DIRCKS, CHRISTINE[a]; ANNEKE BEHN and MARK VARRELMANN*, Institute of Sugar Beet Research, Department of Phytopathology, Holtenser Landstr. 77, 37079 Göttingen, Germany. **Optimization of sugar beet *Rhizoctonia solani* resistance test in field trials by irrigation and fleece cover.**

[a]: First and second author contributed equally to this work

Over the past years the European sugar beet cultivation is increasingly affected by the late root and crown rot disease, caused by the soilborne fungus *Rhizoctonia solani* AG2-2IIIB. Estimated 36.000 ha are currently infected with the fungus. As a consequence of this disease, 60% plant loss and an eminent yield decline can occur. In the USA the total economical loss is estimated 2% due to the infection with *R. solani*. At present there is no registered fungicide available in Europe. The most important measure for Rhizoctonia control is growth of resistant sugar beet cultivars. In Germany sugar beet varieties are tested for Rhizoctonia root rot resistance in field trials. Fields are artificially infected by drilling Rhizoctonia infested barley-grains directly before sugar beet is sown. However, significant variable results between environments and locations are often obtained due to variable weather conditions which influence disease pressure. Therefore valid results can only be obtained with increased number of independent locations. As *R. solani* aggressiveness is known to be fostered by increased soil temperature and humidity, a field trial with variation of irrigation and fleece covering for a four week period following canopy closure was carried out at two locations in Germany. Soil temperature and humidity were monitored and three time harvests as well as rating of diseased beet surface were performed. By applying four cultivars carrying different resistance levels, it could be shown that the two treatments or a combination of both nearly doubled the disease severity in the susceptible cultivar whereas the increase in highly resistant cultivars was much less pronounced. Fleece and irrigation produced similar increase in disease severity but additive increase was not observed when both factors were combined. The variable response of the cultivars to increased temperature and humidity can be used as additional criteria for cultivar performance and for a better and safer evaluation of the quantitative resistance traits. The practicability of the treatments for improvement of Rhizoctonia resistant cultivar evaluation is discussed.