

The F129L mutation of the cytochrome *b* gene in German *A. solani* isolates and its impact on their sensitivity towards QoI fungicides

BIRGIT ADOLF, JUERGEN LEIMINGER, HANS HAUSLADEN

Technische Universität München, Lehrstuhl für Phytopathologie, Technische Universität München, Emil-Ramann-Straße 2, D-85354 Freising-Weihenstephan, Germany

SUMMARY

Early blight, caused by *Alternaria solani*, is one of the most widespread fungal diseases of potato (*Solanum tuberosum*). The most efficient fungicides for early blight control are quinone outside inhibitors (QoIs) like azoxystrobin, when applied as preventive treatments.

However, loss of sensitivity to QoIs has previously been reported for *A. solani* in the United States.

In Germany, we collected 203 *A. solani* isolates from 81 locations between the years 2005 and 2011 and screened them for the presence of the F129L mutation in the cytochrome *b* (*cytb*) gene. 74 isolates carried the F129L mutation. Sequence analysis revealed that isolates contained two different structures of the *cytb* gene – one having an intron after codon G 131 (genotype II), the other one lacking it (genotype I). 63% of our isolates were genotype I. The F129L mutation occurred in genotype II isolates only and there in the majority of isolates (97%).

Additionally we determined sensitivity to azoxystrobin and pyraclostrobin in conidial germination assays. Reduced sensitivity to azoxystrobin was observed for all isolates carrying the F129L mutation. The loss of sensitivity to pyraclostrobin was less pronounced. According to our results of the conidial germination assay, we pooled the isolates in sensitive and less sensitive isolate groups and inoculated potato eye cuttings with the different spore solutions. After treatment with azoxystrobin, plants inoculated with the less sensitive isolate pool developed significantly stronger early blight symptoms than plants sprayed with the sensitive isolates. Our results suggest an increasing amount of F129L isolates in the German population of *A. solani* between the years 2009 and 2011. The loss of fungicide efficacy may be caused by the application of QoIs and related to this the selection for the F129L mutation.

The data are published (1).

KEYWORDS

Alternaria solani, cytochrome *b*, fungicide resistance, QoI

PUBLICATION

- (1) J.H. Leiminger, B. Adolf, H. Hausladen, 2013. Occurrence of the F129L mutation in *Alternaria solani* populations in Germany in response to QoI application, and its effect on sensitivity. Plant Pathology Doi: 10.1111/ppa.12120.