

Genetic diversity of red clover varieties listed in Germany concerning the resistance to *Colletotrichum trifolii*

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Introduction

Colletotrichum trifolii Bain et Essary, a fungal pathogen causing the disease 'Southern Anthracnose' in red clover and red clover pasture stands, seems to be responsible for the increasing failure of red clover plants (*Trifolium pratense* L.) and appears to spread out in Germany.

This research was intended to find out if there are differences in resistance to this pathogen among the red clover cultivars listed in Germany and to find sources of resistance for further breeding. One genotype bred in the USA ('Starfire'), which is known to be highly resistant, was also included in this investigation.

Red clover is an essential element in crop rotations, particularly in organic farming. Therefore, for cultivation resistant genotypes are of special interest.

Materials and methods

A test for resistance as stated by Schubiger et al. (2003) was realized in the greenhouse.

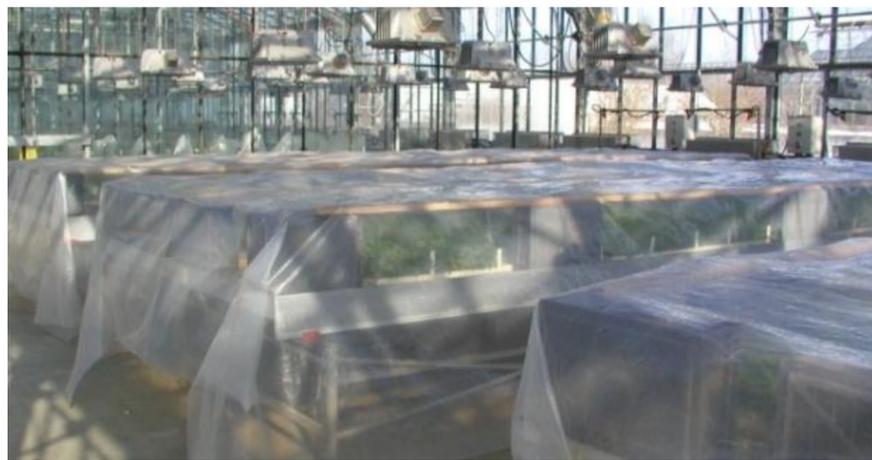


Figure 1. Trial station during time of incubation.

Germinated grains were planted into Quickpots™. Plants were cut five weeks after planting. The inoculation was realized two weeks later with a conidia suspension. Afterwards, the plants were covered with a PVC-tent for incubation for six days (fig. 1). First symptoms could be observed about two weeks after infection (fig. 2). Plants were cut two and five weeks after inoculation. Over a period of three and six weeks after inoculation the number of dead plants was determined twice.

After conversion of the data with the arcsin square root transformation, analysis of variance was realized with the SAS program. The Student-Newman-Keuls Test was used to identify significant differences among genotypes.

Results and discussion

The evaluated cultivars clearly showed a differentiation of the susceptibility to *C. trifolii* (fig. 3).

As expected, 'Starfire' showed the highest resistance level (plant survival 87 %). Among the cultivars listed in Germany, 'Pavo' had the highest plant survival rate (79 %), in contrast to 'Kvarta', which showed the lowest resistance characteristics (plant survival 29 %).



Figure 2. Typical symptoms of a plant attacked by *C. trifolii*.

Conclusion

The results demonstrate that there exist differences in resistance to the fungus *C. trifolii* among the red clover cultivars listed in Germany. Even though these data have to be verified in field trials, it seems to be already possible to identify sources of resistance for breeding resistant red clover cultivars.

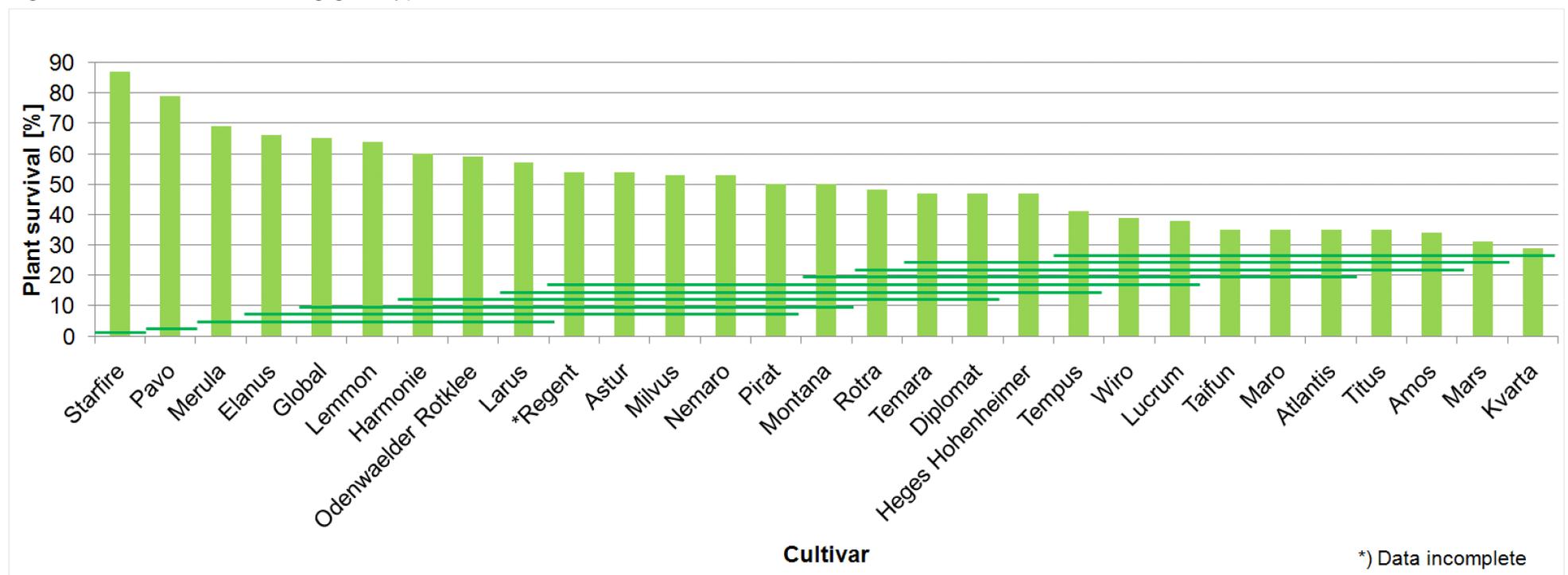


Figure 3. Ranking of the tested cultivars concerning their resistance against *C. trifolii*. Lines show non-significant differences, $P = 0.05$ (SNK).

References

Schubiger, F.X., Streckeisen, P. and B. Boller (2003): Resistance to Southern Anthracnose (*Colletotrichum trifolii*) in cultivars of red clover (*Trifolium pratense*). *Czech J. Genet. Breed.* 39 (Special Issue):309-312.