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MONITORING *RHIZOCTONIA SOLANI* AG2-2 INOCULUM LEVELS IN SUGAR BEET FIELD SOILS

ABSTRACT

Rhizoctonia solani (Kühn) is an important soilborne pathogen causing root and crown rot in sugar beets. A high soil inoculum potential of *R. solani* is the main prerequisite for the development of sugar beet root rot. To quantify *R. solani* AG 2-2 densities in soil, a specific molecular quantification assay, called quinoa-qPCR-assay, was developed. In addition to its efficient use in greenhouse and in field trials with artificially infested soils, the assay was now evaluated for its suitability to monitor the *R. solani* concentration level in naturally infested soil.

A total of fifty sugar beet fields in Bavaria were categorized into high and low risk fields using the factors pre-crop (high-risk: maize, low-risk: winter wheat) and risk-area (high-risk: region with high incidence of root rot, low-risk: region with low incidence of root rot). Sampling was repeated two times at intervals of two months and infection rates of sugar beet were recorded as percent surface area affected.

There was a good agreement between infection rates and inoculum amounts observed with the quinoa-qPCR-Assay. As expected, the *R. solani* concentration level was significantly higher at locations where maize was grown as a pre-crop. Furthermore, when wheat was grown as a pre-crop, the inoculum amount in high-risk areas was twice as high as in low-risk areas. The results demonstrate that the quinoa-qPCR assay is a highly sensitive method to efficiently estimate the inoculum potentials of *R. solani* AG 2-2 in naturally infested soils.
