

# Orchard Practices and productivity

ZR Ernst - Allesbeste

*Maluma-dag*<sup>2014</sup>

# Overview

## ORCHARD PRACTICES

- Planting
- Early pruning
- Mulching considerations
  - Soil moisture content
- Orchard frost resistance
- Maintenance pruning
- Labour intensity & efficiency
- Soil and Leaf nutrient norms

## PRODUCTIVITY

- Pruning Research

# Planting...



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# Planting...

Duke 7 – “Ol’ faithful”

Medium grower

Upright growth

Very few fruit (early crop)

Suitable for ultra high density



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# Planting...

Dusa – “Sea Biscuit”

Thrifty Grower

Perfect central leader tendency

High yields (early crop)

Suitability for ultra high density???



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# Planting...

## Bounty – “Chad Le Clos”

Thrifty grower but slower than Dusa

Shrubby growth

Medium Yields (early crop)

Suitability for ultra high density???

Perfect for wet soil conditions



# Planting...

High Density

800 - 1600 trees/ha

Well suited for small farmers

Focused & Active approach

Higher development cost

Return on Investment

Pruning commitment

6X3; 5x2,5; 3x3; 2,5x2,5 &  
7x3,5 - tramline

vs

Standard

312 - 408 trees/ha

All-round approach

Less intensive

Lower development cost

Slower Return on Investment

Less pruning

7x3,5 & 8x4



# Planting...

Orchard cold damage – Frost resistance

Maluma @ -6°C



Hass



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# Early tree training

Central leader

vs

Topping



*High Density*



*Standard Density*

# Central Leader Pruning (CLP)

## CLP CONCEPT

A-shaped tree or,

Cylindrical tree

Remove vertical growth

Cultivar selection critical

Early training is critical

## CLP: THE METHOD

1. Identify the central leader
2. Remove strong vertical growth
3. Growth with an angle smaller than  $45^\circ$  to the central leader is removed,

*Any lateral branches that grow inward, into the tree, towards the central leader, as well as those that cross other branches need to be removed*

# Topping (Open Vase / A-symmetrical)

## TOPPING CONCEPT

Shrubby tree

Occupies horizontal space

Top center vertical growth

Allow outside growth

## TOPPING: THE METHOD

1. Identify Center Branches (top Central Leader)
2. Manage limbs to create 2-4 outside limbs
3. Manage strong inward growth



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# Maintenance Pruning

## *Standard Density*

Maluma 7x3,5m

Hass 7x3,5m

Less serious hand pruning

More serious hand pruning

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# Maintenance Pruning

*High Density - CLP*



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# Mulching

GOOD PRACTICE

COMPOST WITH LIME 7KG/M<sup>3</sup> AS INITIAL TREATMENT FOR PH CORRECTION

AVOCADO - WOOD CHIPS

**Hypothesis:** Lower density Maluma might need more focus on Mulching as slower growing trees do not create as much natural mulch as faster growing varieties. Vigorous varieties are pruned more heavily and more often, resulting in more organic matter.

*It's all about healthy root systems!! Food - Production*



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# Soil Moisture & Irrigation

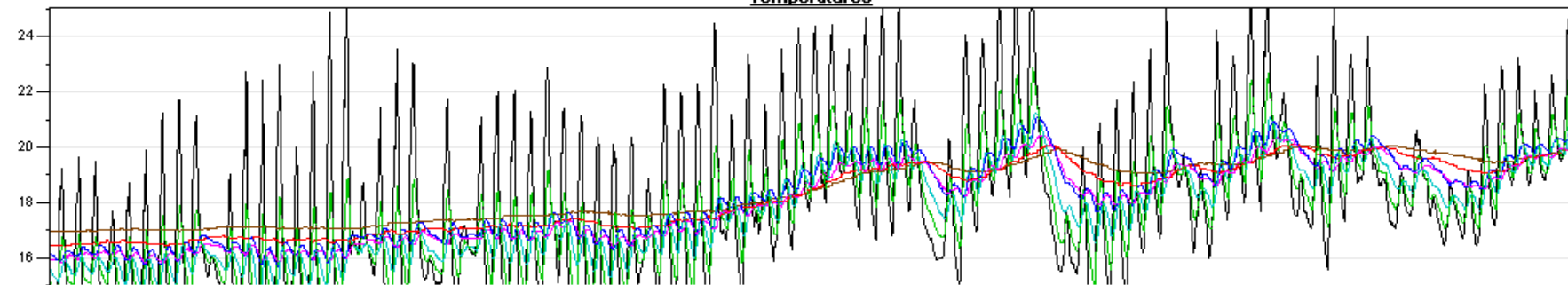
Frans Kruger: possible  
correlation  
between soil  
moisture content  
and quality / shelf  
life / ripening

OPTIMAL SOIL MOISTURE  
CONDITIONS OVER CRITICAL  
FLOWER AND FRUIT SET PERIOD

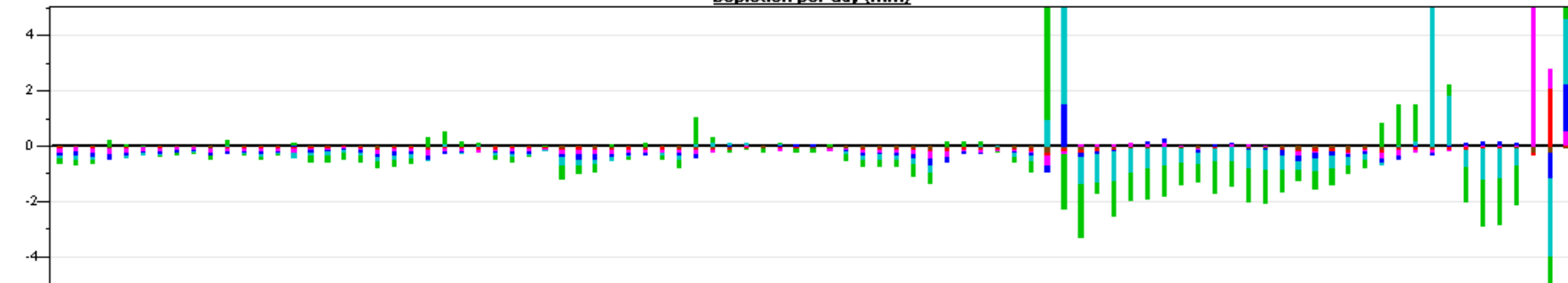


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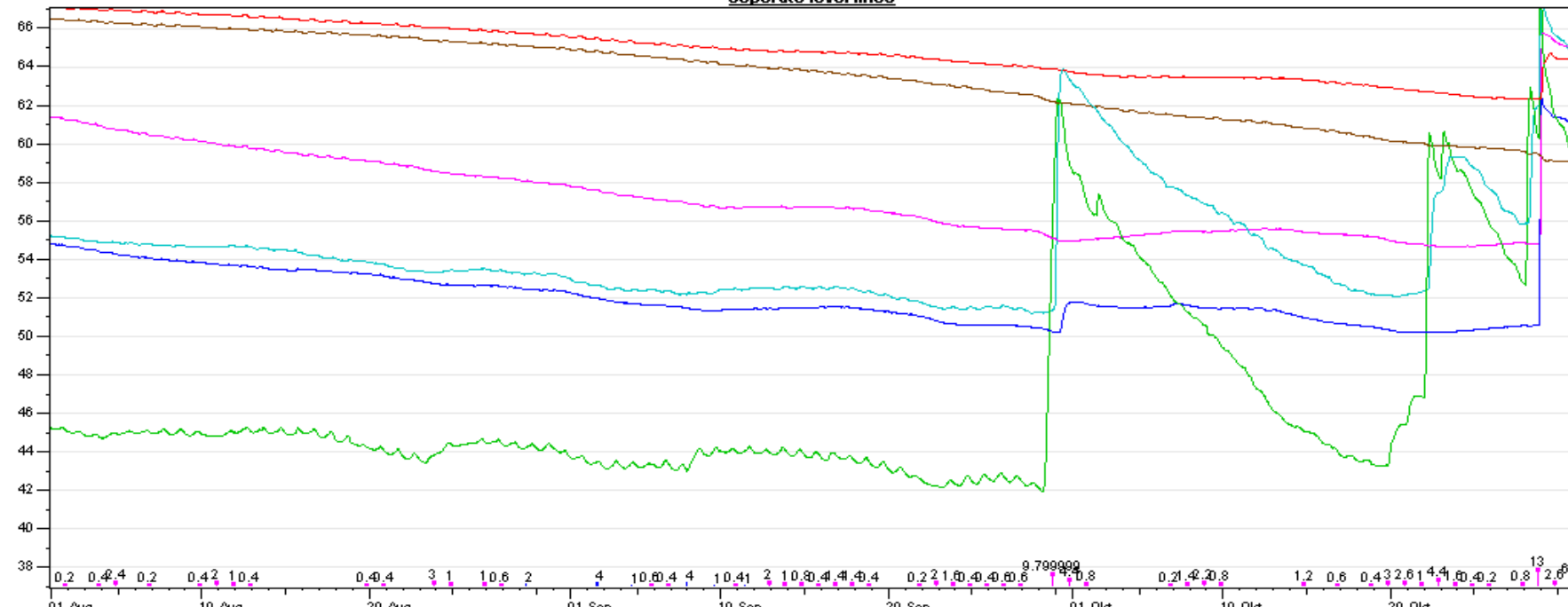
Temperatures



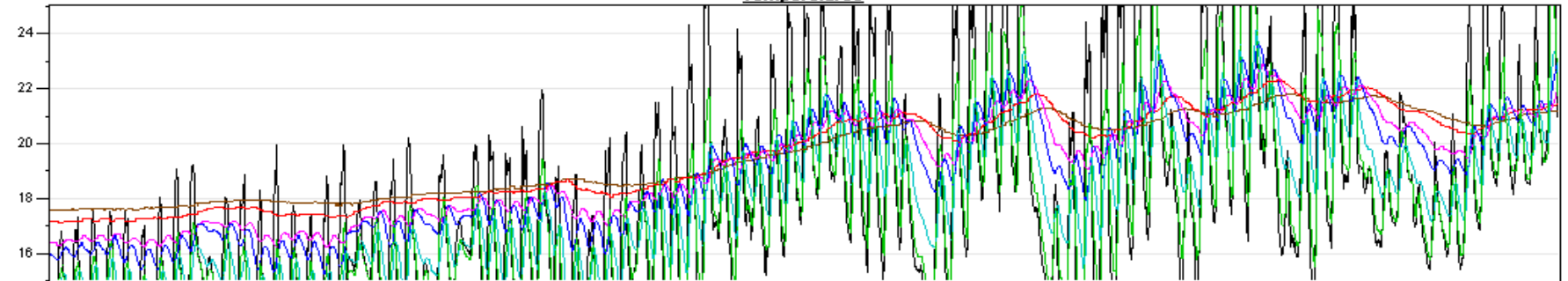
Depletion per day (mm)



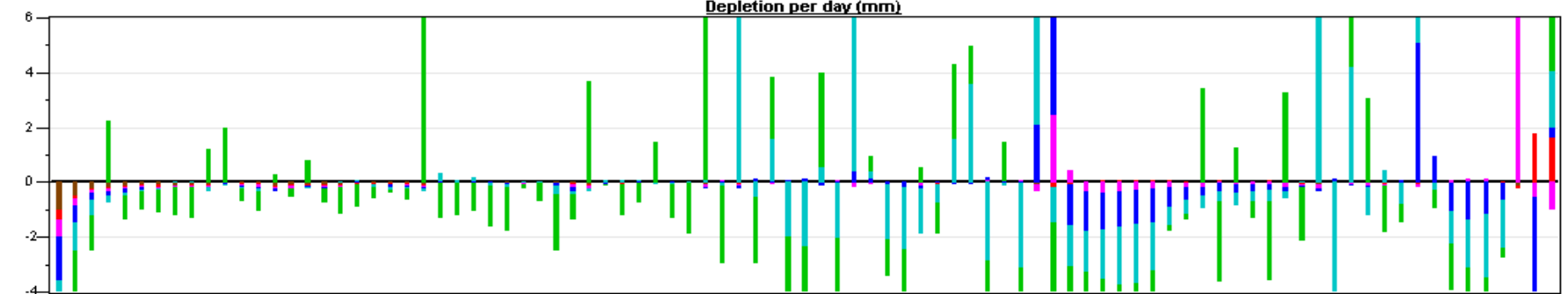
Seperate level lines



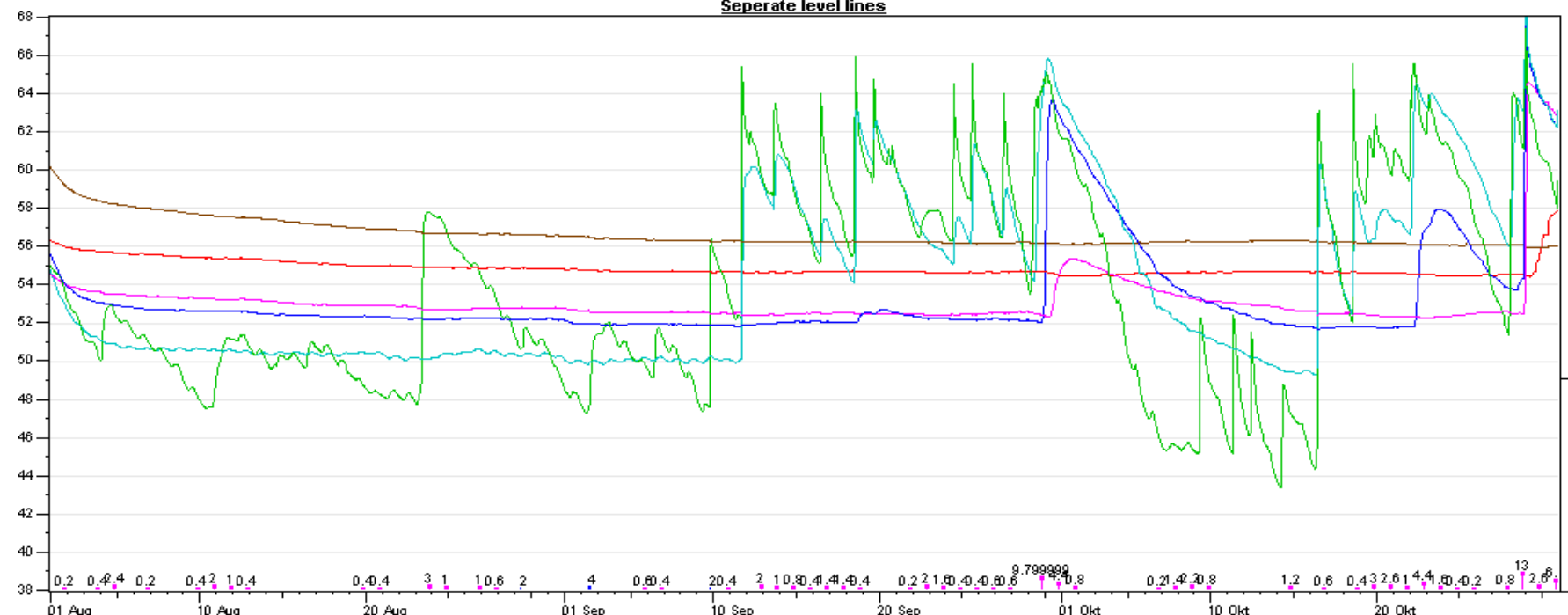
Temperatures



Depletion per day (mm)



Seperate level lines



# Labour Considerations

## HIGH DENSITY

Higher rate of picking

Lower pruning costs

Slashing might be difficult

Herbicide spraying difficulties

Lower spraying costs??

## STANDARD DENSITY

Slower rate of picking

Higher pruning costs

Slashing mechanisation

Herbicide mechanisation



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# Soil and Leaf Nutrient Norms

NEW NORMS NEEDED!!!

We cannot follow Hass norms as growth and fruit nutrient removal differs.  
Production is higher, but seems like less Nitrogen is used

**N** 2.00 – 2,20%

Be proactive and project expected crop



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# Foliar applications

Biophos & Biokelp

Biokelp – 5%

Biophos – 5%

Zinctrain – 2%

Dynamob – 2%

Fullmax – 2%



*Test phase!!!*



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# Foliar applications

Biophos & Biokelp

The aim: getting heavy bearing trees not to alternate and to boost growth and reproduction in young and high density orchards



*Caring the tree for production*



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# Pruning & Production Research

## AIM

*“Etiket Proef”*

To establish bearing patterns, frequency and productivity of Avocado branches on Central Leader, high density Maluma trees.

## methodology

Multiple branches on avocado trees were labeled with coding to record their production, regrowth, flowering and production capabilities during the 2013/14 season. And will be continued.

A label is applied to different bearing and non-bearing branches in order to record their different patterns.

Lets have a look...



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# Pruning & Production Research

*“Etiket Proef”*

## FRUITING CHARACTERISTICS ANALYSED

- AMOUNT OF FRUIT PER BRANCH
- LEAF COVERAGE AND GROWTH
- APPROXIMATE HEIGHT OF FRUIT WITHIN THE TREE
- APPROXIMATE DISTANCE OF FRUIT FROM MAIN TRUNK
- FUTURE PRODUCTION POTENTIAL (**subjective**)

*Visual analysis*



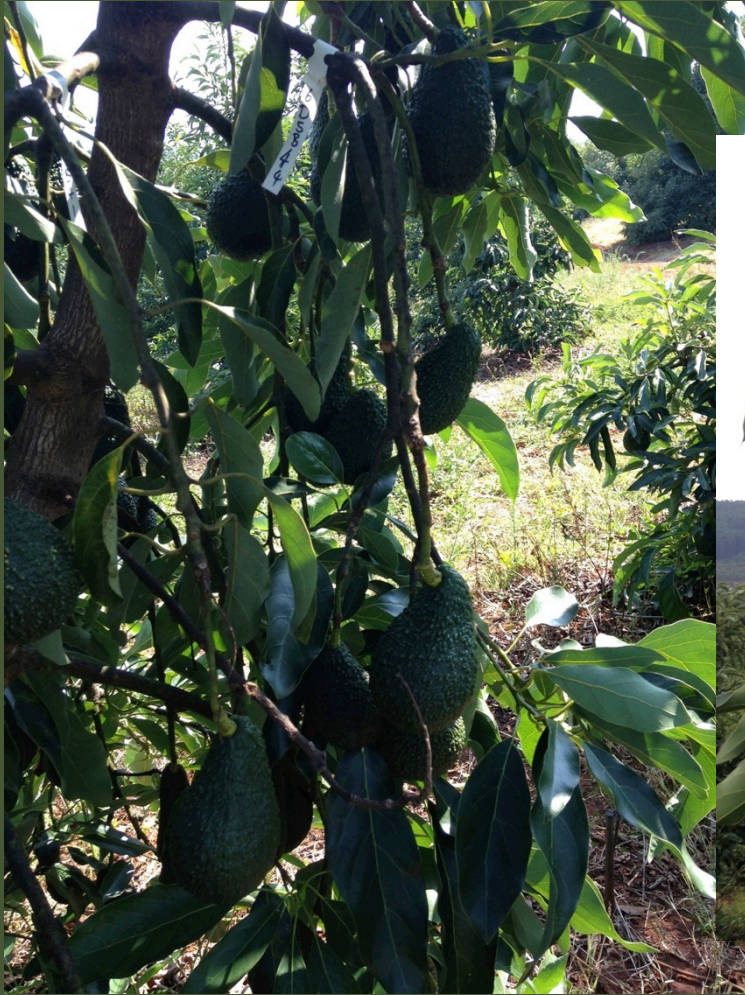
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# Pruning & Production Research

*“Etiket Proef”*

## INITIAL RESULTS

- HEAVY BEARING BRANCHES CROP LESS THE FOLLOWING YEAR NOT NECESSARILY WHOLE TREE
- YOUNG FLUSH CAN CROP YOUNGER THAN 1 YEAR
- IDENTIFIABLE YIELD PATTERN WITHIN TREE
- SELECTIVE PRUNING - MICRO MANAGEMENT SUGGESTION



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# Future Research

- Continue production (label) trials
- Foliar spraying trials
- Screen (sun protection)
- Refining Soil and Leaf Nutrient norms
- Rootstock trials

Baie Dankie!



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