

Clean plant material – can it be achieved and how?



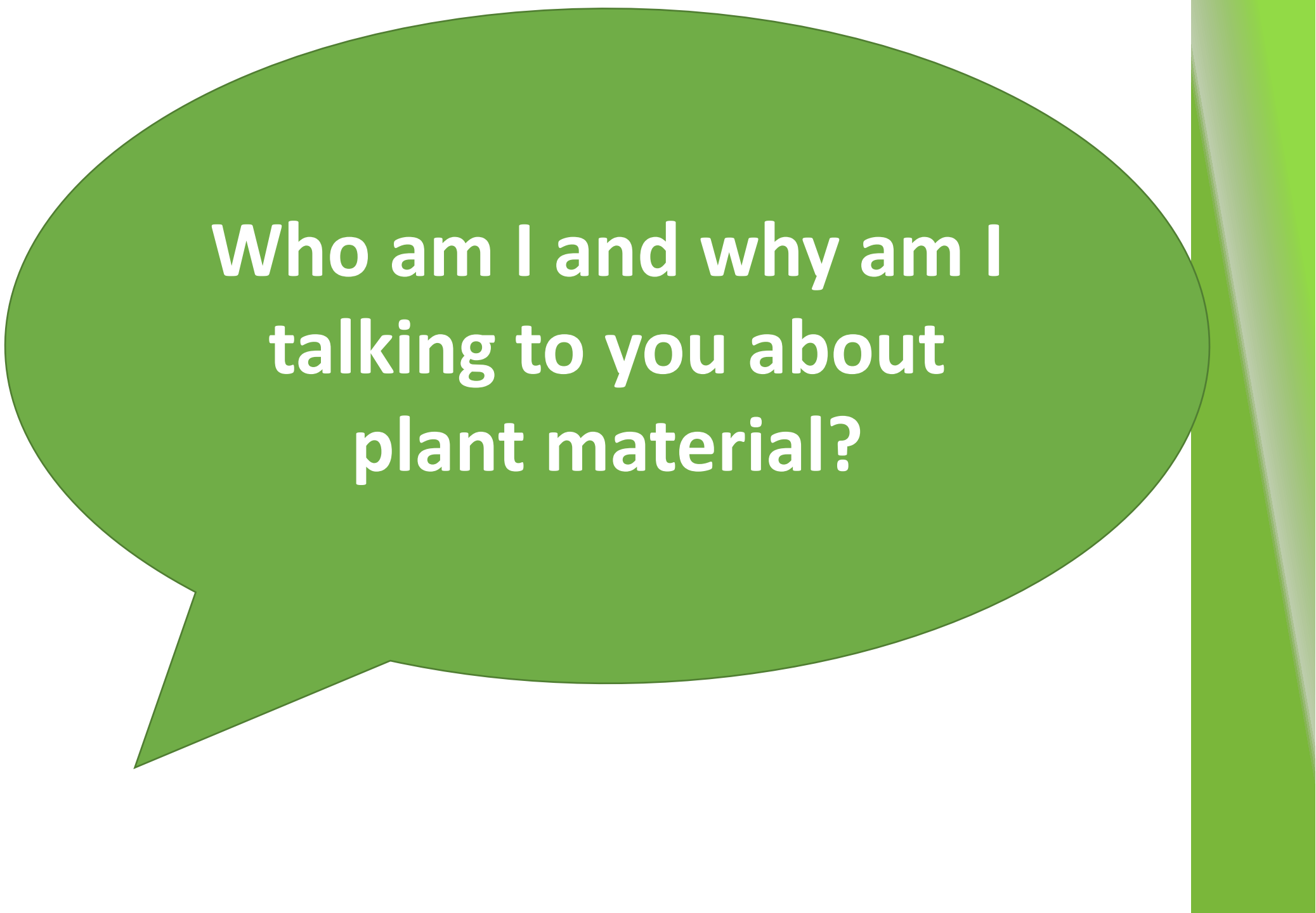
8 June 2022

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(GM: Hortgro Technical / Plant Material Manager)

Aspects to be covered:

1. Introduction
2. Why clean plant material?
3. What does clean plant material really mean?
4. How can clean planting material be achieved?
5. What is the current status of plant improvement?
6. What are the future plans



**Who am I and why am I
talking to you about
plant material?**

HORTGRO Technical



Hortgro Science



Plant Material Management

FFA

Plant Improvement

Tree
certification
Scheme

Deciduous
Plant Improve-
ment scheme

Plant improvement &
multiplication

SAPO

Topfruit

Stargrow

IP Management

SAPO

Cultivar
Commercialisation

SAPO

Culdevco

Breeding

Cultivar imports

SAPO

Other

Cultivar Evaluation

TCF





**Why clean plant
material?**

Why clean plant material?

Start right = ↑ success

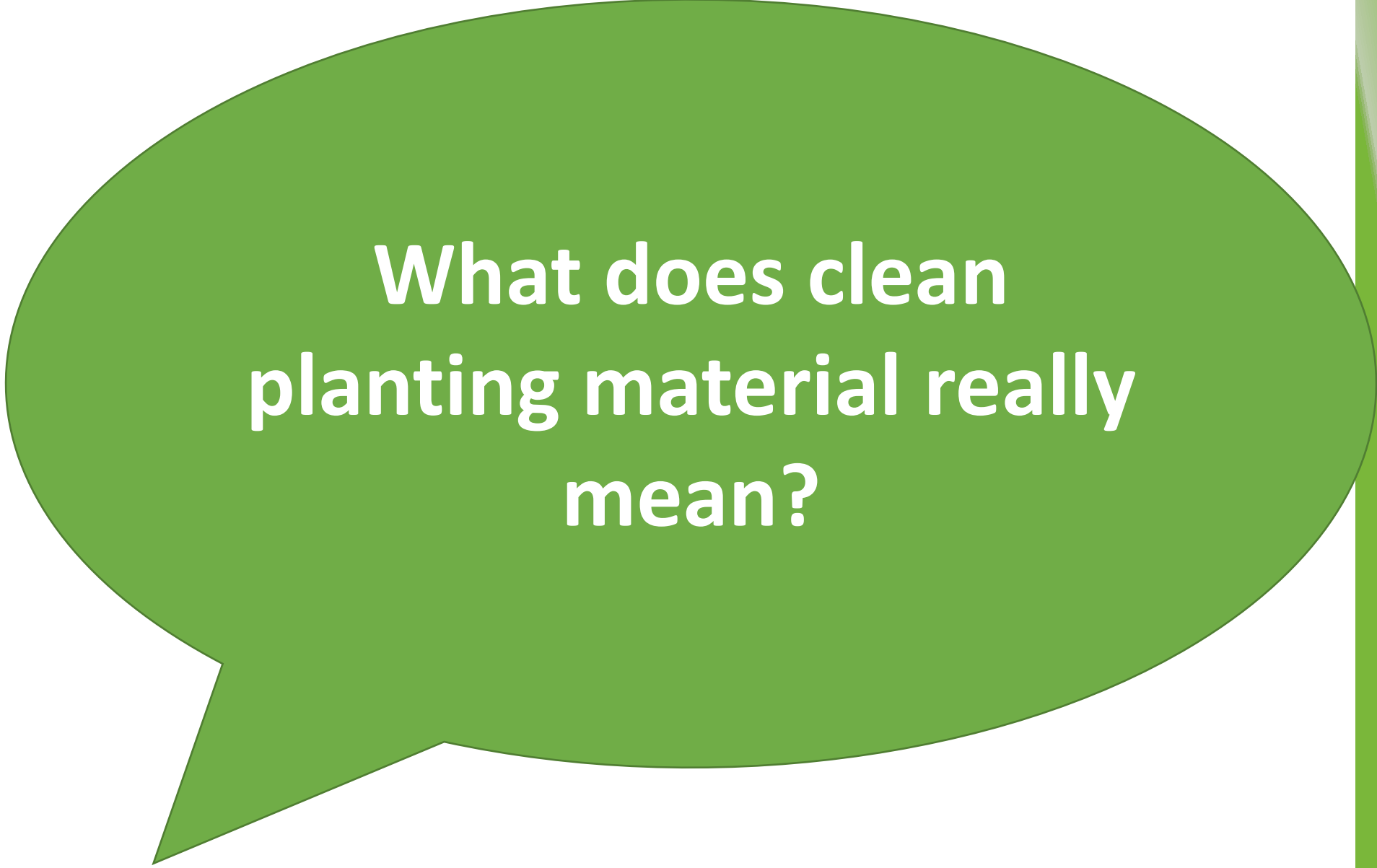
↑ establishment cost

Weak nursery tree = weak orchard tree



Only chance to manage viruses

Early / sustained cropping



**What does clean
planting material really
mean?**

What does clean planting material really mean?

Tested free: economical relevant viruses (6)

Visually free – pathogens

Visually free of pests



True to type

Trees physically standard

Why viruses?

Viruses have no cure = remove infected trees

Spread – propagation material

Negatively affects graft union

Financial impact – hidden
↓
Growth & yields (10-40%)

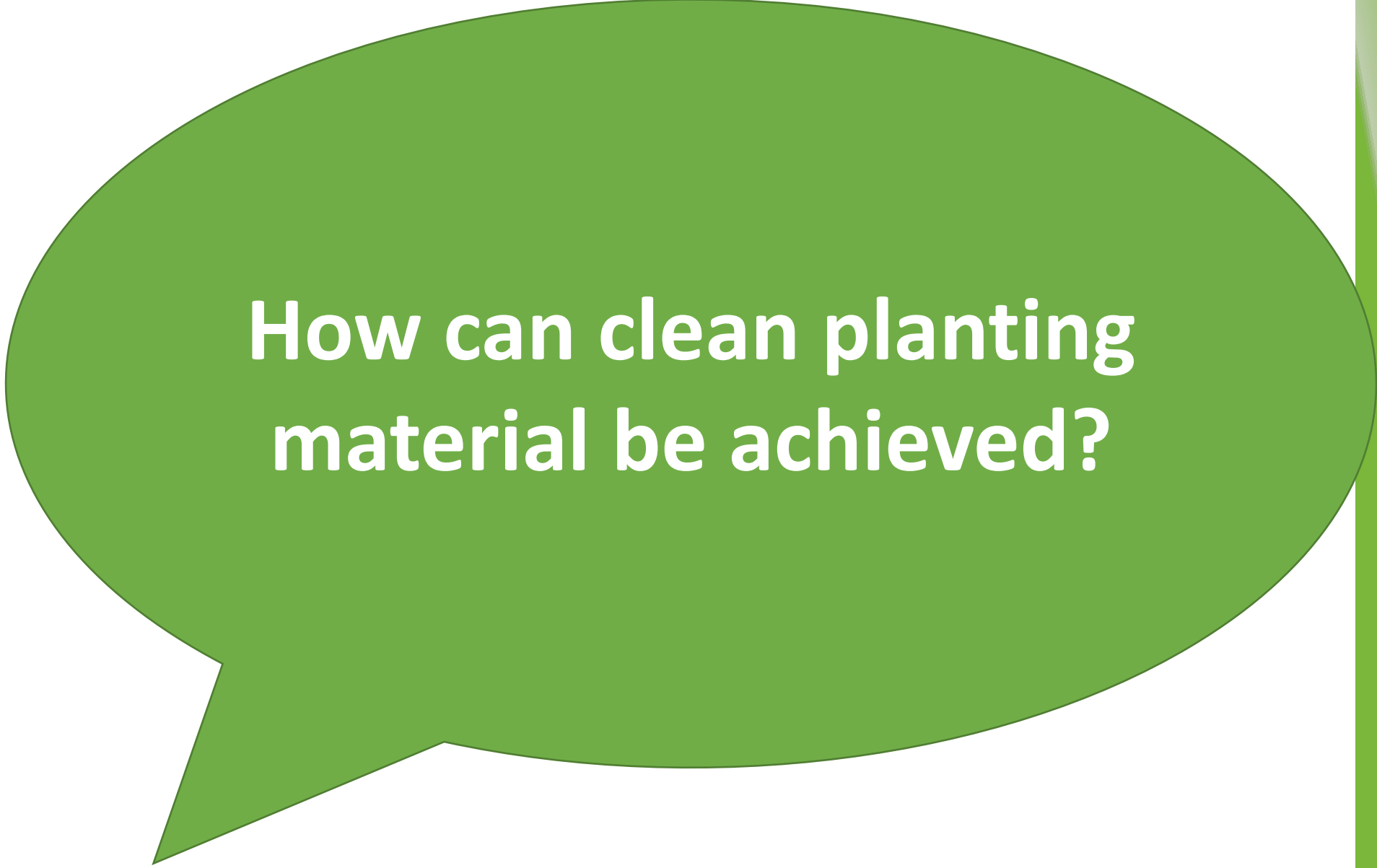
‘Viruses hijack cellular machinery of hosts & turn this machinery to produce more viruses’



Can ↓ tree survival

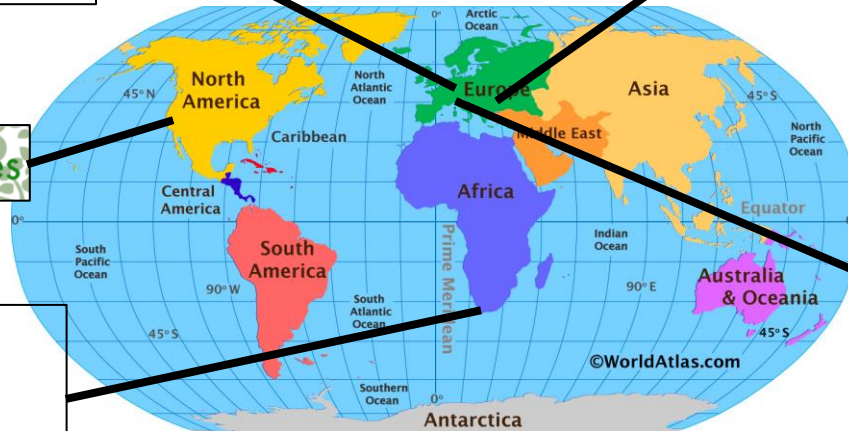
↑ management cost

Quarantine (e.g. plum pox)



**How can clean planting
material be achieved?**

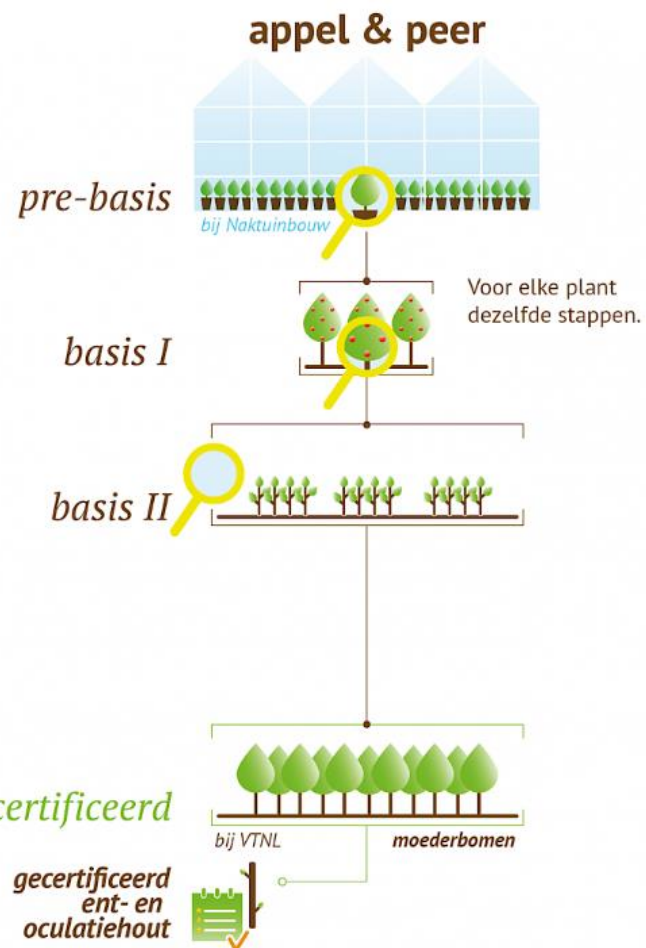
How can clean
planting material
be achieved?



Plant certification schemes



Classic route



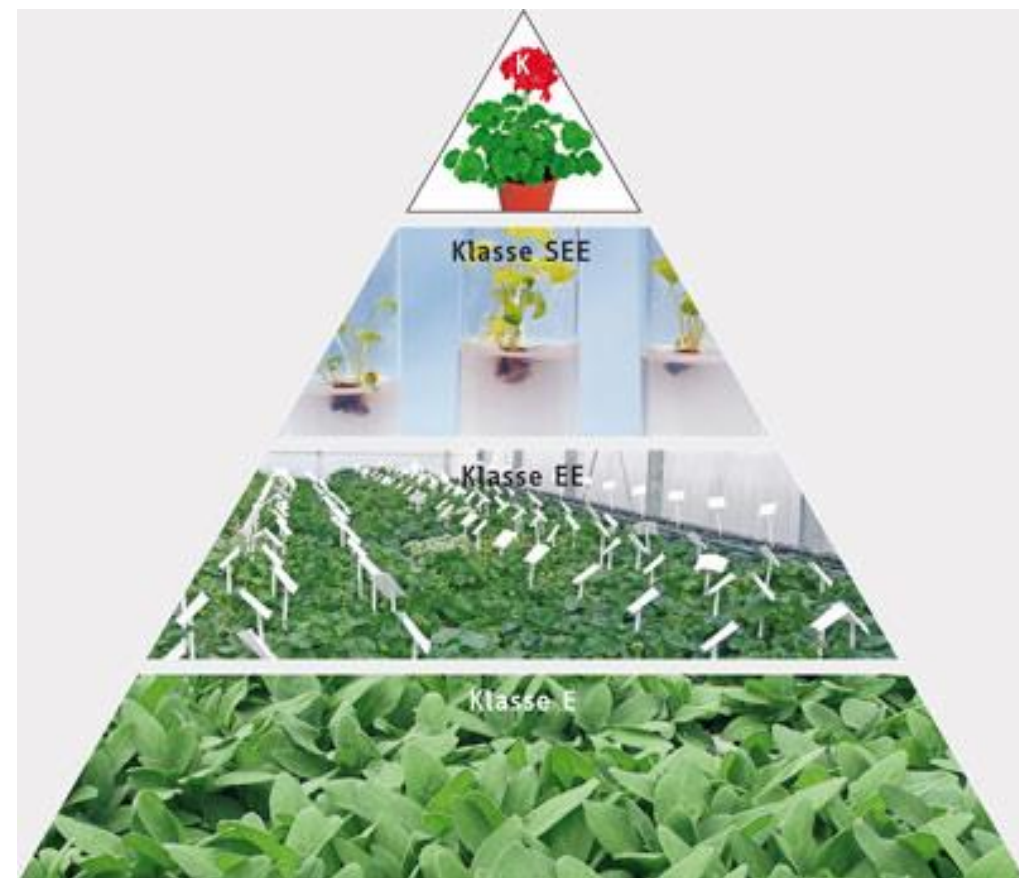
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Nucleus

Foundation

Mother

Nursery



Source: CAV

Clean planting material

Tested free: economical relevant
viruses (6) + Plum viroid I

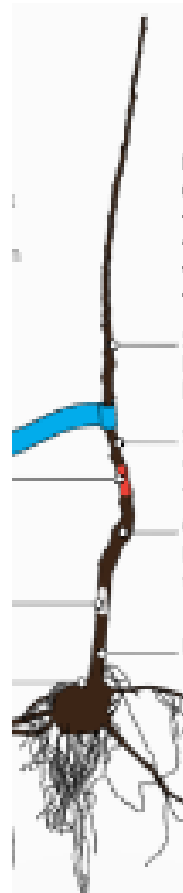
Diagnostics

ELISA / PCR / LAMP /
NGS

Virus removal

(Thermotherapy)

Free – pathogens
(bacterial infections/stem
cankers/crown gall/Phytophthora)



Free of pests
(nematodes – root-knot, ring, root-lesion/ WAA
/ scale insects / mealy bug)

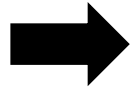
Trees physically standard

True to type

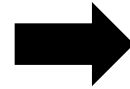
Tissue Culture + Pots



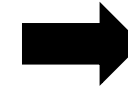
Virus tested nucleus



Tissue culture multiplication



TC growth beds



Micro graft



Root / tree balance



Potted tree



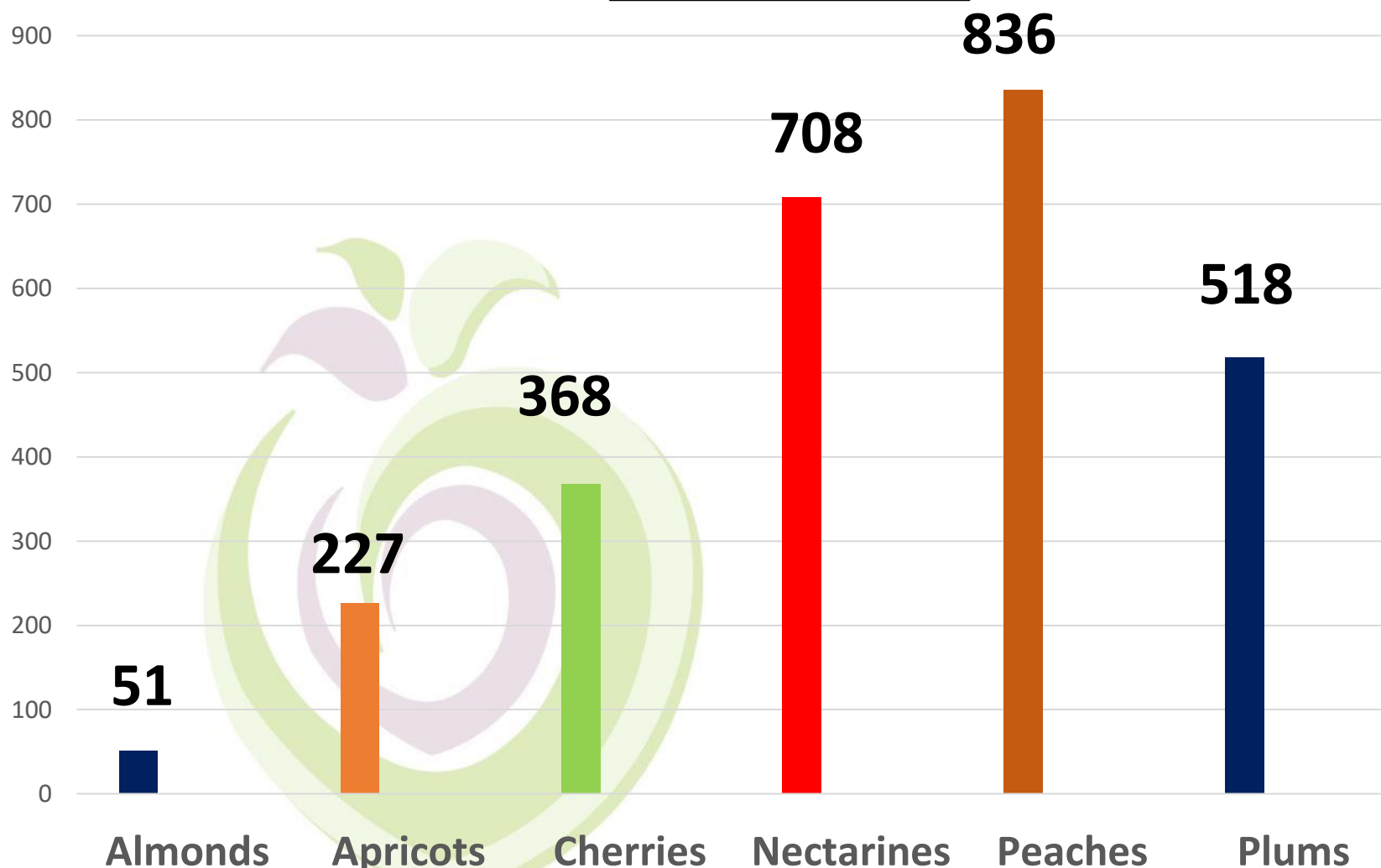
**What is the current
status of plant
improvement in our
industry?**



Import of Stone Fruit cultivars 2011 - 2019



Total: 2 709



Registered clones:

16

50

41

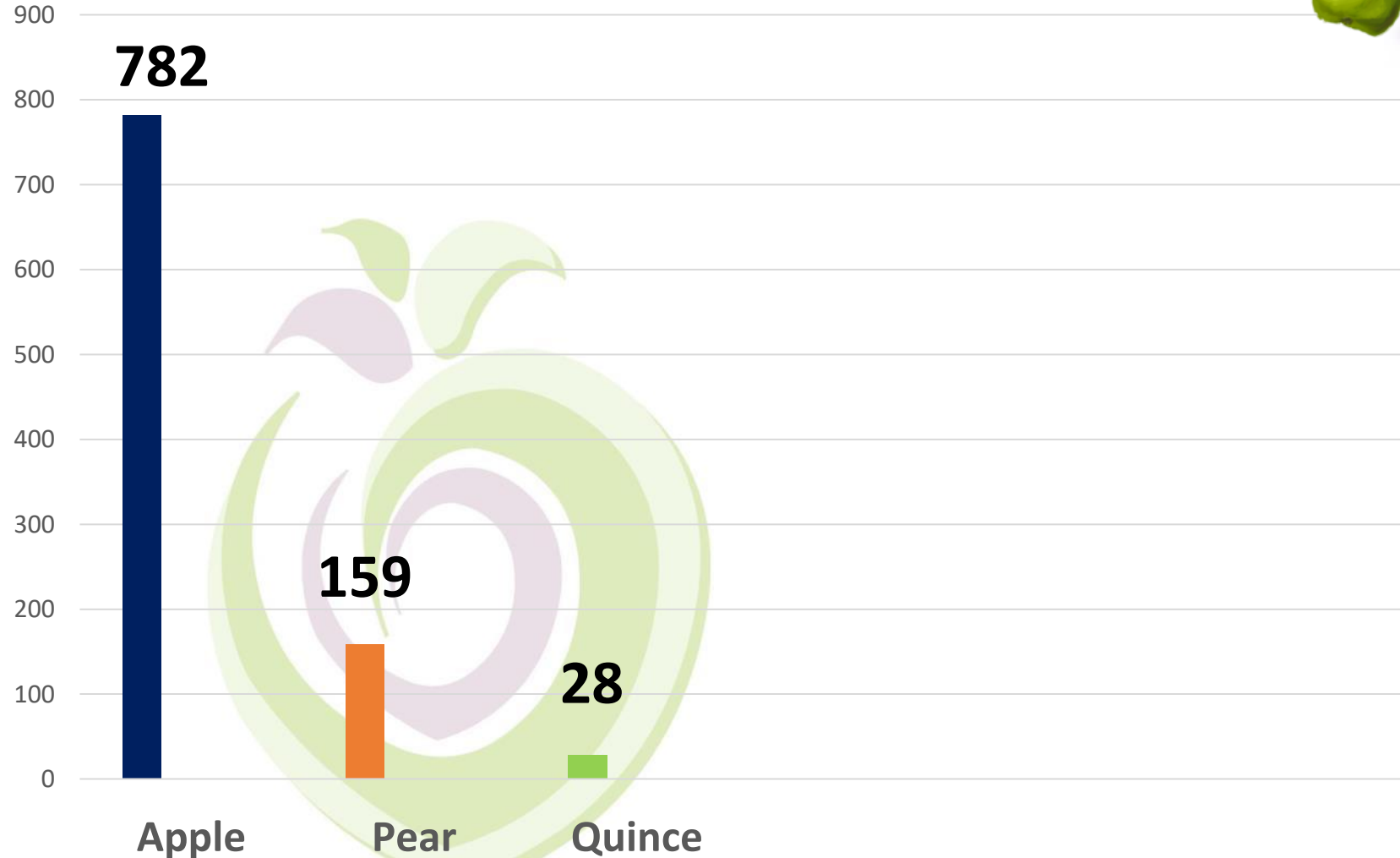
240

199

102

Import of Pome Fruit cultivars 2011 - 2019

Total: 969



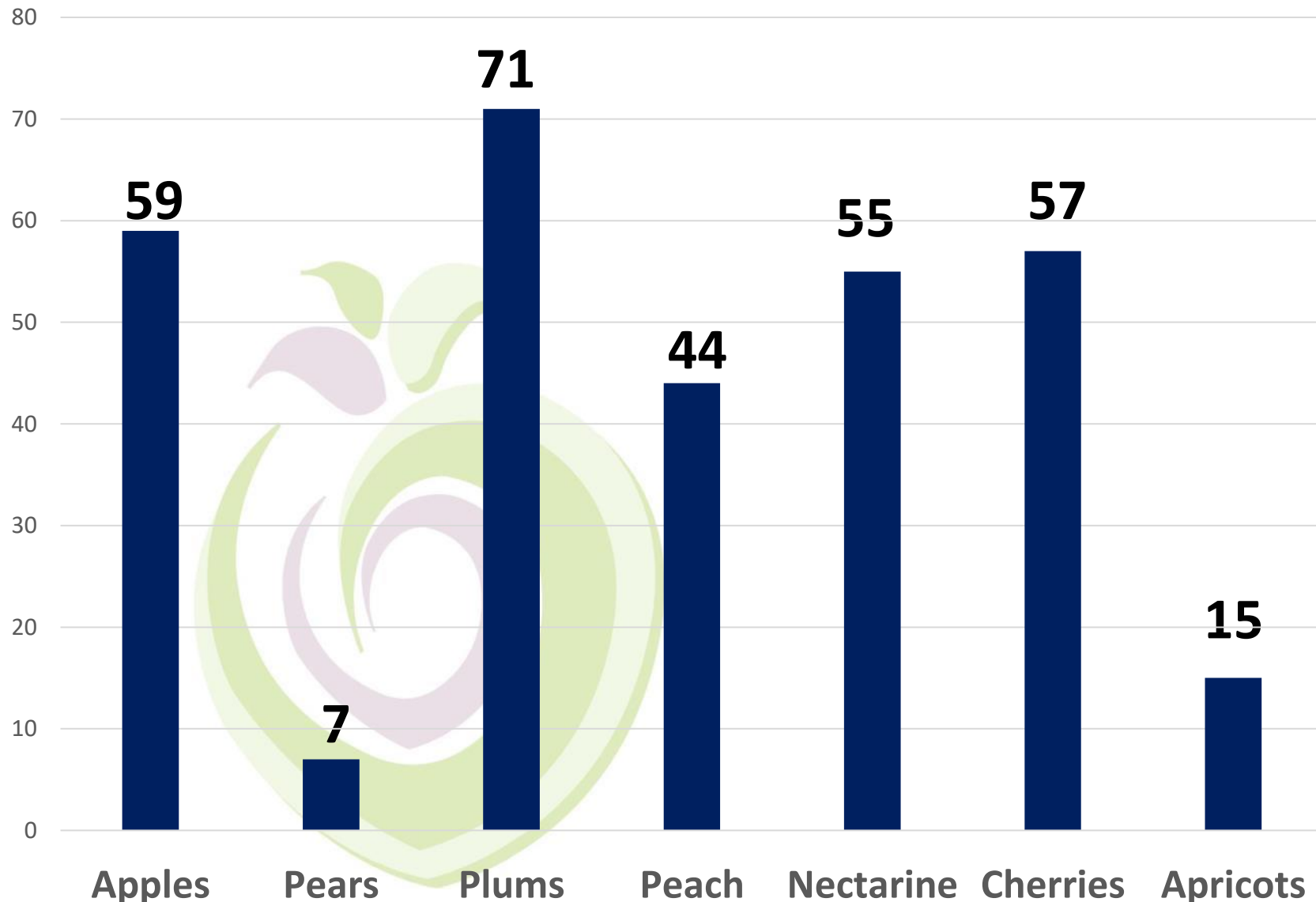
Registered clones:

214

75

4

Imports of Stone & Pome Fruit cultivars - 2020



Total: 208

Clean material

Quarantine pest / diseases

Scheme pest & diseases



agriculture, land reform
& rural development

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Agriculture, Land Reform and Rural Development
REPUBLIC OF SOUTH AFRICA



agriculture, land reform
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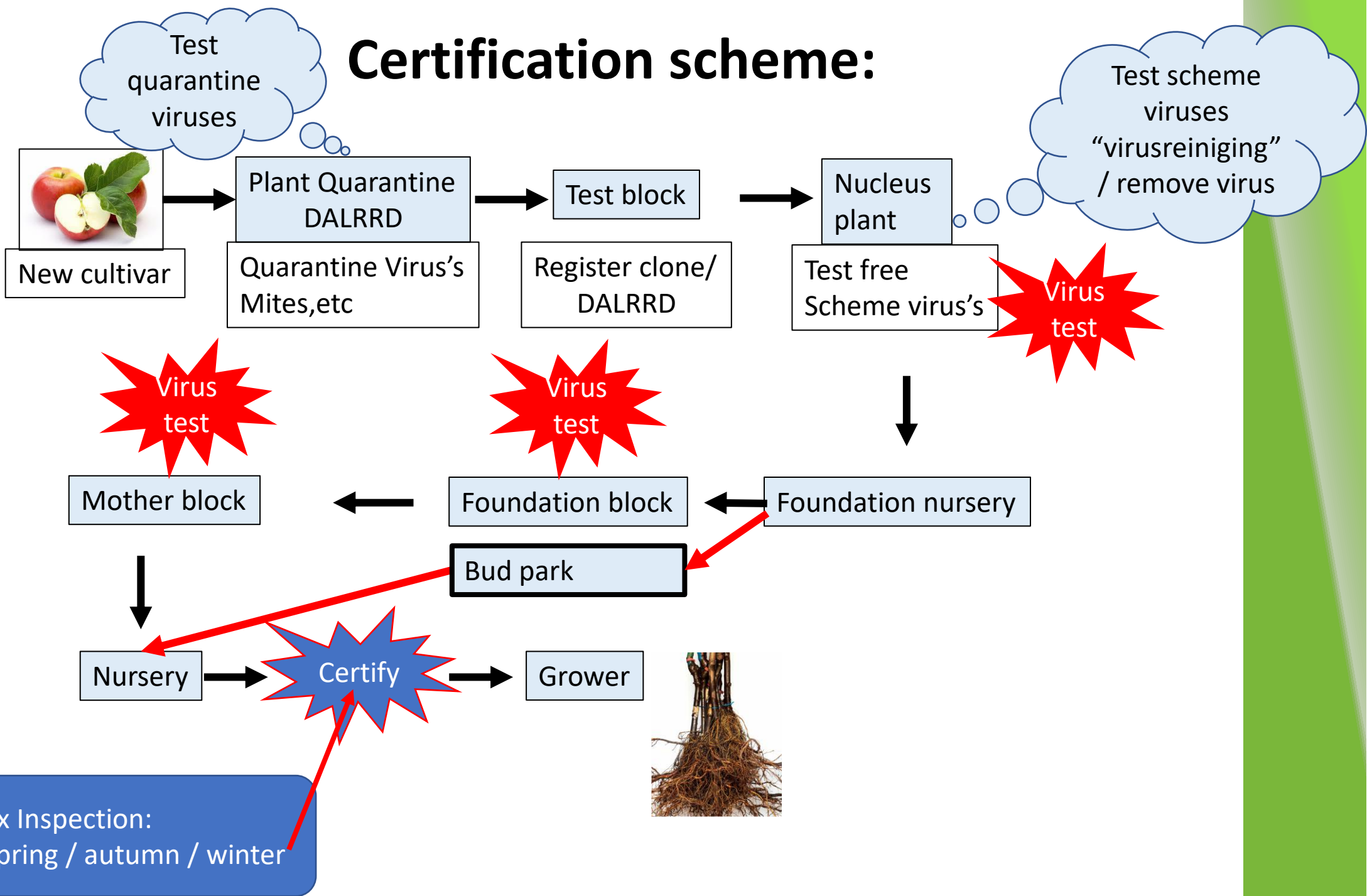
The Plant Improvement Act, 1976 (Act 53 of 1976)



spv | dpa

SAGTEVRUGTEPLANTVERBETERINGSVERENIGING
DECIDUOUS FRUIT PLANT IMPROVEMENT ASSOCIATION

Certification scheme:



Phytosanitary requirements:

Visually free of pathogens:

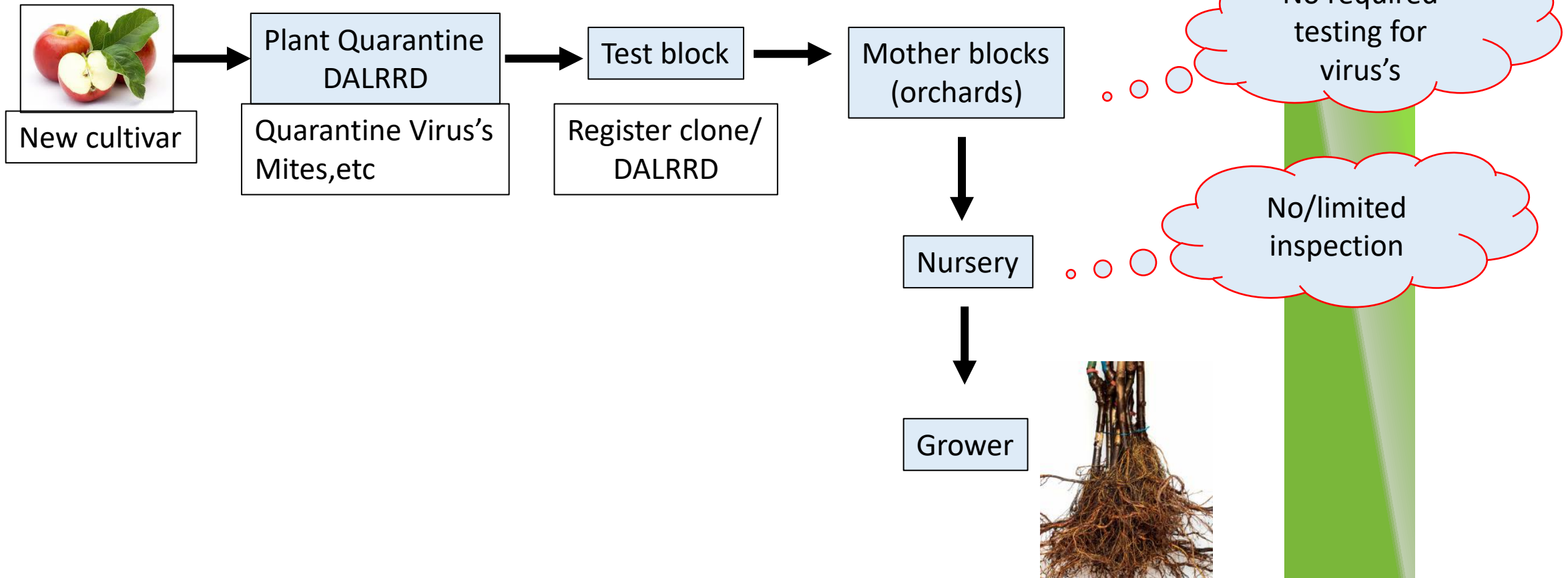
1. Bacterial canker
2. Bacterial spot
3. Crown gall
4. Silver leaf
5. Cankers
6. Wood decay
7. Root & crown rot
8. Phytophthora
9. Pythium
10. Rosellinia
11. Apple flat limb
12. Apple leaf pucker
13. Apple rubbery wood
14. Pear necrotic spot
15. Pear veins yellow



Visually free of:

1. Grey scale
2. Red scale
3. Spanish red scale
4. White peach scale
5. Pernicious scale
6. Mealy bug
7. European red spider mite
8. Root knot nematode
9. Woolly Apple Aphid

Uncertified trees:



Plant improvement

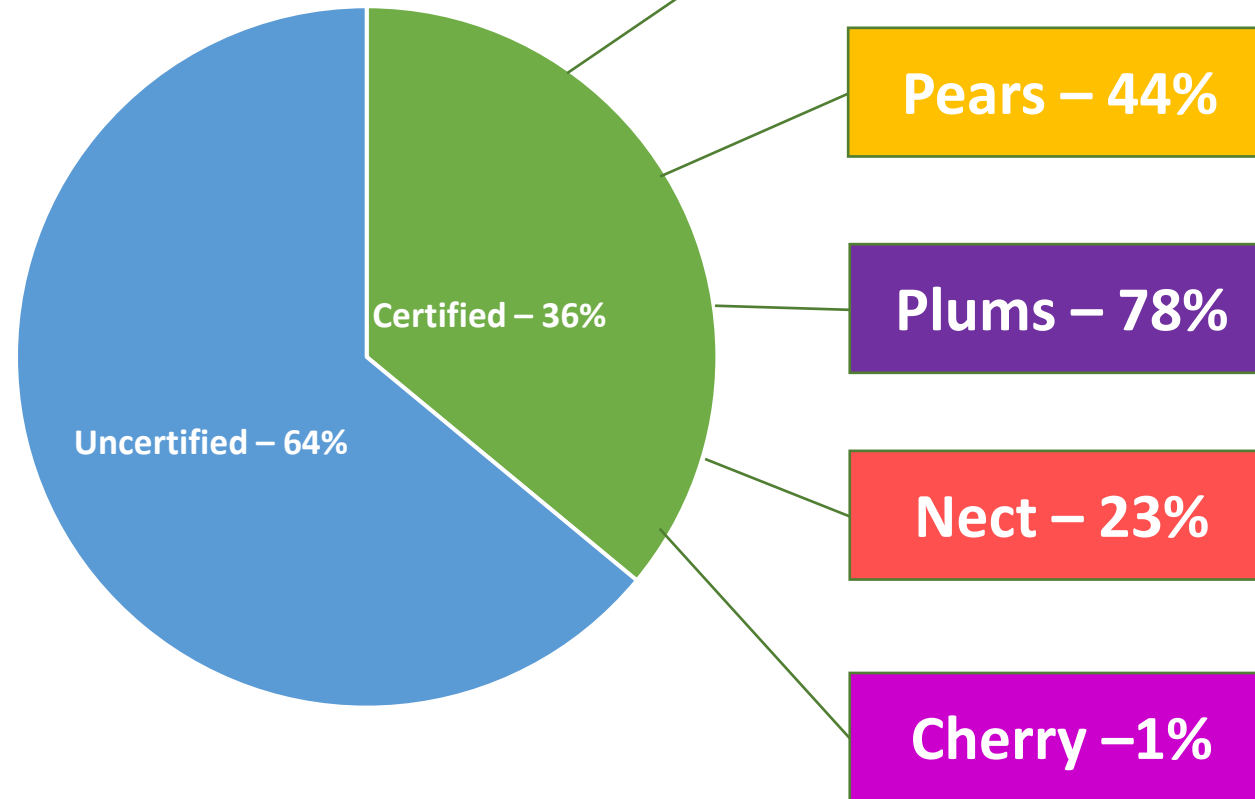
- **3 Plant Improvement Organisations**

- Only PIO's may:
 - register for scheme
 - Register clones
 - Establish nucleus, foundation, motherblocks
 - Multiply buds



- Voluntary Scheme: DPA 3 core focus areas:
 1. Test clean – Scheme Virus's
 2. True-to-type – new and improved clones
 3. Tree quality – standards of scheme

Plant certification in SA





**Where to in the future
regarding plant
improvement?**

Plant Improvement – 2022 & beyond – Best Practices

National & International “Best Practices” benchmark:

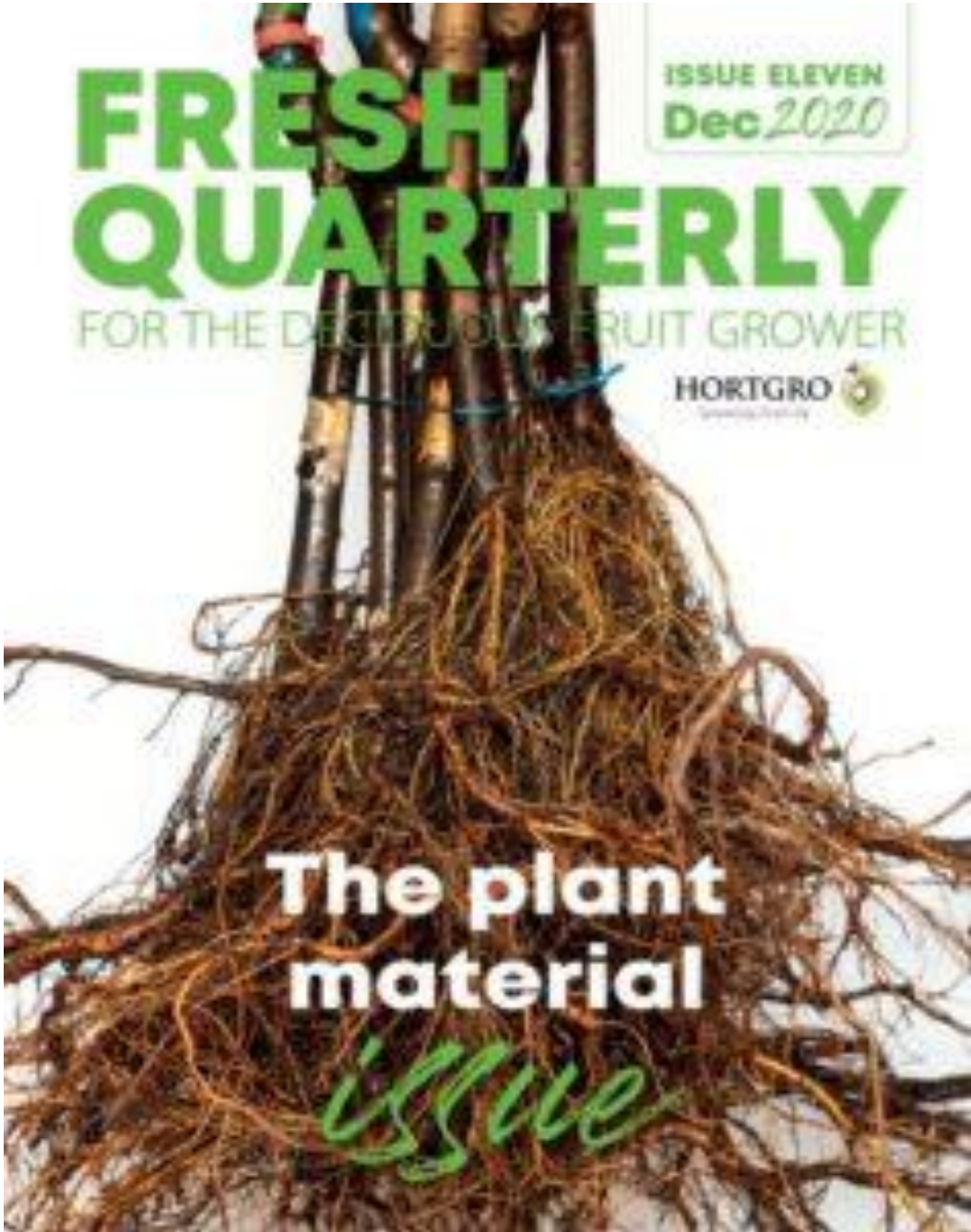
- International
 - Naktuinbouw (The Netherlands)
 - CTIFL (France)
 - CAV (Italy)
 - Prosser (Washington State, USA)
 - FPS (Davis, California, USA)
 - New Zealand (Quarantine system)
- National:
 - Citrus Improvement Scheme
 - Seed Potato Certification Scheme
 - Wine industry



Take home



1. Plant improvement = continuously improving material through:
 1. Genetics (breeding) / selection
 2. Improving diagnostics
 3. Improving technology (Tissue culture / propagation technology)
2. International benchmarking – best practices
3. Implementation a mechanism / system
 - Deliver plant material:
 - reduces risk to grower
 - Allow tree to perform at its optimum

The background of the magazine cover is a photograph of a tree trunk and its extensive root system. The trunk is dark brown and has several blue and red ties wrapped around it. The roots are a lighter brown color and spread out in all directions. The text is overlaid on this image.

FRESH QUARTERLY

FOR THE DECIDUOUS FRUIT GROWER

ISSUE ELEVEN
Dec 2020

HORTGRO 

**The plant
material
*issue***