



Pacific Northwest
Vegetable Extension Group

Identification & Management of Emerging Vegetable Problems in the Pacific Northwest

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Thielaviopsis Root Rot of Pea

Affected plant species:

Pea and many other plant species (e.g., alfalfa, bean, beet, carrot, onion, and sweet potato).

Common name of the causal organism:

Thielaviopsis root rot or black root rot

Latin binomial:

Thielaviopsis basicola

Symptoms & key characteristics for identification:

Symptoms appear as dark black lesions on the roots and below ground stems (Fig. 1A). The lesions can be similar to those associated with *Fusarium* root rot on pea. A thin section of the infected tissue on a microscope slide will reveal the presence of the dark-colored survival spores called chlamydospores, and potentially also the clear endoconidia (Fig. 1B). Severely infected plants may be stunted and leaf tissue can begin to turn yellow, starting at the base of the plant and moving up the plant.

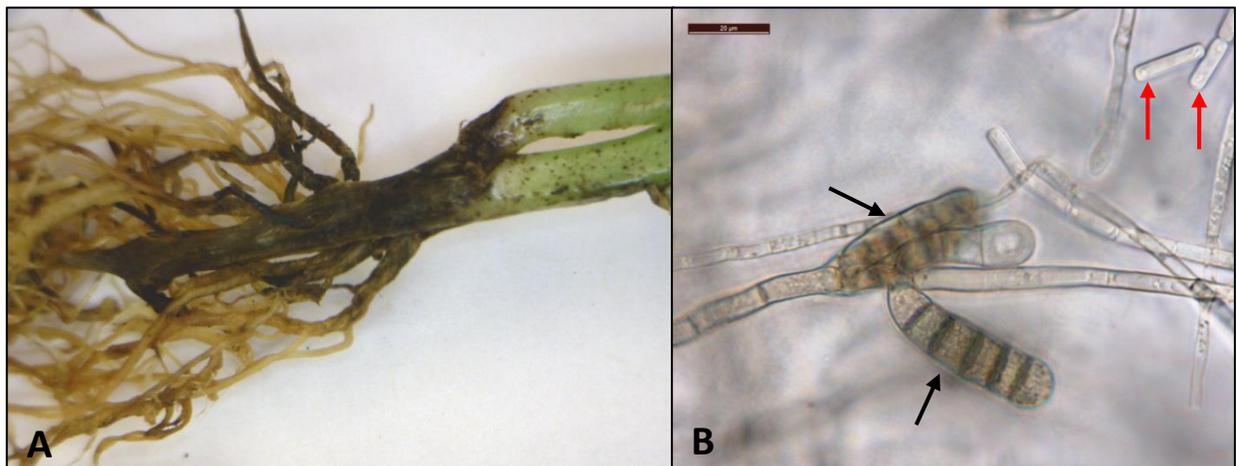


Fig. 1. A) *Thielaviopsis* root rot symptoms (photo courtesy of Lyndon Porter). B) *Thielaviopsis basicola* survival spores called chlamydospores (black arrows) as well as endoconidia (red arrows) commonly found in infected pea tissues (photo courtesy of Avi Alcalá).

Biology/epidemiology:

High moisture and high soil temperatures (82°F and greater) promote development of this disease in pea; however, severe losses can occur at lower temperatures. The pathogen can spread throughout the field via movement of infested soil, infected plant tissue, colonized organic debris, and irrigation water.

Management:

Avoid short pea rotations in fields that have high levels of the pathogen is extremely important since the spores of this pathogen survive in the soil for several years. *T. basicola* has a wide host range (can infect >130 species of plants) including alfalfa, beans, beets, carrot, onion, and sweet potato which are sometimes grown in rotation with pea crops in the Pacific Northwest. Appropriate crop rotations will help avoid build-up of the pathogen in soil. Fields with a history of *T. basicola* infestation need to be rotated out of peas and other hosts to reduce the number of survival spores present in the soil and capable of infecting subsequent susceptible hosts. Disease symptoms are less severe at a soil pH of 5.6 or less. Soil fumigants such as chloropicrin, methyl isothiocyanate, and dazomet, and sterol inhibitor fungicides such as triazoles (thiabendazole) applied as soil treatments are reported to be effective against *T. basicola*. These compounds applied to any crop with a history of *T. basicola* may provide some efficacy against the build-up of this pathogen in a cropping system where peas are in the rotation. Captan applied as a soil treatment has also been reported to help manage this pathogen. Some of these management strategies may be cost prohibitive for application on peas but may be justified on crops rotated with pea, which can limit the impact of this disease. Crop rotation with a non-host, such as cereal, is important to limit pathogen build-up in the soil. The herbicide chloramben can increase severity of *T. basicola* root rot. Benomyl applied at 1.7 kg a.i./ha and thiophanate-methyl at 3.2 kg a.i./ha applied to soil suppressed *T. basicola* in peanuts, so similar chemistries may be effective as soil treatments in peas. Always follow label instructions.

Selected references:

Abawi, G.S. and Hanson, L.E. 2005. Black root rot. In: Compendium of Bean Diseases, 2nd Edition. Editors H.W. Schwartz, J.R. Steadman, R. Hall, and R.L. Forster. APS Press, St. Paul, MN. pp. 12-13.

Harman, G.E. and Dillard, H.R. 2001. Thielaviopsis root rot. Pp. 17-18, in: Compendium of Pea Diseases and Pests, 2nd Edition. Editors J.M. Kraft and F.L. Pflieger. APS Press, St. Paul, MN.

PNW VEG website at http://mtvernon.wsu.edu/path_team/vegpath_team.htm and Photo Gallery at http://mtvernon.wsu.edu/path_team/diseasegallery.htm