HANSON, LINDA E., USDA-ARS, SBRU, 494 PSSB, Michigan State University, East Lansing, MI 48824-1325. **Potential interaction between *Rhizoctonia* and *Rhizopus* causing root rot in sugarbeet.**

ABSTRACT

Rhizoctonia crown and root rot is one of the most important soilborne fungal diseases of sugarbeet. One important factor in managing this disease is host resistance. However, possible reduced control with resistance, as well as other management methods, is being increasingly reported. In 2005, we observed sugarbeets in greenhouse pathogenicity tests with moderate resistance to Rhizoctonia crown and root rot that showed symptoms faster than expected following inoculation. Root rotting also was more severe than expected. Isolations revealed that a second fungus was present in addition to *Rhizoctonia solani*. This fungus was found to be a zygomycete and was morphologically identified as *Rhizopus*. When inoculated alone onto sugar beet in soil that was not saturated, this fungus caused only some minor surface discoloration under greenhouse conditions. When co-inoculated with *Rhizoctonia solani*, moderately Rhizoctonia-resistant beets showed more severe root rot than was observed with *Rhizoctonia solani* alone. In 2007 and 2008, samples were received from some fields with root rot problems that also contained both pathogens. Isolates of *Rhizopus* from these samples produced little damage on their own, but rot was increased when they were applied in combination with *R. solani*. Significant ($P \leq 0.05$) increases in root rot severity were observed on three different sugar beet varieties with the combined fungi compared to either fungus alone. Increases were greater than the additive effect of the two fungi on all varieties. A Rhizoctonia root rot-resistant germplasm had significantly less disease with the combined treatment than a Rhizoctonia root rot-susceptible germplasm (15-25% root rotted and greater than 60% root rotted respectively), but the level of root rot for the resistant germplasm in the presence of the combined pathogens was similar to that for the susceptible with *Rhizoctonia solani* alone (20-30% root rot). In addition, many of the beets with the pathogen combination showed deeper rot penetration into the root than those exposed to a single pathogen. This deeper rot was usually found on tissue below the soil line, although inoculations were to the crown. These data may provide an additional factor of concern when using *Rhizoctonia*-resistant material in fields where both fungi are present. This also could be one factor associated with the lower root rot or root tip rot observed in some *Rhizoctonia* problem areas.