



APPLE ROOTSTOCK DISCOVERIES FROM INDUSTRY TRIALS

Tristan Dorfling

HORTGRO Technical Symposium 2024

OVERVIEW

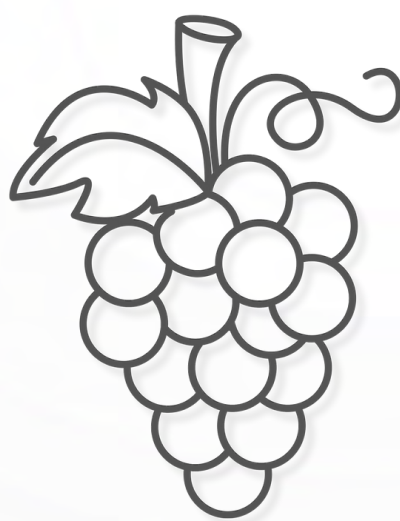
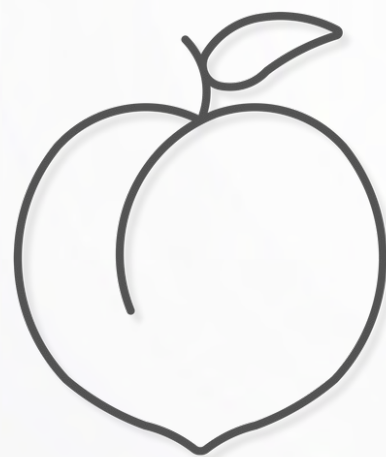
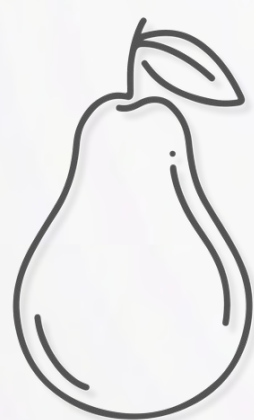
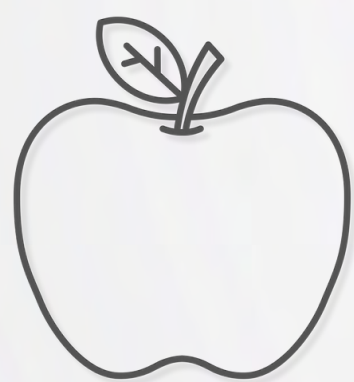
- WHO IS PROVAR?
- HOW DID WE GET TO WHERE WE ARE NOW?
A BRIEF HISTORY OF ROOTSTOCKS IN S.A.
- WHAT HAVE WE LEARNT FROM OUR RESEARCH?
- WHAT HAVE THE CONSEQUENCES OF THE RESEARCH BEEN?
- WHAT ARE WE STILL LOOKING FOR?
- WHAT ARE WE CURRENTLY STUDYING?
- CONCLUDING THOUGHTS





Provar is a privately-owned, **independent** new fruit **cultivar and rootstock evaluator** and data center for the latest in product development intelligence.

We are **transparent and objective**, gathering and distributing evaluation results with **integrity and impartiality**.



HISTORY OF ROOTSTOCKS IN SOUTH AFRICA



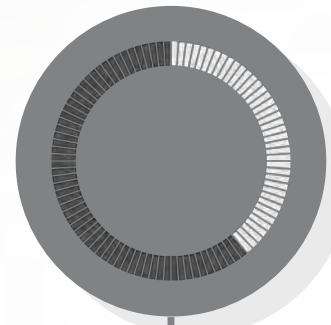
1920

The story
of M.793
begins



1968

Start of Cornell
University rootstock-
breeding programme.



1970

40% of apple trees
sold in the Western
Cape were budded
on M.793



2000

Plantings of M.7
begin to increase.
The first Hortgro-
funded trials of
Geneva rootstocks,
led by Carlo Costa.



2003

The formation of
a Rootstock
Evaluation
Committee (REC)



HISTORY OF ROOTSTOCKS IN SOUTH AFRICA



2007

Prof. Terence Robinson visits



2010

M.793 peaks (50%). Costa's trial is concluded. Dr. Xolani Sibozza continues Hortgro-funded rootstock evaluation



2012

Prof. Gennaro Fazio visits



2013

Another three Hortgro-funded trial led by Sibozza initiated. G.222, G.202, G.228, G.757 and G.41 established as stool beds.



2015

MM.109 replaces M.793. M.7 consists of around 33% of nursery trees lifted

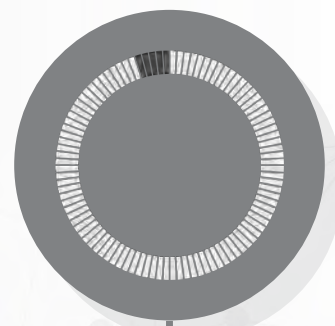


HISTORY OF ROOTSTOCKS IN SOUTH AFRICA



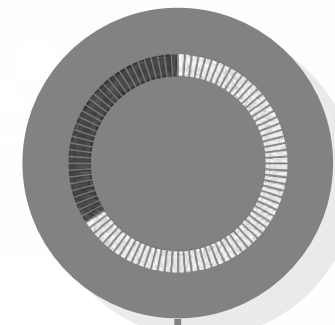
2017

Another two Hortgro-funded trial initially led by Sibozza initiated, Provar later took over the management.



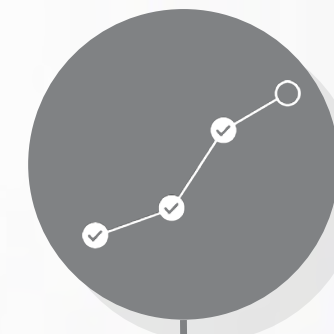
2020

> 95% of nursery trees grafted on Malling, Merton, and Malling-Merton rootstocks. Only 6% are Genevas



2023

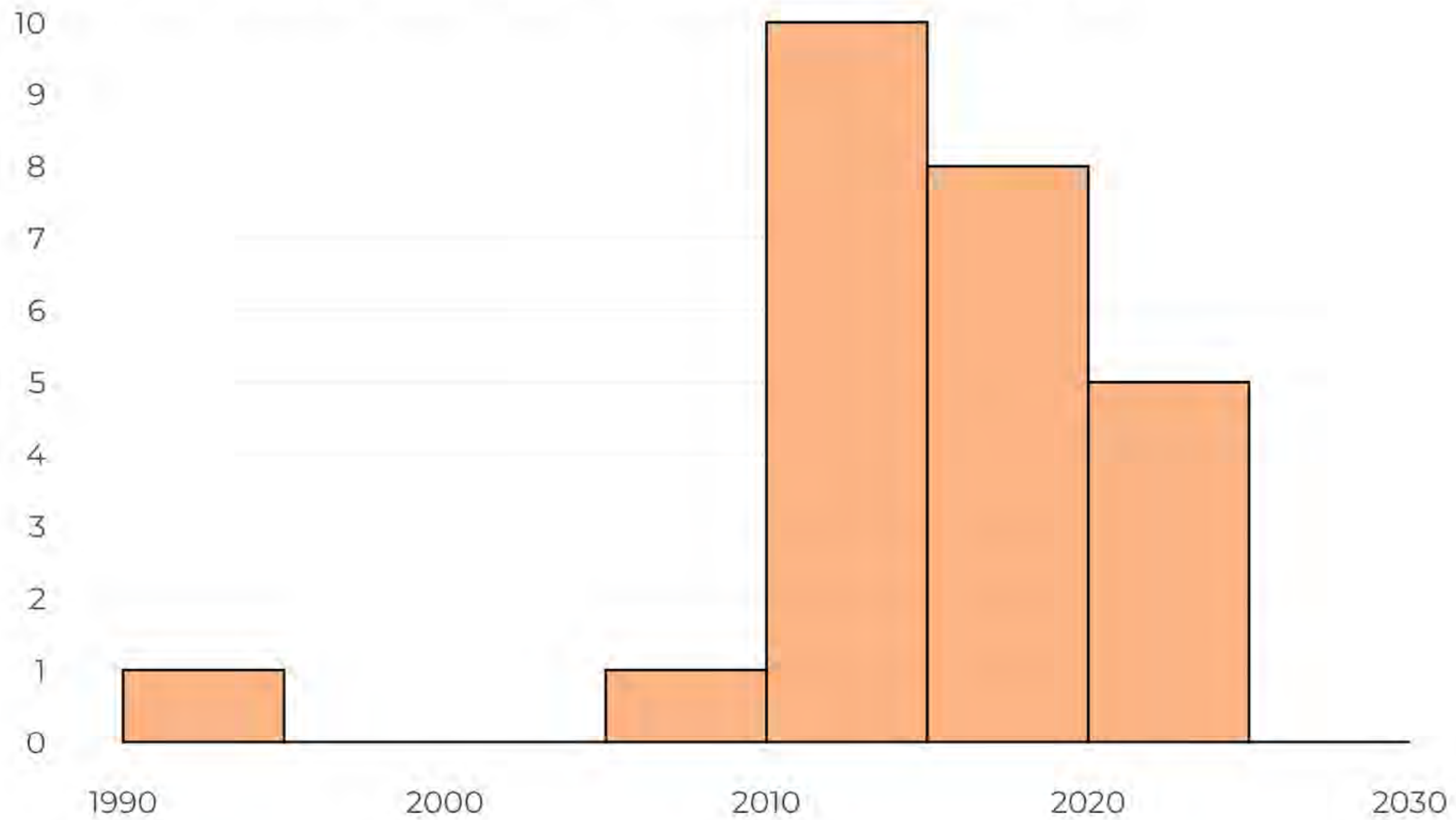
44% of rootstocks planted for grafting are Genevas. 12% are MM.109 and only 1.5% are M.793



TODAY

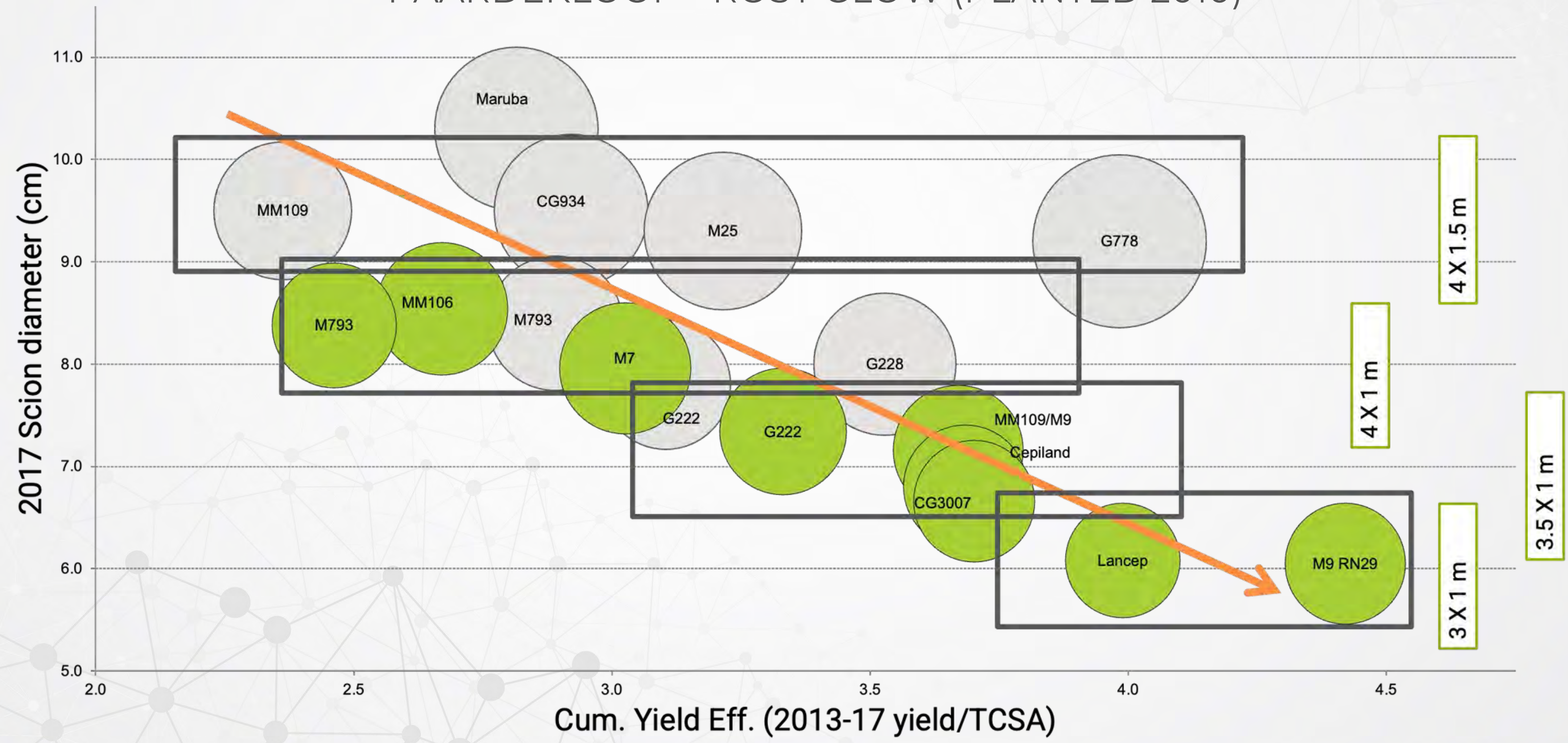
Provar manages 10 Hortgro-funded rootstock trials, including more specific outcomes. Screening trials initiated by Provar.

Number of Hortgro-funded rootstock projects



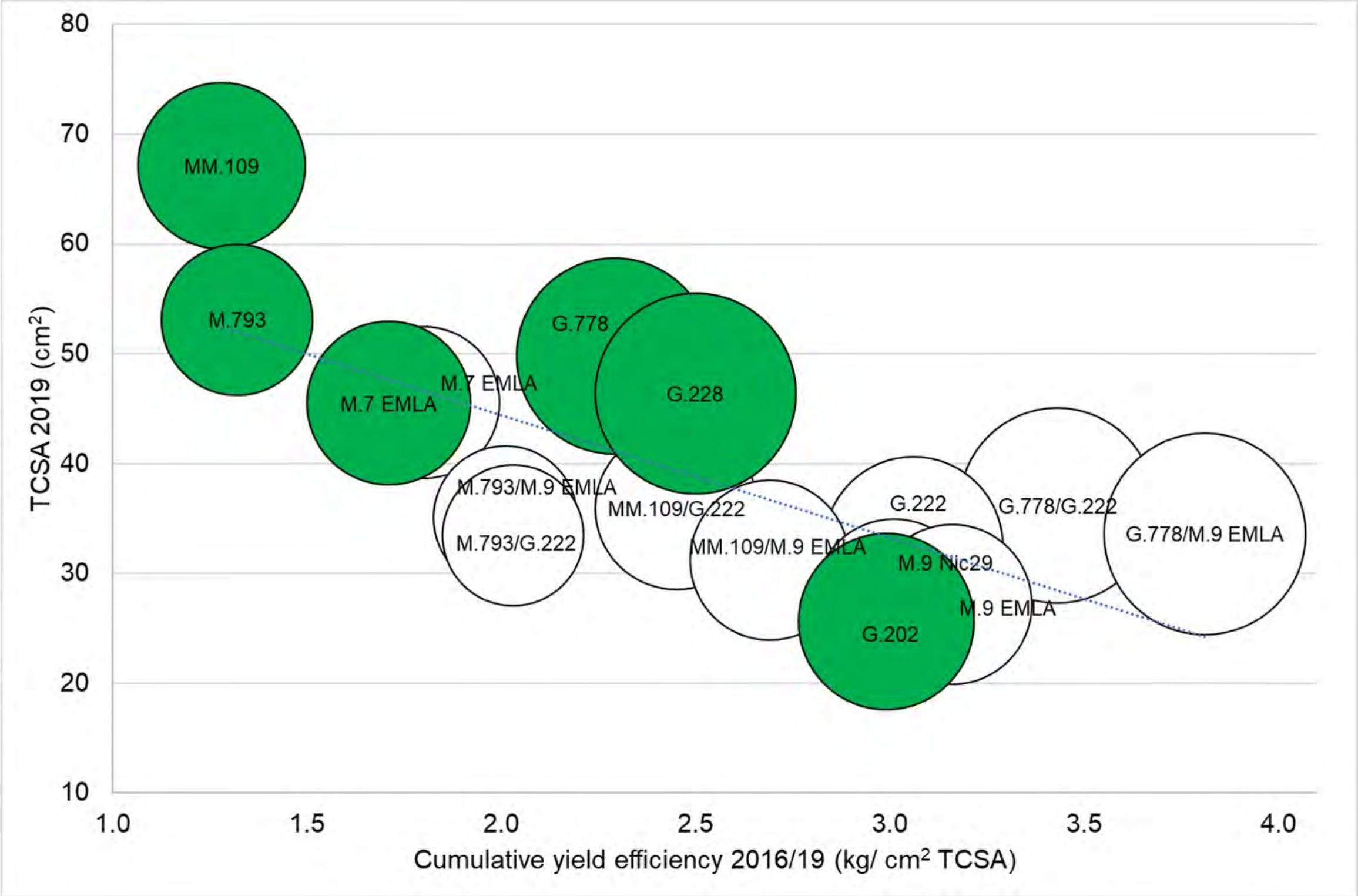
WHAT HAVE WE LEARNT?

PAARDEKLOOF – ROSY GLOW (PLANTED 2010)



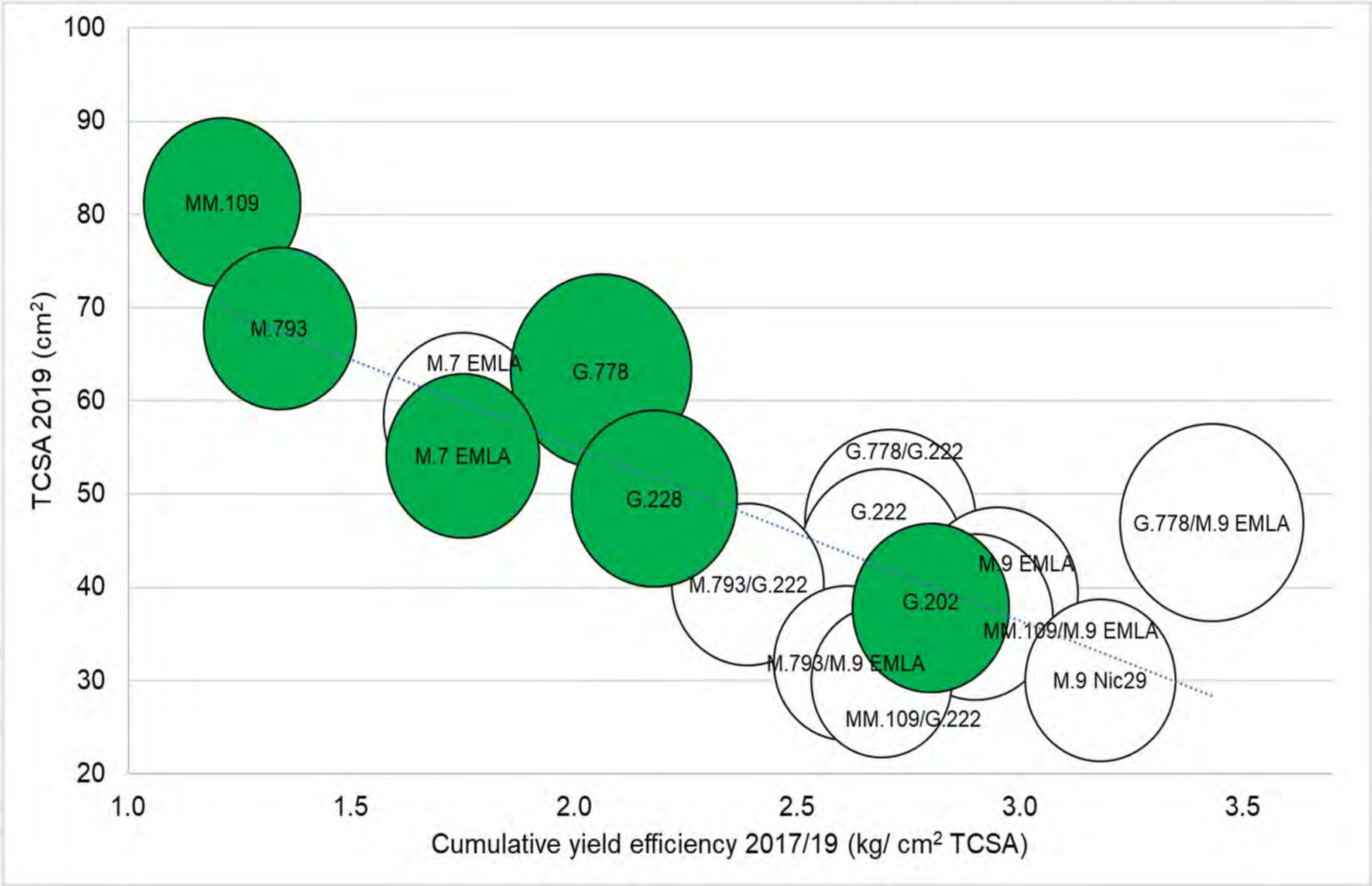
WHAT HAVE WE LEARNT?

OAK VALLEY – FUJI SUPREMA (PLANTED 2013)



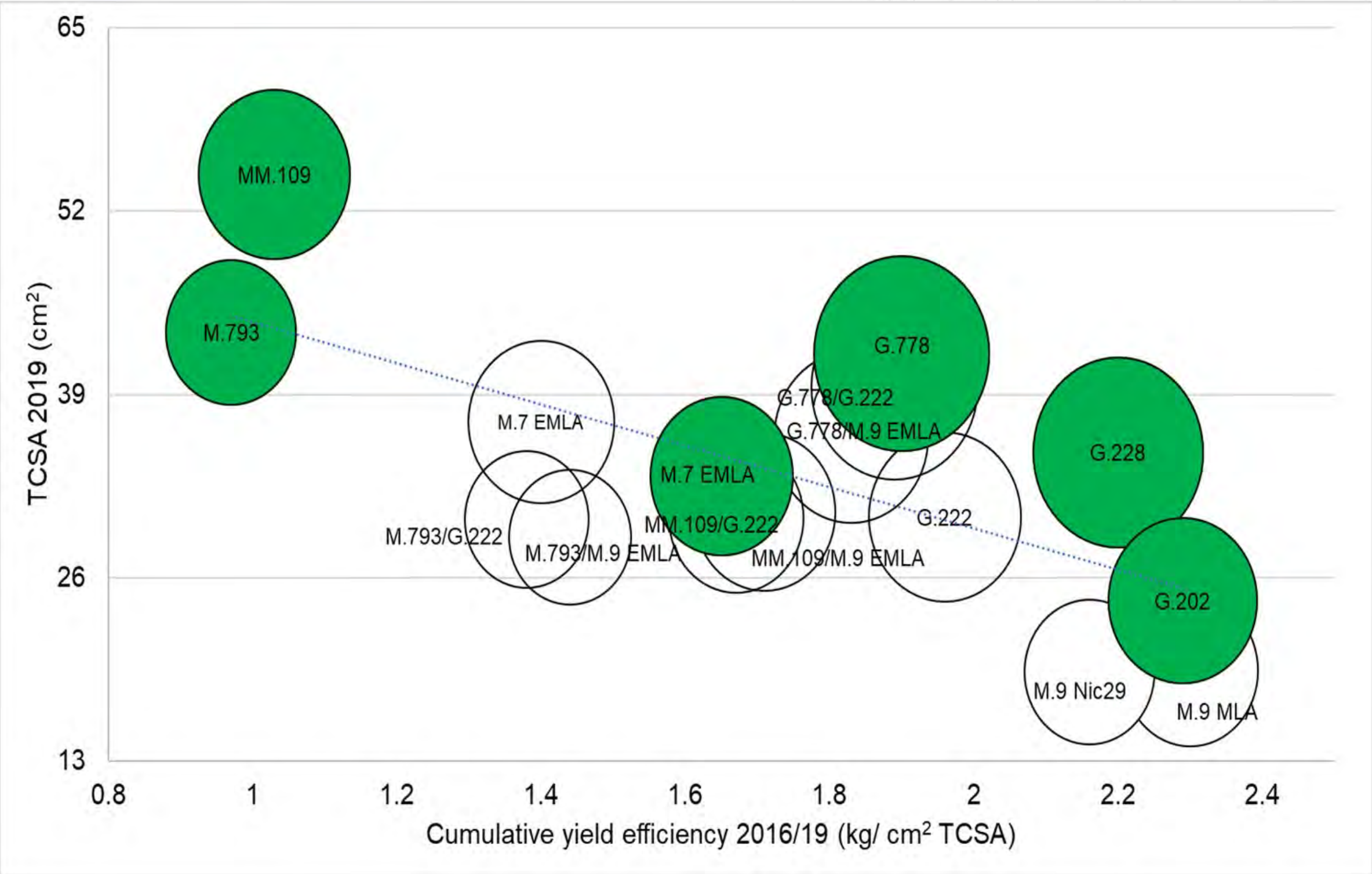
WHAT HAVE WE LEARNT?

BREËVLEI – FUJI SUPREMA (PLANTED 2013)



WHAT HAVE WE LEARNT?

HELDERWATER – FUJI SUPREMA (PLANTED 2013)



ELGIN ORCHARDS - G.778



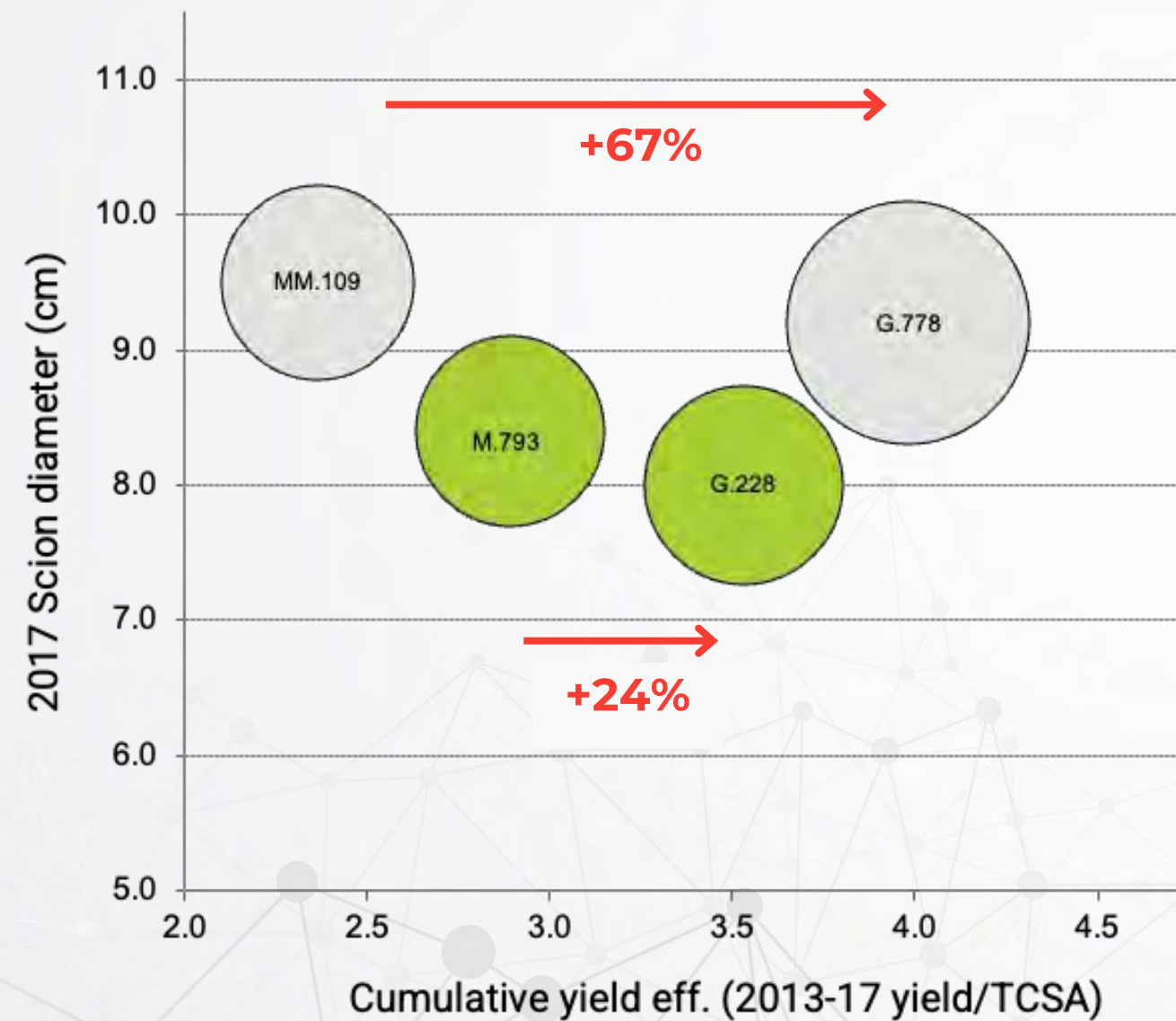
- Established in late September 2020
- 54 t/ha in the second leaf
- 302 cumulative t/ha in the fourth leaf

**A possible world
record!**

Hortgro Industry News.



THE FINANCIAL IMPLICATIONS

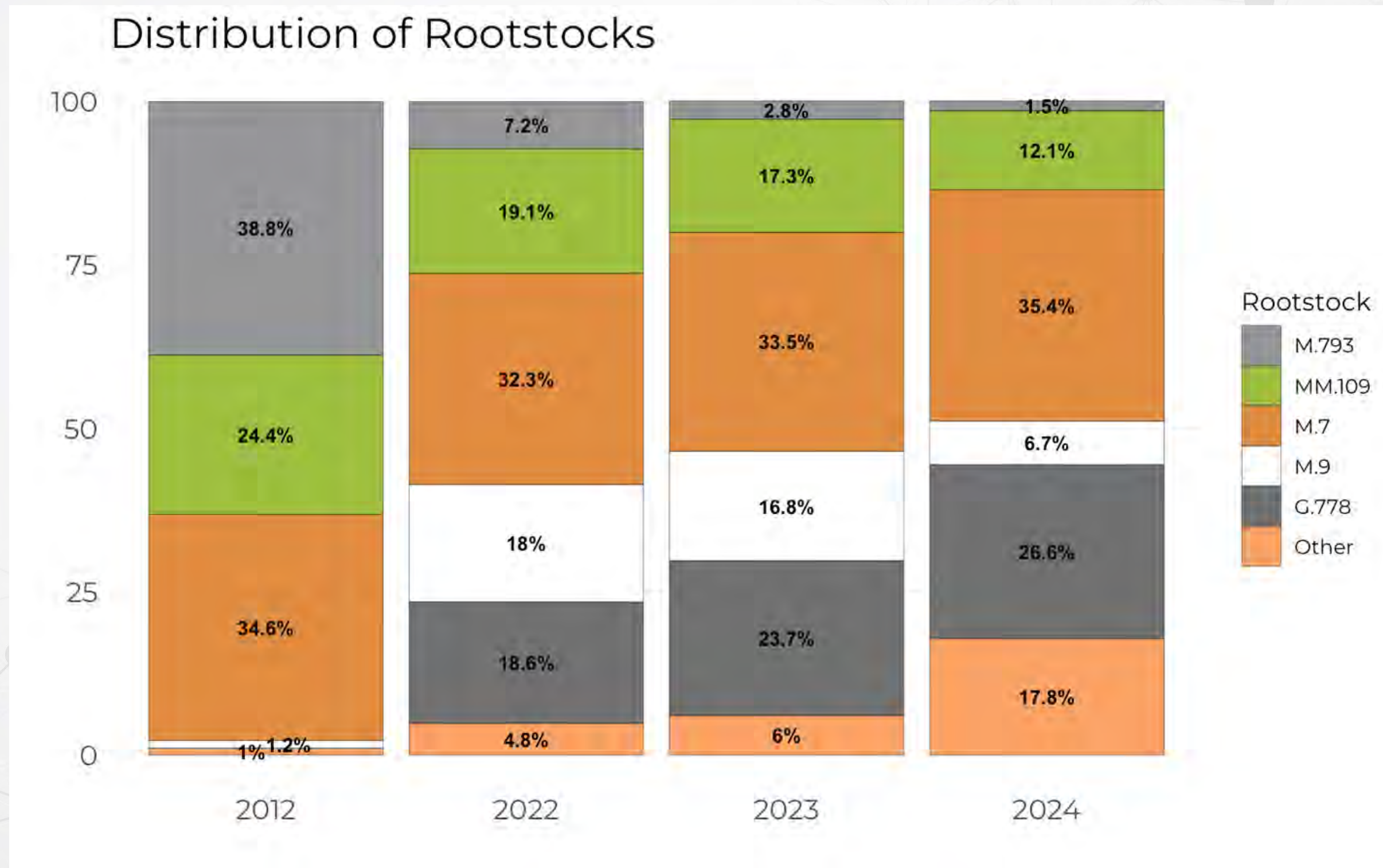


	Tree cost	Income (2013/17)
MM.109	R101,687 @ R61	R1,431,014
G.778	R149,497 @ R90	R2,263,139
	R37,810	-R832,125

	Tree cost	Income (2013/17)
M793	R152,500 @ R61	R2,051,281
G228	R224,200 @ R90	R2,274,218
	R71,700	-R222,937



THE CONSEQUENCE OF ROOTSTOCK RESEARCH

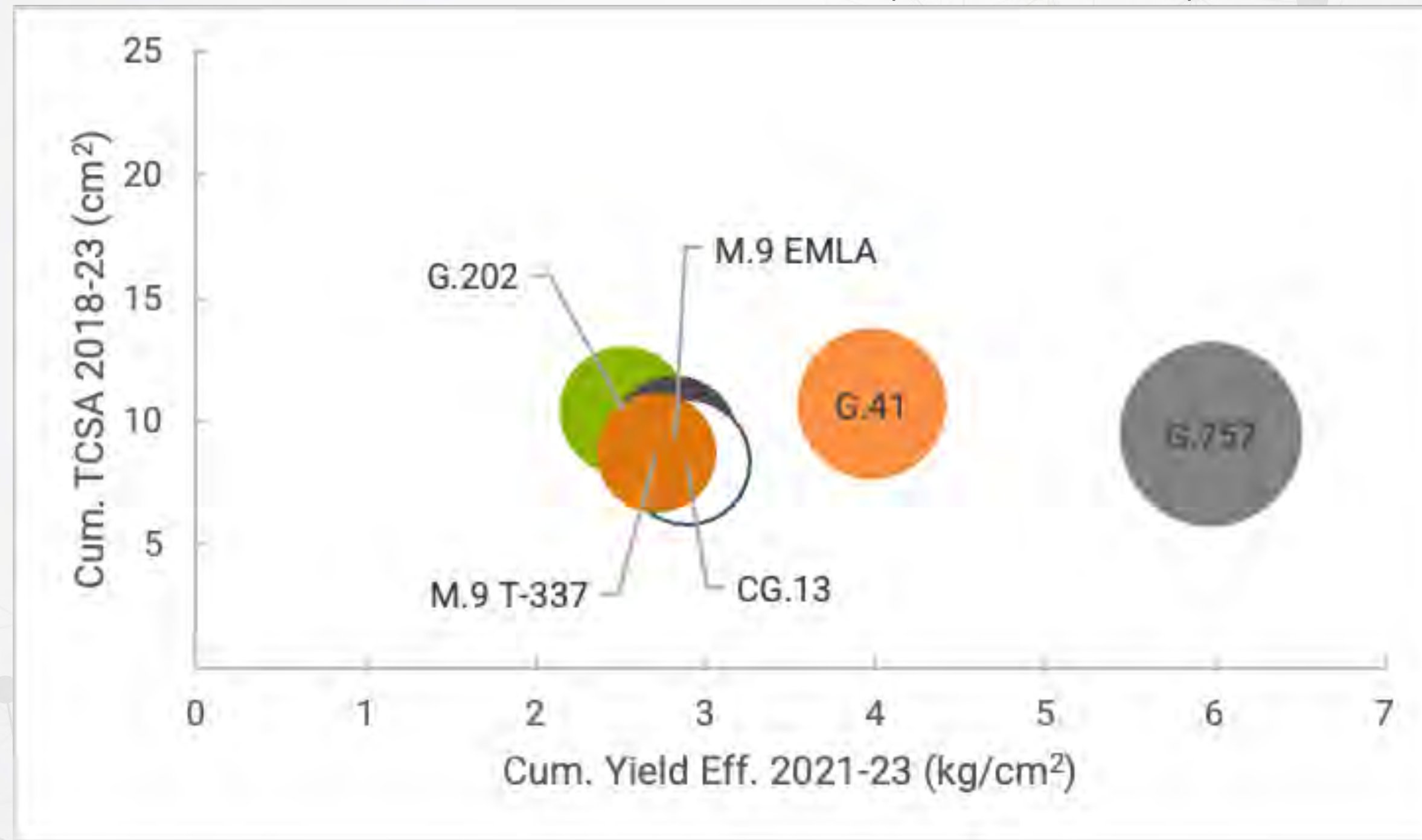


Adapted from Fresh Quarterly – Issue 22 – Sep 2023



SEMI-VIGOROUS ROOTSTOCKS

BOKVELDSKLOOF – BIGBUCKS (PLANTED 2017)

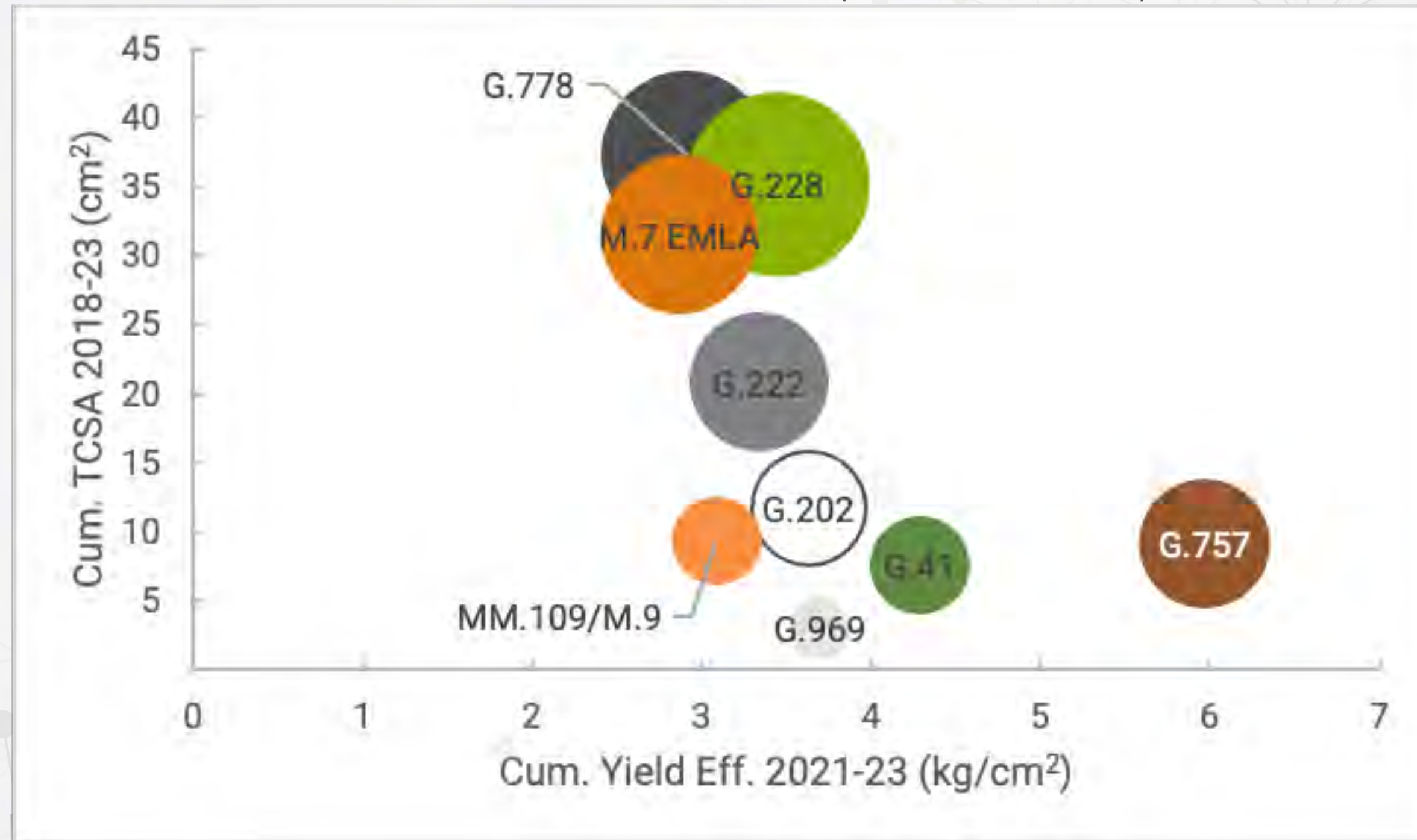


T Dorfling. Evaluation of new apple rootstocks representing two vigour classes in two growing areas



DWARFING / SEMI DWARFING ROOTSTOCKS

OEWERZICHT – BIGBUCKS (PLANTED 2018)

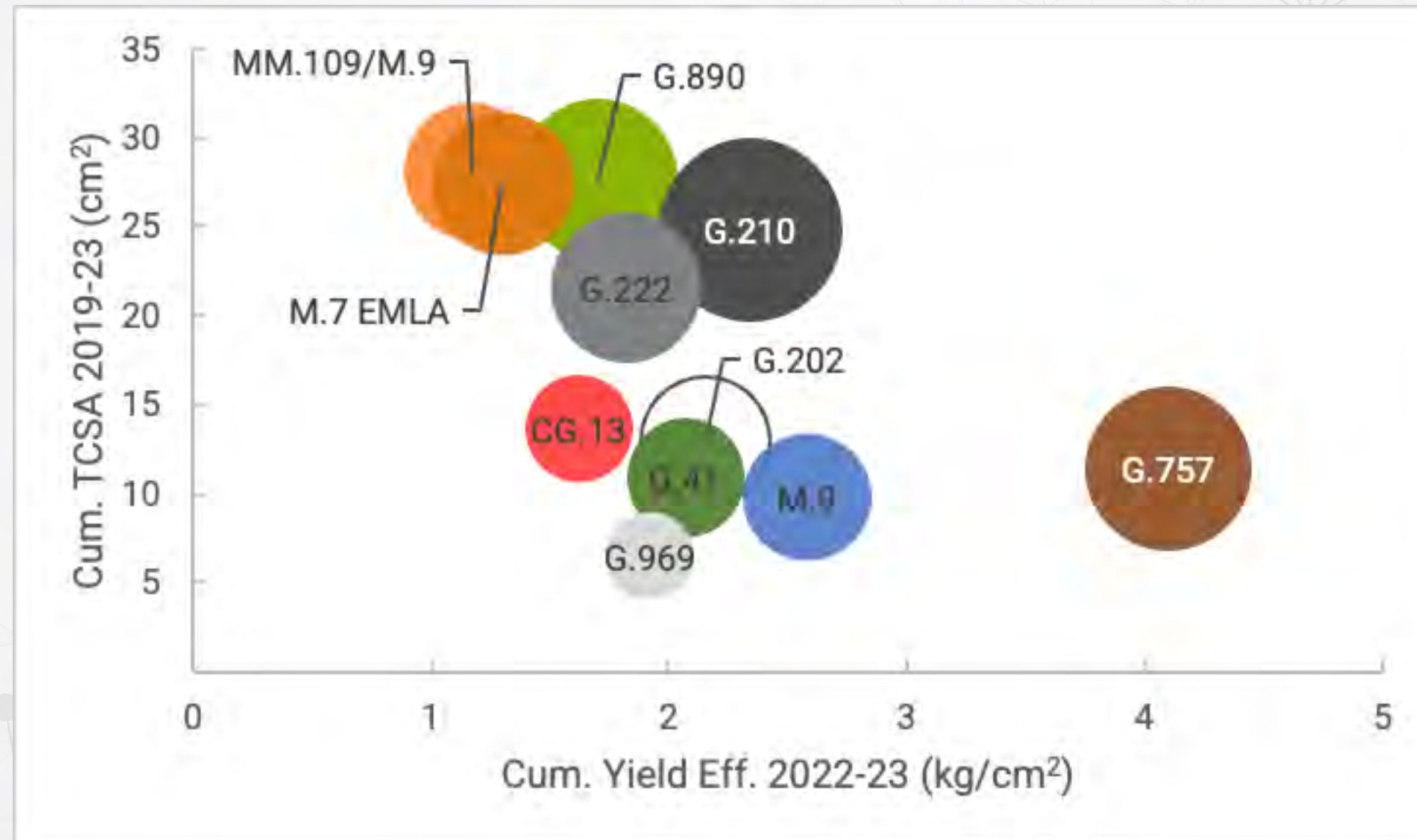


T Dorfling. Evaluation of new apple rootstocks representing two vigour classes in two growing areas



SEMI-VIGOROUS / DWARFING ROOTSTOCKS

OEWERZICHT – BIGBUCKS (PLANTED 2019)

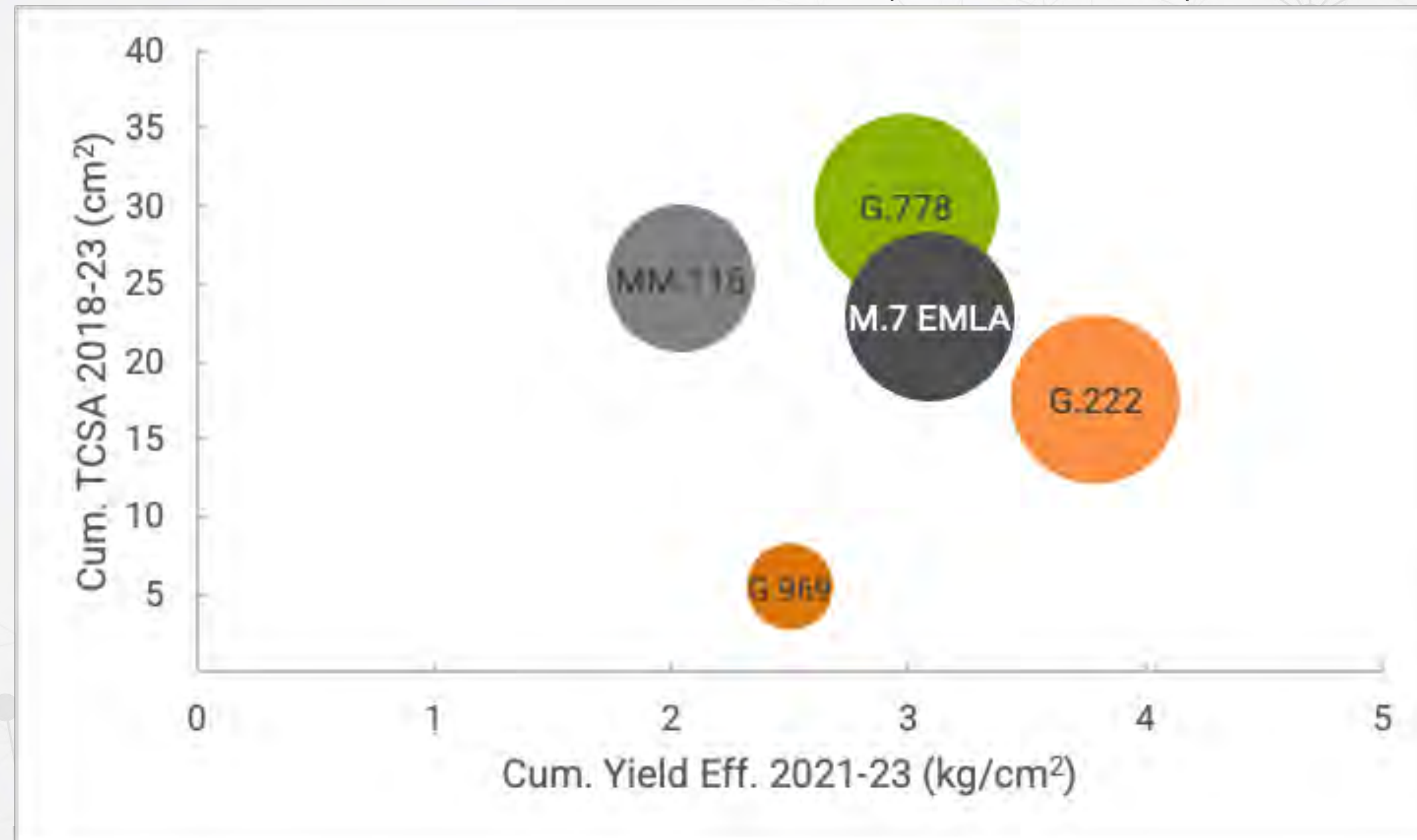


T Dorfling. Evaluation of new apple rootstocks representing two vigour classes in two growing areas



SEMI DWARFING ROOTSTOCKS

BOKVELDSKLOOF – BIGBUCKS (PLANTED 2017)



T Dorfling. Evaluation of new apple rootstocks representing two vigour classes in two growing areas



WHAT HAPPENS NEXT?

WHAT OTHER RESEARCH?

- FRUIT SIZE
- FRUIT COLOUR
- REPLANT TOLERANCE
- WAA TOLERANCE
- VIRUS TOLERANCE
- NUTRIENT PARTITIONING
- GRAFT STRENGTH
- BUD BREAK PATTERNS
- CORRELATIVE INHIBITION



REPLANT DISEASE - SCREENING

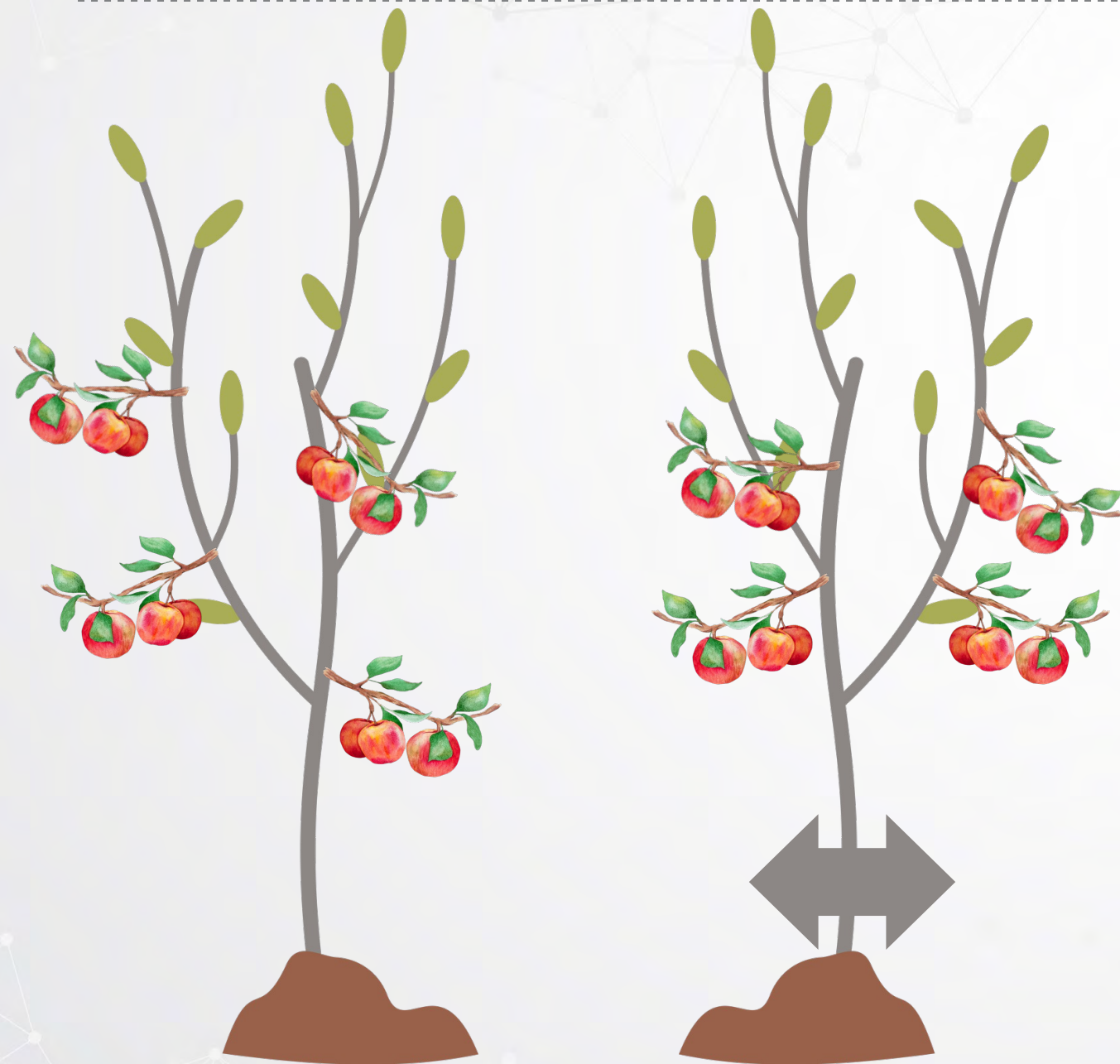
- COMMERCIAL GROWING ENVIRONMENT
- UNBUDDED ROOTSOCKS
- FUMIGATED AND NON-FUMIGATED SOIL



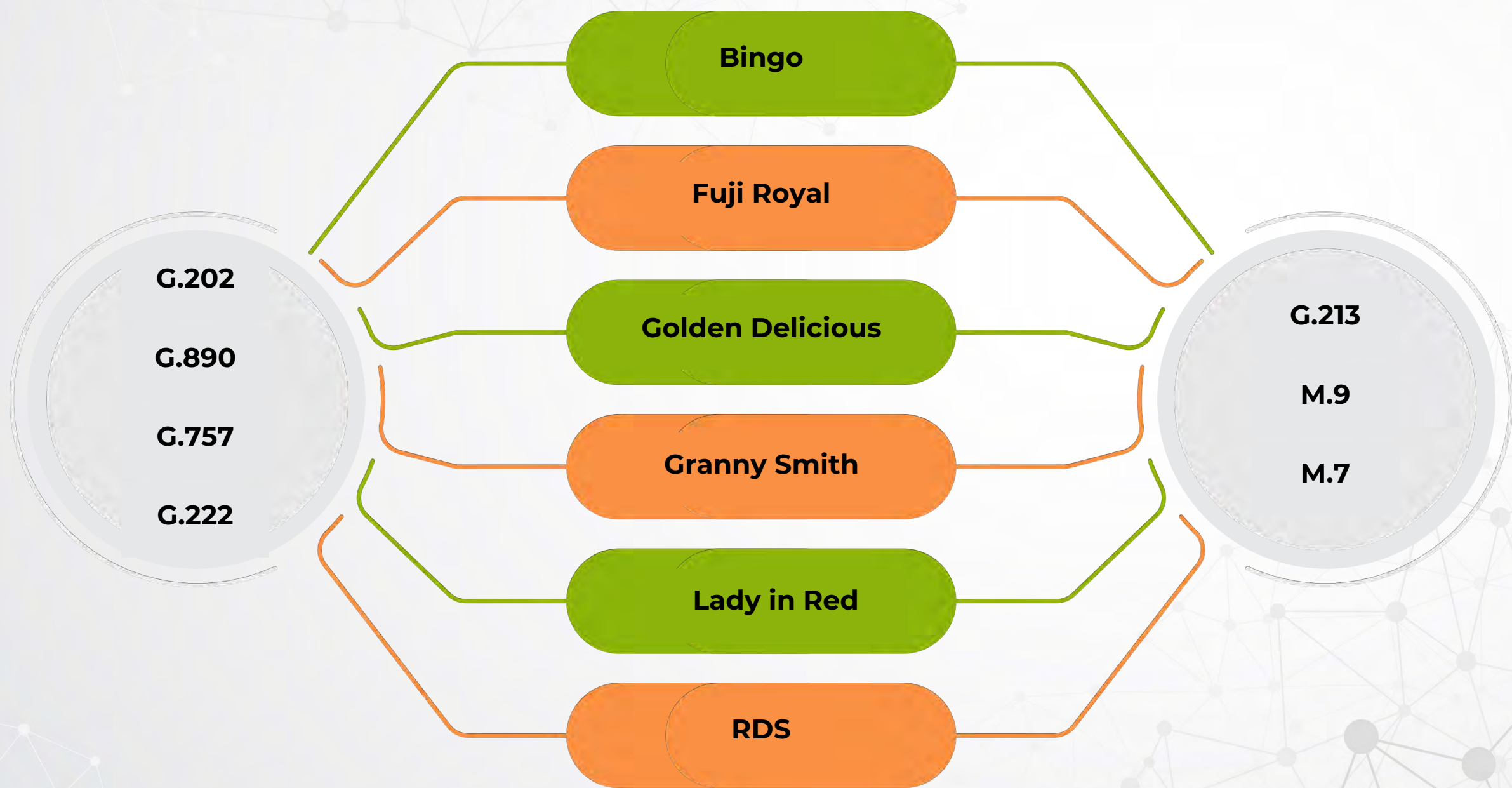
REPLANT DISEASE

CONTROL

FUMIGATED



GRAFT UNION STRENGTH





SOURCE MATERIAL

TISSUE CULTURE

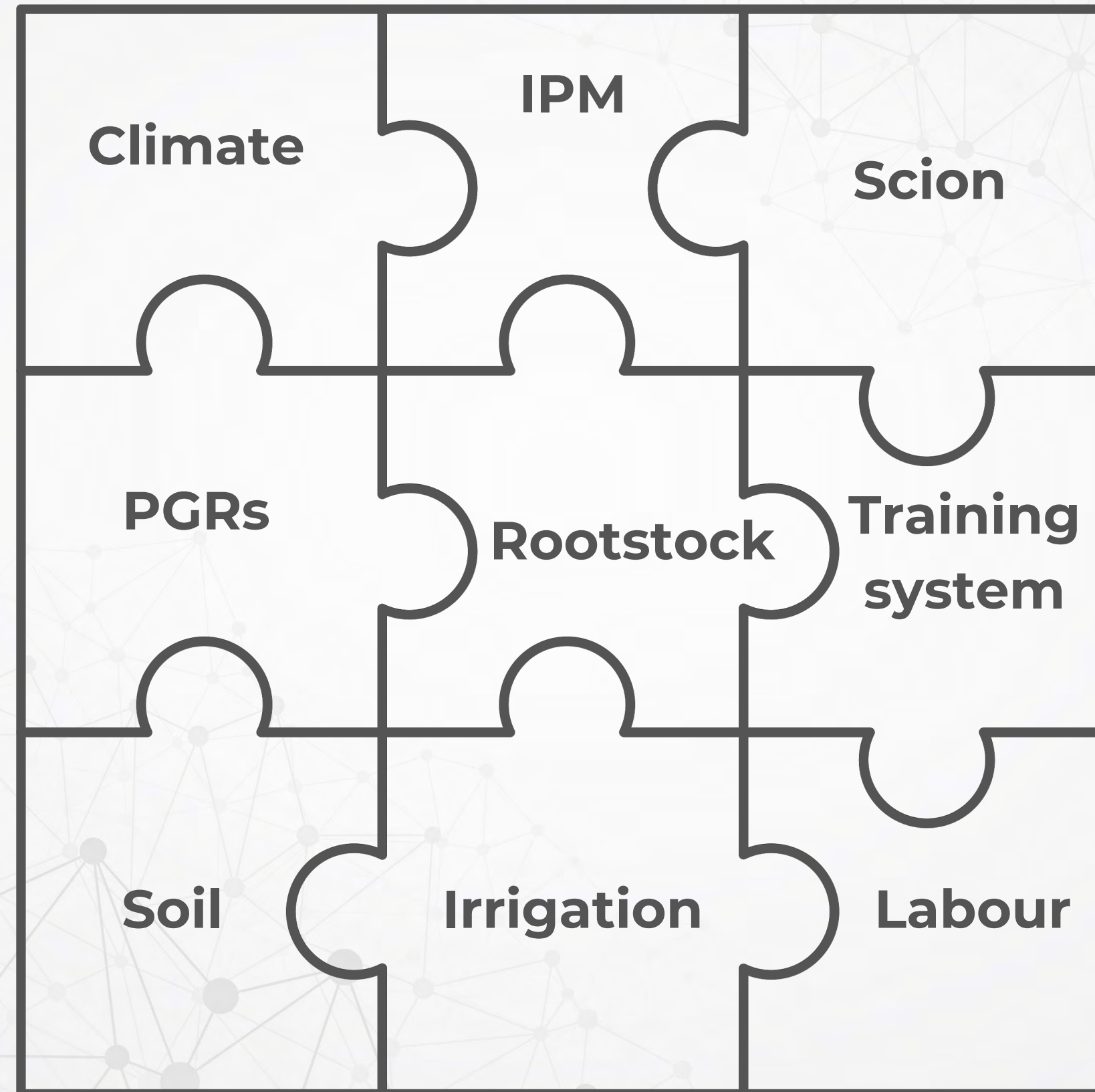


LAYER BED

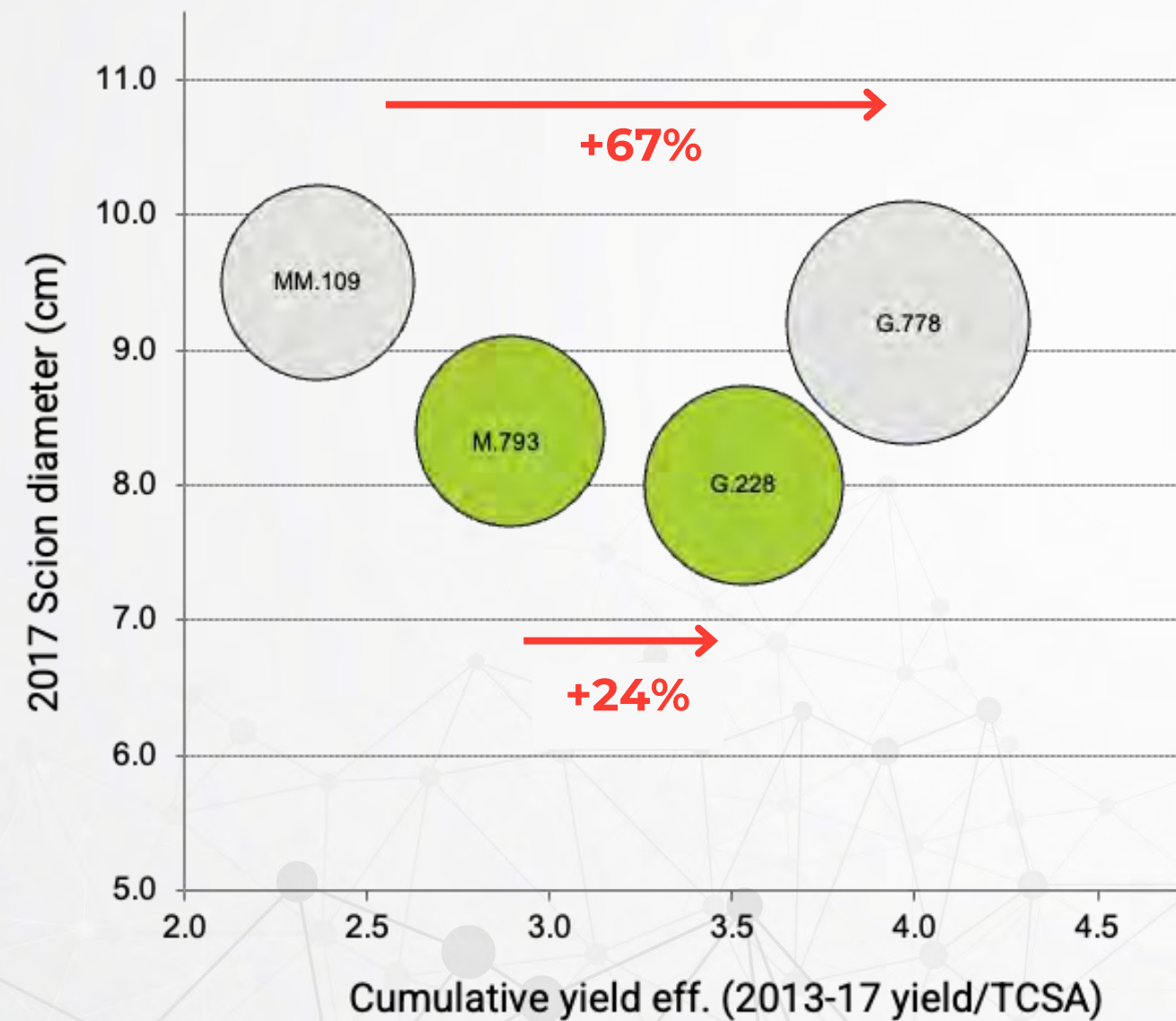


T Dorfling. The performance of tissue culture-derived apple rootstock trees versus trees grown from layers

ITS ABOUT MAKING USE OF THE TOOLS AVAILABLE TO IMPROVE PRODUCTION



THE VALUE OF ROOTSTOCK RESEARCH



	Tree cost	Income (2013/17)
MM.109	R101,687 @ R61	R1,431,014
G.778	R149,497 @ R90	R2,263,139
	R37,810	-R832,125

	Tree cost	Income (2013/17)
M793	R152,500 @ R61	R2,051,281
G228	R224,200 @ R90	R2,274,218
	R71,700	-R222,937

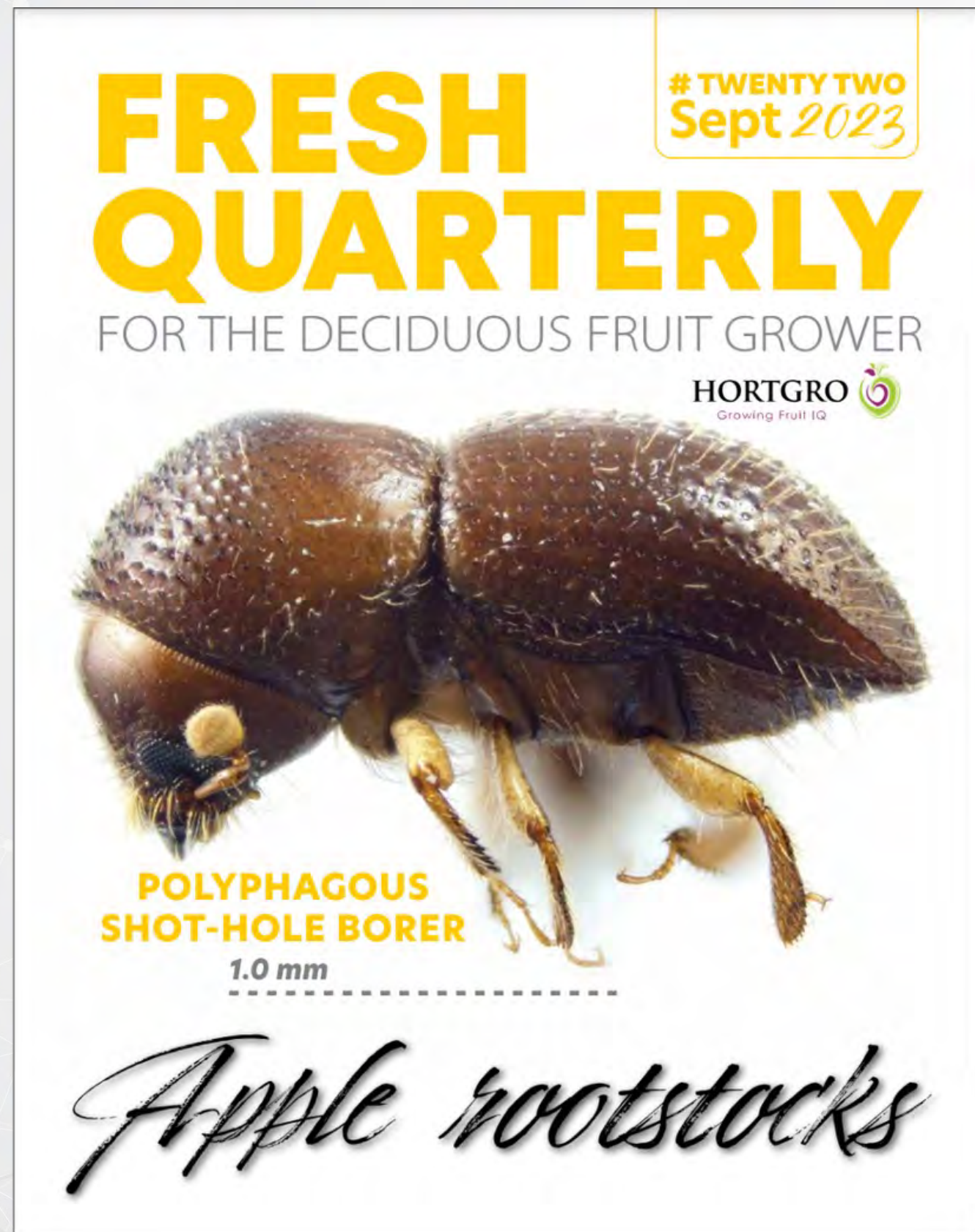


For most South African soils, it would be difficult
to improve on M.793 as rootstock for the apple
industry.

Bergh *et al.* (1978)

Bergh, O., Van Zyl, E.J., Kloppers, F., Hadlow, J. and Dempers, A. 1978. New apple rootstocks: Is it possible to improve on Merton 793? The Deciduous Fruit Grower 28: 268-277.

FRESH QUARTERLY - ISSUE 22 - SEPTEMBER 2023



<https://www.freshquarterly.co.za/publication/fresh-quarterly-issue-22-sep-2023/>



THANK YOU



Contact Us



021 863 0941



www.provar.co.za



Unit 5, Zandwyk Park, R101,
Paarl, 7646

