

UN/ECE APPLE STANDARD FFV-50

New Zealand Information Paper

UN/ECE Apple sizing standard.

Determining the minimum Diameter/Weight sizing

1 Summary

New Zealand supports the inclusion of weight sizing as an alternative to diameter sizing in line with the recommendation made to the UN/ECE meeting in 2002.

Data analysis confirms that there is not a strong relationship between weight and diameter.

Further sampling and analysis of weight/diameter data during the 2003 season has demonstrated that the recommendations for minimum weights submitted in 2002 are appropriate, (considering regional, varietal, and seasonal sampling variations). Furthermore, the recommended minimum weights are fair and would not undermine the current diameter based sizing criteria.

2 Introduction

Following the New Zealand weight/diameter sizing paper presented at the UN/ECE meeting in May 2002, further validation and sampling has been undertaken during the New Zealand 2003 harvest season.

This paper considers key production influences that may affect the consistent application of sizing with specific focus on the minimum sizes required. It also endeavours to determine whether the minimum weights recommended to UNECE in 2002 reasonably satisfy minimum diameter requirements.

3 Weight versus diameter studies undertaken

New Zealand studies have previously highlighted the difficulty in applying diameter size criteria in an industry that successfully implements weight sizing. Previous studies showed, that for any given fruit diameter, weight can vary 22-29% (based on two standard deviations).

Monitoring of the New Zealand apple weight /diameter sizing relationship has been ongoing during the 1988-2003 period.

During this period fruit diameter and weight measurements were taken for:

- Braeburn (1999,2003),
- Cox orange pippin (not defined),

- Cripps pink (1997),
- Fuji (1988,1991,1998),
- Royal Gala (1988,2000,2003),
- Sciros (Pacific Rose) (1998)

Sampling during the New Zealand 2003 harvest season was undertaken to substantiate previous findings and to develop a better understanding of the production characteristics that influence the sizing relationships.

4 Variability due to variety, season and region of production

4.1 Variety factors

Summarised data for the period 1988-2003, by variety, is presented in table 1 to demonstrate the variations that can be anticipated between varieties.

Table 1: Average diameter for a given fruit weight

UNECE sizing	Variety	Fruit weight				
		70g	80g	90g	100g	110g
"Other varieties"	Cox	54.8 mm	57.2 mm	59.4 mm		
	Cripps Pink	53.6 mm	56.7 mm	59.3 mm		
	Royal Gala	54.8 mm	57.2 mm	59.4 mm		
	Average	54.4 mm	57.0 mm	59.4 mm		
"Large fruited varieties"	Braeburn		58.4 mm	60.4 mm	62.3 mm	64.2 mm
	Fuji		58.4 mm	60.2 mm	62.0 mm	63.7 mm
	Pacific Rose		57.8 mm	59.7 mm	61.6 mm	63.3 mm
	Average		58.2 mm	60.1 mm	62 mm	63.7 mm

Applying the UNECE standard criteria to this data:

Extra

- A typical 110 gram "Large fruited" variety relates to an average diameter of 64mm.
- A typical 90 gram "Other" variety relates to an average diameter of 60mm.

Class 1

- A typical 90 gram "Large fruited" variety relates to an average diameter of 60mm.
- A typical 80 gram "Other" variety relates to an average diameter of 57mm.

Class 11

- A typical 90 gram "Large fruited" variety relates to an average diameter of 60mm.
- A typical 70 gram "Other" variety relates to an average diameter of 55mm.

4.2 Seasonal factors

Seasonal comparisons were undertaken for Royal Gala and Braeburn using 2003 as the benchmark year.

Royal gala

Royal Gala seasonal comparisons for 1988, 1999 and 2003 indicated a similar weight/diameter relationship for all 3 seasons. When benchmarked against the 2003 data both 1988 and 1999 produced a marginally lighter 55mm fruit (6% and 4% lighter respectively).

Braeburn

Braeburn data compared 2000 and 2003 seasons. When benchmarked against the 2003 season 2000 produced a 16% lighter 55mm fruit and a 9% lighter 60mm fruit.

4.3 Region of production factors

The data has been collated for the two main growing regions in New Zealand (Hawkes Bay and Nelson). Regional comparisons indicate a relatively consistent relationship between fruit diameter and weight.

Royal gala

Hawkes Bay Royal gala was marginally heavier (2-3%) than Nelson for both the 55mm and 60mm fruit diameters.

Braeburn

Braeburn indicated the reverse to the Royal gala result in that Nelson fruit was 6% heavier than Hawkes Bay fruit for both the 55mm and 60 mm diameters.

5 Discussion

- In applying the UN/ECE diameter sizing criteria for Class I (large fruited varieties 60mm, other varieties 55mm) it is conceivable that while a 70 gram Royal Gala could be packed, a 115 gram Braeburn could fail to meet the minimum diameter sizing.

Conversely while a 95 gram Royal Gala may fail to meet the minimum diameter criteria an 85 gram Braeburn may meet the diameter criteria. The strict application of UN/ECE diameter sizing criteria (without reference to fruit weight) consequently has the potential to produce inconsistent pack weights.

- The relationship between fruit weight and diameter for Braeburn appears less consistent than for Royal Gala. Thus both year of production and region of production appeared to have a more significant impact on the weight/diameter relationship for Braeburn compared to Royal Gala.
- Variety, year of production and region of production all have an influence on the diameter/weight relationship.