



Grower Summary

TF 182a

East Malling Rootstock
Breeding Club

Annual Report 2013/14

Disclaimer

AHDB, operating through its HDC division seeks to ensure that the information contained within this document is accurate at the time of printing. No warranty is given in respect thereof and, to the maximum extent permitted by law the Agriculture and Horticulture Development Board accepts no liability for loss, damage or injury howsoever caused (including that caused by negligence) or suffered directly or indirectly in relation to information and opinions contained in or omitted from this document.

No part of this publication may be reproduced in any material form (including by photocopy or storage in any medium by electronic means) or any copy or adaptation stored, published or distributed (by physical, electronic or other means) without the prior permission in writing of the East Malling Rootstock Breeding Club, other than by reproduction in an unmodified form for the sole purpose of use as an information resource when the East Malling Rootstock Breeding Club is clearly acknowledged as the source, or in accordance with the provisions of the Copyright, Designs and Patents Act 1988. All rights reserved.

AHDB (logo) is a registered trademark of the Agriculture and Horticulture Development Board. HDC is a registered trademark of the Agriculture and Horticulture Development Board, for use by its HDC division. All other trademarks, logos and brand names contained in this publication are the trademarks of their respective holders. No rights are granted without the prior written permission of the relevant owners.

The results and conclusions in this report may be based on an investigation conducted over one year. Therefore, care must be taken with the interpretation of the results.

Use of pesticides

Only officially approved pesticides may be used in the UK. Approvals are normally granted only in relation to individual products and for specified uses. It is an offence to use non-approved products or to use approved products in a manner that does not comply with the statutory conditions of use, except where the crop or situation is the subject of an off-label extension of use.

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

Read the label before use: use pesticides safely.

Further information

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

HDC
Stoneleigh Park
Kenilworth
Warwickshire
CV8 2TL

Tel – 0247 669 2051

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

Project Number: TF 182a

Project Title: East Malling Rootstock Breeding Club

Project Leader: Ms Felicidad Fernández,

Contractor: East Malling Research

Industry Representative: Mr Nigel Kitney

Report: Annual Report 2013/14

Publication Date: 31 December 2014

Previous report/(s): Annual Report 2012/13 (TF 182)

Start Date: 1st April 2008

End Date: 31st March 2015

Headline

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

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.

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.

For UK growers, the HDC involvement in the development of new rootstocks from EMR's programme, will ensure material will be 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.

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

Crossing programme

- Nineteen apple and four pear crosses were carried out in May 2013, of which 13 and two respectively were successful in producing seed.
- Seed from 13 of the apple crosses was sown in January 2014. Germination rates from these seed lots was variable, however an overall germination rate of 85% was achieved resulting in progeny that will be planted in a field plot in June-July 2014.
- Seed from two of the pear crosses was extracted and stored for sowing in 2015.

Seedling populations

- A total of 211 apple seedlings from six families (2,012 crosses) and 556 pear seedlings from four families (2010-12 crosses) were planted in August 2013.
- Apple families planted in 2012 were budded in August 2013.

Selection and propagation

- Field records (vigour, crop load and suckering) were taken on eight apple and three pear families in 2013.
- Three tentative selections were made in September 2013 from apple family M580 (unclear pedigree), with an expectation that they will be taken forward for propagation in 2014 if the good yields recorded in 2013 are repeated.
- Thirteen selections were made in September 2013 from three pear families that were planted in 2006: six from PQ42 (OHxF 51 x *P. amygdaliformus*), four from PQ43 (OHxF 69 x *P. amygdaliformus*) and three from PQ44 (OHxF 333 x *P. betulifolia*).
- Propagation of 47 apple selections and seven pear selections that are already progressing through the rootstock club continued in December 2013. The use of the 'collar system', first utilised in 2012, has proved to be successful in increasing the numbers and quality of suckers produced.
- Re-propagation of the East Malling apple germplasm collection continued in 2013-14 with grafting completed in February 2014.

Pest and disease screening

- Seven apple selections were screened for fire-blight resistance in 2013, with AR295-6 performing better than all the other selections with less than 50% necrosis.
- Woolly apple aphid screen was carried out on 12 apple selections, but colonies did

not thrive, leading to inconclusive results.

Preliminary results

- Winter and harvest records were taken from the RF185 trial. This trial was planted with replicates of four selections from apple family M306 (AR86-120 x M20) in 2012. Significant differences in girth measurements were observed.
- The evaluation of two trials of rootstocks for pear planted in 2006 (DM177 & DM178) continued in 2013. Of the Pyrus rootstocks (DM177), three selections, PQ34-1, PQ34-3 and PQ34-6, continued to perform comparably to EMA. In the quince rootstock trial (DM178) showed seven selections of interest in terms of vigour and yield although conclusions on significance are difficult to draw due to low replication.

Financial benefits

- There are major financial implications of developing and selecting rootstocks with improved agronomic performance, including reduced pruning and picking costs and the ability to grow material with reduced pest and disease susceptibility.

Action points for growers

- There are no action points to highlight at this stage of the project.