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## Sprays for the Control of Fusarium Stem Rot of Carnations

By Ralph Baker

Recently several new spray materials were tested for their efficacy in controlling Fusarium stem rot of carnations (4). At least one of these (OM 1564) was very effective. It also stimulated rooting over and above controls treated only with the conventional rooting hormones. Unfortunately this compound has not been released commercially; therefore, a new look at some of the compounds currently available seemed warranted.

Early laboratory tests indicated that captan was very effective in preventing the germination of spores of Fusarium roseum f. cerealis. Thus sprays of captan at 8-10 day intervals have been recommended for some time (1). Panogen 15 and ferbam have been intensively tested and recommended as dips and drenches (3). Phaltan, a new compound which in certain cases has proved to be superior to captan, has been suggested for carnations (2).

### Materials and Methods

The procedure for testing the fungicides was essentially that used by Petersen (4). Separate mother blocks were sprayed each week for 3 weeks with a suspension of conidia of F. roseum f. cerealis. One day after each of these inoculations,

the various fungicides were sprayed on the mother blocks. Each mother block contained 30 plants (varieties Red Gayety and Miller's Yellow) and received 500 ml. of the fungicidal solution or suspension.

Captan was combined with ferbam, Glyodin and Panogen 15 respectively. All of these compounds were used at 1000 ppm active ingredient except Panogen 15 which was used at 125 ppm. These compounds also were used alone at these concentrations. Phaltan (1000 ppm active) was also used alone.

### Results and conclusions

One day after the second application of the fungicides, 36 cuttings of each variety in each treatment were taken from the mother blocks and rooted under mist for 21 days. At the end of this period, isolations from the base of each cutting were attempted to determine whether F. roseum f. cerealis was present. The results of this experiment are recorded in Table 1.

F. roseum f. cerealis was found in very few cuttings derived from mother blocks sprayed with captan, ferbam, captan and ferbam, or captan and Glyodin.

To test further the potentialities of these compounds, a like number of cuttings was taken 1 day after the third application of fungicides. These were rooted as before but in this instance the plants were transplanted to separate nurse beds to observe the development of symptoms. Fifty-one days after transplanting, the number of dead plants and plants with distinct lesions characteristic of *Fusarium* stem rot were noted. This experiment was designed to duplicate what might happen under conventional culture, as spread of the pathogen in these nursebeds was possible. The results of this experiment are recorded in Table 2.

Table 1 -- The number of cuttings from which isolations of *F. roseum* f. *cerealis* were obtained 21 days after the application of various fungicides.

Fungicide <sup>a</sup>	Red Gayety	Miller's Yellow <sup>b</sup>
Captan	0	2
Ferbam	0	4
Glyodin	4	12
Panogen	8	14
Phaltan	14	2
Captan & ferbam	4	0
Captan & Glyodin	0	0
Captan & Panogen 15	6	8
Inoculated control	20	16
Non-inoculated control	0	0

<sup>a</sup>Fungicides were applied twice at weekly intervals.

<sup>b</sup>Isolations were attempted from 36 cuttings of each variety.

Table 2 -- Development of *Fusarium* stem rot in carnations derived from mother blocks which had been sprayed with various fungicides.

Fungicides <sup>b</sup>	Number of plants dead <sup>c</sup>		Number of plants with lesions	
	Red Gayety	Miller's Yellow	Red Gayety	Miller's Yellow
Captan	0	0	1	2
Ferbam	0	1	14	16
Glyodin	12	19	24	17
Panogen	1	3	15	18
Phaltan	2	0	9	3
Captan & ferbam	0	0	13	5
Captan & Glyodin	1	0	21	16
Captan & Panogen 15	0	0	5	2
Inoculated controls	17	29	18	7
Non-inoculated controls	0	0	0	0

<sup>a</sup>Symptoms noted after 21 days rooting period and 51 days in the nurse bed.

<sup>b</sup>Fungicides were applied 3 times at weekly intervals.

<sup>c</sup>There were 36 plants of each variety in each treatment.

Captan proved to be the most effective under the conditions of this experiment.

From the results of these experiments, captan would appear to warrant continued recommendation as a fungicide for carnation mother blocks.

### Literature Cited

1. Baker, Ralph. 1955. Thinking about carnation diseases. 1954-1955. Colorado Flower Growers Association Bulletin 68: 1-4.
2. Dr. A. W. Dimock, Cornell University, reports on carnation diseases. 1958. Carnation Craft No. 43: 1-6.
3. Petersen, L. J. 1956. Control of Fusarium stem rot of carnations with fungicidal cutting dips. Colorado Flower Growers Association Bulletin 84: 1-3
4. Petersen, L. J. 1957. A look at some of the new spray materials for carnation mother blocks. Colorado Flower Growers Association Bulletin 92: 3-4.