

Fusarium Stem Rot of Carnation: Control Using Systemic Fungicides as Sprays on Mother Blocks

Ralph Baker and
Norman Denoyer¹

A previous paper has reported successful control of *Fusarium* stem rot of carnation in propagation using systemic fungicides in rooting hormones (2). This paper presents results of experiments designed to test the effectiveness of these fungicides when they are used as sprays on mother blocks.

The primary means of dissemination of *Fusarium roseum* in Colorado apparently is carry-over of inoculum on cuttings (1). Periodic fungicidal sprays to mother blocks with captan have been recommended to reduce this inoculum (3). Thus the investigations reported in this paper were designed to test the effectiveness of

the systemic fungicides in sprays in comparison with captan and to determine whether systemic fungicidal activity rendered treated cuttings more resistant to infection.

Cuttings of Pink Sim were produced on mother blocks sprayed every 10 days with captan, Benomyl, or TBZ. Rates in all cases were 1 lb/100 gal water. Mother blocks in controls were sprayed only with water and four replications were used.

Ten cuttings per replication of each treatment were placed in containers (2) with perlite infested with conidia (1000 propagules/cm³) of *F. roseum*. After three weeks, the cuttings were removed and symptoms of *Fusarium* stem rot noted.

¹Denoyer assisted with this work while a senior in Horticulture. Present address: Salida, Colorado.

The results of two repeated experiments are shown in Table 1. While a slight reduction in disease index was noted as a result of using Benomyl and TBZ as compared with the inoculated control, the differences were not striking. As expected, captan gave little evidence of systemic activity.

Table. 1. Symptoms of stem rot on inoculated cuttings^a derived from mother blocks sprayed with various fungicides^b.

| Treatment | Disease index ^c | |
|--------------------|----------------------------|---------------------------|
| | Experiment 1 ^d | Experiment 2 ^d |
| captan | 2.4 | 2.6 |
| Benomyl | 1.9 | 2.3 |
| TBZ | 1.9 | 2.3 |
| Inoculated control | 2.5 | 2.9 |

- a* Cuttings inoculated in propagative bed with 1000 propagules/cc of perlite.
b Fungicides applied at 10-day intervals to mother blocks at rate of 1 lb/100 gal water.
c Disease index on 0-3 scale with 0 being no symptoms and 3 being severe.
d Each experiment had 10 cuttings per treatment in each of 12 replications.

Other experiments were done to determine whether Benomyl and TBZ were comparable with captan in reducing inoculum on cuttings in mother blocks. These were infested heavily with conidia of *F. Roseum* by spraying the plants with a spore suspension. At 10-day intervals two applications of the fungicides were applied in sprays as before. Cuttings were then taken and propagated in steamed perlite under mist and symptoms noted after propagation.

Results are listed in Table 2. Benomyl and TBZ were effective in control. The latter was phytotoxic to mother plants, however, at the concentration used. In this treatment cuttings were thin and plants were stunted.

Table 2. Percent of plants with symptoms of Fusarium stem rot in infested a cuttings from mother plants sprayed with various fungicides b.

| Treatment ^c | Symptoms ^d |
|------------------------|-----------------------|
| | Percent |
| captan | 4 |
| Benomyl | 4 |
| TBZ | 10 |
| Inoculated control | 73 |

- a* Cuttings infested by spraying heavy suspension of conidia on mother plants.
b Fungicides applied at 10-day intervals two times after mother plants had been infested with conidia of *Fusarium roseum*.
c There were 12 cuttings per treatment in each of 4 replications.
d Percent of plants with symptoms after 3-week rooting period in propagative bench.

Thus Benomyl should be promising as an alternative fungicide for use in reducing inoculum on cuttings produced on mother blocks. The results reported in Table 1, however, indicate that application of TBZ and Benomyl in sprays is an inefficient method of inducing systemic fungicidal activity in cuttings.

Literature Cited

- Holley, W. D. and R. Baker. 1963. Carnation production. Wm. C. Brown Co., Dubuque, Iowa. 142 pp.
- Nash, C. H., and R. Baker. 1972. Fusarium stem rot of carnations: control using systemic fungicides in rooting hormone. Colo. Flow. Grs. Assoc. Bull. 271.
- Petersen, L. J., R. Baker, and R. E. Skiver. 1959. Control of Fusarium stem rot of carnations: I. Application of fungicides to mother blocks. Plant Disease Reporter 43:1204-1208.