PLANT PATHOLOGY LABORATORY: SUMMARY OF 2017-2018 FIELD SAMPLES

Jason R. Brantner[1] and Ashok K. Chanda[2]

[1]Senior Research Fellow, [2]Assistant Professor and Extension Sugarbeet Pathologist
University of Minnesota, Department of Plant Pathology, St. Paul and Northwest Research and Outreach Center, Crookston

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 have problems caused mostly by plant pathogens, insects, or abiotic causes such as chemical injury (usually herbicide) or nutrient deficiencies. This report summarizes results of samples received during the 2017 and 2018 growing seasons.

In 2017, samples were received from 54 sugarbeet fields and diagnoses are summarized in Figure 1A. *Rhizoctonia solani* was isolated from 36 fields, *Aphanomyces cochlioides* from 3, *Fusarium* from 2, and chemical injury was determined in 2 fields (= 67, 6, 4, and 4% of fields, respectively). Both *R. solani* and *A. cochlioides* were isolated from 2 fields (4%), while in some fields, no pathogens were isolated. Samples infected by *A. cochlioides* were received in early June and early July, while samples infected by *R. solani* were received from June through the end of the growing season (Fig. 1B).

In 2018, samples were received from 77 sugarbeet fields and diagnoses are summarized in Figure 2A. *Rhizoctonia solani* was isolated from 44 sugarbeet fields, *A. cochlioides* from 23, *Fusarium* from 1, and chemical injury was determined in 7 (= 57, 30, 1, and 9% of fields, respectively). Both *R. solani* and *A. cochlioides* were isolated from 9 fields (12%), and in some fields, no fungal pathogens were isolated. Samples infected by *A. cochlioides* were received mostly in July, following high rainfall in June (Fig. 2B & 3B). Samples infected by *R. solani* were received from June through August (Fig. 2B).

The number of samples received of a particular disease does not always accurately reflect the prevalence of disease. Agricultural staff and consultants may be more comfortable self-diagnosing certain diseases or they may go unnoticed if aboveground symptoms are not observed. However, similarities and differences between 2017 and 2018 were observed. The most common pathogens in both years was *R. solani* while prevalence of samples infected with *A. cochlioides* alone and with both pathogens together was higher in 2018 compared to 2017. Although rainfall was similar in both years (Fig. 3A), the high amount of rain during the month of June in 2018 (Fig. 3B) resulted in a moderate number of samples infected by *A. cochlioides* received in July. It is typical to see development of root rot due to either *R. solani* or *A. cochlioides* (or both) following periods of excess rainfall, so samples usually are received in the weeks following excess rainfall events. Based on observations of roots during sampling of 16 fields in the southern Red River Valley and southern Minnesota growing areas, infections due to *A. cochlioides* are highly under-represented in 2018 field sample results. It is likely that agriculturists in some cases are comfortable self-diagnosing the Aphanomyces infections, but in some cases, the infections are mistaken for Rhizoctonia. The number of samples received with *Fusarium* infection continued to be low in 2017 and 2018. In 2013, samples infected with *Fusarium* were received from 22 fields, but *Fusarium*-infected samples were received from three or less fields in each year from 2014 through 2018. In 2014, varieties with higher levels of resistance to *Fusarium* were being used in locations where the disease had previously been prevalent (Chris Motteberg, American Crystal Sugar Company Agronomist, personal communication), and this has likely continued. As fields and areas with *Fusarium* are documented and more people are aware of this pathogen, varieties with higher levels of resistance should continue to be used to reduce losses, inoculum production, and spread of the pathogen.

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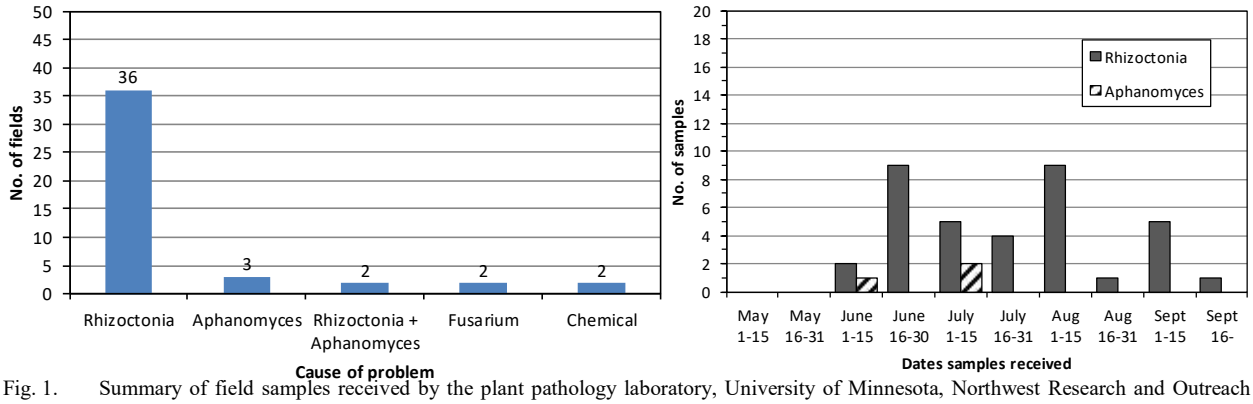

Fig. 1. Summary of field samples received by the plant pathology laboratory, University of Minnesota, Northwest Research and Outreach Center, Crookston in 2017. Results are reported by **A.**) diagnoses and **B.**) dates samples were received for *Rhizoctonia* and *Aphanomyces*, the two most common root pathogens.

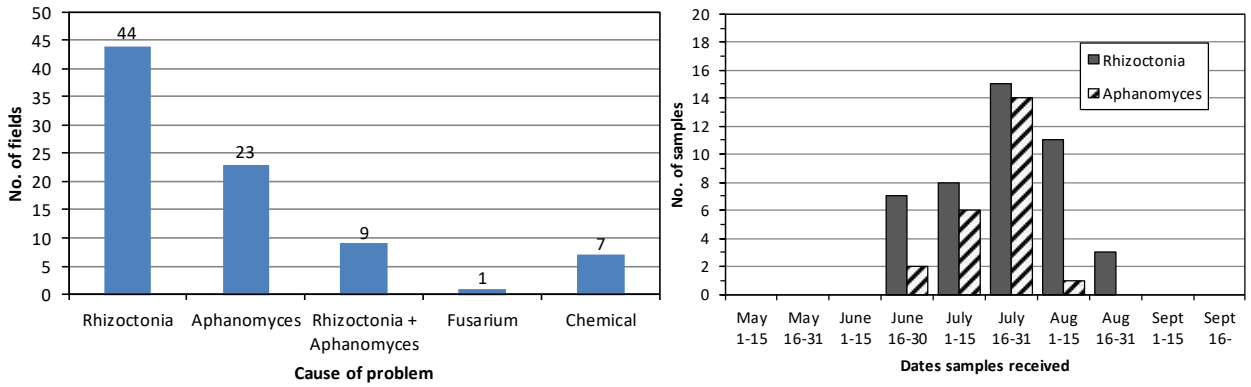

Fig. 2. Summary of field samples received by the plant pathology laboratory, University of Minnesota, Northwest Research and Outreach Center, Crookston in 2018. Results are reported by **A.**) diagnoses and **B.**) dates samples were received for *Rhizoctonia* and *Aphanomyces*, the two most common root pathogens.

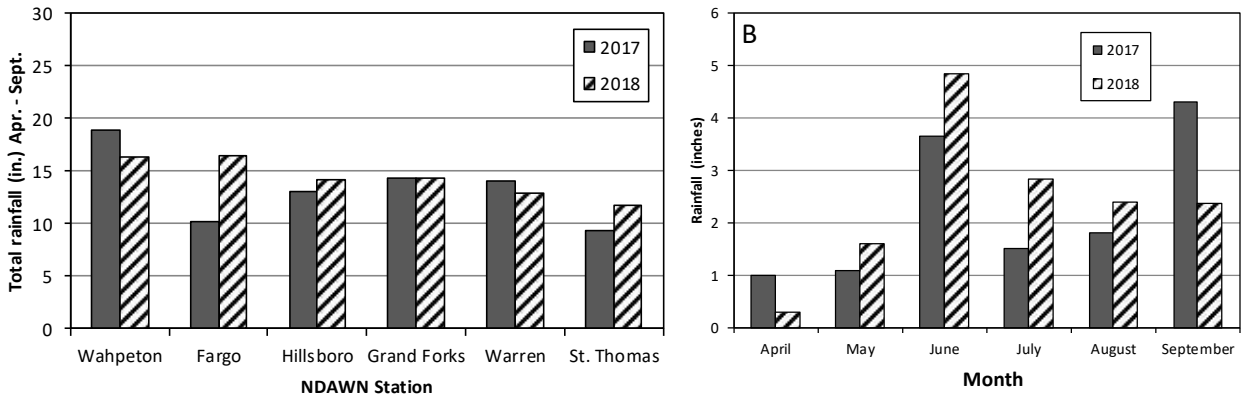

Fig. 3. Total rainfall recorded by the North Dakota Agricultural Weather Network (NDAWN) at six locations in the Red River Valley (Wahpeton, Fargo, Hillsboro, Grand Forks, Warren, MN and St. Thomas). Rainfall is reported in inches for the 2017 and 2018 growing season months of April through September. Rainfall is reported by **A.**) location and **B.**) month (averaged for all 6 locations).