

# The Development of Verticillium-Resistant *Acer* Rootstocks<sup>®</sup>

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## OBJECTIVE

To develop rootstocks for *Acer platanoides* that are resistant to *Verticillium dahliae*.

## PROBLEM

- Verticillium wilt affects many shade trees including *Acer*, *Aesculus*, *Catalpa*, *Fraxinus*, *Prunus*, *Robinia*, *Syringa*, and *Ulmus* species.
- Norway maple (*A. platanoides*) is one of the major hosts.
- Young plants in tree nurseries as well as older plants in urban or rural plantings are affected (Fig. 1).

## COOPERATION

- Applied Plant Research, Nursery Stock Unit (PPO-Trees).
- Plant Research International (first phase).
- Dutch Product Board of Horticulture (PT).
- European Union/LNV-DWK (first phase).

## APPROACH

- Methods to select and screen for resistance in young seedlings were developed (1993–1995).
- Large-scale selection in seedling populations of *Acer platanoides* (1995–1998).
- Propagation of selected individuals (1997–2000).
- Testing resistance of new selections in the field (1999–2003).



**Figure 1.** Common ash (*Fraxinus excelsior*) in roadside plantation strongly affected by verticillium wilt.



Figure 2. Single sample of resistant selection.



Figure 3. Seedling tree after infection by *Verticillium dahliae*.

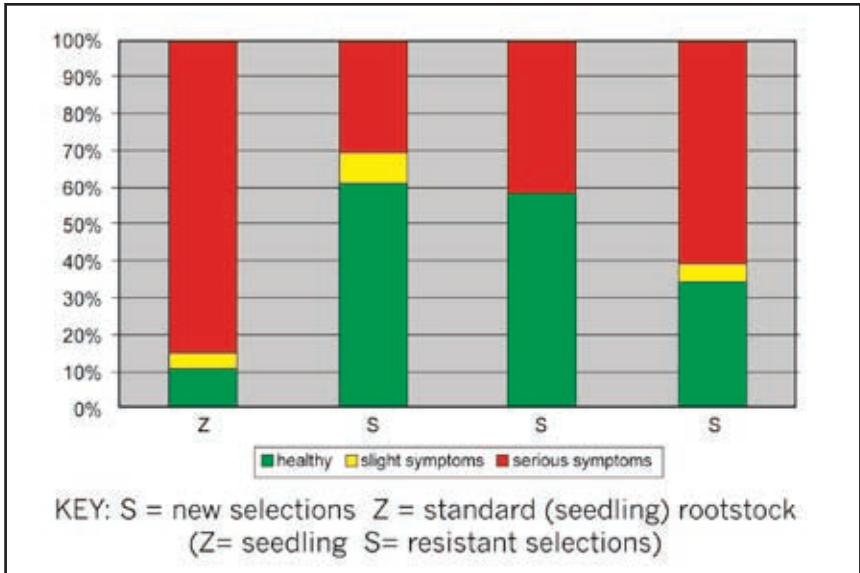


Figure 4. Results of field test of new rootstocks on heavily infected fields.

- Testing best selection as rootstock (2003–2005).

## RESULTS

- From about 20,000 initial seedlings, only some 50 seedlings remained after the first selection.
- After a first round of propagation, about 30 small clones could be tested a second time (Fig. 2).
- Susceptible clones were discarded, and failure to propagate (either by cuttings or in vitro) resulted in about 10 selections that could be tested on a larger scale in the field.
- Some of the best selections performed very well. In a severely infested field, 60% of the individual seedlings of these selections remained healthy, whereas only 10% of the healthy seedling plants (commonly used as rootstock) survived (Fig. 3).
- The best selections now are being developed into verticillium-resistant clonal rootstocks for Norway maple cultivars will become available to growers within the coming years.
- Results of field test of new rootstocks on heavily infected fields is shown in Fig. 4.

Note: See <[www.eu.verticilliumintrees.org](http://www.eu.verticilliumintrees.org)> for more information on verticillium wilts in specimen trees.

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## Cultivar Trials at Applied Plant Research®

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## INTRODUCTION

Applied Plant Research in Boskoop (The Netherlands) has several trials of woody plants and herbaceous perennials each year. The aim of these trials is to find out which cultivars are the best for growers and home gardeners. Trials usually run for several years. During this time, the identity of the plant is verified and accurately described, photographed, and documented. Information about differences in cultivation requirements and use is gathered, in many cases in cooperation with researchers in other countries. Besides the ornamental value, we look at ease of propagation, winter hardiness, resistance to pests and diseases, etc. Finally an evaluation committee of nurserymen also judges the plants. The results of the trials and the test committee are published in several Dutch magazines for nurserymen, landscapers, and gardeners.

## TOP SCORERS FROM RECENT TRIALS

***Helenium*. Highest awards in 30 tested cultivars for:**

- 'Biedermeier' (unique colouring) (Fig. 1).
- 'Kanaria' (strong and versatile) (Fig. 2).
- 'Rubinzweg' (sturdy, intense colour) (Fig. 3).
- 'Wesergold' (yellow with brown centre, long flowering time).
- 'Goldlackzweg' (red, spotted yellow, sturdy).