

## **Natural products for control of powdery mildew on different barley genotypes**

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Global warming is a major challenge for plant health and crop yield. Thereby, both drought stress itself and associated pathogens threaten harvests. Since chemical pesticides can pose a threat to the environment, their use is increasingly regulated, and more sustainable solutions are needed. Natural products can provide a remedy as they have the potential to promote plant growth and tolerance or resistance to diverse stresses. One of the main goals of the project MORGEN (Modelling of drought stress tolerance in barley using biological plant protection – the crop of tomorrow) is to find a sustainable way to reduce both powdery mildew infection and drought stress on barley. Twenty biostimulants, plant strengtheners and basic substances were screened for their effectiveness against *Blumeria graminis* f.sp. *hordei* on four different barley genotypes. Eleven products showed mildew reducing effects for at least one genotype. Two products were effective on all four genotypes. However, biotic and abiotic stressors do not occur separate from each other, but often simultaneously. Thus, to verify their potential, the most promising of the tested products were evaluated for their efficiency against powdery mildew under simultaneous drought stress. In this way, promising products with genotype and drought stress independent efficiency were found. To address the underlying mechanisms, gene expression (qPCR) analyses were conducted to identify regulatory pathways and the associated genes involved in the observed effects.