

WISCONSIN– New Races of *Aphanomyces euteiches*?

Damon Smith, Hannah Reed, University of Wisconsin

Currently, there are two accepted races of *A. euteiches* causing alfalfa root rot in the Midwest, typically managed using resistant cultivars. However, recent observations indicate cultivars considered resistant to races 1 and 2 are not as effective as before. Previous research from 2005-2008 by UW graduate student Amy Gibbs indicated a range of *A. euteiches* populations in 255 soil samples collected in WI and Southeast MN. Just 36% of samples

were identified to contain *A. euteiches* races 1 or 2. Approximately 41% of the samples resulted in a reaction considered “abnormal” when using the conventional bioassay to identify what races of *A. euteiches* are present. Abnormal reactions can be one of four types: type A – susceptible reactions even on resistant cultivars; type B – resistant cultivars giving inconsistent reactions relative to each other; type C – reactions by race-1 resistant cultivar not different from susceptible or resistant cultivars; and type D – reactions by resistant cultivars scoring worse than susceptible cultivars. Follow-up work by graduate student Victoria Seitz led to the isolation of several individuals of *A. euteiches* that were highly aggressive on alfalfa cultivars considered highly resistant to *A. euteiches* race 1 and 2. Seitz concluded there likely was at least one new race of *A. euteiches*, and maybe more. In 2018 we conducted additional soil sampling and bioassays. Bioassays were carried out in a similar fashion as Gibbs performed from 2005-2008. Soil was collected from Northeast IA and WI, for a total of 17 samples tested. In 2018, ~6% of samples were identified to have *A. euteiches* race 1, 38% had race 2 (Figure 1). Abnormal reactions accounted for 56% of bioassay reactions. Of abnormal reactions, equal proportions of 44.4% were type A and B reactions, with no type C reactions and just 11.2% type D reactions. The results in 2018 are similar to Gibbs with a slight increase in abnormal reactions. Abnormal reactions are supporting evidence that additional races of *A. euteiches* likely exist in the Midwest. In order to manage emerging races of *A. euteiches*, alfalfa breeders will need to identify new resistant germplasm. Pathogen screening will need to be performed using newly identified isolates of *A. euteiches*.

Figure 1. Results of 2018 Soil Bioassays.

