

Isolation of *Pseudomonas syringae* pv. *tagetis* from Sunflower in Wisconsin

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ABSTRACT

Styer, D. J., and Durbin, R. D. 1982. Isolation of *Pseudomonas syringae* pv. *tagetis* from sunflower in Wisconsin. *Plant Disease* 66:601.

Pseudomonas syringae pv. *tagetis* has been isolated from sunflower cultivars growing in Wisconsin. Infested seed appears to be the source of the primary inoculum. Field observations suggest that the cultivar Sunbred 212 is resistant.

The causal agent of bacterial leaf spot of marigold, *Pseudomonas syringae* pv. *tagetis* (Hellmers 1955) Young, Dye & Wilkie 1978, was originally isolated from this host in Wisconsin in 1978 (3) and from sunflower (*Helianthus annuus* L.) in North Dakota the following year (1). In 1980, what proved to be the same disease was observed in sunflowers grown in a research plot in south central Wisconsin.

A Gram-negative, fluorescent bacterium was consistently isolated from surface-sterilized stem or leaf pieces placed on nutrient dextrose agar. Further identifi-

cation of the pathogen was based on the bacterium's ability to produce the characteristic apical chlorosis in marigold (*Tagetes erecta* L.) and native and commercial sunflower, to induce a hypersensitive reaction in tobacco (*Nicotiana tabacum* L.), to utilize carbon sources identical to known isolates of *Pseudomonas syringae* pv. *tagetis* (3), and to yield negative results in the oxidase and arginine dihydrolase tests.

Infected sunflower plants exhibited apical chlorosis, a symptom commonly observed in marigolds; some were stunted and produced very small seed heads, indicating that a yield loss could result from this disease. The pattern of the disease, which occurred on cultivars Dahlgren 135, Dahlgren 716, and Interstate 894, strongly suggested that the original inoculum was from infested seed. Secondary spread of the pathogen occurred among and between rows;

despite this spread, however, one cultivar—Sunbred 212—remained symptomless. This cultivar was planted as the center two rows, bordered by the Dahlgren cultivars, in each of 14 treatments in six blocks; it was also planted in a 1-acre plot immediately adjacent to the infected plot. Although further tests must be performed, this observation suggests that some cultivars are resistant to *Pseudomonas syringae* pv. *tagetis* under natural conditions.

Our suggestion that seed is a primary inoculum source is supported by reports of seed transmission in marigold (2,4) and by the worldwide occurrence of the characteristic chlorotic symptom in commercial sunflower (W. E. Sackston, *personal communication*).

LITERATURE CITED

1. Gulya, T. J., Urs, R. R., and Bantari, E. E. 1981. Apical chlorosis of sunflower incited by *Pseudomonas tagetis*. (Abstr.) *Phytopathology* 71:221.
2. Hellmers, E. 1955. Bacterial leaf spot of African marigold (*Tagetes erecta*) caused by *Pseudomonas tagetis* sp. n. *Acta Agric. Scand.* 5:185-200.
3. Styer, D. J., Worf, G. L., and Durbin, R. D. 1980. Occurrence in the United States of a marigold leaf spot incited by *Pseudomonas tagetis*. *Plant Dis.* 64:101-102.
4. Trimboli, D., Fahy, P. C., and Baker, K. F. 1978. Apical chlorosis and leaf spot of *Tagetes* spp. caused by *Pseudomonas tagetis* Hellmers. *Aust. J. Agric. Res.* 29:831-839.

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Accepted for publication 2 March 1982.