Screening for Partial Resistance to Fruit Tree Canker in Apple Cultivars

M. Ghasemkhani¹*, J. Sehic¹, M. Ahmadi-Afzadi¹, H. Nybom¹ and L. Garkava-Gustavsson²

¹ Swedish University of Agricultural Sciences, Department of Plant Breeding and Biotechnology, Balsgård, Fjällkestadvägen 459, 29194 Kristianstad, Sweden
² Swedish University of Agricultural Sciences, Department of Plant Breeding and Biotechnology, Box 101, 230 53 Alnarp, Sweden

*Corresponding Author: Marjan.Ghasemkhani@slu.se, Marjan.Ghasemkhani@gmail.com

Introduction

Fruit tree canker in apple, caused by the fungus Nectria galligena, is considered as a serious economic problem in apple orchards especially in northwestern Europe. Not even chemical control with fungicides is sufficient for protecting the trees. Apple cultivars show variable levels of partial resistance to the fungus whereas complete resistance is not known. Therefore the aim of this study was to identify partially resistant cultivars that can be used in plant breeding as sources of resistance to N. galligena.

Material and Methods

Ten cultivars were used in two experiments. 

Expriment 1. Cut shoots were inoculated and then kept under a plastic tent in a greenhouse while symptoms developed (Fig. 1).

Expriment 2. One-year-old potted trees were inoculated in a greenhouse (Fig. 2).

In both experiments, lesion length was measured and sum of the values for each assessments were calculated. Area under the curve (AUC) was then calculated and used for ANOVA.

Results

‘Rödluvan’ was the most resistant cultivar in both experiments, while ‘Jonathan’ was the most susceptible cultivar in the cut-shoots experiment (Fig. 3) and ‘Åkerö’ in the potted-trees test (Fig. 4). The other cultivars showed varying levels of resistance when the two different methods were compared. Results may be used for further studies to select resistant cultivars for breeding programs.