



Understanding *Ramularia collo-cygni* in the past, present and future

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Abstract

The fungus *Ramularia collo-cygni* is the major biotic agent involved in Ramularia Leaf Spot (RLS). Although it was first described in 1893 it was only initially identified as a pathogen of spring barley in Scotland in 1998. Since then it has increased in its importance throughout the whole of the UK, as well as an increasing number of European countries. Increasing our understanding of this relatively new disease has been a challenge over the last decade. Firstly, by understanding the economic impact of the disease and secondly in developing optimal disease control programmes. Advances in both areas have in turn lead to an increase in fungicide use and this remains the only reliable control method available to growers. However, the threat of fungicide resistance and the future limitation of pesticide groups, means that alternative control methods will have to be developed in the near future. Understanding of the development biology and epidemiology of *R. collo-cygni* has greatly increased over the last few years, leading to an accurate risk forecast system and a greater understanding of the impact and role of seed infection on subsequent disease progress. However, the development of a fully integrated pest management (IPM) system to control RLS will require the introduction of resistant cultivars. Research into breeding resistant lines is still in its infancy and currently there are no resistant cultivars for this disease. *R. collo-cygni* is currently classified as a member of the *Mycosphaerella* family. The entire *R. collo-cygni* fungal genome is being fully sequenced using a combined approach of illumina/solexa and Roche/454 sequencing. This approach will help with the assembly of sequence data, which can then be used for comparative genetic studies to address the biology of *R. collo-cygni* in areas such as population genetics, fungicide resistance and pathogenicity. These advances should assist in the development of environmentally sound strategies to control this important disease of barley production systems.