

## ONION PINK ROOT

Pink root of onion is caused by the fungus *Phoma* (*Pyrenochaeta*) *terrestris*. The fungus is a common inhabitant of soils throughout the United States. In Illinois, the disease is of particular importance in the onion-growing areas around Chicago. Yields may be greatly reduced, especially in fields where onions are grown almost every year. The fungus is capable of infecting roots of other members of the onion family; these include garlic, wild garlic, potato or multiplier onion, wild onion, and shallot. Leeks and chives are usually highly resistant. The fungus is also capable of infecting weakened roots of other vegetable crops; these include cantaloupe, carrot, cauliflower, cucumber, eggplant, lima bean, muskmelon, pea, pepper, potato, spinach, squash, sweet potato, and tomato. In addition, corn, sorghum, cereals, numerous grasses, millets, cowpeas, field cress or pepper weed, common flax, and tepary bean are susceptible. The fungus can be found in the rhizosphere surrounding the roots of many herbaceous and woody plants.



Figure 1. Early-season bulb and root infection of onion by *Phoma terrestris*. (Courtesy H.F. Schwartz)

### SYMPTOMS

Infected onion seedlings may wilt and die. Roots of affected plants usually turn pink. Under certain conditions, the roots may be yellow to yellowish brown instead of pink. These diseased roots soon shrivel, then darken in color to red, purple, finally brown or black, and die. New roots may be produced one or more times, and commonly they also become diseased and die (Figure 1). This process often continues until harvest.

If infection is severe, the leaves on diseased onions turn white, yellow, or brown and die back from the tip as if damaged by drought. Various leaf-blighting fungi (see Report on Plant Diseases No. 931, "Onion Leaf Blights") may attack the withered leaves. Affected plants are usually not killed, but often remain stunted and produce soft, undersized bulbs, because of the restricted root system. The dead outer scale tissue of the leaves and bulb may also be attacked by the pink-root fungus. Living scale tissue is not affected.

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For further information contact Mohammad Babadoost, Extension Specialist in Fruit and Vegetable Pathology, Department of Crop Sciences, University of Illinois at Urbana-Champaign. (Phone: 217-333-1523; email: [babadoos@uiuc.edu](mailto:babadoos@uiuc.edu)).

## DISEASE CYCLE

The pink-root fungus (Figure 2) is weakly pathogenic and appears to be most damaging in heavy, poorly drained soils that are low in organic matter. The disease often follows other disease-causing organisms or injuries from heat, cold, drought, flooding, mineral deficiencies or excesses, and other unfavorable growing conditions that weaken roots.

Hyphae produced from germinating conidia (by hyaline, one-celled microscopic spores, Figure 2b) penetrate young roots and grow through the cortical tissue. Symptoms can appear 7 to 21 days after infection has occurred. The fungus produces minute, black, almost globose fruiting bodies (pycnidia) in the epidermal and cortical cells (Figure 2a). After the onion roots die new pycnidia are formed which produce conidia, and the cycle is repeated.

Once introduced, the pink-root fungus can persist indefinitely in the soil. The longer that onions are grown in the same field the more destructive pink root becomes.

The optimum temperature for growth of the fungus and development of pink root is close to 79°F (26°C). However, infection may occur at temperatures ranging from about 60° to 90°F (16° to 32°C) or slightly above. The fungus is active over a wide range of soil moisture levels. It is disseminated principally by infected or infested onion seedlings and sets, tools, surface-drainage water, or any other agency that transports soil from one area to another.

## CONTROL

1. Where possible, grow onions and other susceptible related vegetables in the same area or field only once in five or six years. Do not include susceptible crops in the rotation. Use green-manure crops and other practices in the rotation that build up the organic matter content of the soil.
2. Onion cultivars with resistance to pink root are available. Also, cultivars adapted for growing in Illinois are less susceptible to stress-related diseases. Cultivars suggested for growing in Illinois are given in Illinois Circular 1354, Illinois Homeowner's Guide to Pest Management. Also consult current seed catalogs and trade publications.
3. Start with healthy onion sets or sow onion seed as early as practical in disease-free, well-prepared, well-drained, fertile soil. Keep plants growing vigorously by following suggested insect, disease, weed, and other cultural practices. For further information refer to above mentioned publication, along with Circular 1373, Midwest Management Guide for Commercial Vegetable Growers.

Contact your nearest Extension office for any of the publications listed.

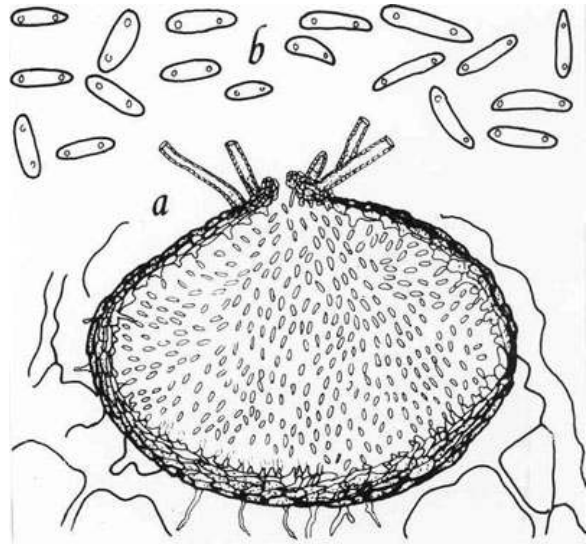


Figure 2. *Phoma (Pyrenochaeta) terrestris*, the cause of pink root of onion and other *Allium* species as the fungus would appear under a high-power microscope. (a) Vertical section through a pycnidium largely embedded in host tissue; (b) conidia. (Drawing by Lenore Gray)