CONTROL OF GLOEOSPORIUM ALBUM ROT AND STORAGE SCAB OF APPLES WITH ORCHARD FUNGICIDES[1]

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Abstract

A regular orchard spray program of Delan gave excellent control of a storage rot of apples caused by Gloeosporium album and storage scab of apples caused by Venturia inaequalis. Dodine was effective for storage scab but not for storage rot. Folpet usually gave better control of rot caused by G. album than did captan but was not consistently effective against storage scab.

Introduction

In 1960, Ross and Lockhart (4) reported that excellent control of a storage rot of apples, caused by Gloeosporium album Osterw., was obtained with a regular orchard spray program of captan followed by 2 late cover sprays of captan or a mixture of captan and zineb. Late cover sprays of zineb or a mixture of captan and zineb controlled storage scab caused by Venturia inaequalis (Cke.) Wint. Recently workers in England (1,2,3) have found that dormant applications of mercury fungicides give some control of Gloeosporium spp. A fungicide is needed that would control both apple scab and Gloeosporium storage rot without applying extra cover sprays.

Each year apples from apple scab fungicide plots are placed in storage to assess the effect of sprays on the incidence of storage rots and storage scab. The results for 1961 and 1962 are given in this paper.

Materials and Methods

The orchard used in previous work (4) was divided into 3 blocks with the treatments randomized in each block. The sprays were applied dilute with a hand gun and the trees were sprayed to run-off. In 1961, 4 pre-cover (May 15, 23-24, June 1, 12-13) and 3 cover (June 21-22, July 3, 17-18) sprays were applied except in a dodine treatment which received 6 sprays at 12-day intervals ending on July 10. In 1962, 5 pre-cover (May 7, 16, 24-25, June 7, 14) and 3 cover (June 26, July 5, 18) sprays were applied with the 12-day dodine treatment consisting of 7 sprays ending on July 20.

The fungicides used were:

Captan (Captan 50-W), N-(trichloromethylthio) - 4 - cyclohexene - 1, 2 - dicarboximide, 50% (Stauffer Chemical Co., New York, N.Y.)

Dodine (Cyprex), n-dodecyl guanidine acetate, 65% (Cyanamid of Canada, Ltd., Toronto, Ont.)

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Folpet (Phaltan 50-W), N-(trichloromethylthio) phthalimide, 50% (California Chemical Co., Richmond, California.)

Glyodin (Crag Fruit Fungicide 341), 2-heptadecyl -2-imidazoline acetate, 34% (Green Cross Insecticides, Montreal, Que.)

Delan, 2,3-dinitrilo 1, 4 -dithioanthroquinone, 75% (Green Cross Insecticides, Montreal, Que.)

One bushel of unblemished apples of each of the varieties McIntosh and Cortland from each plot were stored at 32°F. The McIntosh were stored for about 6 months and the Cortlands for about 5½ months before examining for fruit showing Gloeosporium rot and storage scab. In calculating the per cent fruit with rot or scab all affected fruits were included irrespective of the number of infections. Identification of the causal organisms of nonsporulating lesions was made from isolations on PDA.

Results and Discussion

The results for 1961 are in Table 1 and those for 1962 are in Table 2. There was considerable variation between different replicates of some treatments so rather large differences are required for significance. This suggests that larger samples would be required to give more uniform data. Nevertheless, Delan gave the best and most consistent control of Gloeosporium fruit rot. In 1962, varying the rate of application of Delan made little difference in the control obtained. Dodine did not consistently give good control of rots and the results with folpet varied although it was usually more effective than captan. A regular captan schedule, without extra cover sprays, is usually regarded as being somewhat effective (4) against Gloeosporium storage rot of apples but in these tests it was always less effective than Delan.

Storage scab was much more severe in 1962 than in 1961. In both years Delan gave excellent control. In general, dodine, particularly at the 3/4-1/2 lb. rate, also gave good control; this agrees with previous results (4). Folpet was effective against storage scab in 1961 but not in 1962. Captan did not give good control of storage scab in either year.

Delan was the only fungicide that consistently gave good control fo both storage scab and Gloeosporium rot. If it becomes accepted as an apple fungicide, extra cover sprays should not be necessary for the control of these diseases.

Table 1. Effect of orchard fungicides on G. album rot and storage scab of apples - 1961

Fungicide and rate per 100 gallons		Per cent rot and scab			
		McIntosh		Cortland	
Pre-cover	Cover	Rot	Scab	Rot	Scab
Dodine, 3/4 lb.*	Dodine, ½ lb.*	6.1 ab	2.6 a	8.9 c	0.0
Dodine, 3/4 lb.	Dodine, ½ lb.	12.0 b	0.3 a	4.3 abc	0.1
Dodine, ½ lb.	Dodine, ¼ lb.	6.6 ab	13.2 ab	3.4 ab	2.9
Dodine, ¼ lb. + glyodin, 1 pint	Dodine, ¼ lb. + glyodin, 1 pint	7.1 ab	6.9 ab	8.5 c	0.6
Dodine, ¼ lb. + captan, 1 lb.	Dodine, ¼ lb. + captan, 3/4 lb.	3.9 ab	0.6 a	6.6 bc	0.2
Folpet, 2 lb.	Folpet 1½ lb.	1.6 a	1.4 a	5.7 bc	0.6
Delan, 2 lb.	Delan, 1½ lb.	1.2 a	0.0 a	2.4 a	0.0
Captan, 2 lb.	Captan, 1½ lb.	5.6 ab	23.6 b	5.1 bc	2.6

* Sprayed every 12 days.

The small letters in Tables 1 and 2 indicate Duncans' multiple range groupings, treatments with the same letter do not differ significantly at the 5% level. There are no significant differences in columns without small letters.

Table 2. Effect of orchard fungicides on G. album rot and storage scab of apples 1962.

Fungicide and rate per 100 gallons		Per cent rot and scab			
		McIntosh		Cortland	
Pre-cover	Cover	Rot	Scab	Rot	Scab
Dodine, 3/4 lb.*	Dodine, ½ lb.*	12.3	0.6 a	6.8	0.8 a
Dodine, 3/4 lb.	Dodine, ½ lb.	8.6	8.1 abc	4.7	1.7 a
Folpet, 2 lb.	Folpet, 1½ lb.	4.9	46.4 cd	3.4	34.6 b
Folpet, 1 lb.	Folpet, 1 lb.	5.7	40.2 bc	1.9	36.2 b
Delan, 2 lb.	Delan, 1½ lb.	2.0	0.0 a	2.0	0.4 a
Delan, 1 lb.	Delan, 3/4 lb.	1.3	1.1 ab	0.8	0.0 a
Delan, ½ lb.	Delan, ½ lb.	2.6	0.0 a	1.5	0.0 a
Captan, 2 lb.	Captan, 1½ lb.	8.1	46.6 cd	7.0	27.1 b

* Sprayed every 12 days.

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