Disease Development in Inert Media

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Currently there is strong interest in the possibility of using inert media instead of soil in carnation culture. Holley recently has reviewed the advantages of this innovation (CFGA Bull. 205).

Some years ago a number of experiments involving Fusarium roseum f. cerealis were performed in volcanic scoria. Generally symptoms developed more rapidly and there was greater disease incidence in this type of medium. The current interest in Idealite as a growth medium for carnations lead to the design of a preliminary experiment to determine the influence of this medium on disease development in comparison with soil.

Two pathogens, detected occasionally in the Denver area, were introduced into either soil or Idealite at various inoculum densities. These pathogens were F. roseum f. cerealis (incitant of Fusarium stem rot) and F. oxysporum f. dianthi (incitant of Fusarium wilt). Conidia of these organisms were introduced with a spray gun while steamed media (either soil or Idealite) were being turned in a concrete mixer. Cuttings of carnation cv. Red Sim were transplanted into flats containing the media. There were 12 transplants per flat and each medium and inoculum density was replicated three times.

Symptoms were recorded as they appeared. Fusarium stem rot was detected at the two higher densities after 22 days and Fusarium wilt after 40 days at the highest inoculum density. The development and detection of symptoms over time was generally correlated with inoculum density. Total numbers of plants developing symptoms after 75 days at the end of the experiment are recorded in Table 1. Symptom development was slower and incidence of either disease was less in Idealite although this was not apparent at the two higher inoculum densities of F. roseum.

This preliminary experiment would indicate that plants growing in Idealite may be more tolerant to some important carnation pathogens. The preliminary nature of these results, however, cannot be overemphasized. This was a short term experiment. Inoculation in conventional carnation culture probably

occurs at a different time in the life cycle of the carnation; that is, inoculum may be associated with the cutting during propagation or, in the case of F. oxysporum, enter older plants through the roots. Thus the results reported here may not be directly comparable to the situation in a commercial range. Indeed, in greenhouses presently testing the use of Idealite on a relatively small scale, losses have already been reported. This situation is now under scrutiny and larger tests more nearly duplicating commercial conditions are under way.

Table 1. Number of plants with symptoms 75 days after transplanting into soil or inert medium[a].

Inoculum Density	Fusarium stem rot		Fusarium wilt	
	Soil	Inert medium	Soil	Inert medium
10	15	3		
100	9	0	2	0
1000	19	17	20	2
10,000	13	15	18	3
100,000			32	2

[a]Figures represent number of plants with symptoms from a total of 36.

To Determine Parts Per Million

From Don Juchartz, Wayne County, Michigan, Extension Director, via. Roses, Incorporated Bulletin for June, 1967.

Multiply % of any element in any given fertilizer by 75. This gives ppm of one ounce of the fertilizer in 100 gallons of water.

Example - Ammonium sulfate = 20% N

.20 X 75 = 15 ppm in solution made with 1 oz. $(NH_4)_2SO_4$ in 100 gals. water. To determine number of ounces required to make up a 200 ppm solution divide 200 by 15 = 13 1/3 ounces in 100 gallons water.

New Economics Bulletin

Jarvesoo, E. and J. de Graaf. 1967. Productivity of resources in the greenhouse carnation industry in Massachusetts. Univ. of Mass. Agric. Expt. Sta. Bull. 564. Summary and conclusions from this bulletin follow:

This study, having as its primary purpose the development of production function for the Massachusetts greenhouse carnation industry, is based on the bookkeeping data of 20 specialized carnation-growing operators, ranging in size from 6,000 to 50,000 square feet of bench area (10,000 to 75,000 square feet of total greenhouse area).

The average grower operated 20,070 square feet of bench area; he used 52.4 man-months of labor a year and spent annually $827.40 for soil additions, $3,519.00 for general operating expenses, and showed

$4,331.70 capital costs. The average gross revenue was $38,855.00 a year. (All averages listed are geometric means instead of arithmetic means commonly used.)

A Cobb-Douglas type of production function was fitted to the data and was used to estimate the marginal productivities of resources used for five different aggregated categories of inputs. The marginal productivities were found to be as follows: $0.36 per square foot of greenhouse bench area in a year: $244.18 per man-month of labor, $3.03 per one dollar spent on soil additions, $1.72 per one dollar of general operating expenses, and $2.53 per dollar of capital costs.

The most significant observation based on these findings is that, on an average, Massachusetts carnation growers are using relatively too much labor and too little capital for optimum economic results. Net returns from resources used could be improved by adjustments directed toward increasing capital input items, particularly those that reduce labor requirements and increase crop yields.

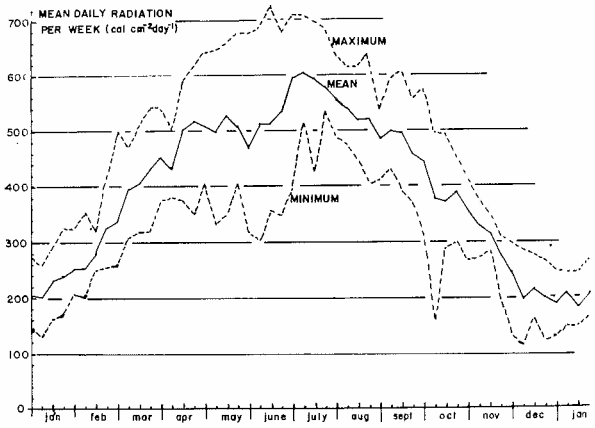
The production function was also used to evaluate the earning power of the different input categories of individual carnation growers to ascertain the direction of desirable adjustments in resource use and the consequent production techniques.

Estimation of the resource productivities of individual cooperating operations showed considerable variability and frequently significant imbalances in resource use. Reorganization of such operations could considerably increase the economic efficiency of resources at growers' disposal, and raise gross revenues with the same total resource inputs.

Colorado Solar Energy

The graph represents data obtained at the Lake Street Research Greenhouses, Fort Collins, Colorado, over the past 8 years, using an Epply pyranometer mounted on the rooftop. It shows the mean daily solar radiation for each week of the year, together with the maximum and minimum daily radiation (dotted lines). Note the variation from winter to summer, and the extremes in total radiation that may occur during the summer.

(J.J.H.)



Your editor,

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