



Agriculture & Horticulture  
DEVELOPMENT BOARD



# **Grower Summary**

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**TF 182**

East Malling Rootstock  
Breeding Club

Annual 2012

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Before using all pesticides check the approval status and conditions of use.

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## **Further information**

If you would like a copy of the full report, please email the HDC office ([hdc@hdc.ahdb.org.uk](mailto:hdc@hdc.ahdb.org.uk)), quoting your HDC number, alternatively contact the HDC at the address below.

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HDC is a division of the Agriculture and Horticulture Development Board.

**Project Number:** TF 182

**Project Title:** East Malling Rootstock Breeding Club

**Project Leader:** Ms Felicidad Fernández,

**Contractor:** East Malling Research

**Industry Representative:** Mr Nigel Bardsley

**Report:** Annual Report 2011/12

**Publication Date:** 05 November 2012

**Previous report/(s):** Annual Report 2010/11

**Start Date:** 1st April 2008

**End Date:** 31st March 2012  
(extendable until 31st March 2014)

## Headline

- East Malling Research (EMR) continues the development of improved rootstocks for apple and pear.

## Background and expected deliverables

Improved rootstocks are essential for profitable and sustainable production in tree-fruit crops. Factors important to growers include dwarfing (to reduce the cost of pruning and picking), induction of precocious and reliable cropping, freedom from suckers, good anchorage and resistance to pests and diseases. Ease of propagation and good scion-stock compatibility are also important in the nursery. There are few breeding programmes worldwide generating tree-fruit rootstocks. East Malling Research (EMR) involvement in rootstock development dates back to its foundation with the subsequent release of the world-famous series of M (Malling) and MM (Malling-Merton in collaboration with the then 'John Innes Horticultural Institution') apple rootstocks. As a consequence of the reduction in government funding for 'near-market' research in the 1990's, industry support for the programme was sought and between 1992 and 2007, breeding apple and pear rootstocks formed one of the objectives of the East Malling Apple and Pear Breeding Club (APBC). The Apple and Pear Research Council and more recently the Horticultural Development Company (HDC) were the UK Licensees for the material developed as part of the APBC, which included two new rootstock releases, M116 for apple and EMH, a quince rootstock for pear.

In 2008, EMR, the HDC and the International New Varieties Network (INN) launched a Rootstock Club (EMRC) to breed, develop, distribute and commercialise new rootstock breeding material from EMR, world-wide.

EMR has a wealth of breeding lines, derived from, UK, USA, Canadian and Japanese material, encompassing diverse agronomic variation and a wide range of resistance to various pests and diseases. Defra continues to fund underpinning strategic research at EMR on genetic mapping of rootstocks and the development of molecular markers for pre-selection of key rootstock characters. The programme is strengthened by EMR's diverse collaborators and international contacts.

For UK growers, the HDC also acts as the UK licensee for the East Malling Rootstock Club (EMRC) with the intention of making new rootstocks released from EMR's programme, widely available to UK levy payers. The HDC helps to 'steer' breeding objectives to meet the

specific requirements of UK growers and ensures that appropriate newly selected rootstocks are trialled further before release to the UK industry.

INN has members in the USA, Chile, South Africa, Australia, New Zealand and throughout Europe. In each country, members can produce virus-free (VF) certified rootstocks and premium quality VF certified finished trees. INN members will arrange, evaluate and select from their own trials to identify those rootstocks best suited to each country's specific growing conditions.

It can take over 30 years to develop a new rootstock. Selection of parental material, crossing, seedling selection and first stage trialling are carried out at EMR, and take around 10 years. Promising material is then propagated and released for HDC-funded trials in the UK and INN-funded trials at appropriate sites around the rest of the world. As trial results accumulate and the most promising selections are validated, the rootstocks are propagated to build up sufficient material for distribution before it is possible to co-ordinate effective world-wide release.

The EMRC is completing the evaluation of apple, pear and quince rootstock material developed by the former APBC that is currently in the pipeline, with the aim of identifying a range of apple, pear and quince rootstocks with desirable size control, precocity and productivity, with resistance to diseases and pests where applicable. New breeding material is being produced, taking account of potential climate change scenarios, using a new streamlined system previously developed in an associated project funded by the Department for the Environment, Food and Rural Affairs (Defra).

The EMRC aims to develop a range of apple, pear and quince rootstocks to suit different growing conditions. Breeding objectives include:

- new dwarfing and semi-dwarfing stocks for apple and pear
- improved scion-graft compatibility, in particular for pear
- increased precocity and productivity
- increased fire-blight and/or woolly apple aphid resistance
- enhanced tolerance to replant disease

## **Summary of the project and main conclusions**

Currently, there are 40 pear selections at different stages of evaluation. Nine apple selections from the EMRC programme have been included in the latest HDC-funded trial planted in February 2010. A further 11 apple and five pear progenies are currently at different stages in the selection pipeline. Progress to date:

- Fifteen apple and eight pear selections have entered propagation for preliminary trials.
- A further seven apple seedlings were identified as interesting and cut back for propagation in 2011-12.
- Twenty new progenies (14 apple and six pear) have been raised thus far.
- Six new crosses (four for apple and two for pear) were carried out in spring 2011.

## **Financial benefits**

- Financial benefits to the UK industry will arise once new rootstocks from the programme are released.

## **Action points for growers**

- There are no action points for growers at this stage in the project.