

ZestLens · Orchard fruit report

Demo Farm · **Block A** · Valencia Late · week 40 · measured 03.10.2026 · report 03.10.2026

Fruit measured 64 64 photo(s) · 1 point(s)	Average diameter 73.5 mm ±0.9 mm (95% CI)	Median diameter 73.3 mm SD 3.8 mm
Avg. weight 205 g diameter → weight formula	Export grade 95% none + slight	Harvest estimate — curve mismatch / none

Executive summary

On 03.10.2026, 64 photo(s) were taken at 1 sampling point(s) in block Block A (Valencia Late) (captured by: Field scout) and 64 fruit were measured.

Average diameter **73.5 mm** (95% confidence interval ±0.9 mm); half of the fruit between 71.6 and 75.8 mm. Most common EU size code **6** (70–80 mm), 41% of the fruit. Fruit below the EU minimum diameter (53 mm): 0%.

In the peel assessment, **95%** of the fruit are defect-free or slightly defective, i.e. export grade.

Estimated average fruit weight 205 g.

LOCAL AI COMMENTARY (GEMMA4:26B)

The current fruit size in Block A shows a predominant distribution between 70–75 mm, with a high export suitability rate of 94.8% and relatively low defect levels. However, since serious defects are present in 1.7% of the samples, you should monitor for oil spotting, as oleocellosis becomes a defect for No.1 grade if the aggregate area exceeds 5% of the surface (USDA Agricultural Marketing Service 1999). Additionally, to prevent the rupture of oil glands during handling, consider delaying harvest after irrigation or rain when cell turgor is high (Habibi F. et al. 2025). Please note that these observations and estimates are rough.

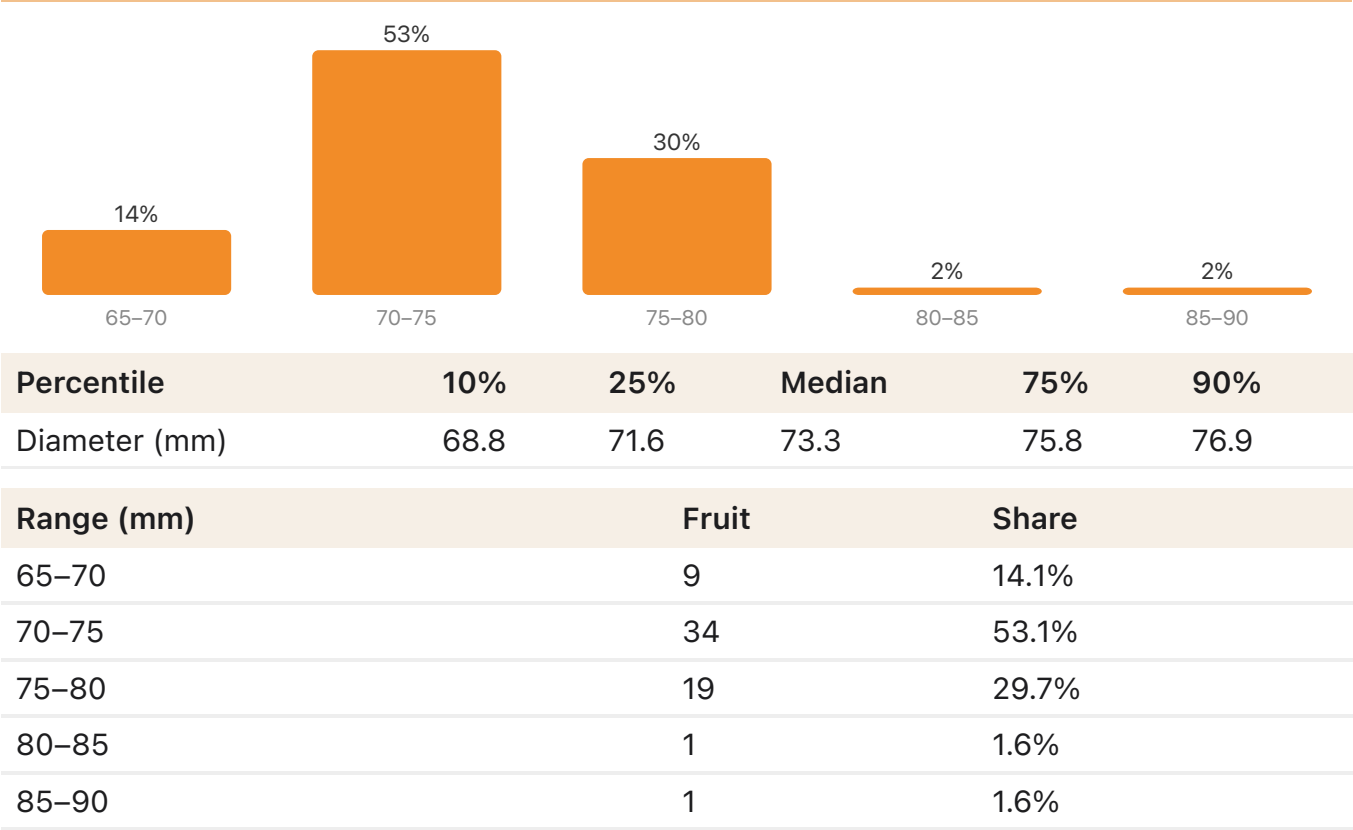
Every number in the commentary was automatically checked against the report data.

Recommendations

- Measurement validation:** Measure 10 fruit with calipers and enter them on the capture screen; until iPhone measurement is calibrated with calipers, mm values may deviate by ±3–5 mm.
- Sampling:** Sampling points this week: 1. To represent the block, corners + centre (4–5 points) with ~40 photos per point are recommended.

- 3. **Bloom date:** Enter the full bloom date in Block settings; the growth comparison and harvest estimate depend on it.
- 4. **Yield:** Count fruit on 5–10 trees and enter the tree count and fruit per tree in Block settings; the report will calculate the yield.
- 5. **Peel:** Moderate or worse defects were suggested on 3 fruit; check the photos (below) and confirm or correct them.
- 6. **Frequency:** Repeat the measurement every 2 weeks at the same points; growth rate and harvest estimate only become reliable with repetition.

Size distribution (5 mm classes)



EU size code (543/2011)

Code	Diameter range (mm)	Fruit	Share	Cumulative (large→)	Avg. weight
2	84–96	1	1.6%	1.6%	359 g
3	81–92	1	1.6%	3.2%	312 g
5	73–84	5	7.8%	11.0%	243 g
6	70–80	26	40.6%	51.6%	216 g
7	67–76	22	34.4%	86.0%	190 g
8	64–73	7	10.9%	96.9%	166 g
9	62–70	2	3.1%	100.0%	148 g

Sample captures (smallest · median · largest)



Smallest · 66.1 mm · code 9
#90 · Block A · Point 1 · 15:42 ·
Field scout



Median · 73.3 mm · code 6
#112 · Block A · Point 1 · 15:44 ·
Field scout



Largest · 88.9 mm · code 2
Outlier — suspect
measurement, check the photo
#76 · Block A · Point 1 · 15:41 ·
Field scout

Peel quality



Severity	Fruit	Share	Suggested type (hint)	Count
● None	46	79.3%		
● Slight	9	15.5%	Other (not in catalogue)	9
● Moderate	2	3.4%		
● Serious	1	1.7%	Oleocellosis	2

Accuracy measured on open datasets: 92% of fruit flagged as "defective" really are defective, 87% of sound fruit are recognised as sound, and 73% of defective fruit are caught. Defect TYPE is not yet reliable (0–17% for most types; 80% for mould) — the type name is only a hint.

CAPTURES WITH MODERATE OR WORSE DEFECT SUGGESTIONS



Serious defect · Other (not in catalogue) (suggestion)
#91 · Block A · Point 1 · 15:42 ·
Field scout



Moderate defect · Oleocellosis (suggestion)
#112 · Block A · Point 1 · 15:44 ·
Field scout



Moderate defect · Other (not in catalogue) (suggestion)
#81 · Block A · Point 1 · 15:41 ·
Field scout

Colour (peel colour stage)

Stage	Fruit	Share
Stage 2	19	29.7%
Stage 3	45	70.3%

Median colour index (CCI): **-8.0** (range -12 ... -6). Negative values mean green peel, positive values orange.

iPhone colour measurement is not calibrated with a colour chart; thresholds are indicative.

Sampling points

Point	Photo	Fruit	Avg. diameter	Difference	Captured by
Block A · Point 1	64	64	73.5 mm	+0.1%	Field scout

Cultivar card · Valencia Late

Harvest period	TR March–April (held on the tree until midsummer); ES 20 Mar–15 Jun
Typical diameter (mm)	ES 67–72; UCR median 71; Adana Feb 66.9 → Mar 69.1; BATEM Antalya 9 clones 69.2–77.8
Weight (g)	ES 170–200; UCR 187; Adana 157–163
Peel (mm)	2,7–5,8
Seeds	1–5
Colour	IVIA colour index 10; regreening at the stem end late in the season
Maturity	TR juice 45–54%; UCR TSS 12.2 / acid 1.1 / ratio 11.7

Source: IVIA cultivar sheet; UCR; Tiring 2017 TURKJANS (Adana); BATEM (dergipark 5313165)

Analysis notes

Size (today)

0% of the 64 measured fruit are below the EU minimum diameter (53 mm); most common code 6.

Source: EU 543/2011 Annex I-B-2 = Del. Reg. 2023/2429 (same values)

Growth

~171 days after bloom (bloom assumed on 15 April — enter it in Report > Block settings) expected 51.6 mm, measured 73.5 mm (ratio 1.43). The measurement is 43% above the curve: the published (Argentine) curve does not fit this orchard, so NO harvest diameter estimate is given. Possible causes: a different bloom date (enter it in Block settings), faster growth in Antalya, or measurement bias (compare 10 fruit with calipers). The estimate will be enabled once our own curve is built from several weeks of measurements.

Source: Avanza, Bramardi, Mazza 2008, Span J Agric Res 6(4) — Valencia Late, Argentina (not Mediterranean)

Sample

Average ± 0.9 mm (95%). Literature recommendation: 7 trees $\times$ 30 fruit (2–3% precision on harvest diameter); ~82% of diameter variation is between fruit $\rightarrow$ increase fruit per tree.

Source: Avanza et al., Rev. Bras. Frutic. (CC BY-NC 4.0)

Colour

Median colour index (CCI) -8. Rule: at most 1/5 of the surface light green. (iPhone colour measurement not yet calibrated with a colour chart — thresholds are indicative)

Source: EU 543/2011 Annex I-B-2 = Del. Reg. 2023/2429 (same values)

Peel quality

Of the 58 fruit assessed for defects, 95% are defect-free or slightly defective (the two classes counted as export grade). This is a vision model suggestion; confirm it in the capture details. The EU sets no numerical area limit for peel defects; the classes are descriptive (Extra: very slight; I: slight; II: defective but not affecting the flesh).

Source: EU 543/2011 Annex I-B-2 (BLE consolidated) + OECD Citrus brochure 2010

Measurement coverage

Only the centre (targeted) fruit in each photo is counted. Automatic measurement of the other fruit in the frame is experimental: on open datasets 30–47% of leaves were mistaken for fruit; it will be enabled once validated with calipers.

Sampling points

There is only one comparable sampling point. For a block, corners + centre (4–5 points) with ~40 photos per point are recommended.

Yield

Average fruit weight ≈ 205 g. For yield, enter the tree count and fruit per tree (manual count on a few trees) in Block settings.

Source: Derived from BATEM Antalya Table 1

Defect suggestions

Other (not in catalogue) ×9, Oleocellosis ×2 — vision model suggestion, confirm on the capture screen. Accuracy measured on open datasets: 92% of fruit flagged as "defective" really are defective, 87% of sound fruit are recognised as sound, and 73% of defective fruit are caught. Defect TYPE is not yet reliable (0–17% for most types; 80% for mould) — the type name is only a hint.

Source: TAGEM Citrus Integrated Pest Management Technical Guidelines 2022 + UC IPM + UF/IFAS (catalogue)

Maturity (cannot be measured from photos)

EU minimum: juice ≥ 35%, sugar/acid ≥ 6.5:1 — measured in the laboratory.

Source: EU 543/2011 Annex I-B-2 = Del. Reg. 2023/2429 (same values)

Literature (selected for this block's situation)

KUSUR: OLEOCELLOSIS

Oil spotting (oleocellosis): a defect for No.1 if depressed/soft, or if the aggregate area exceeds 5% of the surface, or if there are more than 7 green spots.

USDA Agricultural Marketing Service 1999 — United States Standards for Grades of Oranges (California and Arizona)

KUSUR: OLEOCELLOSIS

Oleocellosis is the rupture of oil glands through impact/rough handling; it occurs more readily when cell turgor is high, so harvest should be delayed after irrigation and rain.

Habibi F. et al. 2025 — Postharvest Physiological Disorders of Blood Orange Fruit (HS1501)

MATURITY AND STANDARDS

In Lane Late, TSS was 10.5–11.4% depending on rootstock; highest on Cleopatra rootstock.

Legua et al. 2011 — Plant growth, yield and fruit quality of 'Lane Late' navel orange on four citrus rootstocks

MATURITY AND STANDARDS

In California, Valencia oranges require TSS/acid ≥8:1 and orange colour on at least one quarter of the surface in ≥90% of the lot; if any sample is below 7:1 the lot is rejected.

California Department of Food and Agriculture 2012 — California Code of Regulations, Title 3, § 1430.36 — Oranges, Maturity

MATURITY AND STANDARDS

In Valencia, the harvest window for Valencia Late is given as 20 March–15 June.

IVIA — Instituto Valenciano de Investigaciones Agrarias — Variedades de cítricos: VALENCIA LATE (çeşit fişi)

FACTORS AFFECTING GROWTH AND SIZE

In Texas Valencia (2 blocks, 1968), mean diameter went from 2.18 inches on 1 September → 2.70 inches on 1 March (≈55→69 mm); in 1969, October–March 2.28→2.68 inches.

Allen R.D. (USDA Statistical Reporting Service) 1972 — Evaluation of Procedures for Estimating Citrus Fruit Yield: Fruit Counts, Ground Photography, Remote Sensing

FACTORS AFFECTING GROWTH AND SIZE

The 5th parameterisation of the logistic model (diameter = $1/(\alpha + e^{\beta \cdot \gamma^x})$) was found to fit Valencia Late fruit diameter growth best; the four-parameter models did not converge.

Avanza et al. 2008 — Statistical models to describe the fruit growth pattern in sweet orange 'Valencia late'

YIELD AND SAMPLING

In Texas, to estimate early-season fruit set in early oranges, Valencia and grapefruit with a 10% coefficient of variation, 65–85 blocks per type are sufficient; the optimum allocation is 2 trees per block, 2 scaffold limbs per tree and 2 terminal branches per scaffold limb.

Allen R.D. (USDA Statistical Reporting Service) 1972 — Evaluation of Procedures for Estimating Citrus Fruit Yield: Fruit Counts, Ground Photography, Remote Sensing

YIELD AND SAMPLING

In Texas Valencia, drop by March of fruit tagged in October was 27.5% in 1968 and 22.6% in 1969 (mean of two blocks); differences between blocks and between years were large — a constant drop rate cannot be assumed.

Allen R.D. (USDA Statistical Reporting Service) 1972 — Evaluation of Procedures for Estimating Citrus Fruit Yield: Fruit Counts, Ground Photography, Remote Sensing

MEASUREMENT METHOD (COMPARISON)

Apolo-Apolo et al. (2020) reported, for orange counting with drone imagery + Faster R-CNN, a mean standard error of 6.59% relative to visual counts and F1 > 89% (2 weeks before harvest, 2 photographs per tree, 20 trees).

Özgüven et al. 2022 — Tarımda Drone Kullanımı ve Geleceği (derleme)

Measurement method and accuracy

Measurement	iPhone LiDAR depth + SAM2 fruit mask + sphere correction; processed locally on Mac Studio
Outlier (suspect) measurement	2 fruit (outside Q3 + 1.5·IQR) — mostly leaf included in the mask; marked in the appendix
Capture distance (median)	30 cm (26–38)
Caliper validation	None yet — mm values not calibrated
Defect suggestion accuracy	380 images from open datasets: precision 92%, sound-fruit recognition 87%, recall 73%; defect type is only a hint
Coverage	The targeted (centre) fruit in each photo

Appendix: measured fruit (64)

#	Capture	Time	Point	Diameter mm	Code	g	CCI	Peel	cm
1	#57	15:39	Block A · Point 1	75.7	6	222	-11	● Slight	32
2	#58	15:39	Block A · Point 1	73.8	6	205	-7	● None	29
3	#59	15:39	Block A · Point 1	76.1	6	225	-9	● None	27
4	#60	15:39	Block A · Point 1	78.8	5	250	-11	● Slight	28
5	#61	15:39	Block A · Point 1	76.2	6	226	-8	● None	27
6	#62	15:39	Block A · Point 1	73.8	6	205	-10	● None	27
7	#63	15:39	Block A · Point 1	68.5	8	164	-6	—	30
8	#64	15:39	Block A · Point 1	76.2	6	226	-8	● None	32
9	#65	15:39	Block A · Point 1	72.8	7	197	-9	● Slight	30
10	#66	15:40	Block A · Point 1	75.4	6	219	-8	● Slight	27
11	#67	15:40	Block A · Point 1	68.9	8	167	-6	● None	29
12	#68	15:40	Block A · Point 1	68.8	8	166	-8	● None	33
13	#69	15:40	Block A · Point 1	70.5	7	179	-8	● None	33
14	#70	15:40	Block A · Point 1	70.7	7	181	-8	● None	32
15	#71	15:40	Block A · Point 1	74.2	6	209	-9	● None	37
16	#72	15:40	Block A · Point 1	70.3	7	178	-7	—	35
17	#73	15:40	Block A · Point 1	73.1	7	200	-9	● None	38
18	#74	15:41	Block A · Point 1	76.7	6	231	-7	● None	37
19	#75	15:41	Block A · Point 1	72.9	7	198	-8	● None	31
20	#76	15:41	Block A · Point 1	88.9 △	2	359	-9	● None	28
21	#77	15:41	Block A · Point 1	84.8 △	3	312	-10	● None	28
22	#78	15:41	Block A · Point 1	74.6	6	212	-12	● None	31
23	#79	15:41	Block A · Point 1	77.8	5	241	-9	● Slight	28
24	#80	15:41	Block A · Point 1	71.9	7	190	-10	● None	29
25	#81	15:41	Block A · Point 1	72.3	7	193	-8	● Moderate	33
26	#82	15:41	Block A · Point 1	77.7	5	240	-8	● None	26
27	#83	15:42	Block A · Point 1	73.8	6	205	-12	● None	35
28	#84	15:42	Block A · Point 1	74.2	6	209	-7	—	29
29	#85	15:42	Block A · Point 1	76.3	6	227	-11	● None	27
30	#86	15:42	Block A · Point 1	75.9	6	223	-10	● None	30
31	#87	15:42	Block A · Point 1	74.1	6	208	-6	● None	34
32	#88	15:42	Block A · Point 1	71.9	7	190	-9	● Slight	26
33	#89	15:42	Block A · Point 1	75.0	6	216	-9	● Slight	29
34	#90	15:42	Block A · Point 1	66.1	9	148	-6	● Slight	28
35	#91	15:42	Block A · Point 1	70.7	7	181	-6	● Serious	27
36	#92	15:43	Block A · Point 1	72.9	7	198	-6	● None	28
37	#93	15:43	Block A · Point 1	68.4	8	164	-12	● None	28
38	#94	15:43	Block A · Point 1	68.7	8	166	-11	● None	36
39	#95	15:43	Block A · Point 1	73.5	6	203	-8	● None	33
40	#96	15:43	Block A · Point 1	72.9	7	198	-6	—	34
41	#97	15:43	Block A · Point 1	75.9	6	223	-9	● None	30
42	#98	15:43	Block A · Point 1	70.4	7	178	-8	● None	28
43	#99	15:43	Block A · Point 1	71.9	7	190	-8	● None	31

44	#100	15:43	Block A · Point 1	71.4	7	186	-11	● None	33
45	#101	15:43	Block A · Point 1	71.9	7	190	-7	● None	28
46	#102	15:43	Block A · Point 1	73.5	6	203	-8	● None	34
47	#103	15:44	Block A · Point 1	74.6	6	212	-10	—	38
48	#104	15:44	Block A · Point 1	68.3	8	163	-8	● None	37
49	#105	15:44	Block A · Point 1	70.7	7	181	-10	● None	28
50	#106	15:44	Block A · Point 1	78.9	5	251	-7	● None	30
51	#107	15:44	Block A · Point 1	75.9	6	223	-7	● None	33
52	#108	15:44	Block A · Point 1	72.5	7	195	-7	● None	32
53	#109	15:44	Block A · Point 1	66.2	9	148	-8	● None	31
54	#110	15:44	Block A · Point 1	77.0	5	233	-8	● Slight	30
55	#111	15:44	Block A · Point 1	75.8	6	223	-7	● None	30
56	#112	15:44	Block A · Point 1	73.3	6	201	-6	● Moderate	26
57	#113	15:45	Block A · Point 1	73.3	6	201	-6	● None	29
58	#114	15:45	Block A · Point 1	75.8	6	223	-7	● None	32
59	#115	15:45	Block A · Point 1	76.0	6	224	-9	● None	35
60	#116	15:45	Block A · Point 1	69.6	8	172	-7	● None	31
61	#117	15:45	Block A · Point 1	72.3	7	193	-9	● None	30
62	#118	15:45	Block A · Point 1	71.7	7	188	-6	—	33
63	#119	15:45	Block A · Point 1	72.0	7	191	-6	● None	28
64	#120	15:46	Block A · Point 1	72.4	7	194	-6	● None	31

ZestLens · Finport Tarım ve Gıda Ürünleri San. Tic. A.Ş. · Measurements and defect assessments are AI suggestions; estimates are rough and are calibrated with calipers.