



CASE STUDY

LOERIESTROOM



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About Loeriestroom

Loeriestroom is a 30 ha farm situated close to Groot Brakrivier in the Garden Route. About 6 of the farm's 30 hectares are cultivated with approximately 3000 avocado trees of the Maluma Hass cultivar.

What is your farming philosophy?

Mark's farming philosophy is firstly to produce high-quality avocados for export and high-end local markets. Therefore, he has chosen the Maluma Hass cultivar for its "high oil content and an excellent nutty flavour."

Secondly, he aims to balance farming operations with a sound conservation program by clearing the farm of alien vegetation.

"We have removed species such as *Acacia cyclops*, *Acacia mearnsii* and *Lantana camara* to restore the land to fynbos and riverine forest."

How did you get started with FruitLook?

"I learned about Fruitlook from my brother who is also an avocado farmer."

Mark is a participant of the FruitLook Technical Support Program.





How do you use FruitLook throughout the avocado growing season?

Avocadoes need constant attention throughout their 12-month growing cycle. The trees flower around May or June, set fruit in September, and are harvested in October of the following year.

Each one of these stages requires careful monitoring to ensure the trees have enough nutrients and water.

Mark mainly uses FruitLook to monitor the overall health of his orchards. “I draw comparisons between seasons and orchards in terms of biomass gain, leaf nitrogen, evaporation (ET) deficit, etc.”

Mark compares the biomass production (Figure 1) and cumulative biomass production (Figure 2) of the orchards to make sure they are growing as expected and are on par with or even better than previous seasons. This way, Mark can proactively respond if an orchard’s growth is lagging.

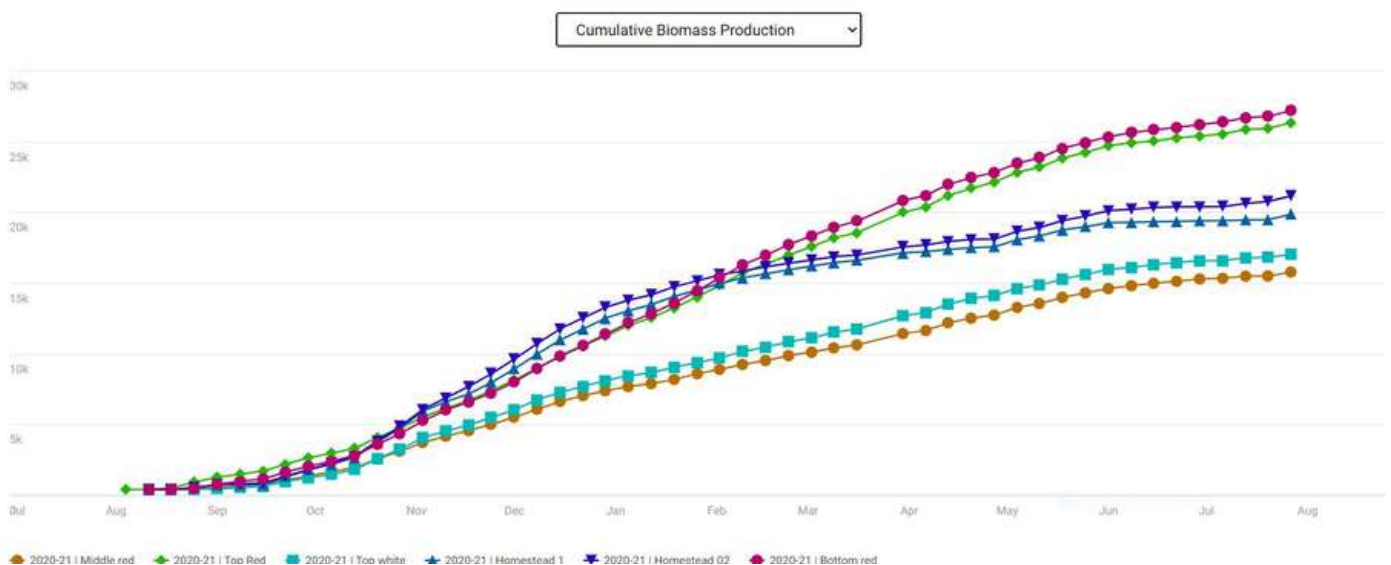


Figure 1. A comparison of cumulative biomass production between avocado orchards on Loeriestroom farm.

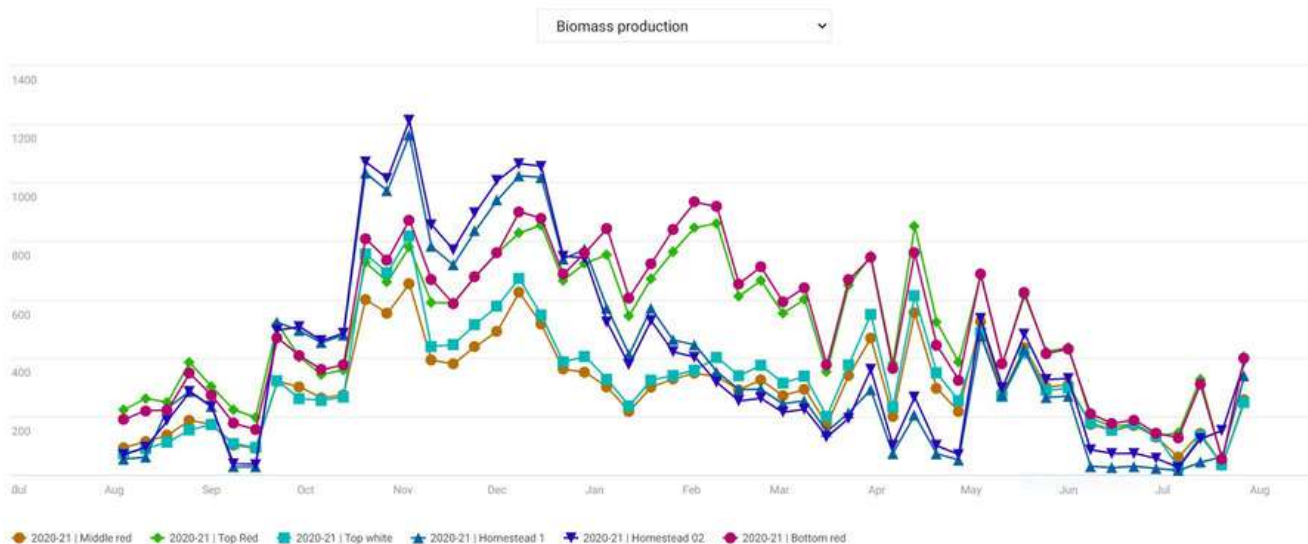


Figure 2. A comparison of biomass production between avocado orchards on the Loeriestroom farm.

Mark follows different fertiliser regimes for orchards of different soil types and tree sizes. He keeps track of the nitrogen trends of each orchard by doing annual leaf analysis and monitoring the amount of nitrogen in the upper leaf layer in FruitLook.

“The younger orchards will have a lower amount of nitrogen in their upper leaves, but should follow the same seasonal trend as the older orchards”, as seen in Figure 3.

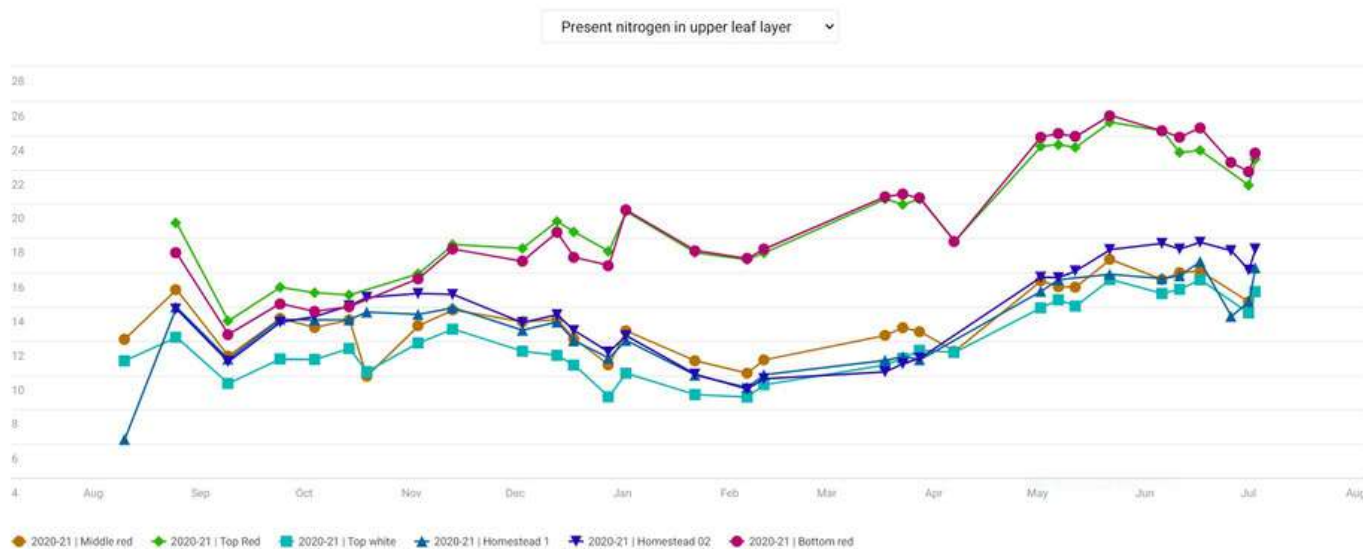


Figure 3. A comparison of present nitrogen in the upper leaf layer between older (red and green) and younger (blue, purple, orange and turquoise) avocado orchards on Loeriestroom farm.



How does FruitLook fit into your irrigation management?

Mark irrigates based on several factors, namely rainfall and soil moisture content measured by probes on the ridges in the orchards.

He mentions that he relies on his intuition to a certain extent as well. "I just get a feeling when we need to irrigate after a bit of a hot spell or when warm weather is forecasted. It is important to me to also irrigate after some rainfall, because I want salts to flush out of the soil. FruitLook's ET deficit confirms whether I am on the right track."

In Mark's farming context, a sudden increase in ET deficit generally means the soil is drying out whilst a constant value of 0 or close to 0 usually means an orchard is being overwatered. "I try and balance all these factors, and using FruitLook enables me to do so."

Mark also participated in the testing phase of FruitLook's Water Balance Calculator. This calculator allows its user to monitor the plant-available water (PAW) in the soil.

Over time, users will learn how much irrigation is sufficient to keep crops

stress-free under certain weather conditions. The most important part of the Water Balance Calculator for Mark is "knowing how much water is available for my crop."



"I try and balance all these factors, and using FruitLook enables me to do so."

How have you experienced FruitLook Technical Support?

Mark says the experience has been good. There have been occasions when he needed the FruitLook team's assistance. "When I couldn't redraw the boundaries of my orchards, the FruitLook team helped me to do it."

Do you have any examples of how the FruitLook Technical Support service has helped you to gain the most from FruitLook during the season?

Mark learned that he could also use the colour comparison function in FruitLook's map overview page to identify orchards that might be ready

to be harvested. "The FruitLook Tech Coach correctly pointed out which blocks I was about to harvest from only looking at the biomass colour comparison on the map overview page. They were the green ones."

These orchards produced 15% more biomass than the seasonal average (displayed in green on the FruitLook overview page, as seen in Figure 4) and matched Mark's in-field observations.

Mark shared a few examples of certain in-field actions reflected in the FruitLook data, that led to a conversation with the FruitLook support team.

"When I started increasing the amount of irrigation, the FruitLook Tech Coach asked me if there was a reason for over-irrigating the orchards. She could tell this from observing the low ET deficit that developed in May (Figure 5). It was also confirmed by a full soil profile (current PAW of 100%) in the Water Balance Calculator (Figure 6)."



Figure 4. An overview of avocado orchards on the Loeriestroom farm on the FruitLook platform. During this particular week, the green orchards produced 15% more biomass than the average for the season, whilst the yellow orchards were on par with the seasonal average, and the red orchards produced 15% less biomass compared to the seasonal average.

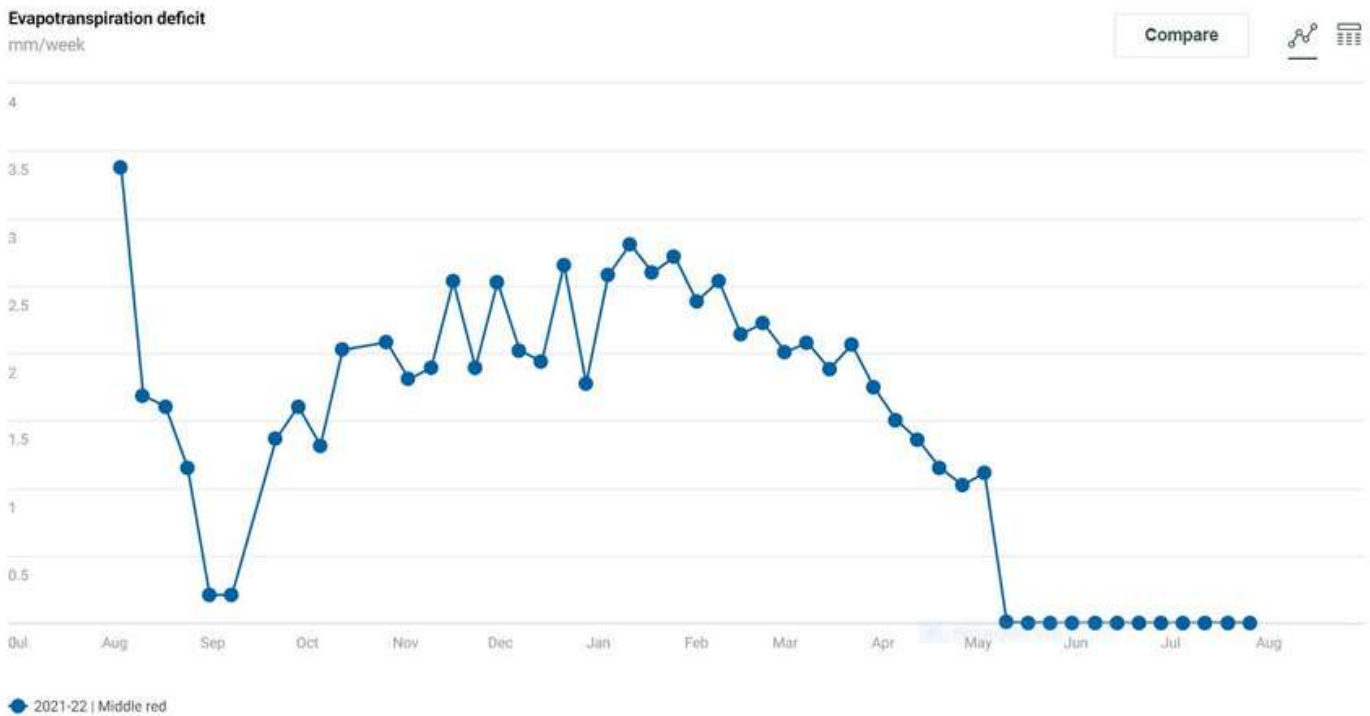


Figure 5. The ET deficit values of an avocado orchard on Loeriestroom farm during the 2021-2022 season.

Water Balance Calculator based on Fruitlook's Evapotranspiration Data [Instructions](#)

1. First, enter all necessary field specification information in the grey cells below.

Farm:	Loeriestroom
Crop:	Avocadoes
Field:	Middle Red
Size of field:	0.80 ha
Depth of soil (m):	1.00 m = estimated depth of rooted soil
Irrigation efficiency:	95% for example: drip 85-95%; sprinkler 75-85%; flood irr. 50-80%
Soil type:	Clay Loam texture class of soil
PAW:	130 mm/m = Plant Available Water in soil at saturation, see Table 1 →
SWL at start:	80% = estimated Soil Water Level at start in % of PAW
Maximum Deficit:	70% = maximum allowable depletion of PAW in %
RDI strategy:	100% = % of PAW deficit to be replenished at irrigation
Start date:	2022/05/24 (yyyy/mm/dd)

2. Second, complete Etc (FruitLook Actual Evapotranspiration data), Rainfall and Irrigation Applied in the grey cells below.

No.	Week (Reading date)	ET (FruitLook) mm/week	Rainfall (per week) mm/week	Irrigation applied m ³ /week	Current PAW		Excess water (run-off) mm
					in mm	in %	
1	2022/05/18 - 2022/05/24	9.57	26.00	47.00	104	80%	0
2	2022/05/25 - 2022/05/31	5.01	24.00	3.00	126	97%	15
3	2022/06/01 - 2022/06/07	4.96	55.00	0.00	130	100%	50

Table 1: Plant Available Water (PAW) in mm per soil type

PAW:	mm/m
Sand	20 - 75
Loamy sand	75 - 100
Sandy loam	100 - 115
Loam	105 - 120
Silty loam	110 - 125
Fine sandy loam	110 - 125
Clay loam	110 - 130
Sandy clay	110 - 130
Silty clay loam	125 - 150
Silty clay	125 - 145
Clay	110 - 135

Figure 6. A screenshot from the Water Balance Calculator shows a full soil profile during May 2022.

Mark stated that FruitLook is a useful way to confirm if the avocado production is still on track. "It's another layer of knowledge."

Would you like to continue with FruitLook Technical Support in the next season?

"Yes, I found the FruitLook team to be very helpful, friendly and easy to work with. I enjoyed the interaction."



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