The Possible Role of Manure in Disseminating Carnation Wilt Diseases

W. D. Thomas, Jr. and Oliver V. Holtzmann

During the past two years several questions have arisen about the importance of unsterilized manure as a source for the wilt bacteria and Fusaria of the carnation. It is not uncommon for some forms of Fusarium, causing root rots of wheat and other cereal crops, to be found in manure. Numerous other disease-producing fungi and bacteria have been reported to be disseminated by the same means. Further question has arisen concerning manure as a favorable medium for the growth of these organisms.

Twenty manure samples were collected from different greenhouses in the Denver area from which isolations were made at 1:1000 dilution. Triplicate platings were made from each sample. The results in Table 1 show that 4 manure samples contained Fusarium species, two of which were capable of causing wilt or root rot of carnation. Numerous other fungi and bacteria were obtained, none of which were pathogenic against carnations. The colonies of Fusarium which developed were tested against carnations to determine their pathogenicity and all were found to be capable of causing either root rot or wilt.

The wilt and root rot Fusarium and the wilt bacteria were grown on sterilized potato dextrose agar medium infused with a solution of manure. A parallel test on potato dextrose agar medium, alone, was used as a control. No significant differences in the rates of growth of any of the organisms were observed.

From these tests it is apparent that manure may serve as a source for Fusarium infestation. The use of sterilized manure apparently does not stimulate growth of either Fusarium or the wilt bacterium.

Table 1. -- Isolations from 20 manure samples from Denver Greenhouses

Sample No.	Average no. colonies per plate				
	Fusarium dianthi /1	Fusarium culmorum/2	Other Fusarium spp.	Miscellaneous fungi	Miscellaneous bacteria /3
1	0	15	0	13	16
2	0	0	0	10	6
3	0	0	0	0	16
4	0	0	0	0	182
5	0	0	0	0	68
6	0	0	0	39	30
7	0	0	0	40	12
8	0	0	1	4	92
9	0	0	0	1	38
10	0	0	0	2	61
11	3	0	0	5	10
12	0	0	0	0	50
13	0	0	0	12	42
14	0	0	0	3	81
15	0	0	0	10	46
16	0	0	5	16	64
17	0	0	0	35	9
18	0	0	0	1	63
19	0	0	0	1	33
20	0	0	0	2	53

/1 Symptoms of wilt and branch rot followed inoculation.
/2 Symptoms of root rot followed inoculation.
/3 No bacterial wilt resulted from inoculations.