THE OHIO STATE UNIVERSITY EXTENSION

Extension FactSheet

AC-42-96

Plant Pathology, 2021 Coffey Road, Columbus, OH 43210-1087

Rhizoctonia Root, Stem, and Crown Rot of Alfalfa

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Alfalfa in Ohio is often attacked by *Rhizoctonia solani*, a soilborne fungus which is capable of causing root, stem, and crown rots, particularly during hot, humid weather. Mature plants may die if the fungus grows throughout the crown tissue. *Rhizoctonia* also kills young seedlings (damping off) when relatively high soil temperatures coincide with seedling emergence.

Symptoms

Root rot

Rhizoctonia destroys feeder roots and ultimately invades the taproot, producing dark, oval lesions (Figure 1). Such lesions are often associated with feeding scars caused by the clover root curculio (*Sitona hispidula*). These lesions are initially shallow and scab-like in appearance, but may enlarge and girdle the taproot. Because the taproot is not rotted completely in the early stages of the disease, plants may remain alive if affected only by the root rot phase. Regrowth is slowed due to the reduced ability of the root system of affected plants to absorb water and nutrients. During cool months of the year when the fungus is inactive, lesions may heal over and new feeder roots may be regenerated.

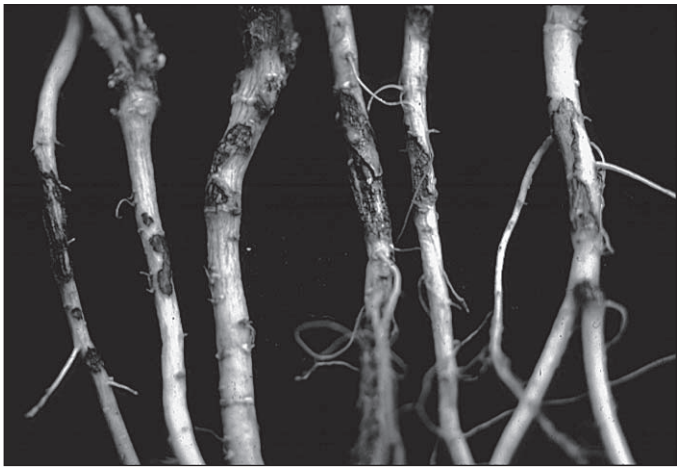

Figure 1. *Rhizoctonia* lesions on alfalfa taproots.

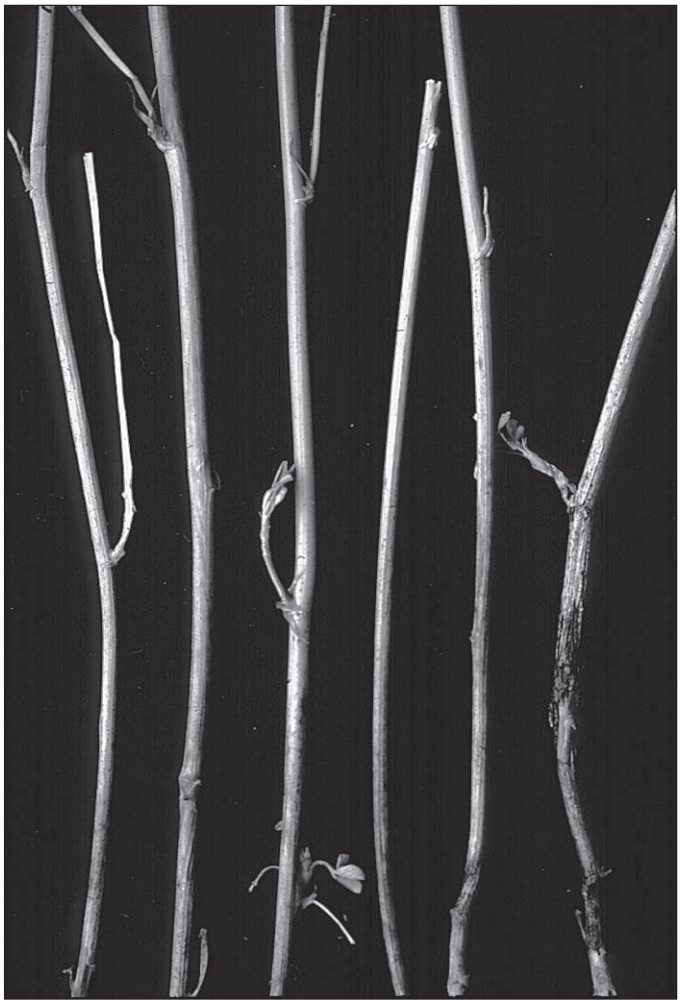

Figure 2. *Rhizoctonia* lesions on alfalfa stems.

Stem Rot

In the stem rot phase, irregular brown to black lesions with somewhat indistinct margins (unlike those of anthracnose) are produced at the base of stems (Figure 2). Such lesions may eventually girdle and kill stems. Foliage of infected stems is chlorotic (yellowed) or straw-colored. Stem and foliar symptoms may easily be confused with those caused by anthracnose or Fusarium wilt.

Crown Rot

The most destructive phase of the disease occurs when *Rhizoctonia* invades and destroys the crown region (Figure 3). Crown buds are killed, and surviving buds give rise to stunted unthrifty shoots. If environmental conditions continue to favor the fungus, the alfalfa plant dies. Dead plants may be scattered throughout a field, but usually occur in large patches. Although *Rhizoctonia* is capable of causing crown rot in the absence of other organisms, it is frequently found in combination with *Fusarium*, *Phoma*, and *Colletotrichum*. These and other fungi and bacteria comprise a group known as the "crown rot complex." All of the members of this complex have some capability of destroying alfalfa crown tissue.

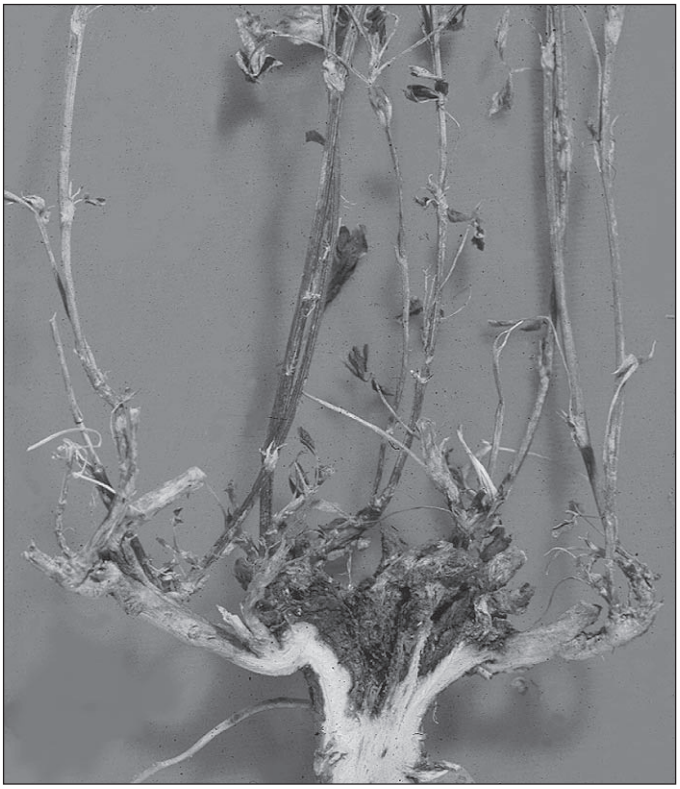

Figure 3. Crown rot caused by *Rhizoctonia*.

Figure 4. Experimental test for ability of *Rhizoctonia* to cause post-emergence damping off. Right: Control (Uninoculated) seedlings. Left: *Rhizoctonia* placed at the end of each row has grown from plant to plant, killing all seedlings in the row.

Control

Rhizoctonia survives in the soil or in decaying organic matter as hardened masses of fungal tissue (sclerotia). It survives well in the absence of the alfalfa host, but populations of the fungus will eventually diminish if non-host crops are planted in a rotation. Therefore, rotation to corn or small grain for at least one year between alfalfa crops is recommended. Reseeding alfalfa into areas where *Rhizoctonia* is known to be present is unlikely to be successful, since the fungus also attacks and kills emerging seedlings (Figure 4).

There are no alfalfa varieties which are designated as resistant to *Rhizoctonia*, nor are there any fungicides approved for use in controlling this disease. Adoption of a sound alfalfa management program, with proper harvest and fertility management, will help reduce the effects of *Rhizoctonia* infection.

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