Edited by Joe J. Hanan

Bulletin 412
October 1984

Published by the Colorado Greenhouse Growers' Assoc., Inc. in cooperation with Colorado State University

research bulletin

PROGRESS REPORT: EFFECT OF SOIL FUNGICIDE, *TRICHODERMA* AND LIGHTING ON PRODUCTION AND TIMING OF CARNATIONS.[1]

David F. Graper[2]

Truban® and *Trichoderma* are effective controls of *Pythium* root rot. However preliminary results at CSU have shown no effects since cultural conditions at the research range are good enough to eliminate *Pythium*, or reduce its ravages.

Three experiments are underway at the CSU Lake Street Greenhouses on carnations. The first of these is a continuation of the soil fungicide and *Trichoderma* research which was begun in June, 1983. The remaining two experiments were started in early June of this year. One is an experiment looking at soil fungicides and *Trichoderma* while the other new experiment involves lighting and timing carnations, based upon work by W.E. Healy at Minnesota.

The soil fungicide and *Trichoderma* research, started in 1983, is still underway (Fig. 1). Data has been taken through the winter and will continue to be taken through May, 1985. Although data analysis has not yet been completed, indications are that there are no significant differences between the control, steaming only, and the use of Truban® and *Trichoderma* alone or in combination. However, *Pythium* has not been found, at high levels, in soil samples from these beds.

One half of the plots will be lighted for the winter crop as a part of the lighting and timing research that is also being done.

The new bench of carnations for this research has treatments much the same as the 1983 experiment except that the plots were deliberately infested with *Pythium* inoculum two weeks after planting to simulate the usual reinfestation which occurs in greenhouse benches after steaming (Fig. 2). Possibly, due to our stringent sanitation practices, the use of Fe_{138}, or other factors, *Pythium* counts in the bench soil were nearly nonexistent when taken two months after inoculation. Fe_{138} has been found to be a less available form for the *Pythium* fungus than Fe_{330} and may have suppressed the development of the root rot. Counts of *Trichoderma* in the soil were also low.

The lighting and timing research is being conducted in two parts. The first of these consists of two new benches which have been divided into four treatments with four replicates.

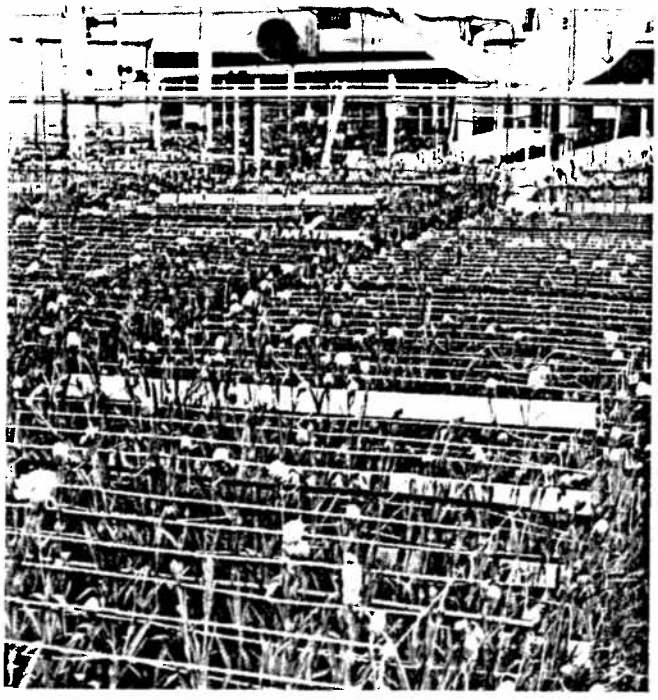

Figure 1: 1983 Soil fungicide and *Trichoderma* research plots. These are to continue for the second year with one-half of these plots to be lighted.

[1]Research supported by CGGA and American Florist Endowment.
[2]Graduate Assistant.

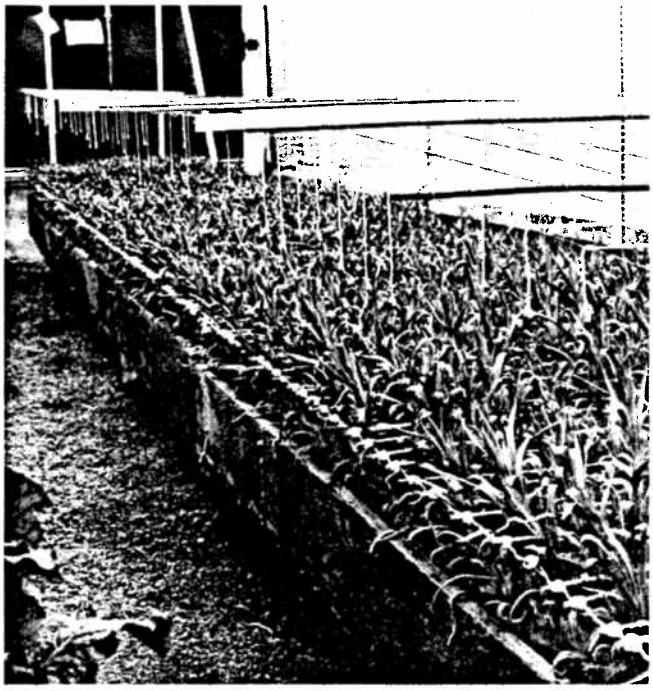

Figure 2: 1984 Soil fungicide and *Trichoderma* research plots. Planted June 7, 1984. Plots deliberately infested with *Pythium.* However, soil samples in August showed a population of only 6 propagules per gram in one of the eight plots.

Treatments consist of natural day control, 30, 45, and 60 short days followed by a long day photoperiod until the crop comes into production. Plants were given a single pinch and short days were begun when the new breaks had six to seven leaf pairs visible (Fig. 3).

The purpose of the short day treatment is to allow the second crop breaks to develop before they are suppressed by the long day treatment supplied by night interruption lighting. This should allow for a much larger and more uniform second crop to be cut during the winter months.

Counts of second crop breaks in all three new benches have been found to be significant but this significance is probably due to plot location rather than treatment affect. The short day treatment plants seem to have developed two to three more nodes on each break than the controls in this experiment (Tables 1 and 2). It is hoped that truly significant differences will show up as the plants develop and the cut begins. Research is planned to terminate in May, 1985 with a thesis available in the fall of 1985. The *Pythium* infested bench will be removed after the first crop and additional trials made while growing single plants in pots.

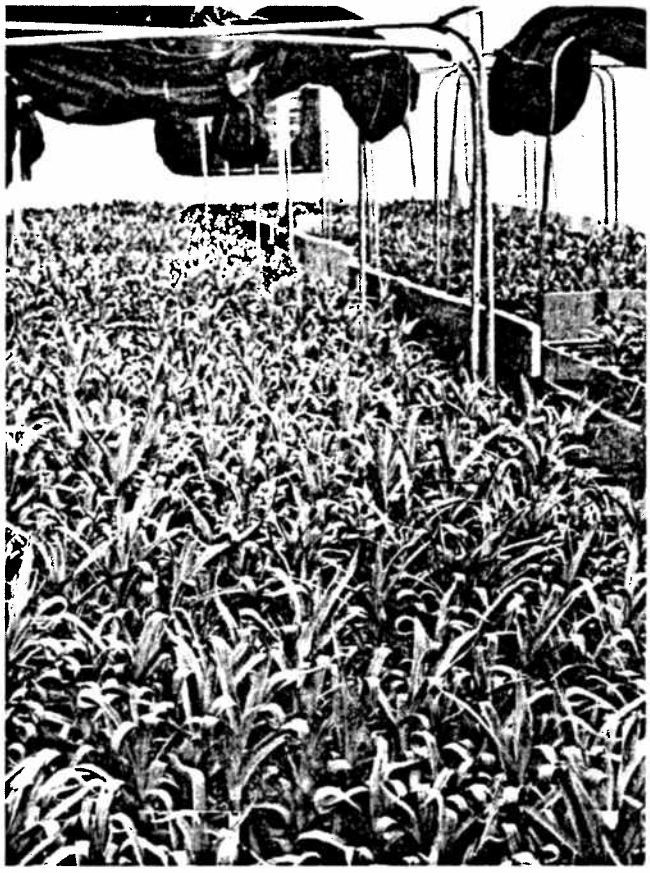

Figure 3: Lighting and timing research on carnations benched June 7, 1984.

The major point to be made at this time is that *Pythium* must be present or else Truban® and *Trichoderma* applications are wasted effort. The growth enhancement reportedly found with *Trichoderma* has not been noted. In general, where conditions are such as to enhance *Pythium* growth, defensive measures make good sense, and thus influence crop timing on carnations in terms of more flowers and faster return to peak flowering.

Table 1: Truban® and *Trichoderma* research on carnations. Side break development on first crop, counted August 22, 1984.

	TREATMENT				
	Control	Truban®	*Trichoderma*	Truban®+*Trichoderma*	LSD (5%)
Average breaks per plant	15.4	16.3	14.2	16.7	2.1

Table 2: Lighting and timing research on carnations. Side break development on first crop counted August 25, 1984.

	TREATMENT				
	Control	30 SD	45 SD	60 SD	LSD (5%)
Average breaks per plant	12.3	13.9	13.7	11.2	1.9