

# Fungicides for control of chrysanthemum rust

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Rust of chrysanthemum, showing the top and bottom of infected leaves.

Rust of chrysanthemum caused by *Puccinia chrysanthemi* is common when plants are grown outdoors, and occasionally causes losses in greenhouse-grown potted plants and the cut flower crop. With the continuing rise in the cost of fuel, greenhouse growers are ventilating less and consequently creating conditions that favor rust.

There are several fungicides registered for use in controlling the disease; however, some of the newer, more effective rust fungicides have not been evaluated for control of rust of chrysanthemum. The purpose of this study was to identify the most effective chemicals for use in a rust control program.

## Materials and methods

Chrysanthemum cultivars were grown in a sand-peat potting mixture in four-inch clay pots, in a greenhouse with temperatures ranging from 16° to 27°C. In the first experiment, the cultivars were 'Yellow

Bonnie Jean' and 'Red Beauregard'; 'Paragon' was added in the second experiment. Fungicides were applied using an air-pressurized Hudson sprayer. Plants were sprayed to run-off. The plants were inoculated one week after application of the fungicides by spraying with a water suspension of urediospores. Plastic bags were placed over the inoculated plants for 24 to 36 hours. Disease evaluations were made 3 to 4 weeks after inoculation. The results are presented in tables 1 and 2.

In the first experiment zineb provided excellent control. The two experimental compounds, Triadimefon and RH-2161, provided some control but not enough to warrant further testing. In the second experiment, all of the fungicides provided superior control. No injury was noted from any of the treatments nor was there any effect on blooming. Of the fungicides evaluated, only zineb presently is registered for use in controlling rust of chrysanthemum. Chlorothalonil (Daconil 2787) is registered for

use in controlling foliage diseases of chrysanthemum; thus, applying this fungicide would also help to control rust.

Both zineb and chlorothalonil control rust by protecting sprayed parts from infection. It is important that they be applied before infection. As new growth develops, it also must be treated. Repeated applications at 7- to 10-day intervals may be necessary for control of rust under conditions particularly favorable for disease development.

Application of oxycarboxin through the drip or tube irrigation system offers several advantages. There is less worker exposure to the pesticide from application and from handling the plants, no visible residue is present on the leaves to detract from the appearance of the plants, and application is inexpensive.

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TABLE 1. Evaluation of Fungicides for Control of Chrysanthemum Rust on Two Cultivars

Treatment	Amount/liter	Average number of rust pustules per leaf§	
		Yellow	Red
		Bonnie Jean	Beauregard
Dithane Z-78* 75W	1.80 g	7	2
RH2161†	2.50 ml	65	39
RH2161	1.25 ml	119	65
Bayleton‡ 25W	0.60 g	265	110
Bayleton 25W	0.30 g	198	125
Control	---	322	223

\* Zineb, Rohm and Haas Co.  
 † Experimental Compound, Rohm and Haas Co. 240g/liter  
 ‡ Triadimefon, Mobay Chemical Co.  
 § Average of 4 plants. Total infected leaves (10 to 15) per plant divided into total number of rust pustules on the leaves of each plant.

TABLE 2. Evaluation of Fungicides for Control of Chrysanthemum Rust

Treatments*	Amount per liter	Average number of rust pustules per leaf			Average number of infected leaves		
		RB‡	YJB‡	P‡	RB	YBJ	P
Plantvax† drench	0.031g	0	0	0	0	0	
Furavax EC	15.0 ml	0	0	0.50	0	0.50	
Plantvax	1.20 g	0.50	2.0	3.3	0.50	1.8	
Daconil 2787	1.80 g	2.0	1.5	3.8	1.5	0.75	
Ortho Triforine EC	0.93 ml	0.25	6.5	5.8	0.25	4.0	
Fore	1.80 g	0.75	1.0	3.3	0.75	0.5	
Dithane Z78	1.80 g	1.3	7.8	4.8	1.0	2.0	
Control	---	15	20	31	6	7.5	
LSD 0.05		4.4	6.7	8.8	1.8	2.3	

\* Plantvax = 75% oxycarboxin, Furavax EC = 60 g/liter 2,4,5-trimethyl-N-phenyl-3-furancarboximide.  
 Daconil 2787 = 75% chlorothalonil, Ortho Triforine EC = 18.2% triforine.  
 Fore = 80% mancozeb, Dithane Z-78 = 75% zineb.  
 † Five weekly applications of 200 ml/4" pot beginning two weeks before inoculation.  
 ‡ RB = 'Red Beauregard,' YJB = 'Yellow Bonnie Jean,' P = 'Paragon.'