

## **Mycoleptodiscus Crown and Root Rot of Alfalfa An emerging problem in Minnesota and Wisconsin?**

During the summer of 2009, the University of Minnesota Plant Disease Clinic and the plant pathologist in the USDA-ARS Plant Science Research Unit in St. Paul, MN received several samples of alfalfa plants with severe crown and root rot from south eastern MN and south western WI. The disease was observed on plants from new plantings and established stands. The disease was identified as *Mycoleptodiscus* crown and root rot. Although the disease has been known since the 1950's, it has not caused severe problems in alfalfa production fields. It is not known if the weather pattern in 2009 caused an increase in observation of the disease or if the disease is becoming a bigger issue in alfalfa production. It is a disease that should be watched for over the next few years.

### **Symptoms**

Field symptoms consist of patches of plants that are stunted and yellowed with poor forage production. The patches may expand yearly. Plants dug from these patches have few lateral and fibrous roots. The remaining lateral roots may be black and rotted. Crown branches may be rotted off, leaving one to a few areas for shoot production. In the interior of the crown, brown decayed material extends from the crown into the taproot. The margin of the rotted area is often black. The black margin and presence of black sclerotia (resting structures) in the root and on the surface of the rotted crown is diagnostic. A hand lens or microscope is needed to see sclerotia. Disease in controlled conditions develops more rapidly at higher temperatures. Therefore, symptoms will likely be more visible during mid- to late-summer months. The pathogen also causes damping-off of seedlings under high temperature conditions (approximately 30°C), which we are unlikely to see in the upper Midwest.

### **The pathogen**

The fungus causing the disease is *Mycoleptodiscus terrestris*. It has a surprisingly broad host range. It has been shown to be highly pathogenic on many legumes including birdsfoot trefoil, white clover, alsike clover, red clover, crimson clover, and soybean, as well as alfalfa. It is a weak pathogen of tomato and cabbage. It also is a pathogen of water milfoil and has been tested as a biocontrol agent for this lake weed. On birdsfoot trefoil the symptoms are root decay, plant wilting followed by plant death. The fungus causes post-emergence damping-off of soybean seedlings characterized by reddish brown to black cortical decay of crown and root tissues. It also causes a dark decay of the lateral root system and taproot of older plants similar to that caused by *Rhizoctonia* root and stem rot. The disease has been reported on soybean in south and central Illinois for many years but has not been considered to be of major importance.

### **Disease cycle**

The fungus is assumed to overwinter as sclerotia in plant debris and in soil. Root rot and seedling damping-off is probably initiated by infection from germinating sclerotia. The fungus likely forms spores on diseased crown and stems near the soil line. Crown rot probably results from infected stems or by infection from germinating sclerotia near the soil surface.

### **Disease management**

No disease management measures have been reported. At this point there are no known resistant alfalfa cultivars. A standard assay is under development so that cultivars can be tested for resistance and for use in a selection and breeding program. Maize and small grain crops are not hosts for the fungus, so crop rotation may be useful. However, sclerotia are known to be long-lived and may persist over many seasons in the soil. The fungus is reported to be sensitive to several fungicides but chemical control may not be practical or effective in the field.

### **What to do if you suspect *Mycoleptodiscus* crown and root rot in an alfalfa field**

Dig about 10 plants from the affected area. Trim off foliage. Remove soil from roots. Place plants in a zip-top bag and send by Express Mail to:

Debby Samac  
USDA-ARS-Plant Science Research Unit  
495 Borlaug Hall, 1991 Upper Buford Circle  
St. Paul, MN 55108  
(612) 625-1243 [dasamac@umn.edu](mailto:dasamac@umn.edu)

Please include as much information on the sample sheet as possible. There is no charge for the diagnosis.



Figure 1. (Left) Three-month-old plants with blackened and rotted lateral roots and black lesions on taproot. (Right) Two-year-old plant with crown rot. Note that rot appears to be coming from stems. Lateral roots are also rotted.



Figure 2. (Left) Two-year-old plant with crown rot. Note loss of right lateral branch. Black rot on lateral roots can also be seen. (Right) Section of plant with loss of lateral branch showing black rotted material in interior crown tissues.

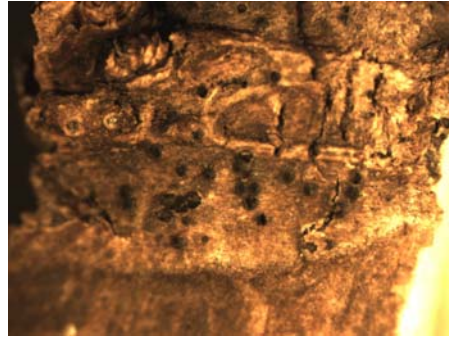


Figure 3. (Left) Severe crown rot on two-year-old plant. All crown buds are killed. (Right) Sclerotia (black dots) on crown of three-year-old plant under magnification.



Figure 4. (Left) Black advancing margin of crown rot. (Right) Crown and root rot initiating from infected stems.

Collected by: \_\_\_\_\_ Date collected: \_\_\_\_\_

Address: \_\_\_\_\_

\_\_\_\_\_

Phone: \_\_\_\_\_

Sample ID	
Location	
Field Size	
Date Planted (month, year)	
Variety	
Previous Crop	
Grower name	
Grower address	
Grower phone number	
Symptoms	