

# Brussels sprout ring spot control with fungicides

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Benomyl fungicide almost completely controlled ring spot in Brussels sprouts, and was better at the 1 per cent level of significance than all other fungicides included in the trial. Daconil 2787 resulted in 90 per cent control and was significantly lower in number of lesions per leaf at the 1 per cent level than were maneb and maneb plus zinc compounds which gave 72 per cent control. Some degree of control (42 to 50 per cent) was given by captan, copper and thiram.

**R**ING SPOT, caused by the fungus *Mycosphaerella brassicola*, becomes widespread during the winter in the Central Coast Brussels sprout growing district of California. High humidity and rainfall with moderately cool temperatures provide ideal conditions for development of the disease. Symptoms first appear in late fall as lesions on mature or senescent leaf tissue. Older or less vigorous plants are usually infected first. As the disease progresses, infections occur on younger leaves and then on the sprouts. Large losses are sustained in many winter-grown fields as a result of infection on sprouts. At points of infection, the fungus produces a brown or reddish-tan lesion up to 1/2 inch in diameter, bordered by a green zone that retains its color even after the leaf turns yellow. The spots become gray with age and usually have concentric rings with numerous small black fruiting bodies of the fungus appearing in the lesions.

## Inoculum

The primary inoculum for the disease originates from infected plant debris in and on the soil. Since crop rotation is not usually practiced by Brussels sprout growers, the practice of continuous cropping leads to a build-up of inoculum in the field.

Brussels sprout fields grown for winter harvest were selected in Davenport, north of Santa Cruz, as experimental areas for testing several fungicides for control of

Ring Spot. The variety used in this two-year experiment was Gravendeel. Fungicides were applied when the disease first appeared and retreatment was made every 14 days for a total of 4 applications. All fungicides were applied at 1 1/2 lbs. of active material plus 1 per cent X77 spreader in 80 gallons of water per acre using a constant air pressure sprayer with an 8003 nozzle at a pressure of 28 psi. Each plant was sprayed to run-off. Fungicides used in the trials were thiram (Thylate), copper (Kocide 101), captan, maneb (Dithane M22), maneb plus zinc (Manzate D and Dithane M45), Daconil 2787 and benomyl (Benlate).

## Control

The control was evaluated in each plot by sampling the fourth or fifth leaf from the growing point two weeks after the last treatment was applied. Eight leaves from each treatment in each replication were taken and the number of lesions were counted in the 1968 trial and the number on 10 leaves in the 1967 trial. Each treatment was replicated four times in a randomized block design.

Disease incidence and infection occurred earlier in the 1967 trial than in the trial conducted in 1968. This difference may have been due to the fact that

about three times more rain (10 to 12 inches) fell during the trial in 1968 and the average temperature was approximately 6° cooler in 1968 than in 1967. Also, the fields were planted about 20 days later in 1968 than in 1967. However, the degree of control achieved was about the same for both years.

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EFFECT OF FUNGICIDE SPRAYS ON CONTROL OF RING SPOT OF BRUSSELS SPROUTS

Treatments*	Number of lesions per leaf		Per cent Control
	1967†	1968†	
benomyl	0.8	.2	98.2
Daconil 2787	1.8	2.8	87.2
maneb zinc (Dithane M45)	5.3	7.9	64.5
maneb zinc (Manzate D)		8.0	64.4
maneb		8.5	61.1
captan	12.9	11.1	50.3
copper		12.7	43.4
thiram	11.3	12.9	42.4
check	25.6	22.4	

\* All fungicides applied at rate of 1 1/2 lbs active ingredient per acre.

† Analysis computed on transformed data. All figures connected with a common line not significant at 1% level.

Brussels sprout leaf infected with ring spot (to right), compared with leaf protected by chemical (shown to left).

