A Look at Some of the New Spray Materials for Carnation Mother Blocks

by L. J. Petersen

Generally speaking, the presence of Fusarium stem rot (causal agent, Fusarium roseum f. cerealis) has been correlated more frequently with cuttings and plants grown under the mother-block system than other cultural systems (1). Evidence to date has indicated that the application of captan to infested mother-blocks has def-

initely decreased the incidence of this disease. Complete control has not been achieved, however; therefore, some new materials have been tested in 1956 and 1957 and evaluated for their effectiveness as pre-harvest sprays on carnation mother-blocks.

Although the cultured-cutting technique (2) has reduced the incidence of systemic diseases of carnations to negligible proportions, the elimination of parasites within the cutting does not guarantee pathogen-free stock. This observation has focused attention on the problem of reducing inoculum on infested cuttings, presumably capable of carrying-over the organism from the mother-block to the propagative beds (1). Consequently, the importance of an effective spray treatment designed to reduce the incidence of infection from inoculum originating at this source cannot be over-emphasized.

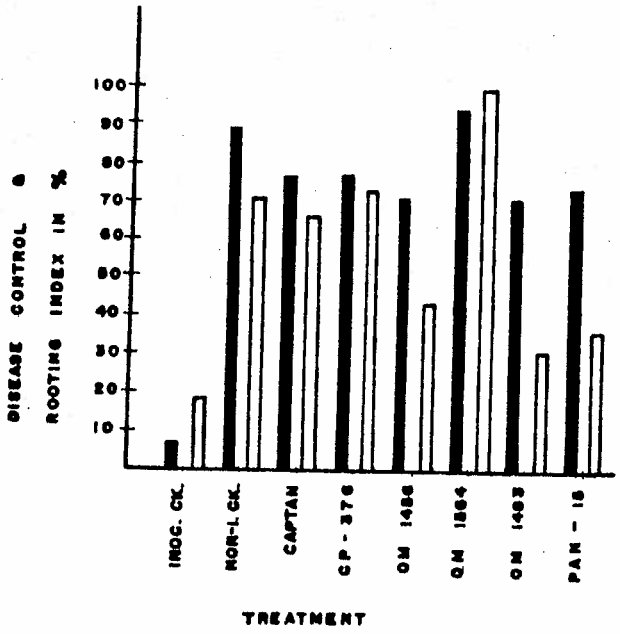


Fig. 1.--The effect of various antifungal pre-harvest sprays on control of Fusarium stem rot and degree of rooting of Red Sim carnations. Solid bars show disease control in percent and white bars show degree of rooting in percent.

Captan has been the recommended pre-harvest spray material for carnations (1), but, since the stem rot pathogen is so difficult to control, the

search continues for fungicides with greater potentialities. Among the new materials, the Omadines (manufactured by the Olin Mathieson Chemical Corp.) appear to have interesting possibilities. With the manganese salt of Omadine, OM1564 holding the most promise for effective control of F. stem rot. This chemical possesses potent fungicidal activity and in addition seems to stimulate rooting after a series of 8 weekly sprays (Fig. 2 and 3)

Fig. 2.--Illustration showing degree of rooting between cuttings taken from an OM1564 treated plot and a non-inoculated, non-treated check. Cuttings on left sprayed a total of 8 times with OM1564 at 1000 ppm.

Materials and Methods

The test compounds consisted of 3 Omadines, OM1483, OM1456, and OM1564, captan, dichloronitrobenzene (CP376) and Panogen 15. The test organism was the most pathogenic strain of Fusarium roseum f. cerealis isolated from diseased plants in the Denver area. Macroconidia of this organism were suspended in distilled water and standardized to 100,000 spores/ml. The spore suspension was then applied as a fine spray to mother block test plants as uniformly and evenly as possible. After inoculation the plants were allowed to dry for 24 hours before chemical treatments were applied. All chemical sprays were applied with a Burgess electric sprayer model VS-651. The rate of application was 500 cc./plot (test plots contained 36 plants each) at dosages of 2 gr./liter for the wettable powders and a dilution of 1:800 for Panogen 15. Colloidal multifilm was used as a wetting agent.

Fig. 3.--Inoculated control plot 83 days after benching. Note large number of diseased plants and compare with Fig. 4.

Cuttings were propagated under mist after treatment. The rooting period was 21 days in all tests. After the rooting period cuttings were rated for disease severity and degree of rooting. In some cases, rooted cuttings were transplanted in order to further observe the performance of the various spray materials.

Fig. 4.--OM1564 treated plot 83 days after benching.

Results and Conclusions

At the concentrations tested, OM1564 was more effective in controlling Fusarium stem rot after 3 successive foliar applications than any material tested and equally as effective after 8 applications. In addition, rooting was noticeably better after 8 applications than the non-inoculated control.

While captan reduces the incidence of Fusarium stem rot, the data presented in Fig. 1 indicates that newer materials may be as good or better for this purpose.

Several factors must be considered, before conclusions can be drawn. Even though OM1564 (Mn Omadine) appears to be better than captan in the control of Fusarium stem rot, it may be altered chemically under certain conditions. This may be observed readily by a change in color after a few minutes exposure to either sunlight or fluorescent light. The full significance of this has not been worked out but tests have indicated that the compound is 50% less effective after 7 days exposure to sunlight.* This may or may not be a determining factor in its usefulness as a fungicide. Certainly, it appears that this would govern the timing of spray applications to some extent.

Perhaps an even more significant factor involved is availability of the compound, since none of the Omadines are on the market at present. It is known that at least a few may be available in the future. Whether or not Manganese Omadine will be one of these is not known.

The experiments reported and discussed in this report represent initial steps in evaluating OM1564. Further testing is necessary under commercial scale operations.

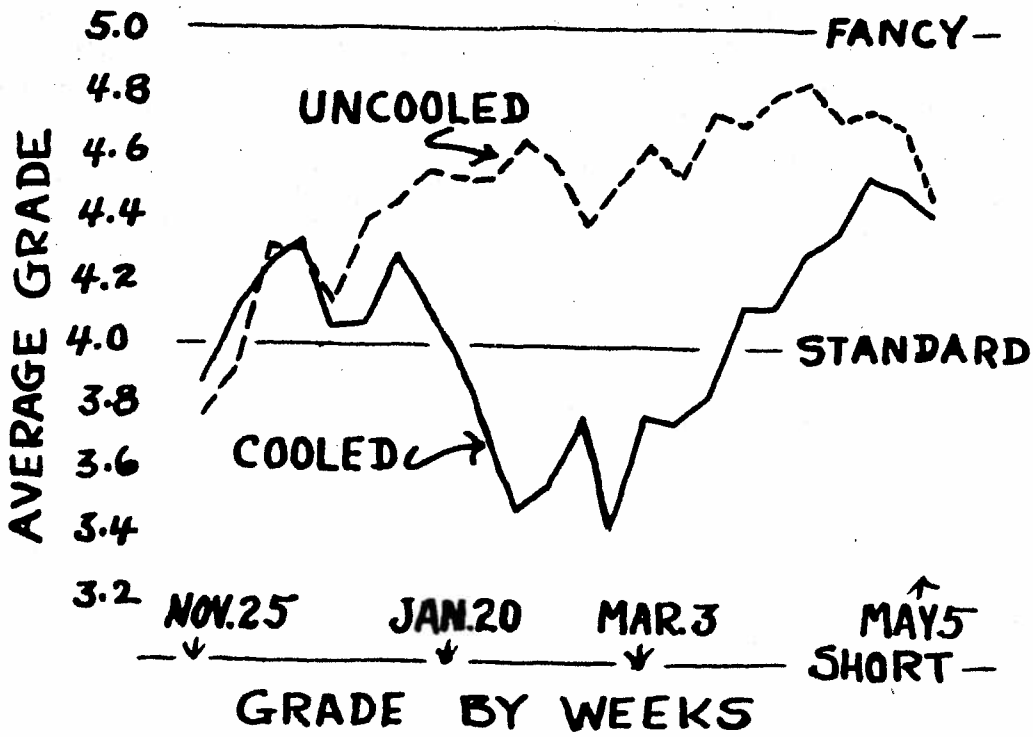
Literature Cited

1. Baker, Ralph. 1957. Thinking about carnation diseases. Colorado Flower Growers Assoc. Bulletin. 90:1-5.

2. Tammen, J., R. K. Baker, and W. D. Holley. 1956. Control of carnation diseases through the cultured cutting technique. Plant Dis. Reptr. Supplement 238:72-76.

* Personal communication from A. M. Hillis, Olin Mathieson Corp.

How Summer Cooling Affected Winter Quality in One Planting at Fort Collins Last Year



There is a lot of food for thought in this graph. We will cover this and a lot of other important points at the College Day session on Wednesday, October 9. Plan to be here.

your editor
W D Holley