

USE OF SOIL FUNGICIDES TO INCREASE STANDARD CARNATION PRODUCTION

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The use of Truban® in raised soil beds resulted in a significant 12 percent yield increase of 'White #1' over a 35 week period as compared to treatments steamed only. N-Serve, a nitrification inhibitor also provided higher yields, but the difference was not statistically significant. Subdue®-treated plots did not show any effect compared to untreated.

Work by Baker and associates in the last few years suggested that *Pythium* may inhibit growth of carnations even though there are no obvious foliar symptoms. This occurs even though the soil may be steamed pasteurized prior to planting. Truban® (common name is etheridizole) is a fungicide that is specific for the control of water molds like *Pythium*, but it is also known as a nitrification inhibitor. That is, the conversion of ammonium to nitrate in the soil is prevented or reduced, tending to maintain higher soil nitrogen levels. The fungicide Subdue® (common name is metalaxyl) is also a specific inhibitor of water molds and has nitrification properties. We conducted an experiment to test the effects of etheridizole and metalaxyl on carnation production as compared to N-Serve, a chemical which is commercially employed as a nitrification inhibitor. The literature suggests N-Serve is a fungicidal to *Phytophthora* which is a related water mold. The standard cultivar 'White #1' was planted June 15, 1982, in steamed, raised, soil beds. These were pinched on July 6. The treatments were:

1. No treatment (control),
2. Etheridizole raked into the top soil layer at 15 milliliters per plot (27.3 sq.ft.),
3. Metalaxyl, 10.5 ml per plot, and
4. N-Serve, 1.22 grams per plot.

Additional applications of metalaxyl and N-Serve were made approximately 6 months later. Each treatment was randomized, three plots per treatment, in an FRP covered greenhouse. Standard cultural and nutrition procedures were followed. It should be pointed out, however, that ammonium concentration in the water was one to two mil-

liequivalents per liter — standard for Fort Collins water. Previous tests have indicated that many carnation growers in the Denver area may use ammonium concentrations in constant feed ranging from 4 to 8 meq/l.

Table 1 shows that carnations in the etheridizole-treated plots produced an average of 3.8 more flowers per plot per week than either the control or metalaxyl treatments. Plants in N-Serve-treated plots produced 1.8 more flowers per

Table 1: Effect of three soil chemical treatments on production of 'White #1' carnations planted June 15, 1982, and single pinched July 6. All treatments steam pasteurized.

	Control	Etheridizole	Metalaxyl	N-Serve	
Average cut flowers per week per plot	28.6	32.4	28.5	30.4	3.0*
Yield per square foot**	36.6	41.5	36.6	38.9	
Yield per plant	13.9	15.7	13.9	14.8	
Total accumulative yield, 216 plants	2996	3398	2996	3187	
Average mean grade	4.24	4.23	4.18	4.24	ns

*Value required for a statistically significant difference between treatments. NS = no significant difference.

**Seventy-two plants per plot, three plots per treatment, plant density of 2.6 per square foot, 35 weeks of production beginning Sept. 12, 1982, with records ceasing May 8, 1983.

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week per plot than those in the control and metalaxyl treatments. Of particular interest was the fact that the largest difference resulted during the second crop (Fig. 1) where plants in the etheridizole treatments peaked 3 weeks ahead of the control and metalaxyl treated plants, and 1 to 2 weeks ahead of the N-Serve-treated plants. There was not any great difference in timing of the first peak between treatments, although plants treated with metalaxyl produced the greatest number of cut flowers during any 1 week. The control plants had the lowest peak production during the first crop, and the next to lowest peak in the second period (Fig. 1). There was no significant effect of treatment on cut flower quality as indicated by mean grade (Table 1: 5 = fancy, 2 = design).

One problem in interpreting these results is the fact that metalaxyl is difficult to keep in raised soil beds since it is water soluble. Also, ammonium concentrations were relatively low. Higher NH_4 levels in the feed might have produced larger differences. In any event, etheridizole is a good addition to cultural procedures for standard carnations, especially where *Pythium* may be in the water supply. This effect has been confirmed in a number of commercial establishments (CGGA Bulletin 376).

Figure 1: Smoothed average weekly yield per plot (72 plants) from 'White #1', standard carnations treated with Truban, metalaxyl (ridomy), N-Serve or no treatment (control). All treatments steamed, benched June 15, 1982, and single pinched July 6, 1982.

