

Pink Root on Onions – Pink root on onions is caused by the soil-borne fungus *Phoma terrestris*. This pathogen is common in New Mexico and is problematic worldwide wherever onions are grown. The disease is especially devastating in warmer climates. Although many isolates of this fungus are specific to onion, some have the ability to infect other hosts including tomatoes, soybean, eggplant, pepper, spinach, carrots, corn, small grains, cucurbits, corn and ryegrass.

Symptoms: The most noticeable symptom of the disease is the reddish-purple discoloration that occurs on infected roots (Figure 1). In the early stages of the disease, the color change is subtle (Figure 2), but the discoloration darkens as the disease progresses eventually leaving the roots stained dark purple (Figure 3). By the end of the season, infected roots have become dry and brittle and often disintegrate. Roots of infected plants become dysfunctional and plants will suffer from nutrient deficiency and drought. When young seedlings are infected, they may die; however, death is not the end result when more mature plants are infected. In this case, plants are stunted, exhibit leaf tip dieback and bulb size is reduced affecting overall yield and marketability (Figure 4).

Disease Cycle – The pathogen survives in soil, plant debris, and colonized roots as chlamydozoospores (Figure 5), pycnidia and pycniospores (Figure 6). The fungus survives for long periods in the absence of a host plant. When a susceptible host is available, pycniospores germinate and infect the roots. The fungus moves through the roots, but doesn't infect the basal plate or the scales. The fungus completes its life cycle when it produces the overwintering structures (chlamydozoospores and pycnidia) in the infected tissue.



Figure 1. Pink root on onions (Photo: NMSU-Plant Diagnostic Clinic)



Figure 2. Early symptoms of pink root on onion (Photo: NMSU – Plant Diagnostic Clinic)



Figure 3. Late symptoms of pink root on onion (Photo: Manitoba Agriculture, Food and Rural Initiatives, www.gov.mb.ca).



Figure 4. Bulb size is reduced in severely infected plants (Photo: NMSU – Plant Diagnostic Clinic).

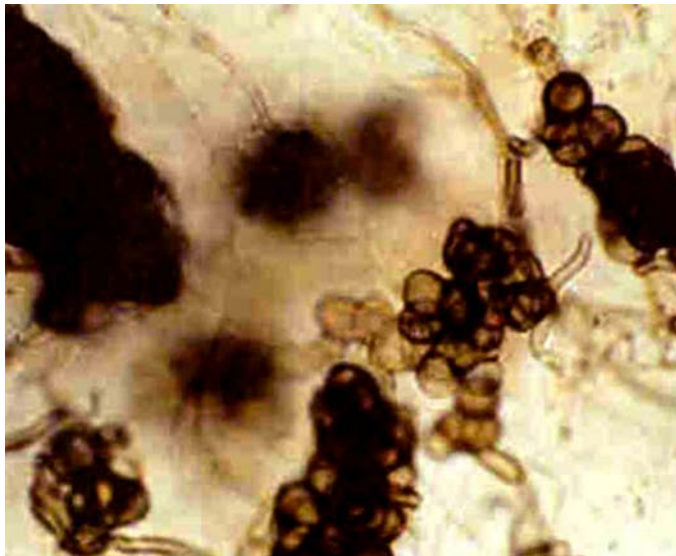


Figure 5. Chlamydospores of *Phoma terrestris* (Photo: Alvarado & Polanco, Universidad Centroccidental Lisandro Alvarado, Venezuela)

Conditions for Disease – The disease is most damaging in heavy, poorly drained soils that are low in organic matter. Plants weakened by other diseases, insects, or abiotic disorders such as temperature stress, excessive water, and nutrient problems are more susceptible to disease. The disease is favored by warm (75 – 82 F), moist soils.

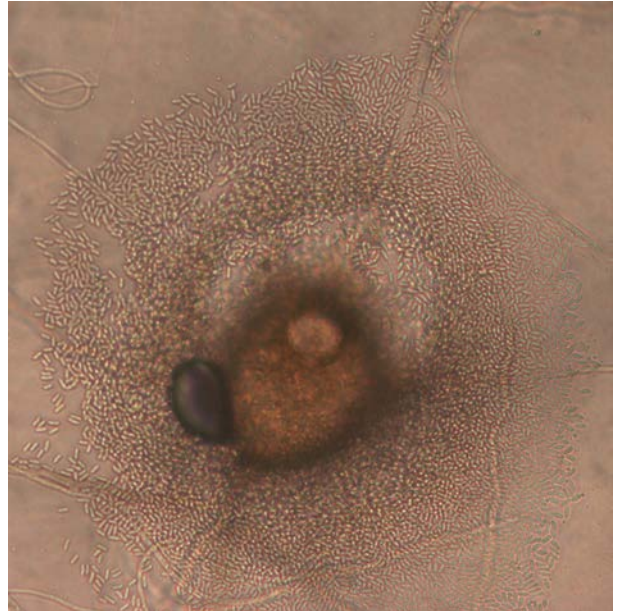


Figure 6. A Pycnidium and pycnidiospores of *Phoma terrestris* (Photo: NMSU – Plant Diagnostic Clinic).

Management – the following management strategies help to reduce pink root:

- 3-6 year crop rotation (out of onions, it's relatives and other susceptible host plants)
- Use resistant or tolerant cultivars
- Soil solarization (heat wet soil with a clear plastic tarp for 4-8 weeks depending on day length and sun intensity)
- Plant in well drained soils
- Avoid overwatering
- Provide adequate nutrition

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