERRY RUNNER PLANTS[1]

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Abstract

Demosan (chloroneb) was the only fungicide of nine tested that gave satisfactory control of mold in cold-stored strawberry plants that had been inoculated with Typhula sp. Captan, yuintozene, and two mercury-containing fungicides also controlled the mold but, unlike Demosan, were phytotoxic at the rates used.

Introduction

Losses of cold-stored strawberry plants due to a Typhula sp. have been reported in Nova Scotia (1, 2). Average plant losses are generally less than 25%, but nursery growers have lost up to 26% of their cold-stored plants (2).

The effect of several post-harvest fungicide treatments on control of Typhula sp. in cold-stored plants and on plant survival are reported in this paper.

Materials and methods

Strawberry plants, cultivar Redcoat, cleaned and ready for storage were obtained from a commercial nursery. Nine fungicides either alone or in combination were used in these tests. The name, active ingredient, formulation, and source of each of the fungicides are as follows:

Bay 33172, 2-(2 furyl)-benzimidazole 50%, WP. Chemagro Corporation, Kansas City, Missouri.

Daconil 2787, tetrachloroisophthalonil 75%, WP. Diamond Alkali Co., Cleveland, Ohio.

Benlate, benomyl [methyl 1-(butyl carbamoyl)-2 benzimidazolecarbamate] 50%, WP. Dupont of Canada Ltd., Toronto, Ontario.

Demosan, chloroneb (1, 4-dichloro-2,5-dimethoxy-benzene) 65%, WP. Dupont of Canada Ltd., Toronto, Ontario.

Thylate, thiram 65%, WP. Dupont of Canada Ltd., Toronto, Ontario.

Puratized Agricultural Spray, phenylmercury triethanol-ammonium lactate 7.5%, Sn. Gallowhur Chemicals Canada Ltd., Montreal, Quebec.

Erad Eradicant Fungicide, phenylmercuric acetate 10%, Sn. Green Cross Products, CIBA Co. Ltd., Montreal, Quebec.

Captan, captan 50%, WP. Green Cross Products, CIBA Co. Ltd., Montreal, Quebec.

Terraclor, quintozene 75%, WP. Olin Agricultural Division, Little Rock, Arkansas.

The fungicides used as dusts were prepared by diluting the wettable powder products with talc: to obtain the concentration of active ingredient listed in Table 1.

Eight bundles of 25 plants were dipped or dusted with each fungicide material at the rates shown in Table 1. For each dip treatment, the bundles of plants were dipped in the fungicide for 1 minute and the excess liquid was allowed to drain off before inoculating with Typhula. For the dust treatments, each bundle of plants was opened up and the dust was applied using a jar with a perforated cover. Four bundles of plants from each treatment were then inoculated by placing 25 g of pulverized cornmeal-sand cultures of Typhula around the crowns and tops of the roots. The remaining four bundles of plants from each treatment were not inoculated. Controls consisted of water-dipped or untreated plants. The plants were stored at -1.1 C in polyethylene bags tied at the top with a wire tag. After 6 months the plants were removed from storage and observations on mold development were recorded as % plants affected. A sample of 25 plants from most treatments was planted in soil in the greenhouse and observations on appearance and survival were recorded.

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Table 1. Effect of post-harvest fungicide treatments on the development of mold on Typhula-inoculated strawberry plants and on the survival and growth of the plants in the greenhouse following storage for 6 months at -1.1 C

Fungicide	Rate (lb formulation/ 100 gal)	Post-harvest treatment	Mold (%)	Survival (%)* I	Survival (%)* NI	Growth of plants** I	Growth of plants** NI
Bay 33172	2	Dip	100				
Bay 33172	4	Dip	100				
Benlate	3	Dip	100				
Benlate 12.5% active		Dust	100	88	100	3	4
Captan	2	Dip	100				
Captan	4	Dip	Trace†	80	96	2	2
Captan 7.5% active		Dust	100	52	100	2	4
Daconil	1	Dip	100				
Daconil	2	Dip	100				
Daconil	4	Dip	100				
Daconil	8	Dip	100				
Demosan	2	Dip	25	100	100	5	5
Demosan	4	Dip	0	100	100	5	5
Demosan 8.4% active		Dust	7	100	100	5	5
Puratized Agr. Spray	1/2 pt	Dip	Trace†	84	100	3	3
Puratized Agr. Spray	1 pt	Dip	0	88	100	3	3
Erad	1/2 pt	Dip	0	0	0	0	0
Terraclor	4	Dip	7.5	100	100	2	2
Terraclor	8	Dip	Trace	100	100	1	1
Terraclor + Captan	2 + 2	Dip	10	100	100	3	4
Terraclor + Captan	4 + 4	Dip	Trace	100	100	2	3
Terraclor + Captan	8 + 8	Dip	Trace	100	100	1	1
Thylate	2	Dip	100	100	100	3	4
Thylate 7.5% active		Dust	100	88	100	3	4
Control		Water dip	100	52	100	1	4
Control		None	100	72	100	2	5

* I indicates inoculated with Typhula and NI, not inoculated.

** Rating of plant growth: 0 = no growth, 1 = very poor, 2 = poor, 3 = fair, 4 = good, 5 = excellent. Absence of a rating for survival or growth indicates that because of extensive mold development the plants were not included in the greenhouse test.

† Roots dark when removed from storage.

Demosan was the only fungicide that gave satisfactory control of Typhula in inoculated cold-stored strawberry runner plants and had no phytotoxic effects (Table 1). Demosan was most effective for mold control at 4 lb per 100 gal. Although there was 25% mold on plants dipped in Demosan at 2 lb per 100 gal and 7% mold on plants dusted, these plants showed 100% survival and excellent growth in the greenhouse. Captan at the 4 lb rate, Puratized Agricultural Spray, Erad, and Terraclor controlled Typhula but were phytotoxic. Captan at the 4 lb rate caused the roots to become black, while the mercury fungicides and Terraclor retarded plant growth. Bay 33172, Benlate, Daconil, and thiram did not control Typhula.

Both the dip and dust treatments with Demosan gave satisfactory control of Typhula mold on cold-stored strawberry runner plants, but this fungicide is not registered in Canada for use on strawberry plants.

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Literature cited

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