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IMPACT OF PHYSICAL SOIL PROPERTIES ON THE OCCURRENCE OF RHIZOCTONIA ROOT AND CROWN ROT IN SUGAR BEET (*BETA VULGARIS* SSP. *VULGARIS*)

ABSTRACT

The soil borne pathogen *Rhizoctonia solani* (*R. solani* AG2-2IIIB) is the causal agent of the late crown and root rot in sugar beet, which became an increasing problem in European sugar beet growing in the past decades. Conditions causing Rhizoctonia disease outbreak are not yet understood. However, physical soil characteristics are assumed to have a strong influence on Rhizoctonia inoculum potential in the soil and Rhizoctonia infestation of sugar beet. We present results from multi-factorial split-plot field experiments (pre-crop / inoculation as main plot, tillage, sugar beet variety and harvest time as sub-plots) with four replicates conducted at Haardorf (Lower Bavaria). This region is the main infestation area for Rhizoctonia root and crown rot in Germany. The soils were inoculated with a barley inoculum and maize was grown as a susceptible pre-crop to create a high and uniform infestation potential in the soil. Maize straw was left (grain maize) or removed (silage maize) from the field, and the soil structure of the topsoil (0-15 cm) was differentiated by a variation of soil tillage and additional soil compaction in autumn (tillage: plow 25 cm, cultivator 10-12 cm, cultivator 5 cm plus additional load).

Undisturbed soil samples were taken to determine physical soil characteristics (field capacity, bulk density, air capacity, pore volume) probably affecting Rhizoctonia infestation. In addition, soil moisture, soil temperature and the electrical conductivity was continuously recorded by data loggers in the field during the growing season. The Rhizoctonia infestation level of sugar beet was evaluated by a crop scoring system at different harvest dates. Correlations between soil structural properties and the occurrence of Rhizoctonia infestation in the field will be presented.