

Resistance of Some Carnation Varieties to Fusarium Stem Rot

By Ralph Baker

In a recent bulletin* results were reported indicating that *Fusarium roseum* f. *cerealis*, causal agent of the disease known as stem or branch rot, was not an important factor so long as cuttings were kept free of the disease during the propagative period. In repeated trials plants were inoculated with the pathogen at the time of transplanting from the propagative bench to the nurse bed. Some suppression of growth occurred when plants were inoculated at this time; however, they were not killed unless improper cultural methods were practiced thereafter. Only the variety Frosted Sim was used in these tests, hence it was desirable to compare the degree of resistance of this variety to that of other varieties. In the fall of 1954 an experiment was set up for this purpose involving 7 other varieties.

Indexed cuttings of the varieties listed in Table I were placed in the propagative bench for 21 days. All the varieties except Yellow Number 9 produced adequate root systems during this period. The plants were then placed in steamed soil in flats and inoculated with a heavy spore suspension of the pathogen. The design of this experiment was a randomized block with 3 replications. Twelve plants of each variety were placed in each flat. Fifty one days after inoculation the plants were taken from the flat, the roots were washed, and disease index ratings determined. Plants were rated for symptoms in six classes as follows:

Plants healthy

class 0 Plants showing no symptoms on either above or below-ground parts.

Above-ground parts with no symptoms

class 1 Plants showing trace of basal rot.
class 2 Definite evidence of basal rot (Trace to one-half inch)
class 3 Basal rot extending one-half to one inch up stem.

Both above- and below-ground parts showing symptoms

class 4 Basal rot extending one to one-half inches up stem. Stem at base usually girdled. Slight wilting and graying of leaves.
class 5 Plants killed at termination of experiment.

The results are shown in Table 1. The varieties in this table are listed in the order of increasing susceptibility.

It is quite apparent from this study that the two Sim varieties tested are somewhat more resistant to the stem rot pathogen than other common varieties. This would indicate that in the more susceptible varieties stem rot may be important even when rooted cuttings free of the disease are used. Even so, with proper sanitation and cultural practices the inoculation potential build up in a nurse bed may not be sufficient to incite a great deal of damage. In this connection the greater susceptibility of some varieties in comparison to Sim would emphasize even more the importance of adequate control measures during propagation.

Table 1.--Disease index ratings of eight varieties of carnations inoculated at time of transplanting from propagative bench. Symptoms read 51 days after inoculation.

| Variety | Number of plants in each disease index class | | | | | | Mean disease index rating* |
|----------------|--|---|----|----|----|----|----------------------------|
| | 0 | 1 | 2 | 3 | 4 | 5 | |
| Aura | 18 | 1 | 5 | 6 | 5 | 1 | 1.5 |
| Frosted Sim | 12 | 5 | 8 | 6 | 4 | 1 | 1.7 |
| White Sim | 8 | 7 | 11 | 5 | 5 | 0 | 1.8 |
| Millers Yellow | 6 | 5 | 4 | 11 | 10 | 0 | 2.4 |
| Serenade | 3 | 5 | 6 | 10 | 11 | 1 | 2.8 |
| Colorado Gold | 2 | 3 | 4 | 9 | 7 | 11 | 3.4 |
| Yellow #9 | 0 | 3 | 3 | 10 | 11 | 9 | 3.6 |
| Fanfare | 0 | 2 | 1 | 4 | 8 | 21 | 4.5 |

*Represents mean disease index rating of 36 plants of each variety.

The 36 plants were divided into three replications.

Difference required for significance (odds 19:1) = 1.5
Difference required for significance (odds 99:1) = 2.0

*Baker, Ralph and James Tammen. *Fusarium* stem rot of carnations. Colo. Flower Growers Association Bulletin 58. August 1954.