

Fruitometry Orchard Analytics

2022 Harvest Overview

September 5, 2022

General Overview

The objective of this report is to calculate the accuracy of Fruitometry's Fruit Density estimations delivered during New Zealand kiwifruit season 2022. A comparison is performed between fruit densities calculated from packout data against Fruitometry's delivered estimations.

The selection criteria to include Maturity Areas in this report was:

- That all the blocks that comprise the Maturity Area have been scanned by Fruitometry during the specified timeframe and a corresponding Fruit Density Report has been delivered to the Client.
- That the Client has provided a fully detailed official packout report for 2022 harvest.
- That no fruit thinning has happened in the considered blocks after the digital scan.

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 and Rejects according to New Zealand industry definitions.

Fruitometry densities presented are calculated exclusively from 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.

Data represents a total of **94.1** hectares from **56** Maturity Areas that were scanned between 15th of January and 1st of March 2022.

Summary of Findings

- The average accuracy of delivered Fruitometry Density Estimates resulted **93.7 %** compared to Packout data. This translates into an average error of **6.3 %** for Fruitometry's estimations.
- Overall, **91.1 %** of the delivered fruit density estimates were above **90 %** accuracy.
- Average error for GA estimates resulted **5.5 %**.
- Average error for HW estimates resulted **7.4 %**.

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 variety.

Figure 4 displays the distribution of percentual errors of Fruitometry's estimations. Every bar represents the percentage of delivered estimations that fell in each error band.

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

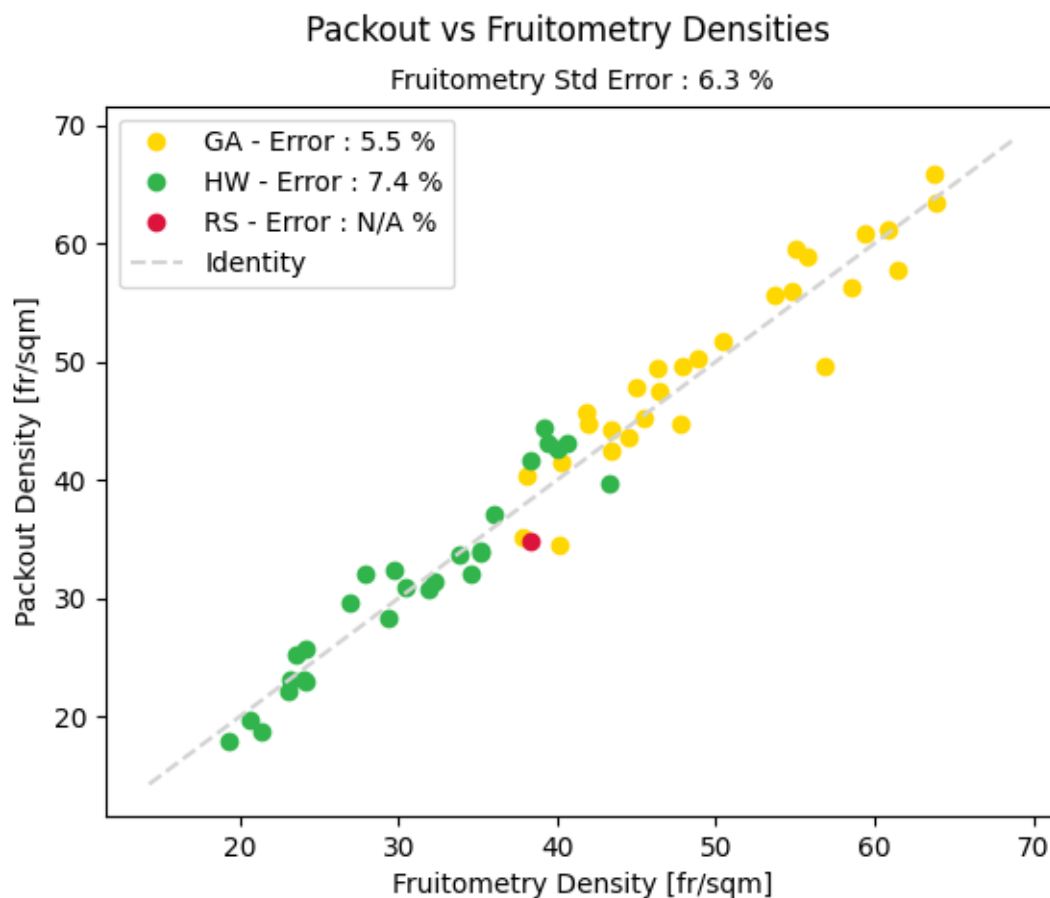


Figure 1: Fruit Density Scatterplot: Fruitometry Estimations vs Packout. Identity line represent when both estimated and packed fruit densities are equal.

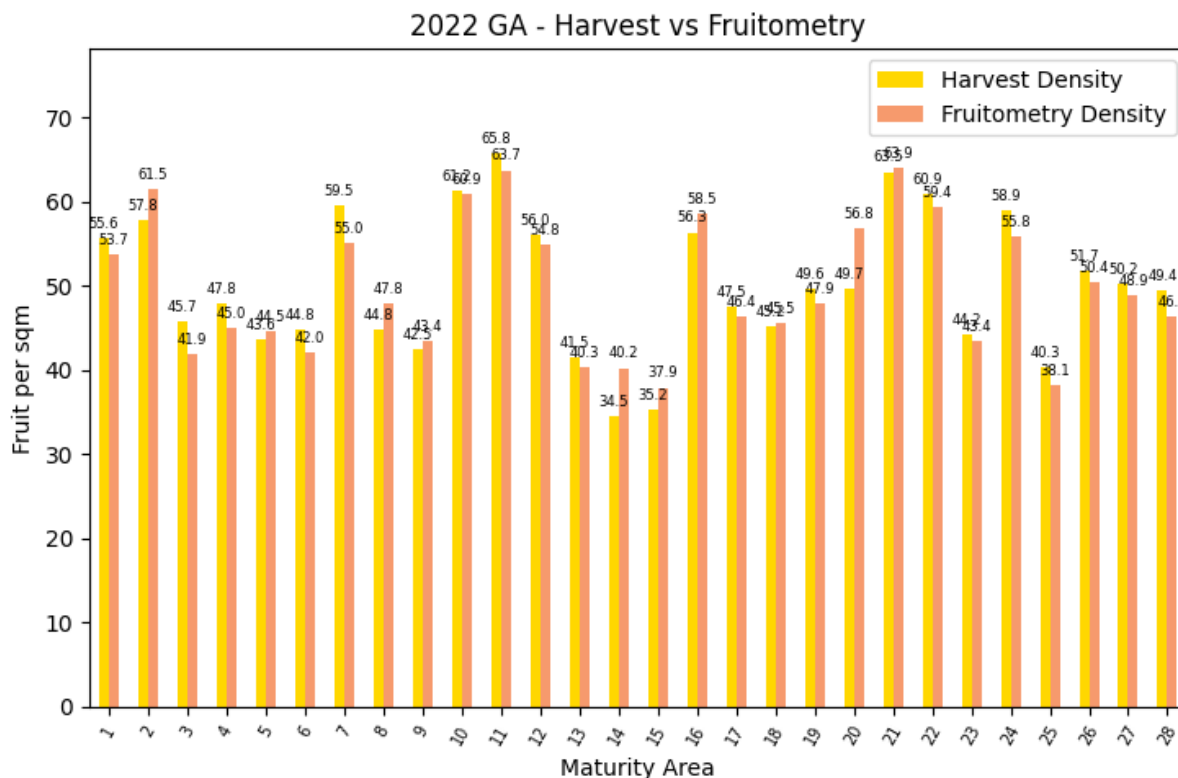


Figure 2: Fruit Density Comparison: Fruitometry Estimations for Gold kiwifruit vs Packout.

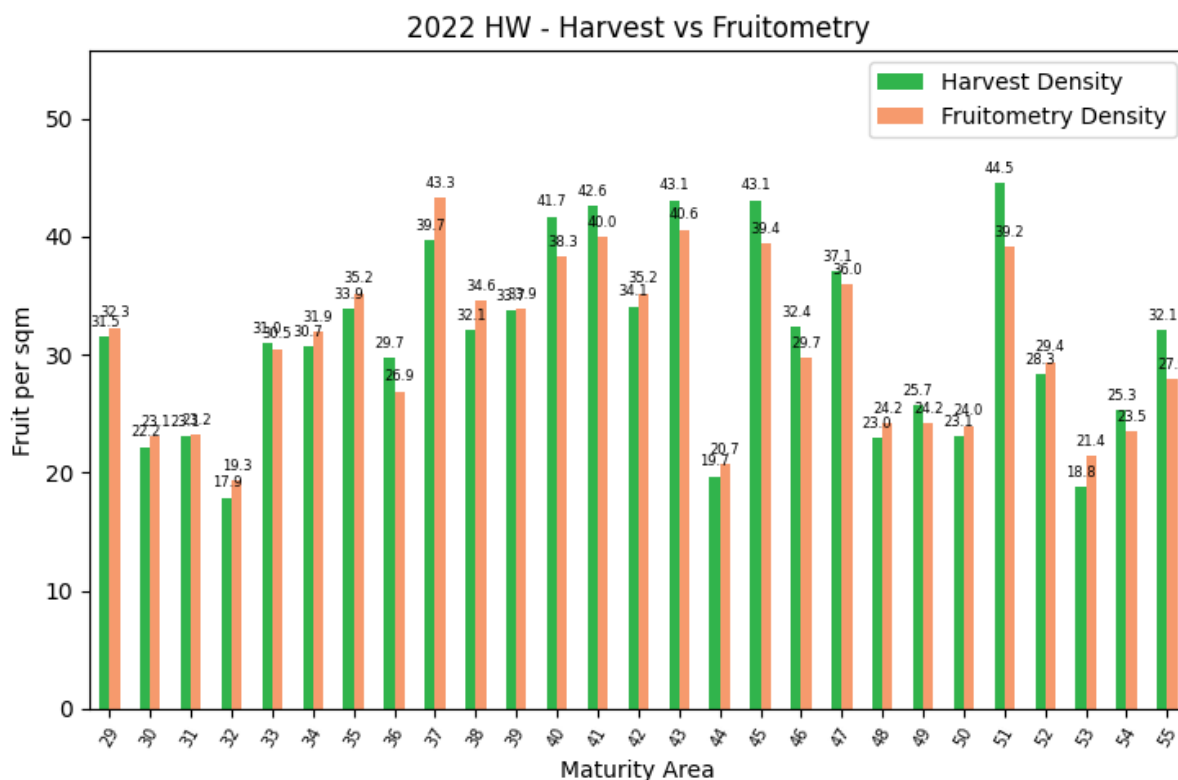


Figure 3: Fruit Density Comparison: Fruitometry Estimations for Hayward kiwifruit vs Packout.

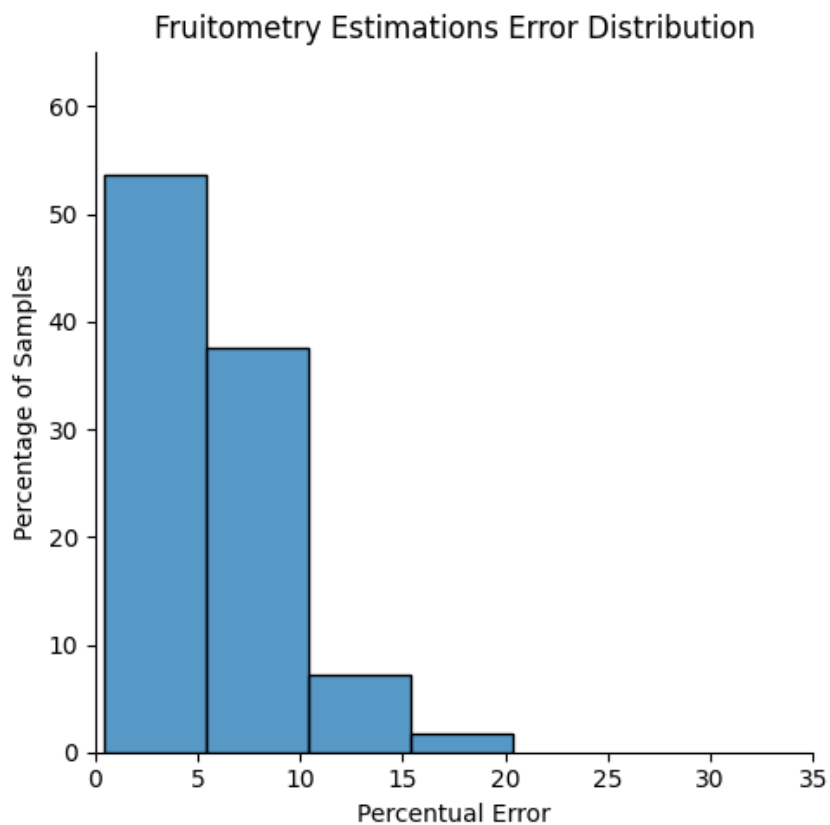


Figure 4: Errors Distribution for Fruitometry Estimations relative to Packout Densities.

Appendix

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

MA	Var.	Packout [fr/sqm]	Fruitometry [fr/sqm]	Difference [%]	Scan Date [dd-mm-yy]	Harvest Date [dd-mm-yy]
1	GA	55.6	53.7	-3.4	11-03-22	01-05-22
2	GA	57.8	61.5	6.4	09-02-22	11-05-22
3	GA	45.7	41.9	-8.3	01-03-22	02-04-22
4	GA	47.8	45.0	-5.8	01-03-22	26-04-22
5	GA	43.6	44.5	2.2	01-03-22	04-04-22
6	GA	44.8	42.0	-6.2	01-03-22	05-04-22
7	GA	59.5	55.0	-7.7	25-02-22	17-04-22
8	GA	44.8	47.8	6.6	10-02-22	04-05-22
9	GA	42.5	43.4	2.1	04-02-22	26-04-22
10	GA	61.2	60.9	-0.5	17-02-22	25-04-22
11	GA	65.8	63.7	-3.2	25-02-22	29-04-22
12	GA	56.0	54.8	-2.1	25-02-22	14-04-22
13	GA	41.5	40.3	-3.0	18-02-22	25-03-22
14	GA	34.5	40.2	16.4	18-02-22	21-04-22
15	GA	35.2	37.9	7.8	18-02-22	28-03-22
16	GA	56.3	58.5	3.8	08-02-22	04-05-22
17	GA	47.5	46.4	-2.3	07-04-22	10-04-22
18	GA	45.2	45.5	0.7	04-02-22	15-04-22
19	GA	49.6	47.9	-3.5	01-03-22	03-05-22
20	GA	49.7	56.8	14.3	21-02-22	17-04-22
21	GA	63.5	63.9	0.7	09-05-22	11-05-22
22	GA	60.9	59.4	-2.5	17-03-22	04-05-22
23	GA	44.2	43.4	-1.7	17-03-22	14-04-22
24	GA	58.9	55.8	-5.3	17-03-22	04-05-22
25	GA	40.3	38.1	-5.4	17-03-22	06-04-22
26	GA	51.7	50.4	-2.6	26-01-22	07-04-22
27	GA	50.2	48.9	-2.6	02-02-22	30-03-22
28	GA	49.4	46.3	-6.3	02-02-22	30-03-22
29	HW	31.5	32.3	2.8	09-02-22	23-05-22
30	HW	22.2	23.1	4.0	01-02-22	24-04-22
31	HW	23.1	23.2	0.4	21-02-22	07-04-22
32	HW	17.9	19.3	8.1	17-02-22	12-04-22
33	HW	31.0	30.5	-1.6	12-05-22	04-06-22
34	HW	30.7	31.9	3.8	21-02-22	04-06-22
35	HW	33.9	35.2	4.0	21-02-22	15-04-22
36	HW	29.7	26.9	-9.6	04-02-22	18-05-22
37	HW	39.7	43.3	8.8	21-02-22	10-05-22
38	HW	32.1	34.6	7.6	21-02-22	23-04-22
39	HW	33.7	33.9	0.7	21-02-22	21-04-22
40	HW	41.7	38.3	-8.2	15-02-22	05-06-22
41	HW	42.6	40.0	-5.9	02-03-22	30-03-22
42	HW	34.1	35.2	3.1	20-05-22	25-05-22
43	HW	43.1	40.6	-5.9	20-05-22	25-05-22
44	HW	19.7	20.7	5.3	21-02-22	11-04-22
45	HW	43.1	39.4	-8.7	04-02-22	26-04-22
46	HW	32.4	29.7	-8.5	04-02-22	15-04-22
47	HW	37.1	36.0	-2.8	21-02-22	05-04-22

MA	Var.	Packout [fr/sqm]	Fruitometry [fr/sqm]	Difference [%]	Scan Date [dd-mm-yy]	Harvest Date [dd-mm-yy]
48	HW	23.0	24.2	5.1	21-02-22	16-04-22
49	HW	25.7	24.2	-6.1	21-02-22	06-04-22
50	HW	23.1	24.0	4.1	21-02-22	07-04-22
51	HW	44.5	39.2	-12.0	10-02-22	04-06-22
52	HW	28.3	29.4	3.9	21-02-22	07-04-22
53	HW	18.8	21.4	13.9	26-01-22	05-06-22
54	HW	25.3	23.5	-7.3	17-02-22	24-05-22
55	HW	32.1	27.9	-13.0	04-03-22	22-05-22
56	RS	34.9	38.3	9.8	03-03-22	14-03-22

Table 1: Detailed Packout vs Fruitometry fruit densities.