LONG-TERM citrus crop projections

# Update for Southern Africa

In January 2021 the Citrus Growers' Association of Southern Africa (CGA) updated the Citrus Long-term Crop Projection Model using tree census information from November 2020, as well as recent budwood sales.

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The Citrus Long-term Crop Projection Model provides a sense of future volumes of citrus that are likely to be produced and available for export. It is not a market demand forecast.

The key finding from having updated the model is that citrus volumes are likely to increase at approximately 7.1% year-on-year over the next five years: 206 million 15 kg cartons are estimated for 2026, up from 148 million cartons projected for 2021. By 2036 volumes are expected to reach 270 million cartons.

## November 2020 tree census

The CGA uses the official phytosanitary registration process to collect tree census information. While not fool-proof, this method does ensure a quick, high return rate of information from growers. Any errors in the data seem to be consistent across years, so the trend seems reliable. Some

interesting high-level numbers coming from the 2020 tree census include:

- Total number of production units (PUCs) = 2509
- Number of farming enterprises: 1 068 (i.e. approximately 2.5 PUCs per farm business)
- Total hectares: 96 031 ha. This is a significant increase from the tree census completed in 2019 (up from 88 569 ha, an approximate increase of 7 462 ha)
- Number of orchards: 26 304. The average size of these orchards was 3.65 ha with a median of 2.3 ha
- In terms of tree age, the average is 15.82 years old (median: 13.0 years). The oldest trees are 110 years and still in production.
- In terms of existing orchards already in the ground, Valencias (29 239 ha) remain the largest variety followed by mandarins (19 570) and lemons (17 944)
- The situation is changing as we observe that for orchards under five years, mandarins and lemons have the greatest areas.

Figure 1: Shows the area (ha) of citrus planted per citrus growing region
Figure 2: Area (ha) planted per citrus variety
Figure 3: Area (ha) planted per citrus variety where age is less than five years

**Figure 1:**

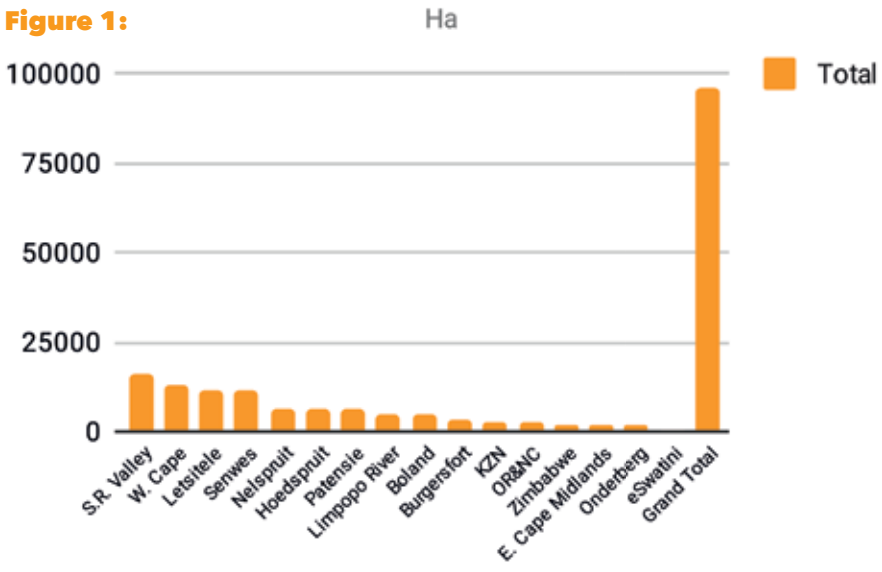



**Figure 2:**

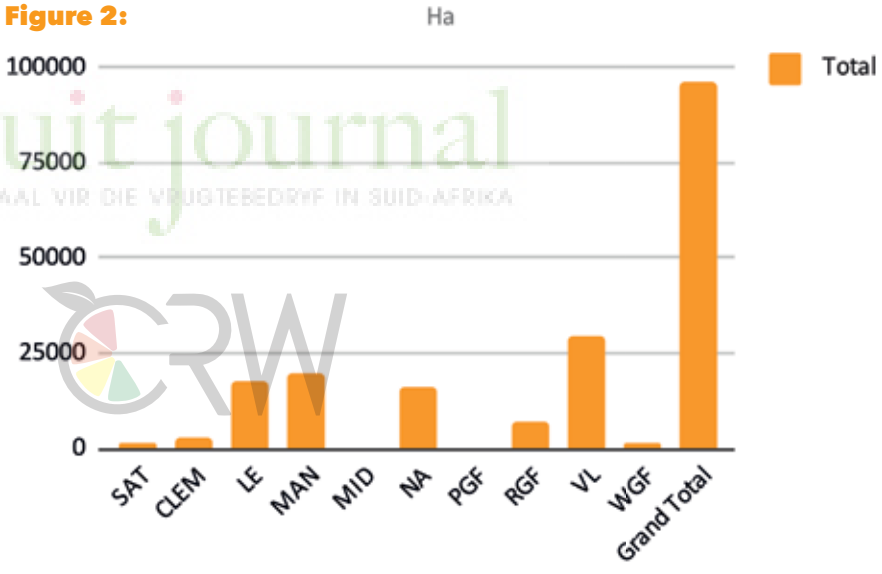
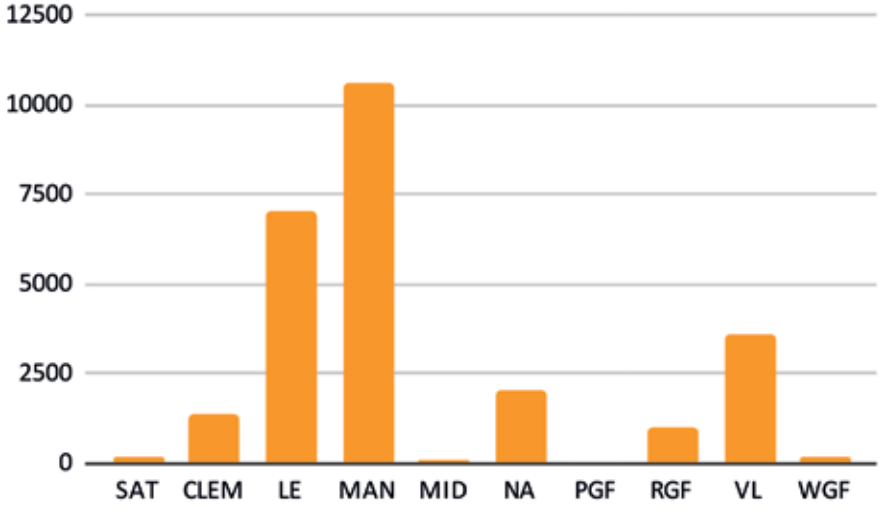



**Figure 3:**




## Key assumptions

In order to project the volumes into the future, it is necessary to make some assumptions about what will happen in years to come. The relative impact of these assumptions on the model output can be tested by re-running the model under different scenarios. The model is able to consider the following questions (assumptions):

- How many years of budwood sales to use as a base (default: 4 years)
- How many buds sold are converted into actual trees (default: 75%)
- At what age is an orchard replaced or removed? This aspect of the model was updated this year to try to reflect the

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actual tree ages per region, based on the age observed in the tree census.

- What is the typical yield (tons) per hectare per variety per age category? This is highly variable, so typical values are used.
- What is the typical export packout percentage per region per variety?
- Are there any water or land constraints that influence how much larger any CGA Region could expand? The CGA has collected estimates from representatives in each region to determine these limits.
- What are the typical planting densities per variety?

Comparing the models done in previous years (2014 - 2016) to the actual export figures, it seems the key assumptions algorithms used, and the process to get to the output have been reasonably accurate, providing a reliable sense of the direction the industry is moving in.

**Figure 4:**

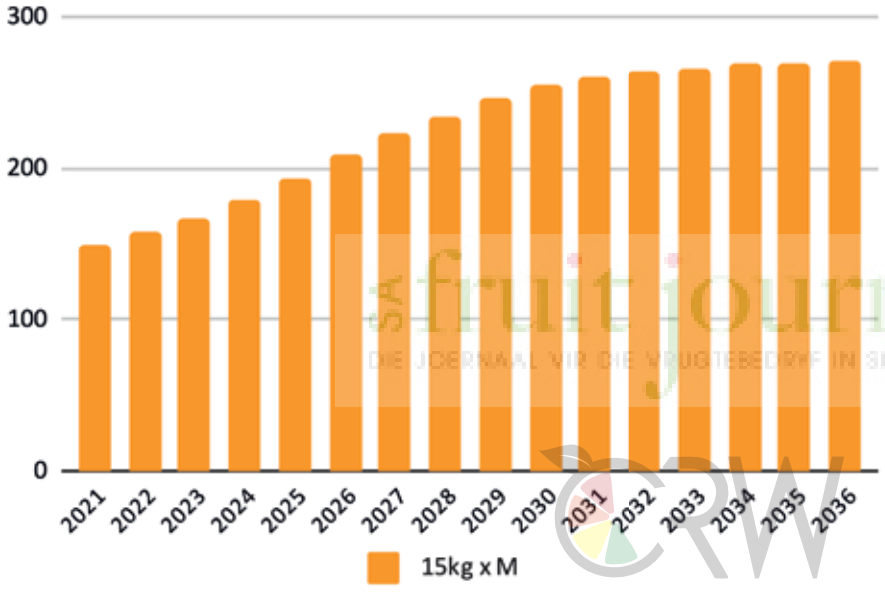
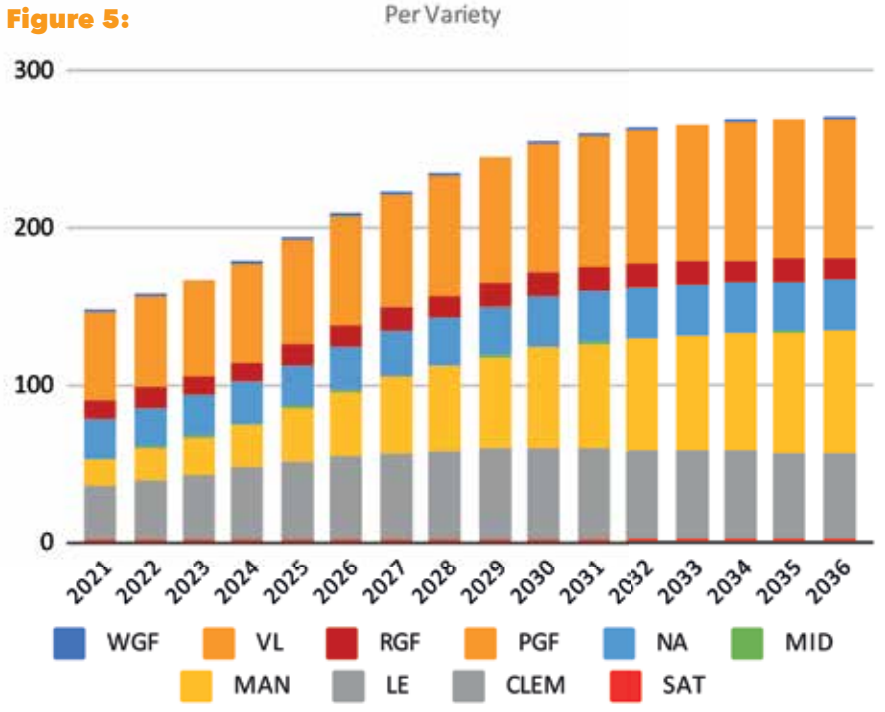



**Figure 5:**



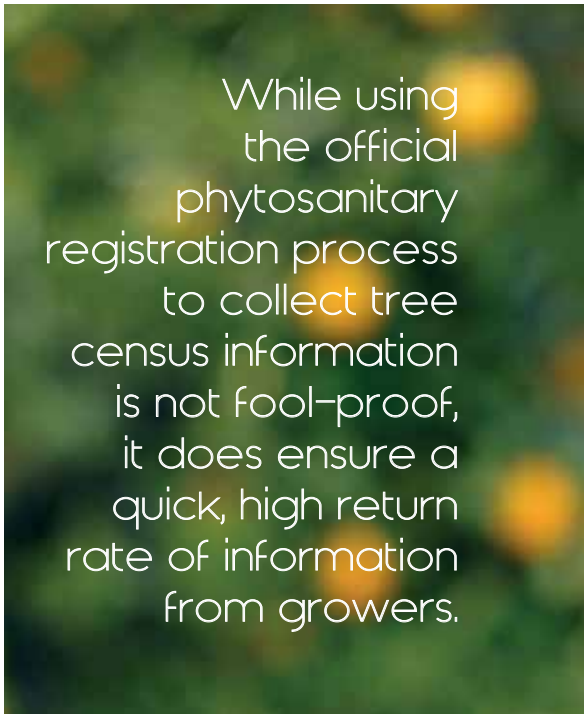

## Key outputs

Figure 4 shows the modelled volumes to be available for export from 2021 until 2036. By 2026 the expected volumes should exceed 200 million cartons, up from 149 million in 2021. This represents significant growth over the next five years driven mainly by young trees already in the ground. In line with budwood sales over the last number of years, the model shows the highest growth in Mandarins, lemons and Valencias (see Figure 5).

In terms of where new plantings are likely to occur, basically all regions are expected to expand planting. Where growth in an area is concentrated on a particular variety and that variety has shown large budwood sales, these regions are expected to increase ahead of others.

## Land and water constraints

Over the factor that has the largest effect on long-term (i.e. >10 years) growth of the



industry is land and water availability. In the scenario where available new potential area is left unconstrained, the model shows massive growth (average 6% year-on-year for 15 years), whereas steady growth is observed if constrained to the estimates provided by regional representatives. The extent to which substitution to citrus from other crops could occur is unclear.

The impact of the other assumptions was less severe, and in some cases practically insignificant. In other words, based on the existing area of citrus already planted, the trajectory is up and will remain so for at least the next 15 years. For example, immediately changing budwood sales or planting densities will have little impact on expected future volumes.

## Future analysis

The high-level outcomes of the model are provided here. Additional analysis around trends in rootstocks selection, planting density trends, regional production trends, yields per variety in different regions and others are possible and citrus growers interested in "what-if" scenarios are welcome to provide these to the CGA office.

**Figure 6:** Per Region