

A Serious New Disease of Marigold in North Carolina

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Bacterial leaf spot of marigold, caused by Pseudomonas syringae pv. tagetis, was found in greenhouses in North Carolina in 1983 and again in 1984. It is a very destructive disease of immature marigold plants and the causal bacterium is seedborne. It was described for the first time in the United States in 1978 in a field in Wisconsin (2).

The first symptoms of the disease that were detected in our work in the greenhouse with the cultivar Lemondrop were small black spots on cotyledons of seedlings in the seed bed (Fig. 1A). About a week later, necrotic spots or flecks could be detected on leaves and were surrounded by chlorotic tissue in an irregular pattern. About another week later, apical growth became chlorotic and distorted (Fig. 1B). Spots were found on less than 1% of the seedlings in the seed bed, but a large percentage of plants transplanted from these seed beds became infected and developed leaf spotting, stunting, distortion, chlorosis of apical growth, and, in some cases, death.

An experiment was conducted last year to determine if the pathogen was seedborne in a particular lot of seed and to get some idea of the magnitude of

(continued on page 12)

New Marigold Disease in N.C.—(continued from page 11)

spread of the disease under seed bed conditions in the greenhouse. Naturally infected 'Lemondrop' marigold seed were planted densely in Metro Mix 220 contained in 6-inch clay pots. Pots were maintained in the greenhouse with intermittent mist for 10 days, then transplanted to individual 4-inch pots containing Metro Mix 220. These were placed on the greenhouse bench and watered in a conventional fashion with a sprinkler hose as needed. There were two seedings, 5/3 and 5/13/83. Transplanting was 10 days after seeding and disease readings were made 30 days after transplanting. Most of the plants were diseased (78.5%) and unsalable (Table 1). A high percentage (32.5) of plants died.

In 1984, a North Carolina grower reported over 90% loss of several thousand market packs of 'Petite Spry' and 'Petite Yellow' to disease. The disease was determined to be bacterial leaf spot. Obviously this is a very serious disease problem and since it is seedborne, one that must be controlled by the seed producer.

There is little a bedding plant grower can do once the disease appears other than to dispose of affected plants to reduce the possibility of spread to healthy plants. Providing good air circulation, and watering only during fast-drying conditions should also help keep the disease in check.

The pathogen that causes bacterial leaf spot of marigold also causes diseases of zinnia, common ragweed, sunflower and Jerusalem artichoke (1).

References

1. Shane, W. W. and J. S. Baumer. 1984. Apical chlorosis and leaf spot of Jerusalem artichoke incited by Pseudomonas syringae pv. tagetis. Plant Disease 68:257-260.
2. Styer, D. J., G. L. Worf, and R. D. Durbin. 1980. Occurrence in the United States of a marigold leaf spot incited by Pseudomonas tagetis. Plant Disease 64:101-102.

Table 1. Disease incidence in seedlings of 'Lemondrop' marigolds grown from seeds naturally infected with Pseudomonas syringae pv. tagetis.

Disease severity ^a	% plants in different disease severity categories		
	Test #1 (264 seedlings transplanted)	Test #2 (736 seedlings transplanted)	Average for Tests 1 & 2
0	26	17	21.5
1	17	13	15.0
2	18	18	18.0
3	8	18	13.0
4	31	34	32.5

^aDisease index: 0=healthy, 1=light, spotting and/or chlorosis, 20% reduction of biomass; 2=moderate, 20-50% reduction of biomass; 3=severe, 50% reduction of biomass; 4=dead.

(continued on page 13)

New Marigold Disease in N.C.—(continued from page 12)

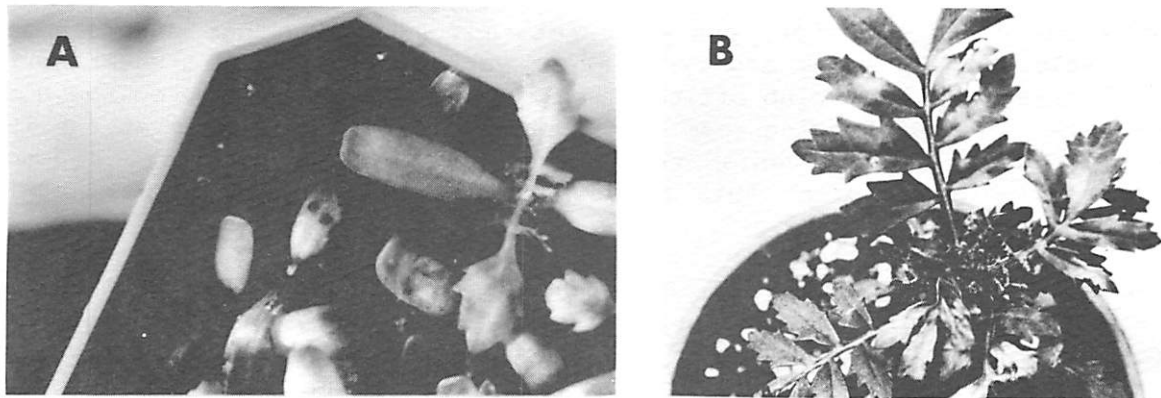


Figure 1. Symptoms of bacterial leafspot of marigold: A) Small black spots on cotyledons in the seed bed and B) Chlorotic and distorted apical growth.
