

HANSON, LINDA E.* and J. Mitchell McGrath, USDA-ARS, SBRU, 494 PSSB, Michigan State University, East Lansing, MI 48824-1325. **Seedling disease resistance screening assays.**

ABSTRACT

A number of pathogens can cause early season stand loss in sugar beet. Fungi such as *Rhizoctonia solani* AG-2-2 and AG-4 and *Fusarium oxysporum* cause post-emergence damping-off in sugar beet. In a 2008 survey for seedling diseases in Michigan, *Rhizoctonia solani* AG-2-2 was the most commonly isolated pathogen. *Fusarium oxysporum* was the next most commonly isolated fungus, and was the only pathogen isolated from beets collected from one field. Recent work has identified some sugar beet germplasms which show reduced damage from isolates of *Rhizoctonia solani* AG-2-2 IIIB at early growth stages compared with the majority of beet germplasm tested. These and other USDA-ARS germplasm are being screened for response to additional isolates of AG-2-2 IIIB as well as AG-2-2 IV originally collected from both seedling damping-off and mature plant crown and root rot samples. Both isolates from seedlings and from root rot caused damping-off of beet seedlings. As has been reported previously in other studies, AG-2-2 IIIB isolates were generally more virulent than AG-2-2 IV isolates. Germplasm EL51 continued to show resistance to isolates of AG-2-2 IIIB in screenings, and additional germplasm also had reduced disease severity with one or both anastomosis groups in a soilless potting mix assay. Testing for response to *F. oxysporum* also showed evidence for differences in the level of susceptibility to damping-off in different germplasm. Pathogenicity of fungal isolates could be readily detected using an in vitro assay with seedlings in germination papers exposed to aqueous spore suspensions. However, these screens were more sensitive to seed infection with other pathogens and less consistent for differential host responses than exposing seedlings in soilless potting mix by application of a spore suspension to the potting mix. Testing of plants at different ages and growth conditions may be useful to determine optimal conditions for plant screening and allow for identification of germplasm with improved resistance to early season losses.