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Lansing, MI 48824. Evaluation of resistance of sugarbeet seedlings to
Aphanomyces cochlioides: conditions affecting disease severity in a model system.

Aphanomyces cochlioides causes damping-off of sugarbeet seedlings throughout U.S production areas. We present a method for uniform production and inoculation of seedlings and evaluation of disease severity. Seeds of a susceptible variety were placed on moist germination papers which were then folded and rolled to form cylindrical "rag dolls"; these were kept under constant light at 22°C for 4 days. Seedlings longer than 5 cm were transferred in groups of 25 to water (controls) or to suspensions of *A. cochlioides* zoospores and incubated for 10 minutes. They were placed in new rag dolls, incubated in growth chambers at 15, 20, 25, or 30°C for 5 days under constant light, and were evaluated for disease development 1, 3, and 5 days after inoculation. Disease severity was rated on a scale of 0 to 4 (0 = no disease, 1 = 1 to 25%, and 4 = >75% of tissue rotted). Inoculated seedlings incubated at 30°C had mean ratings of ca. 4 after 3 days, whereas seedlings at 15°C were moderately diseased (mean score ca. 2) after 5 days. The rate of disease development was intermediate at 20 and 25°C. Occasional symptoms observed on control seedlings usually were attributable to breakage during handling. These methods provide a useful means for assessment of disease development in large populations of seedlings. Future experiments will use these methods to discriminate between resistant and susceptible varieties and to select resistant individuals for breeding purposes.