



AGRIMOTION

SCIENTIFIC | INDEPENDENT | PRECISE

HOW TO SELECT A ROOTSTOCK FOR YOUR NEW DEVELOPMENT

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HOW TO SELECT A ROOTSTOCK FOR YOUR NEW DEVELOPMENT

NOT

WHAT ROOTSTOCK TO USE

POME FRUIT ROOTSTOCK RESEARCH

2

<https://www.freshquarterly.co.za/apple-rootstock-tables/> by Wiehann Steyn

Table 2: Cumulative yield efficiency as kg fruit per cm² trunk cross-sectional area

Rootstock	Bigbucks ¹ 4+5 th leaf	Fuji ¹ 7 th leaf	Rosy Glow 7 th leaf	Golden Delicious 10 th leaf	Summary ²
M.9 T337	1.8	–	–	–	High
M.9 EMLA	2.0 (1.8–2.1)	3.7 (3.5–3.8)	–	–	High
M.9 Nic29	1.6	3.3 (3.0–3.9)	4.4	–	High
G.757*	3.6 (2.7–4.0)	–	–	–	Very high
G.41*	3.0 (2.7–3.2)	–	–	–	High
G.213*	–	–	–	–	High ³
G.214*	–	–	–	–	High ³
G.202	1.9 (1.7–2.1)	3.6 (3.1–4.2)	–	–	High
G.222	2.2 (1.9–2.3)	3.2 (2.8–3.7)	3.2	5.6	High/Intermediate
M.7 EMLA	1.8 (1.7–1.9)	2.4 (1.9–3.3)	3.0	4.0	Intermediate

STONE FRUIT ROOTSTOCK RESEARCH

<https://www.freshquarterly.co.za/stone-fruit-rootstocks-revisited/>

by Dr Piet Stassen with input from Petru du Plessis and other technical advisers

ROOTSTOCK	PARENTAGE ¹	GROWTH VIGOUR	RIPENING	FRUIT SIZE	CHILLING REQUIREMENT
Atlas	<i>P. persica</i> x <i>P. davidiana</i> x <i>P. dulcis</i> x <i>Prunus</i> x <i>biureiana</i>	Moderately strong	Late	Very good	250 – 550+ PCU ²
Cadaman	<i>P. persica</i> x <i>P. davidiana</i>	Very strong	Middle	Good	250 – 550+ PCU ²
Flordaguard	<i>P. persica</i> x <i>P. davidiana</i>	Very strong	Early	Good but small if high numbers of ring nematodes occur	100 – 550 PCU ¹ Frost sensitive
Garnem	<i>P. persica</i> x <i>P. dulcis</i>	Very strong	Middle	Very good	350 – 550+ PCU ² Lower limit unknown
GF 677	<i>P. persica</i> x <i>P. amygdalus</i>	Moderately strong	Middle	Good but small with nectarines	250 – 550+ PCU ¹
Guardian	<i>P. persica</i>	Moderately strong	Middle	Small like Kakamas seedling but better total yield	250 – 550+ PCU ²
Kakamas seedling	<i>P. persica</i>	Semi-dwarfing	Early	Small if under stress especially on sandy soils	200 – 550+ PCU ¹
Marianna	<i>P. cerasifera</i> x <i>P. munsoniana</i>	Moderately strong	Middle	Good but small if high numbers of ring nematodes occur	350 – 550+ PCU ²
Maridon	Tetraploid of Marianna	Semi-dwarfing	Middle	Good but small if high numbers of ring nematodes occur	350 – 550+ PCU ²
Royal seedling	<i>P. armeniaca</i> cv. Blenheim Royal	Moderately strong	Middle	Good	350 – 550+ PCU ²
SAPO 778	<i>P. persica</i> x <i>P. amygdalus</i>	Moderately strong	Middle	Very good	350 – 550+ PCU ¹
Viking	<i>P. persica</i> x <i>P. davidiana</i> x <i>P. dulcis</i> x <i>Prunus</i> x <i>biureiana</i>	Moderately strong	Late	Good but small if high numbers of ring nematodes occur	250 – 550+ PCU ²

BEGIN WITH END IN MIND

- THE WINNING ORCHARD (**W**)
 - Overcome challenges that reduce profit
 - **INCREASE** yield, pack out and value of crop
 - **DECREASE** wastage, costs

BEGIN WITH END IN MIND

- THE WINNING ORCHARD (**W**)
 - Overcome challenges that reduce profit
 - **INCREASE** yield, pack out and value of crop
 - **DECREASE** wastage, costs
 - Soil
• Climate **Environment (E)**
 - Scion (Cultivar)
• Rootstock **Genetics (G)**
 - Spacing
• Pruning
• Harvest
• Irrigation
• Nutrition
• Netting
• Etc. **Other (O)**

BEGIN WITH END IN MIND

- THE WINNING ORCHARD

W = E G O

G = S *R*

BEGIN WITH END IN MIND

7

- SELECTING THE WINNING ROOTSTOCK

R = W O E S



















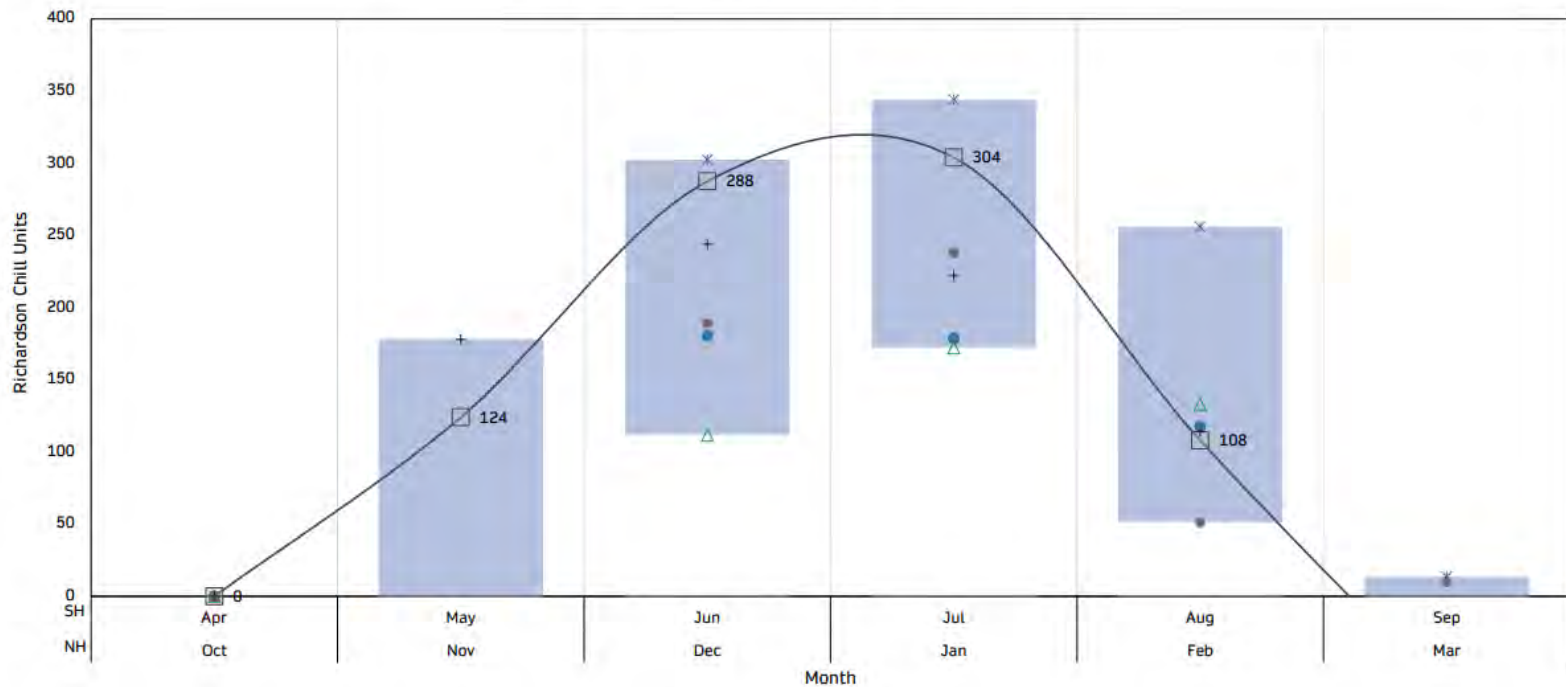
ENVIRONMENT

CLIMATE

17

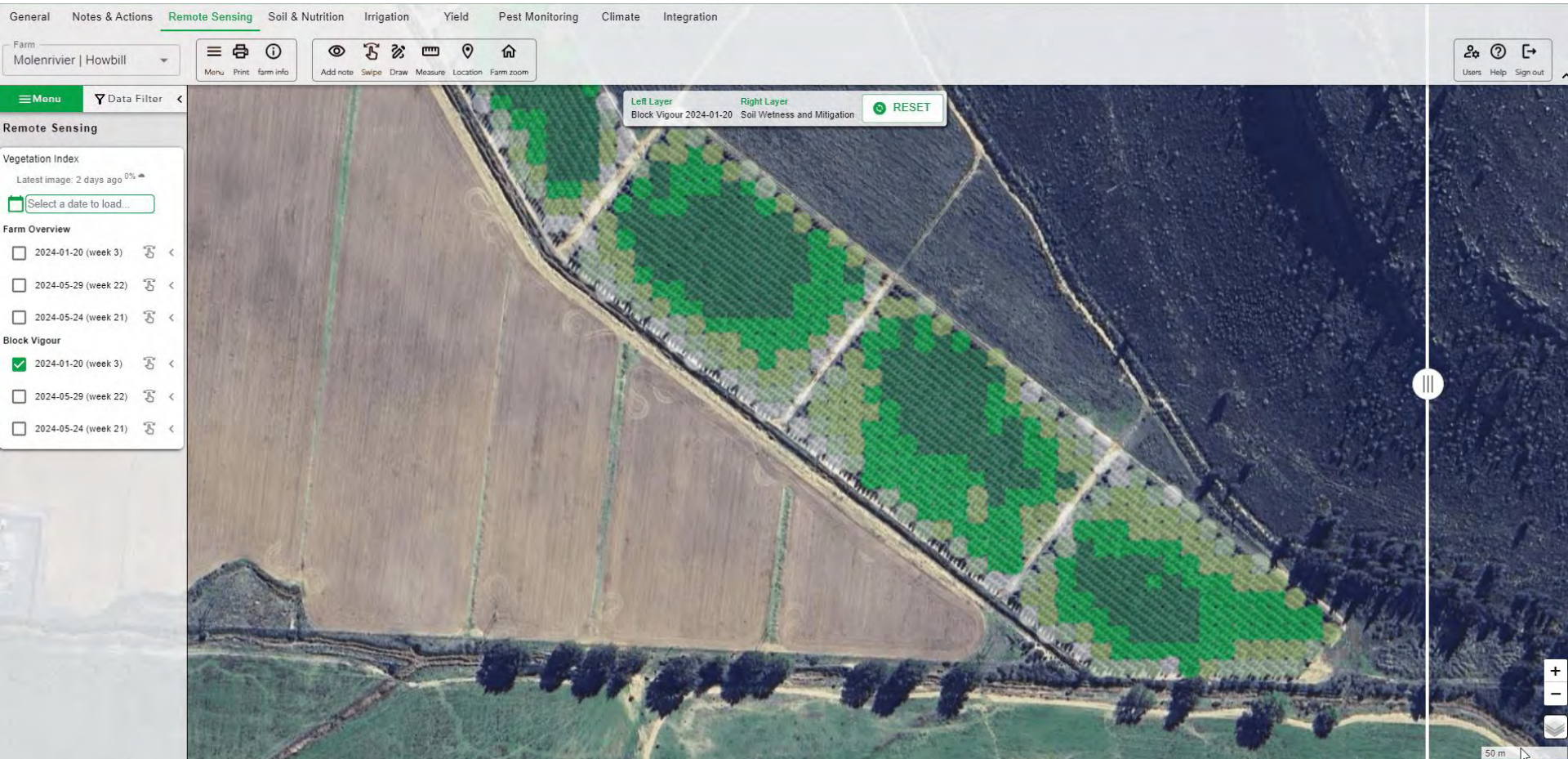


Richardson Chill Unit Distribution



ENVIRONMENT

SOIL PHYSICAL and CHEMICAL



ENVIRONMENT

SOIL BIOLOGICAL





GENTETICS

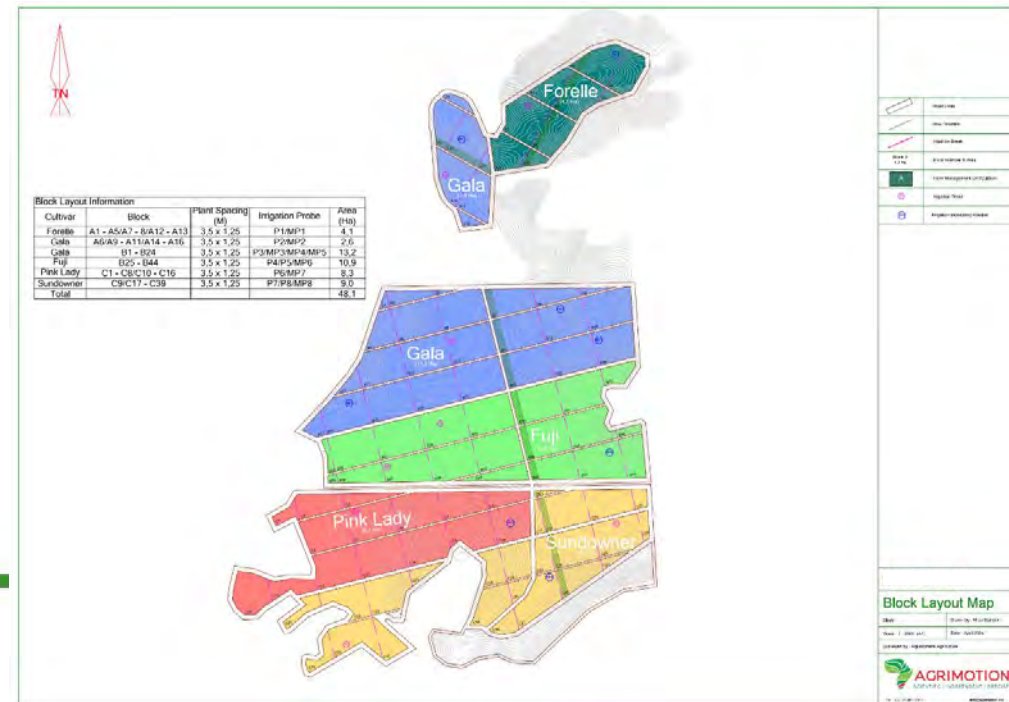
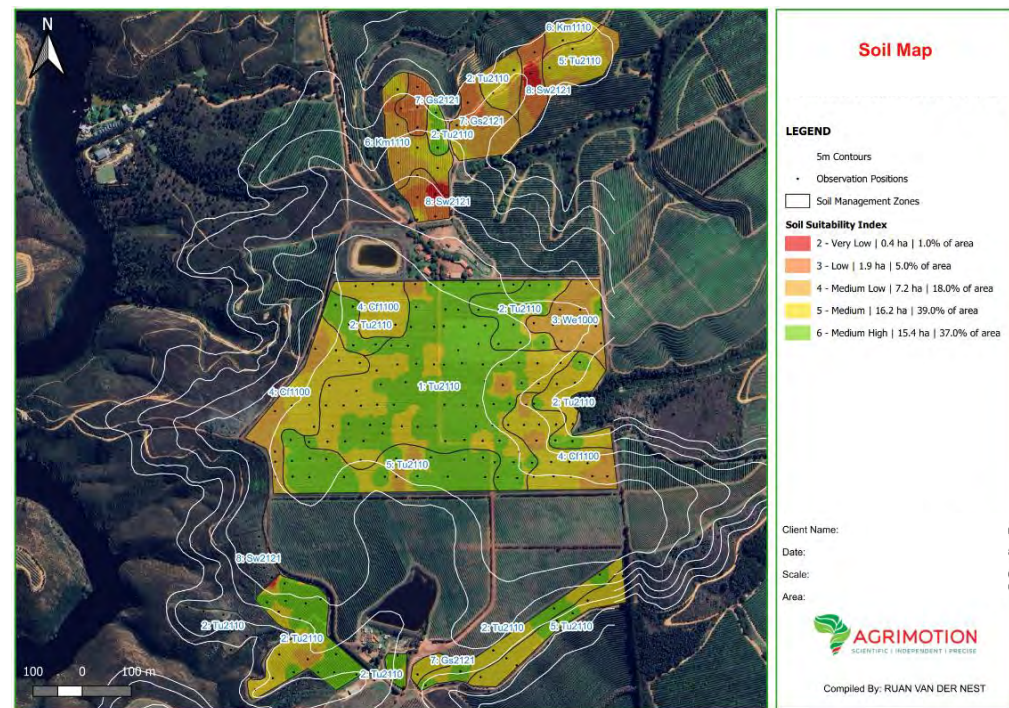
SCION

21



OTHER

- Establishment
 - Site
 - Row direction
 - Spacing



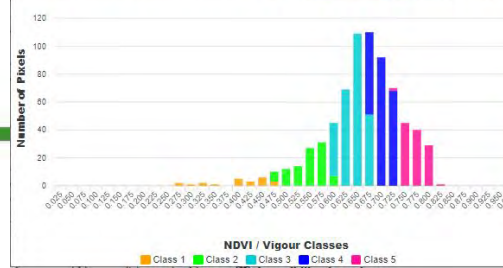
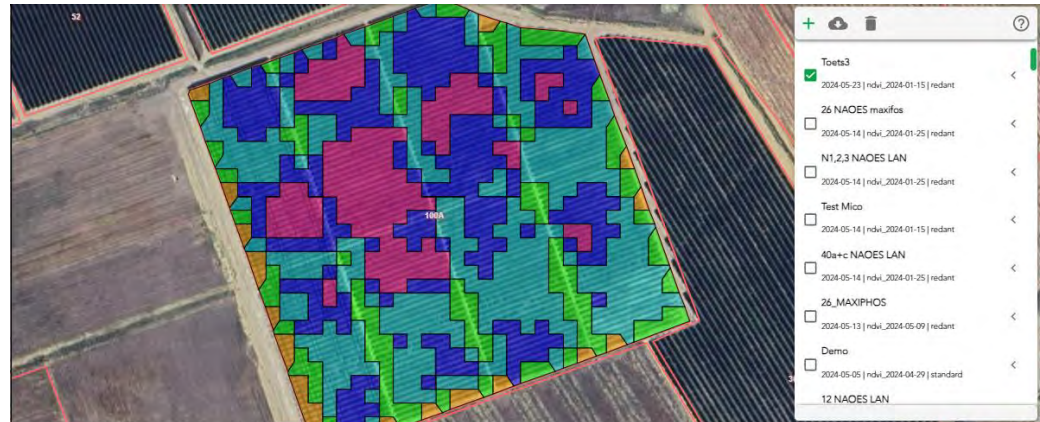
OTHER

- Establishment
 - Site
 - Row direction
 - Spacing
- Pruning



OTHER

- Establishment
 - Site
 - Row direction
 - Spacing
- Pruning & Root pruning
- Irrigation
- Nutrition
- Harvest
- Etc



OTHER...

Mistakes made here amplify the Genetic and Environmental factors

- Wrong tree density: High vs Low
- Irrigation distribution: Drip vs Micro
- Site selection: Planning (2 years) vs Ad hoc
- Row direction: Long rows vs light
- Ridges: Ladders vs roots
- Retrofit: Net

R = W O E S

EXAMPLE #1

W Strong vigour on replant site to build bearing volume. Labour currently understand this tree. Financially not forced to change. Doing well.

O Same

E Same + Replant

S Similar with newer strain

R Same / Similar but new



R = W O E S

EXAMPLE #2

W “Softer” tree with better light distribution for colour. Mechanical prune. Reflective mulch. More trees to achieve same or better bearing volume. “Regen” element.

O HD = Drip, Mechanical prune, Trellis

E Same + Replant, open tree sunburn

S Something new (liken it to something)

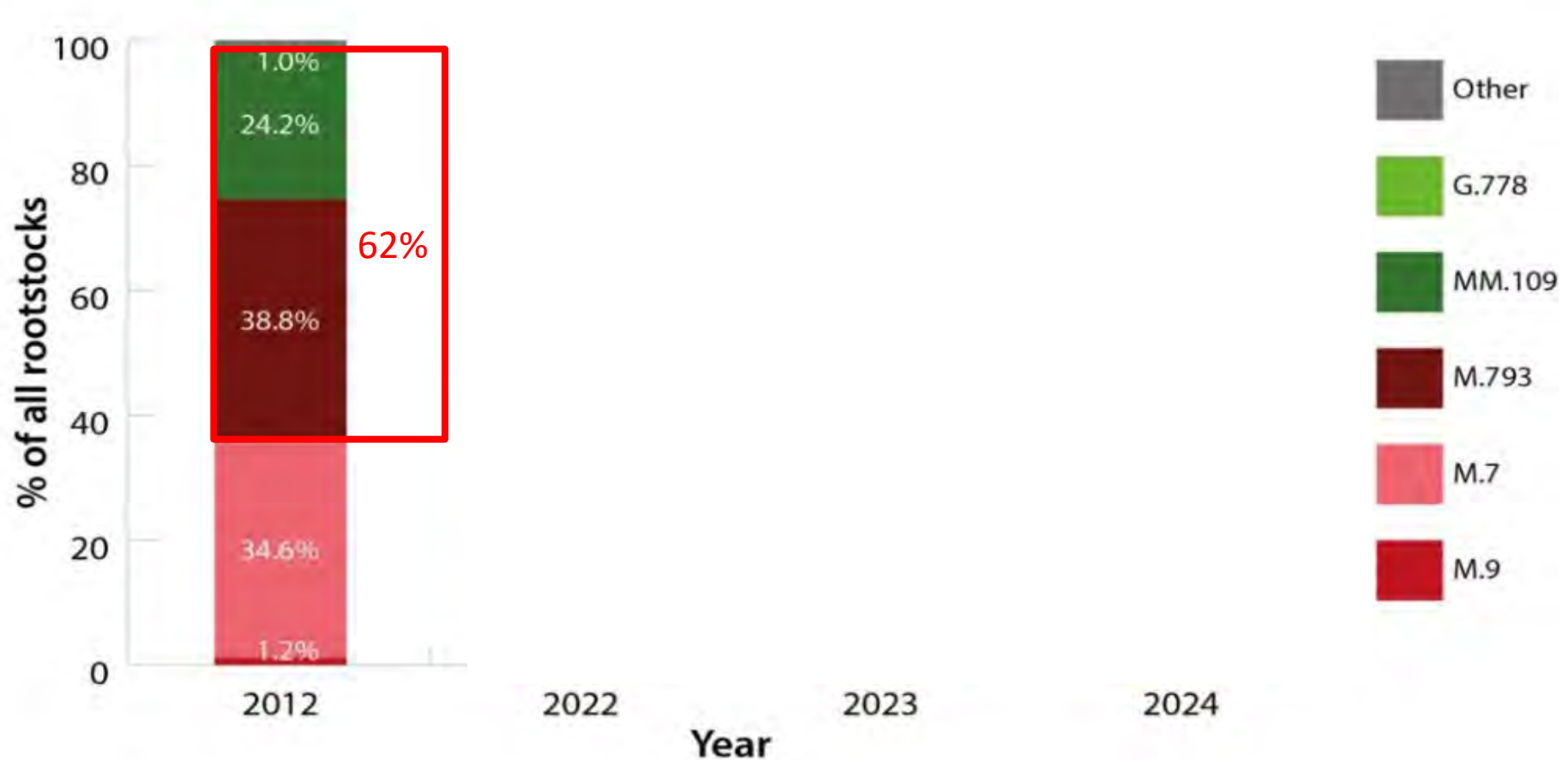
R **Dwarfing, replant resistant, precocious, familiar as scion is not**



APPLE ROOTSTOCK TRENDS

<https://www.freshquarterly.co.za/south-african-apple-rootstock-trends/>

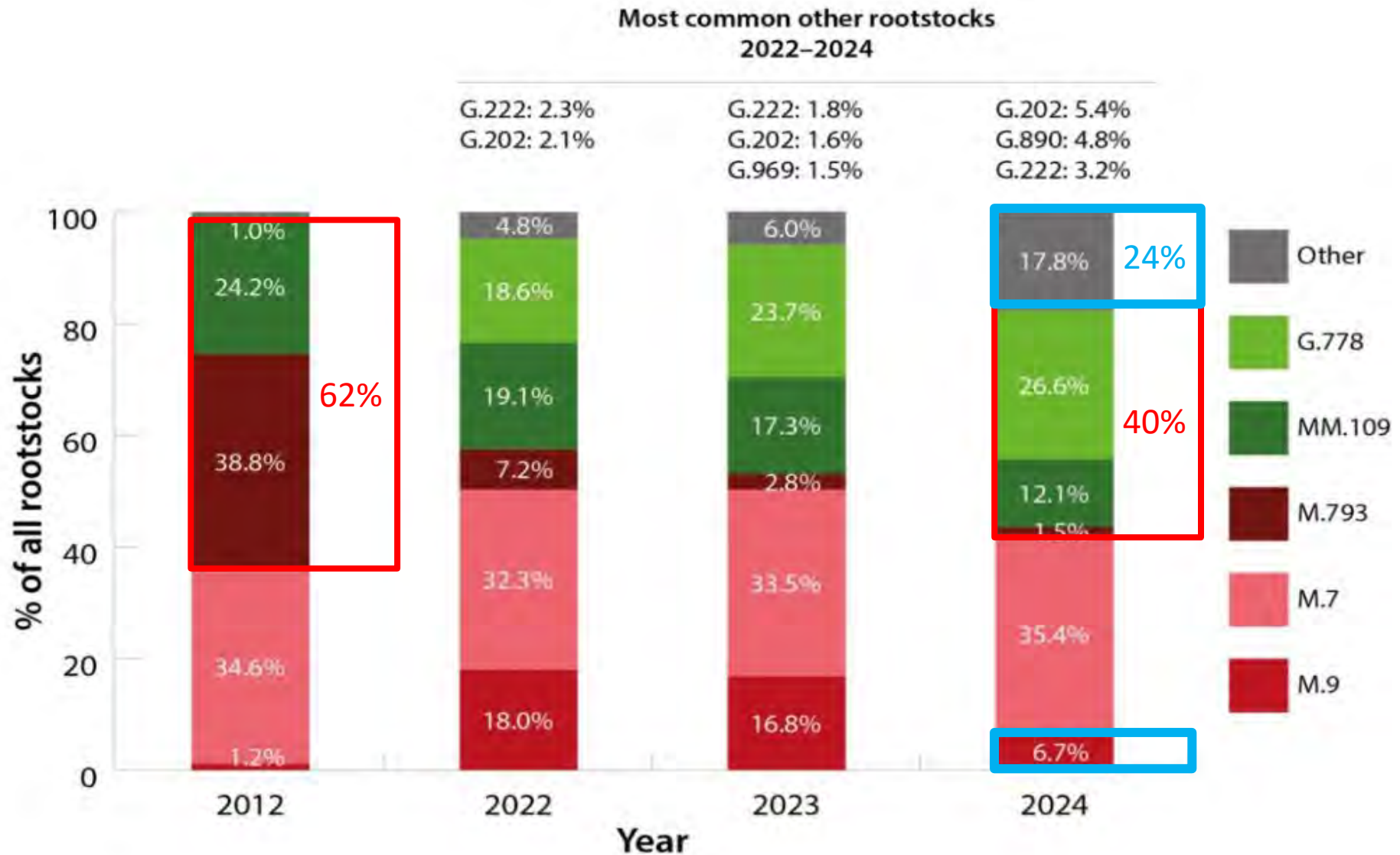
Kriel R. 2023. PlantSA figures for rootstock production from 2012–2024. (personal communication).



APPLE ROOTSTOCK TRENDS

<https://www.freshquarterly.co.za/south-african-apple-rootstock-trends/>

Kriel R. 2023. PlantSA figures for rootstock production from 2012–2024. (personal communication).





ROOTSTOCK SELECTION

ESTABLISHMENT OF WINNING ORCHARDS...

...Begin with the end in mind

...Consider Soil and Climate

...Consider Scion

...Consider Establishment and Production practices



AGRIMOTION

A Decade of Building Trust and Sharing Hope

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an easy to use solution for
boots-on-the-ground monitoring and
precision fruit production.

