
Stemming the Tide of *Phytophthora capsici*

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Moderator: Mr. Mickey Fouracres

**MONITORING SURFACE IRRIGATION WATER
FOR *PHYTOPHTHORA CAPSICI***

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The fungal-like oomycete *Phytophthora capsici* causes disease on cucurbitaceous and solanaceous crops worldwide. *Phytophthora capsici* can infect plants at any stage of development, from seedling to fully mature at harvest. Environmental conditions which favor disease include warm temperatures and prolonged moisture. Because *P.capsici* produces long-lived soilborne oospores, controlling the spread of this pathogen is of great concern. In free water, *P. capsici* sporangia releases zoospores which may be transported by moving surface water. Surface irrigation sources (river system, ponds, and ditches) in three Michigan counties with history of susceptible crop production were monitored for *P. capsici* during four growing seasons (2002 to 2005).

Methods

Pear and cucumber baits were suspended in water at monitoring sites for 3 to 7 days and water temperature was recorded. Baits were washed and lesions excised and cultured on water agar amended with rifampicin and ampicillin to control bacterial growth. *Phytophthora capsici* was identified based on morphological characteristics after 5 days of incubation under ambient laboratory lighting. Recovered isolates (270) were screened for sensitivity to the fungicide mefenoxam and characterized for compatibility type (CT). Isolates were also subjected to amplified fragment length polymorphism analysis.

Results and Conclusions

Phytophthora capsici was detected at monitoring sites in multiple years despite nearby crop rotation to non-hosts. Mefenoxam insensitivity of isolates was common in water sources from southwest and southeast Michigan. Most monitoring sites yielded isolates of a 1:1 ratio of A1:A2 CTs. AFLP analysis of select isolates from 2002 to 2004 indicated a lack of similarity groups persisting over time and in specific geographical locations. *Phytophthora capsici* was not found to overwinter in the eleven Michigan surface water sources monitored. The consistent detection of *P. capsici* in surface water used for irrigation in Michigan suggests that this is an important means of pathogen dissemination. The reliance of surface water for irrigation of *P. capsici*-susceptible crops should be minimized, and if possible, avoided to prevent further pathogen spread.

Citations

Gevens, A.J., Donahoo, R.S., Lamour, K.H., and Hausbeck, M.K. 2007. Characterization of *Phytophthora capsici* from Michigan surface irrigation water. *Phytopathology* 97(4)421-428.

Waterhouse, G. 1963. Key to the species of *Phytophthora* de Bary. *Mycological Papers*, No. 92, Commonwealth Mycological Society, Kew, Surrey, England. 22 pp.