COMMERCIALLY VALUABLE YIELD

E.D. Ernst
Allesbeste, Tzaneen, Limpopo Province, Republic South Africa

Summary

Keywords: Profitability, Quality, Size, Economics

Farm profit is the result of the production value minus cost. Production value can be defined as the number of units produced multiplied by the unit selling price. Naturally the question arises how profit can be increased. This can be done by keeping input costs in check, maximising total production, and/or maximising price. Although this seems quite straightforward, it is not that simple. All yields are not created equal and quality of the product comes into play.

Fruit quality can be seen as the absence of price discounting factors in terms of some reference price. The higher the quality, the less price discounting will be applied. Fruit quality defects are generally classified into two categories – internal (grey pulp, etc.) and external (mechanical damage, etc.).

The concept of commercially valuable fruit sizes has been discussed by, among others, (Kallsen, 2005) and also by Lovatt and Salazar-Garcia (2000). Attempts have been made by these, and other, authors to define which sizes fall under the commercially valuable size category for various fruit crops as well as how to manipulate these fruit crops to increase the proportion of fruit produced that fall within this valuable size category. It is clear that fruit of certain sizes are more desirable than others to the consumer market.

According to the definition of fruit quality above, it can be seen that fruit size is a quality factor due to price discounting taking place according to the size of fruit. Sizes that fall outside the commercially valuable category should therefore be considered as a quality defect.

Total yield figures can, therefore, be deceiving and do not paint the full picture as quality defects are not considered. In order to accurately calculate success in maximising production and returns, commercially valuable yield should be calculated instead.

Introduction

The formula for farm profit can be expressed in simple terms as:

$$Profit = (Production \times Price) - Cost$$

In order to maximise farm profit, producers need to embark on various strategies, such as keeping input costs in check, maximising total production and maximising product price. It seems straight-forward, but unfortunately it isn't. For instance, all yields are not created equal. It is necessary to consider quality of the product as well. This is something that is considered common knowledge.

It is worthwhile to consider fruit quality as the absence of price discounting factors in terms of some reference price. Some price discounting factors can easily be recalled as a matter of fact, including external defects such as grey pulp, and external defects such as mechanical damage.

However, there are certain factors that have a price discounting effect but tend not to be recognised as quality defects. One such factor is fruit size.

The concept of commercially valuable fruit size has been proposed and discussed by various researchers. The concept stems from the fact that the markets tend to differentiate substantially between fruit of different sizes in terms of demand, and subsequently in price. The result of this is that certain fruit sizes are deemed to be more valuable. Lovatt and Salazar-Garcia (2000), considered the commercially valuable fruit sizes to be between 213g and 269g.

Materials and Methods

The effect of fruit size on price can be studied by looking at Figure i, which shows a typical season's average fruit price per size count/calibre. It is also broken up between export and local fruit, which is mostly a reflection of other external quality factors.

Figure ii shows two avocado cultivars, Hass and Maluma, and their respective fruit size distributions in the main avocado producing area of South Africa. This is overlaid on the price distribution graph as discussed earlier in order to illustrate how different size distributions relate to the price distribution.

Table i shows the percentage of fruit for each cultivar that falls within the commercially valuable price bracket, as defined by Lovatt and Salazar-Garcia (2000), as well as a wider commercially valuable price bracket which seem to be evident from Figure i.

An assumption is further made for a hypothetical scenario where the total yield of an avocado orchard is 15 tons/ha and 65% of the crop would be of sufficient external quality to be exported. The average season prices are then taken, as used in Figure i, along with the fruit size distributions of Figure ii to determine the total return in the case of each size distribution. The returns resulting only from the count/calibre 12 – 22 fruit are also calculated for each size distribution. The results of these calculations are shown in Table ii.

The average price for each size distribution was also calculated using the price distribution of Figure i and is provided in Table iii to determine the effect of fruit size distribution on average price.

Results

One thing that is noticeable when looking at Figure i is that the highest prices are paid for the larger fruit of sizes from count/calibre 12 – 22. It follows that, according to these figures, the most commercially valuable fruit sizes are those from count/calibre 12 - 22.

Another point of interest is that the price paid for export quality fruit of count/calibre between 24 and 26 are the same as for the highest priced local quality fruit of count/calibre 16. In other words, this indicates that smaller fruit of very good external quality of count/calibre 24 – 26 are priced the same as larger fruit of lesser external quality. Price discounting is therefore taking place on fruit of good external quality, based on fruit size.

Figure ii shows that Maluma tend to produce larger fruit, which tend to fall more towards the higher priced sizes, than Hass. Table i shows this in terms of the percentages of each cultivar's size distribution that fall within the commercially valuable size bracket. The calculations of

Table ii, based on the hypothetical scenario discussed earlier, shows that the Hass size distribution derives about 68% of it's total return from the commercially valuable size range, while the Maluma distribution derives about 90% of its return from the same size range. The effect of this can be seen in Table iii in terms of the average price per kilogram for each cultivar. The Maluma size distribution fetches a 39% higher average price per kilogram simply because it has significantly more fruit within the commercially valuable size range than the Hass size distribution.

Discussion

It is clear that total yield figures that might seem good at first glance might not paint the full picture and can be deceiving. It is much more useful to calculate the commercially valuable yield as the portion of total yield that falls within the commercially valuable price range. It was shown that the effect of a low commercially valuable yield ratio can be highly detrimental to total returns, even though total yield might seem high.

It was also conceptualised that quality defects can be described as price discounting factors in terms of some reference price. It was shown that small fruit sizes in particular are price discounted and it can therefore be concluded that small fruit should be viewed as a quality defect.

References

Chao, C., Ferguson, L., & Lovatt, C. J. (2004). 2,4-D increase the yield of commercially valuable large size fruit of Clementine mandarin. *31st Annual Conference of the Plant Growth Regulation Society of America, Abstract #63.*

Kallsen, C. (2005). Topping and manual pruning effects on the production of commercially valuable fruit in a midseason navel orange variety. *HortTechnology*, pp. 335-341.

Salazar-Garcia, S., & Lovatt, C. (2000). Use of GA3 to Manipulate Flowering and Yield of 'Hass' Avocado. *Journal of the American Society for Horticultural Science*, 25-30.

Figures

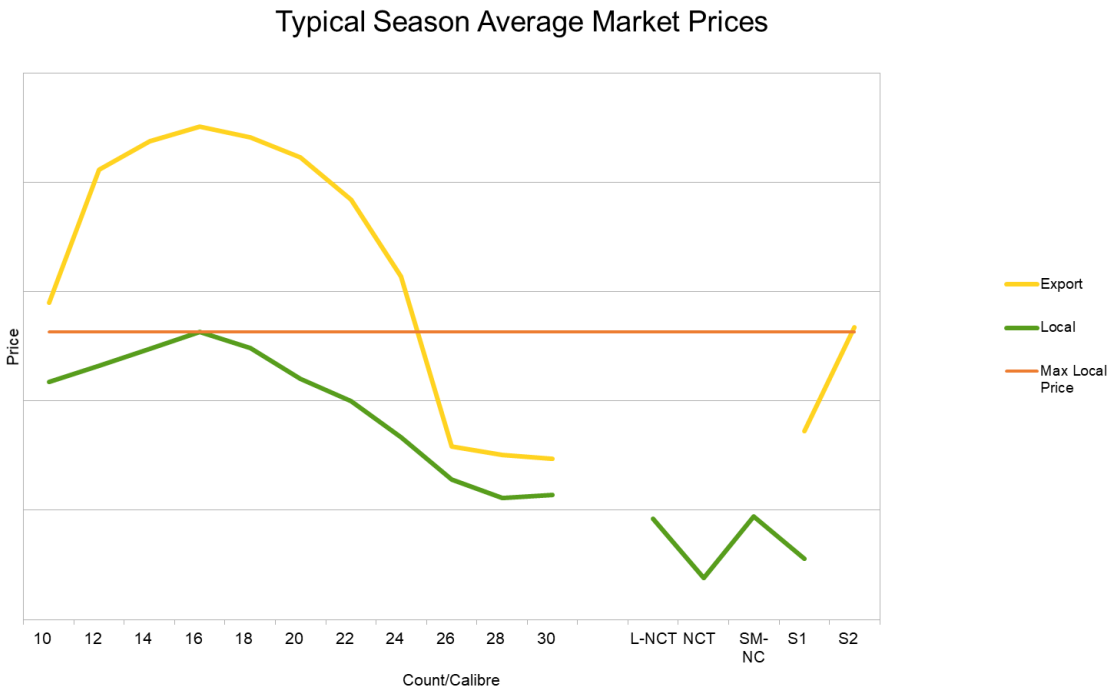

Figure i - Price differentiation by fruit size

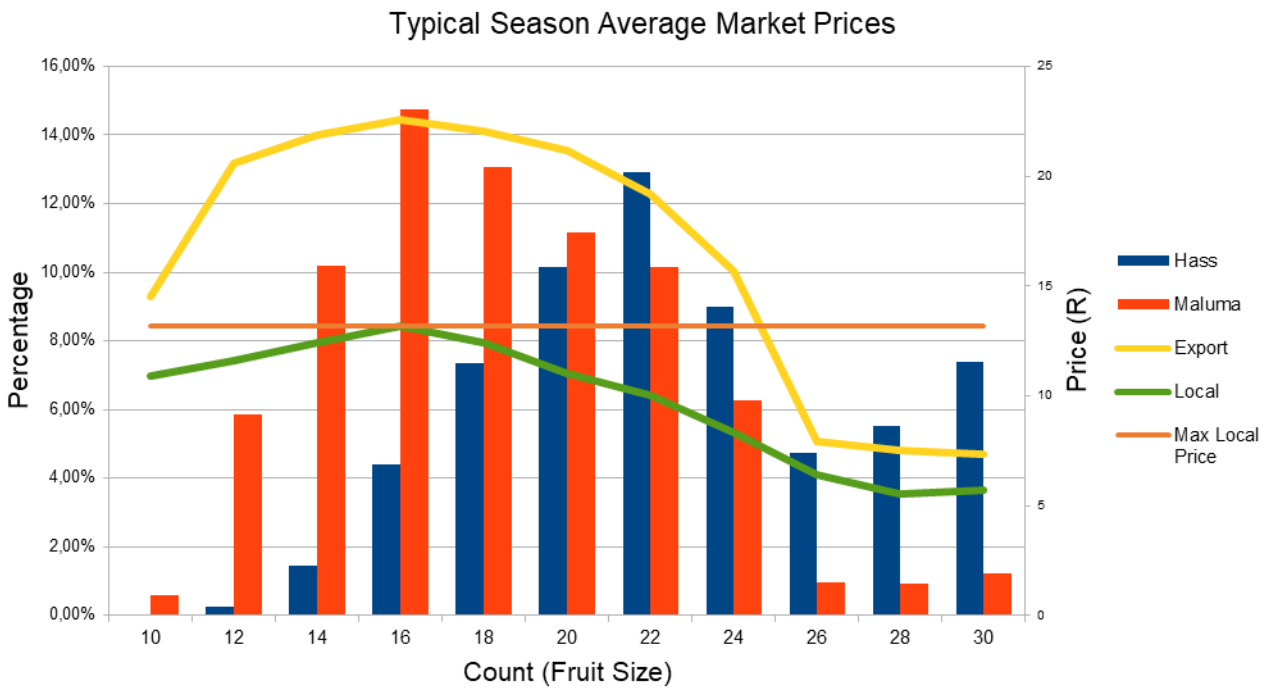

Figure ii - Size distributions of Hass and Maluma cultivars

Tables

	Count 14 - 18 (Lovatt & Salazar-Garcia)	Count 12 - 22 (Wider spec)
Hass	13%	37%
Maluma	38%	65%

Table i - Proportion of fruit within commercially valuable price sizes

	Total return	Count 12 – 22 (Wider spec)	% of total return	Total yield	Commercially Valuable Yield	Commercially Valuable Yield ratio
Hass	R141 202.17	R95 861.10	68%	15 000 kg/ha	5 482 kg/ha	37%
Maluma	R195 857.43	R176 666.35	90%	15 000 kg/ha	9 771 kg/ha	65%

Table ii - Effect of size distribution on return

	Average price (R/kg)
Hass	R9.41
Maluma	R13.06 (+39%)

Table iii - Effect of size distribution on average price