



Seasonal Accuracy Report

2023 Harvest Overview

December 20, 2023

General Overview

The purpose of this report is to provide an accuracy assessment for Fruitometry's fruit density estimations delivered at pre-harvest stage for New Zealand kiwifruit harvest 2023. A comparison is performed between fruit densities calculated from packout data against Fruitometry's delivered estimations.

The selection criteria to include data for comparison in this report was:

- That all the blocks that comprise each Maturity Area (MA) considered have been scanned by Fruitometry not longer than 16 weeks before harvest and a corresponding Fruit Density Report has been delivered at the time to the Client.
- That the Client has provided a fully detailed official packout report for 2023 harvest for the MAs considered.
- That no fruit thinning has happened in the blocks after the digital scan or the amount thinned has been carefully monitored to be less than 1% of the total fruit load.
- That the difference between the registered canopy area according to the orchard map and the producing canopy area did not exceed 5%.
- In order to limit the uncertainty on the size profiles the maximum rate of rejected fruit admitted was 20%.

Packout densities presented are calculated from official packout reports to include all the fruit collected from the orchards at the time of harvest: Class 1, Class 2, Non Standard Supply and Rejects according to the industry definitions. In the cases where some fruit was thinned or some fruit was found on the vines after harvest, the counted amount has been considered as 'fruit loss'.

To preserve the robustness of the dataset and avoid inconsistencies resulting from the harvest process, data from different maturity areas belonging to the same KPIN have been aggregated by cultivar.

The Fruitometry densities presented are calculated exclusively from the delivered Fruit Density Reports. This means that further improvements in the accuracy of our products are not reflected in this study if they were implemented after the commercial report was delivered to the Client.

*This study comprises data from a total of **136.8** hectares distributed among **71** different Maturity Areas from **38** KPINs. The comparison dataset consists of 22 data points for SunGold cultivar and 22 data points for Hayward. All of the blocks comprising each Maturity Area were scanned between January 15th and June 1st, 2023.*



F R U I T O M E T R Y

Orchard Performance Metrics

Summary of Findings

- The average accuracy of delivered Fruitometry pre-harvest density estimates resulted **95.8 %** compared to Packout data. This represents an average error of **4.2 %** for Fruitometry's fruit estimations.
- Overall, **100.0 %** of the delivered fruit density estimates were above **90 %** accuracy.
- Average accuracy for GA fruit density estimates resulted **95.8 %**.
- Average accuracy for HW fruit density estimates resulted **95.9 %**.
- At an aggregate level, Fruitometry's estimations achieved a **99.76 %** accuracy in predicting the total fruit yield from the considered orchards.

Data and Graphs

Figure 1 presents a scatterplot to allow visual representation of Fruitometry's estimations spread against Packout. The identity line is drawn for reference and represents where the estimated and packed densities are equal.

Figures 2 and 3 show a side-by-side comparison between Fruitometry's Estimated Fruit Densities and the resulting Packout Fruit Densities by cultivar.

A Table featuring all the data presented in this report can be found in the Appendix.

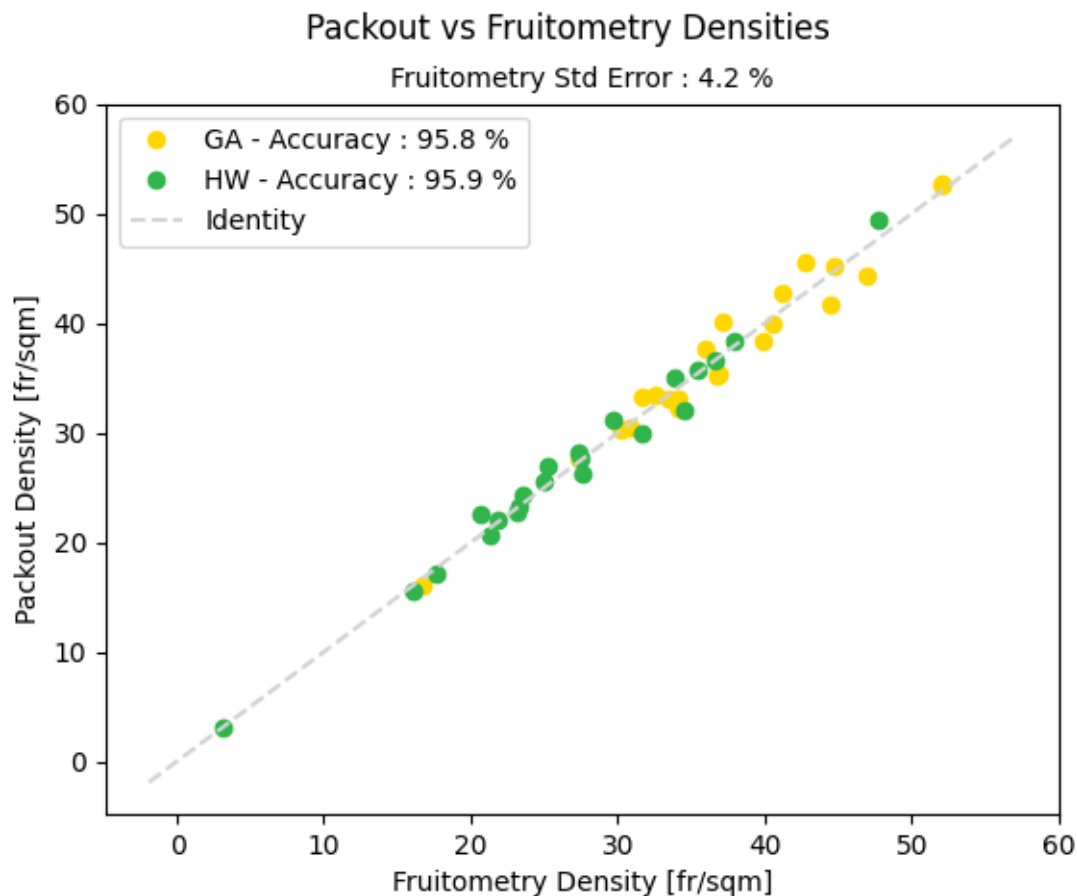


Figure 1: Fruit Density Scatterplot: Fruitometry Estimations vs Packout. Identity line represent when both estimated and packed fruit densities are equal.

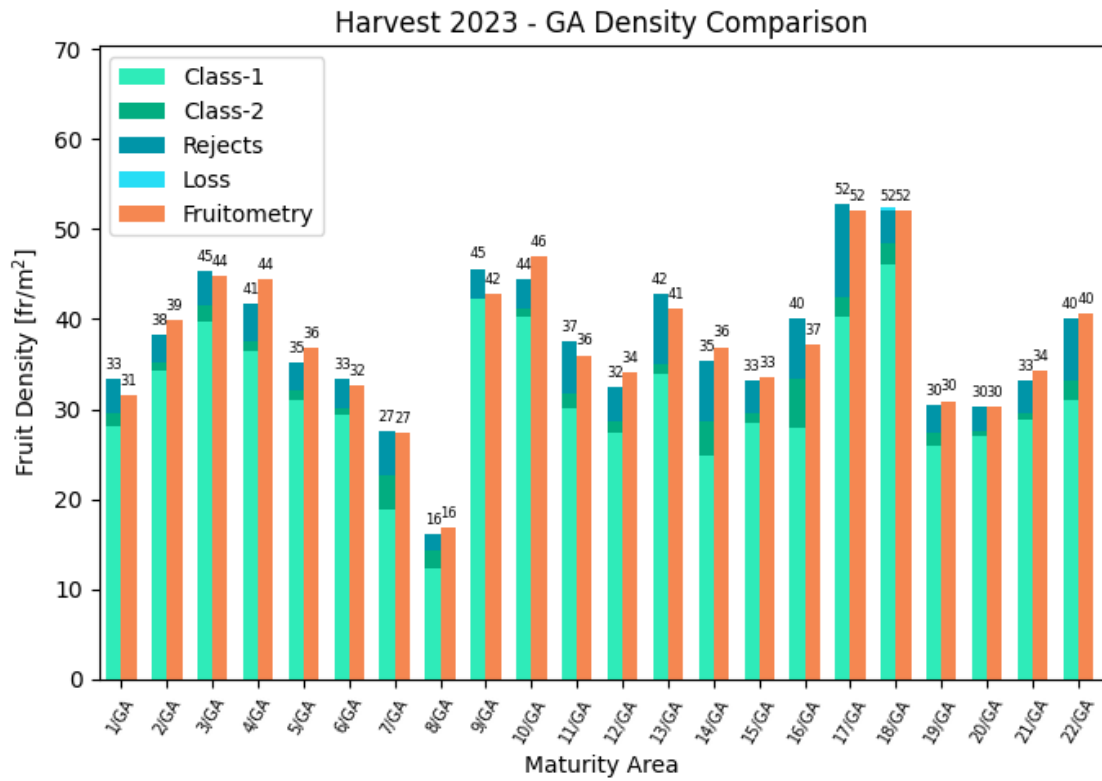


Figure 2: Fruit Density Comparison: Fruitometry Estimations for G3 kiwifruit vs Packout.

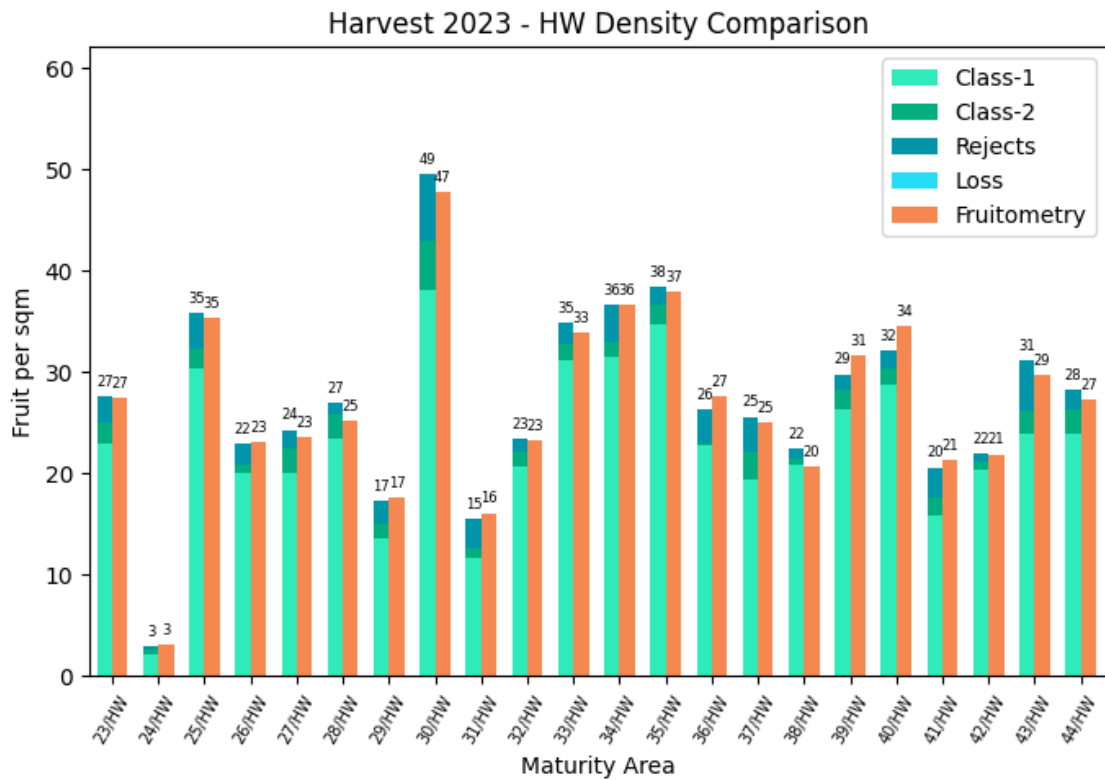


Figure 3: Fruit Density Comparison: Fruitometry Estimations for Hayward kiwifruit vs Packout.

Appendix

All the data presented in this study is summarized in Table 1.

KPIN/var	Packout [fr/sqm]	Fruitometry [fr/sqm]	Accuracy [%]	Scan Date [mm-yy]	Harvest Date [mm-yy]
1/GA	33.3	31.6	94.8	04-23	04-23
2/GA	38.3	39.9	95.8	04-23	04-23
3/GA	45.3	44.8	98.8	03-23	04-23
4/GA	41.7	44.5	93.4	04-23	04-23
5/GA	35.2	36.8	95.4	04-23	04-23
6/GA	33.4	32.6	97.7	03-23	04-23
7/GA	27.6	27.3	98.9	02-23	03-23
8/GA	16.0	16.8	95.3	02-23	—23
9/GA	45.6	42.8	93.9	04-23	04-23
10/GA	44.4	46.9	94.4	03-23	04-23
11/GA	37.6	36.0	95.8	04-23	04-23
12/GA	32.3	34.1	94.5	03-23	03-23
13/GA	42.8	41.2	96.2	02-23	04-23
14/GA	35.4	36.9	95.8	02-23	04-23
15/GA	33.1	33.5	98.6	04-23	04-23
16/GA	40.1	37.2	92.8	02-23	04-23
17/GA	52.7	52.1	98.9	04-23	04-23
18/GA	52.6	52.1	99.1	04-23	04-23
19/GA	30.4	30.9	98.2	03-23	04-23
20/GA	30.3	30.2	99.8	03-23	04-23
21/GA	33.1	34.2	96.9	03-23	04-23
22/GA	40.0	40.6	98.5	03-23	05-23
23/HW	27.6	27.5	99.4	04-23	04-23
24/HW	3.0	3.1	94.5	05-23	05-23
25/HW	35.8	35.4	98.8	03-23	04-23
26/HW	22.8	23.1	98.5	03-23	04-23
27/HW	24.3	23.6	96.9	03-23	05-23
28/HW	27.0	25.2	93.4	03-23	—23
29/HW	17.2	17.6	97.7	04-23	04-23
30/HW	49.5	47.8	96.5	04-23	—23
31/HW	15.5	16.1	96.0	05-23	06-23
32/HW	23.3	23.3	99.8	02-23	04-23
33/HW	35.0	33.9	96.9	04-23	—23
34/HW	36.7	36.6	99.6	03-23	—23
35/HW	38.4	37.9	98.7	05-23	—23
36/HW	26.2	27.6	94.6	03-23	—23
37/HW	25.6	25.0	97.8	04-23	05-23
38/HW	22.5	20.7	91.8	03-23	03-23
39/HW	29.9	31.6	94.0	05-23	05-23
40/HW	32.0	34.6	92.0	03-23	05-23
41/HW	20.6	21.3	96.6	04-23	04-23
42/HW	22.0	21.9	99.3	04-23	—23
43/HW	31.1	29.7	95.6	04-23	05-23
44/HW	28.2	27.3	96.7	03-23	—23

Table 1: Detailed Packout vs Fruitometry fruit densities.