

The early blight situation in Sweden – species abundance and strobilurin sensitivity

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SUMMARY

Early blight is a very common potato disease in the south-eastern part of Sweden, but has also been reported from other areas of the country. The disease has increased in severity during the last decades, but the true causal agent of the lesions is often not known. Identification of the causal agent of lesions with symptoms resembling early blight started in 2009, focusing on detection of *Alternaria solani* and *A. alternata*. Potato leaflets showing symptoms of early blight were collected three times during August and September from 2009 to 2012 in south-eastern Sweden. In addition, in 2010 and 2012, samplings were performed in the middle part of Sweden. Using diagnostic PCR methods (Edin, 2012; Zur 2002) the two *Alternaria* species were commonly identified in samples from south-eastern Sweden, most often found in co-occurrence. The two species were only found in a few samples from other areas, separate or in co-occurrence.

Despite repeated applications of strobilurin-based fungicides, the incidence of early blight was high in many of the sampled field. Loss of sensitivity toward strobilurins has been associated with various substitutions in the gene encoding cytochrome *b* in several plant pathogen species. In order to identify any substitution in *A. solani*, the PCR-products of all the confirmed samples were sequenced using the same primer combination as above. All *A. solani* samples were wild type, except for the samples from one farm collected in 2012 where the gene encoding cytochrome *b* diverged considerably from the wild type. The PCR product was shorter than the ordinary one. These strains may be of another genotype more resembling the American strains of *A. solani* (B. Adolf, pers. comm.). These diverging samples as well as other samples with a shorter PCR-product will be analysed using the primers developed by Pasche *et al* (2005).

For *A. alternata*, a section of the cytochrome *b* gene of was amplified and cut using a restriction enzyme to identify the occurrence of G143A substitution (B. Vega, pers. comm.). The substitution was found in the majority of the samples from 2011 and 2012. This implies that the efficacy of strobilurin-based fungicides may have been reduced in the *A. alternata* population. However, the consequences for the potato crop are unknown since the pathogenicity of *A. alternata* may be low on potato, but further analyses are needed to confirm this.

During the collections in August and mid-September 2011 and 2012 scattered lesions with symptoms similar to early blight were found on *Solanum nigrum* in three different fields. In 2011, *A. alternata* was found in 14 of these lesions, eight of which had the G143A substitution. Two of the lesions collected in 2012 were caused by *A. solani*.

KEYWORDS

Alternaria solani, early blight, fungicide sensitivity

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