PATHOGENICITY, DETECTION AND PREVENTION OF PYTHIUM SEED ROT IN ALFALFA

Oleksandra Rachynska, Travis Rebstock, Conner Tordsen, Jennifer Giles, and Andrew Sathoff*
Dakota State University
Madison, SD 57042
*Corresponding author email: andrew.sathoff@dsu.edu

ABSTRACT

Alfalfa (*Medicago sativa*) is a perennial legume plant that is mostly grown as food for livestock animals and a cover crop due to its high protein content and association with Rhizobium. In the USA, alfalfa is widely grown, with South Dakota having the second-highest acreage cultivated. Alfalfa fields may be affected by Pythium seed rot and damping-off because of favorable environmental conditions for pathogen growth. Surveys revealing *Pythium* spp. causing disease on alfalfa in South Dakota are in deficit. In this research, eastern South Dakota alfalfa fields were sampled to bait putative Pythium isolates from soil samples by using the rolled-towel technique. DNA was extracted from the Pythium isolates with the following application of PCR. After obtaining pure cultures, we detected *Pythium* spp. using ITS and cox1 sequences. Pythium pathogenicity towards alfalfa was tested through the culture plate method with *P. sylvaticum* being the most frequently isolated alfalfa pathogen. Fungicide evaluation against *Pythium* spp. was performed using agar plate-based assays. Among those fungicides tested, CruiserMaxx (mefanoxam, fludioxonil, thiamethoxam) revealed high activity against Pythium isolates. This research confirmed the presence of various pathogenic *Pythium* spp. in eastern South Dakota fields and provided data about fungicide effectiveness. Better disease management and higher alfalfa yields may result from an enhanced understanding of Pythium infections of the plant.