

PLANT PATHOLOGY LABORATORY: SUMMARY OF 2007-2008 FIELD SAMPLES

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The plant pathology laboratory at the University of Minnesota, Northwest Research and Outreach Center in Crookston receives sugarbeet samples for diagnosis every growing season. These samples may have problems caused by plant pathogens such as *Aphanomyces cochlioides*, *Rhizoctonia solani*, *Pythium* spp., *Fusarium oxysporum*, *Verticillium* spp. or others. Samples also may have problems caused by insects or abiotic causes such as chemical injury (usually herbicide) or nutrient deficiency. This report summarizes results of samples received during the 2007 and 2008 growing seasons. Results include cause of the problems as well as when samples were submitted for *Aphanomyces* root rot and *Rhizoctonia* crown and root rot (RCRR), the two most common soilborne fungal diseases. In both years, the sugarbeet plant pathology project requested sugarbeet roots with symptoms of RCRR to build a culture collection for identification of particular strains of *R. solani*. Thus, our results show disproportionately high numbers of samples with *R. solani*, and may not reflect the true proportions of disease problems present in fields.

In 2007, samples were received from 138 sugarbeet fields and diagnoses are summarized in Figure 1A. Our request for *Rhizoctonia* samples resulted in receipt of almost 100 samples from which *R. solani* was isolated. We also received over 30 samples with *Aphanomyces* and a few with *Fusarium* or chemical injury. Samples infected by *A. cochlioides* or *R. solani* were submitted at different times during the growing season (Figure 1B). Root samples infected with both pathogens began to be submitted in the last half of May. Samples infected by *Aphanomyces* quickly rose to a peak in the second half of June and were no longer submitted by the end of July (Figure 1B). *Rhizoctonia* diseases (seedling and RCRR) were received throughout the growing season, but reached a peak in the first half of August (Figure 1B).

In 2008, samples were received from 96 sugarbeet fields and diagnoses are summarized in Figure 2A. We again requested sugarbeet roots with RCRR and were rewarded with 64 samples. *Aphanomyces* was the second most common diagnosis, but this pathogen was less common compared to samples assayed in 2007. A few samples had problems with chemicals, *Fusarium*, as well as *Verticillium*. The timing of submission of sugarbeet plants with *Aphanomyces* root rot was different in 2008 than in 2007. The cold, dry weather in the spring of 2008 delayed onset of disease. Thus, *Aphanomyces* problems were not observed early in the season and peaked in the second half of July (Figure 2B). Pattern of submission of *Rhizoctonia* samples was similar to 2007, beginning in late May and rising to a peak in August (Figure 2B).

Appearance of symptoms caused by *A. cochlioides* is linked with periods of warm soil and especially, high soil moisture, which is required for production of motile zoospores that infect sugarbeet roots. As a result, the number of problems caused by *A. cochlioides* and time of occurrence varies from year to year. While RCRR is favored by high soil moisture, it does not require the amounts needed by *Aphanomyces*. Consequently, occurrence of RCRR is related more to amount of inoculum present, soil temperatures, and cultural practices (e.g., cultivating or rotary hoeing that may favor disease by throwing infested soil into sugarbeet crowns). Peaks of RCRR at the beginning of August in both years suggest that fungicide applications in fields with a history of this disease should be made in early to mid-July (infections likely occur at least a couple of weeks before observation in the field).

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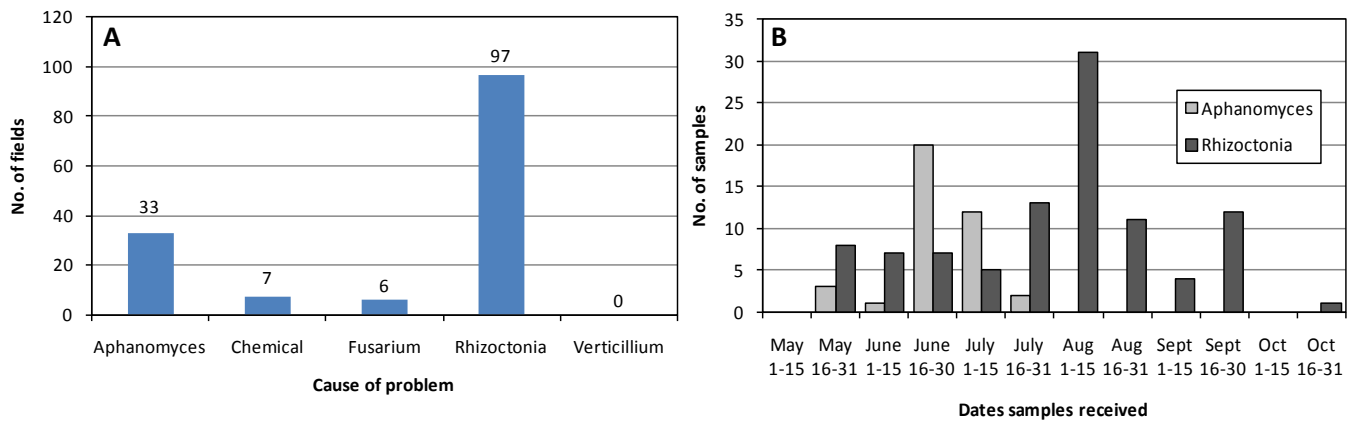


Figure 1. Summary of samples received in 2007 by **A.)** cause of problem and **B.)** date sample was submitted for the two most common root pathogens (*Aphanomyces* and *Rhizoctonia*) at the plant pathology laboratory, University of Minnesota, Northwest Research and Outreach Center, Crookston

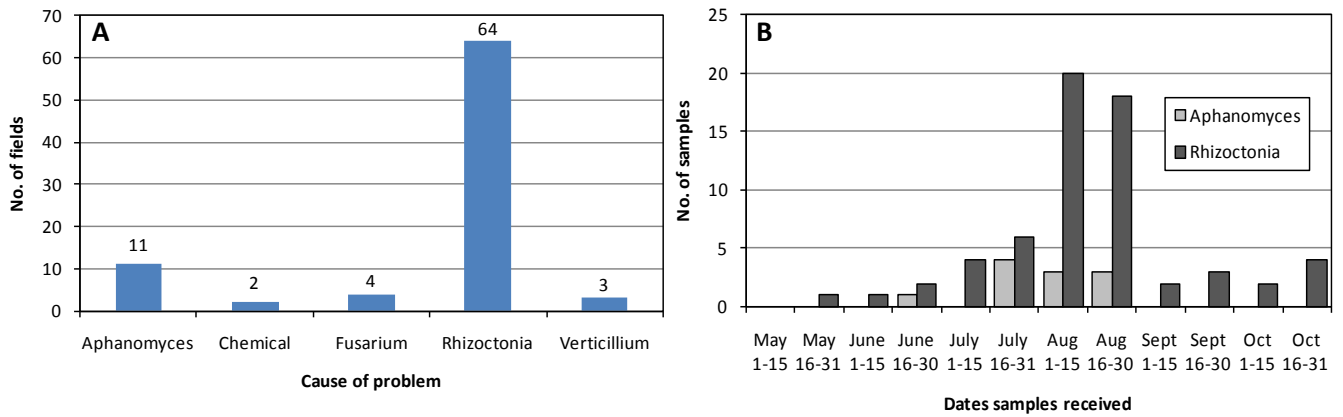


Figure 2. Summary of samples received in 2008 by **A.)** cause of problem and **B.)** date sample was submitted for the two most common root pathogens (*Aphanomyces* and *Rhizoctonia*) at the plant pathology laboratory, University of Minnesota, Northwest Research and Outreach Center, Crookston