

## A project to identify and map scab and powdery mildew resistance genes in apple

Muçaj, Buist<sup>1</sup>; Braun, Peter<sup>2</sup>; Dierend, Werner<sup>3</sup>; Rueß, Franz<sup>4</sup>; Flachowsky, Henryk<sup>1</sup>; Peil, Andreas<sup>1</sup>

<sup>1</sup>Julius Kühn Institute (JKI) – Federal Research Centre for Cultivated Plants, Institute for Breeding Research on Fruit Crops, Dresden, Germany.

<sup>2</sup>Hochschule Geisenheim University (HGU), Geisenheim, Germany.

<sup>3</sup>Hochschule, University of Applied Sciences Osnabrück (HS OS), Osnabrück, Germany.

<sup>4</sup>Staatliche Lehr- und Versuchsanstalt für Wein- und Obstbau (LVWO), Weinsberg, Germany.

Email of corresponding author: andreas.peil@julius-kuehn.de

Apples are one of the most important fruits worldwide and the most important fruit species in Germany. However, the cultivation of this culture faces many different challenges. At the top of the list are apple scab (*Venturia inaequalis*) and powdery mildew (*Podosphaera leucotricha*). Both of these fungal pathogens are favored by climate change and are becoming increasingly important. To control these pathogens, up to 20 plant protection treatments are applied per season in commercial fruit production. The frequent use of fungicides leads to ecological issues and promotes the formation of fungicide-resistant races in these pathogens. An important approach for more sustainable apple production and less environmental damage is the cultivation of apple cultivars resistant to scab and powdery mildew. The aim of this project is to advance the breeding of new cultivars resistant to scab and powdery mildew by identifying and introducing new resistance genes. The objectives are to phenotype scab and powdery mildew at three different locations in Germany, to identify and map apple scab and powdery mildew resistances from genetic resources and *M. orientalis*, and to develop and validate KASP assays for powdery mildew and scab resistance genes.

**Acknowledgements:** The project is granted by the German Federal Office for Agriculture and Food.