069 - Pathogens occurring on leguminous subsidiary crops used for permanent soil cover in different cropping systems and climatic regions

Pathogenspektrum auf Leguminosenarten zur verbesserten Bodenbedeckung in unterschiedlichen klimatischen Regionen

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Conservation agriculture (CA) attempts to apply minimum soil disturbance while ensuring acceptable profits. Weeds, nutrient availability, and soil borne diseases are important issues and often limiting factors for adoption of such systems, especially in organic farming. Weed suppression, nutrient cycling, and N-fixation could be achieved by the integration of additional, subsidiary crop (SC) species, especially legumes into the rotation to be used either as living mulches or cover crops. The ability of legumes to fix satisfactory amounts of N depends crucially on legume root health. However, many potential SC species share important soil-borne pathogens and in addition may serve as alternative hosts on common main crops in the system.

Within the EU project OSCAR (Optimizing Subsidiary Crop Applications in Rotations, www.oscar-covercrops.eu) field experiments are on-going from Scandinavia to Morocco since 2012 to study the effects of tillage, climate, and soil conditions on occurrence and frequency of pathogens in various legume SC species. Root samples of *Trifolium repens, T. subterraneum, Vicia villosa* and *V. sativa* from several sites were assessed for disease severity according to a modified rating scheme of Flett (1994) and Aldaoud et al. (1997), and analyzed for the presence of root pathogens.

Overall, disease severity was low with the highest levels observed on *V. sativa.* However, low pathogen incidence on symptomatic plants points to the fact that stress factors other than pathogens might have played a role. Pathogen occurrence was highly variable across climatic regions and experimental fields. *Fusarium spp.* were the most frequent genera isolated with *Fusarium oxysporum, F. solani* and *F. avenaceum* being dominant on all four plant species. In adition, *Phoma medicaginis* and *Didymella sp.* were recovered at low frequencies and mainly from *T. subterraneum* roots. *F. oxysporum* and *F. solani* are known to have both pathogenic and non-pathogenic strains which are able to colonize roots. Thus detection in the plant material is not proof of ongoing disease infection. Therefore, additional screening tests on the susceptible pea (*Pisum sativum* L.) variety Santana were conducted to confirm pathogenicity of recovered isolates. *F. avenaceum* is a pathogen with no host specificity and under favorable conditions may cause significant damage on a wide range of cultivated plants. This, together with its ability to produce mycotoxins makes *F. avenaceum* a potentially important pathogen when including SCs into crop rotations.

References

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