



Using innate beneficial microbes to promote resistance

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Abstract

Managing plant-associated microbial population to improve innate resistance to pests and pathogens has received considerable attention recently. Some crop protection methods using fungicide are being restricted by new European Union Directives, so additional and alternative approaches, such as utilising resistance elicitors (plant defence stimulators), are gaining new prominence. Further protection could be achieved by introducing beneficial microorganisms with biocontrol activity alongside agro-chemical application. However, the effects of agro-chemical treatments on non-target microorganisms have to be assessed under field conditions.

Culturable bacteria were initially isolated from leaves of the winter barley cultivar Sumo and were largely dominated by bacteria belonging to the *Pseudomonas* genus, particularly *P. syringae*. This species, as well as *Pectobacterium atrosepticum*, demonstrated significant biological control properties against *Rhynchosporium commune*, the most prevalent disease in the field causing “barley leaf blotch” or “scald”.

The leaf-associated bacterial populations of eight winter barley cultivars treated either with conventional fungicides or an elicitor mixture were monitored in 2009. Agro-chemical treatments resulted in considerable protection against diseases but could interfere with the innate protection against fungal pathogens by altering the microbial balance and in particular lead to a significant increase of the bacterial diversity.