THE COMPLEXITY OF THE FUSARIUM PROBLEM

by

Oliver V. Holtzmann

The presence of many different types of Fusarium in soils presents a very complex problem. It is recognized that at least two of these Fusaria cause disease of carnations: Fusarium oxysporum f. dianthi, wilt and branch-rot, and Fusarium culmorum, root rot. How many more are able to invade carnations without showing immediate effects is not known.

During a study of the effects of three Fusaria on five different host plants carnation, sweet william, onion, bean, and tomato plants were inoculated with each of the Fusaria. All but the carnations were grown from seed. The soil was inoculated at the time of planting.

Many Fusaria cause "damping-off" of seedlings. The results in Table I show that the Fusaria commonly recognized as associated with carnation may cause damping-off of other plants.

Table 1. Percentage of damping-off of 5 crop plants by 3 species of Fusarium.

	F. oxysporum f. dianthi	F. oxysporum f. phaseoli	F. solani
Carnation	0	0	0
Sweet William	58	18	80
Onion	17	7	17
Bean	7	0	33
Tomato	0	0	0

A given species of Fusarium is often considered to be limited to one group of plants. However, the results shown in Table 2 reveal that other Fusaria may invade carnations, and that at least one carnation Fusarium may invade other plants. This is of particular importance in that these crops may have been produced on what is commonly considered to be "virgin" soil. Consequently, they may serve as reservoirs in which carnation Fusaria may increase. It may be possible, also, that other species of Fusarium may cause diseases of carnation. This problem needs further investigation. It is obvious from these tests, however, that the importance of complete sanitation, including steam sterilization of soil, manure, and mulches must be observed in order to decrease losses due to Fusarium diseases.

Table 2. Percentage of plants infected by 3 species of Fusarium as determined by culturing tests.

	F. oxysporum f. dianthi	F. oxysporum f. phaseoli	F. solani
Carnation	66	0	44
Sweet William	50	38	31.3
Onion	0	0	8
Bean	26.7	60	33.3
Tomato	53.3	40	40