CITRUS OCTOBER FORECAST
MATURITY TEST RESULTS AND FRUIT SIZE

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Florida All Orange Production Down 32 Percent from Last Season
Florida Non-Valencia Orange Production Down 40 Percent
Florida Valencia Orange Production Down 25 Percent
Florida All Grapefruit Production Down 40 Percent
Florida All Tangerine and Tangelo Production Down 7 Percent

FORECAST DATES - 2022-2023 SEASON	
November 9, 2022 (Maturity only)	March 8, 2023
December 9, 2022	April 11, 2023
January 12, 2023	May 12, 2023
February 8, 2023	June 9, 2023
July 12, 2023	

Citrus Production by Type – States and United States

Crop and State	Production [1]			Forecasted Production [1]
	2019-2020	2020-2021	2021-2022	2022-2023
	(1,000 boxes)	(1,000 boxes)	(1,000 boxes)	(1,000 boxes)
Non-Valencia Oranges [2]				
Florida	**29,650**	**22,700**	**18,250**	**11,000**
California	43,300	41,300	31,800	38,000
Texas	1,150	1,000	170	900
United States	74,100	65,000	50,220	49,900
Valencia Oranges				
Florida	**37,750**	**30,250**	**22,800**	**17,000**
California	10,800	7,700	8.600	9,100
Texas	190	50	30	250
United States	48,740	38,000	31,430	26,350
All Oranges				
Florida	**67,400**	**52,950**	**41,050**	**28,000**
California	54,100	49,000	40,400	47,100
Texas	1,340	1,050	200	1,150
United States	122,840	103,000	81,650	76,250
Grapefruit				
Florida-All	**4,850**	**4,100**	**3,330**	**2,000**
Red	**4,060**	**3,480**	**2,830**	**1,800**
White [3]	**790**	**620**	**500**	**200**
California [4]	4,700	4,200	4,100	4,100
Texas	4,400	2,400	1,700	2,000
United States	13,950	10,700	9,130	8,100
Lemons				
Arizona	1,800	750	950	1,150
California	25,300	20,100	24,900	23,000
United States	27,100	20,850	25,850	24,150
Tangerines and Mandarins [5]				
Florida	**1,020**	**890**	**750**	**700**
California	22,400	28,800	17,400	20,000
United States	23,420	29,690	18,150	20,700

[1] Net pounds per box: oranges in California-80, Florida-90, Texas-85; grapefruit in California and Texas-80, Florida-85; lemons-80; tangerines and mandarins in California-80, Florida-95.

[2] Early non-Valencia (including Navel) and midseason non-Valencia varieties in Florida; Navel and miscellaneous varieties in California; Early and mid-season varieties in Texas.

[3] Includes seedy grapefruit.

[4] Includes pummelos in California.

[5] Includes tangelos.

All Oranges 28.0 Million Boxes

The 2022-2023 Florida all orange forecast released today by the USDA Agricultural Statistics Board is 28.0 million boxes, down 32 percent from last season's final production. The total includes 11.0 million boxes of non-Valencia oranges (early, mid-season, and Navel varieties) and 17.0 million boxes of Valencia oranges. The Navel orange forecast, at 300,000 boxes, accounts for 3 percent of the non-Valencia total.

The estimated number of bearing trees for all oranges is 44.0 million. Trees planted in 2019 and earlier are considered bearing for this season. Field work for the latest Commercial Citrus Inventory was completed in June 2022. Attrition rates were applied to the results to determine the number of bearing trees used to weigh and expand objective count data in the forecast model.

A 9-year regression was used for comparison purposes. All references to "average", "minimum", and "maximum" refer to the previous 10 seasons, excluding the 2017-2018 season, which was affected by Hurricane Irma. Average fruit per tree includes both regular bloom and the first late bloom.

Non-Valencia Oranges 11.0 Million Boxes

The non-Valencia forecast of 11.0 million boxes is 40 percent less than last season's production. The estimated number of bearing trees (without Navels) is 15.8 million, down 8 percent from the previous season. The estimated fruit per tree for early and mid-season (non-Valencia) oranges is 474, a decrease of 97 pieces from last season, and the lowest in a series dating back to the 1964-1965 season. Projected fruit size is below average, requiring an estimated 335 pieces of fruit to fill a 90-pound box. At 38 percent, projected droppage is above average.

The Navel forecast of 300,000 boxes is 39 percent less than last season's production. The estimated number of bearing trees is 653,000, down 14 percent from the previous season. The estimated fruit per tree is 106, a decrease of 49 pieces from last season. Projected fruit size is above average, requiring an estimated 136 pieces of fruit to fill a 90-pound box. Projected droppage is above average at 30 percent.

Valencia Oranges 17.0 Million Boxes

The Valencia forecast of 17.0 million boxes is 25 percent lower than last season's production. The estimated number of bearing trees is 27.5 million, down 4 percent from the previous season. The estimated fruit per tree is 323, a decrease of 72 pieces from last season, and the lowest in a series dating back to the 1964-1965 season. Projected fruit size is below average, requiring an estimated 275 pieces of fruit to fill a 90 pound box. Projected droppage is above average at 33 percent.

Reliability

To assist users in evaluating the reliability of the October 1 Florida production forecasts, the "Root Mean Square Error," a statistical measure based on past performance, is computed. The deviation between the October 1 production forecast and the final estimate is expressed as a percentage of the final estimate. The average of squared percentage deviations for the latest 20-year period is computed. The square root of the average becomes statistically the "Root Mean Square Error." Probability statements can be made concerning expected differences in the current forecast relative to the final end-of-season estimate, assuming that factors affecting this year's forecast are not different from those influencing recent years.

The "Root Mean Square Error" for the October 1 Florida all orange production forecast is 11.3 percent. However, if you exclude the three abnormal production seasons (three hurricane seasons), the "Root Mean Square Error" is 7.5 percent. This means chances are 2 out of 3 that the current all orange production forecast will not be above or below the final estimates by more than 11.3 percent, or 7.5 percent excluding abnormal seasons. Chances are 9 out of 10 (90 percent confidence level) that the difference will not exceed 19.6 percent, or 13.2 percent excluding abnormal seasons.

Changes between the October 1 Florida all orange forecast and the final estimates during the past 20 years have averaged 9.02 million boxes (5.87 million, excluding abnormal seasons), ranging from 0.30 million boxes to 42.3 million boxes including abnormal seasons, (0.30 to 20.4 million boxes excluding abnormal seasons). The October 1 forecast for all oranges has been below the final estimate 3 times, above 16 times, (below 3 times, above 13 times, excluding abnormal seasons). The difference does not imply that the October 1 forecast this year is likely to understate or overstate final production.

Forecast Components, by Type – Florida: October 2022

[Survey data is considered final in December for Navels, January for non-Valencia oranges, February for grapefruit, and April for Valencia oranges]

Type	Bearing trees	Fruit per tree	Droppage	Fruit per box
	(1,000 trees)	(number)	(percent)	(number)
ORANGES				
Non-Valencia (excluding Navels) .	15,841	474	38	335
Navel..	653	106	30	136
Valencia	27,465	323	33	275
GRAPEFRUIT				
Red	1,574	381	31	128
White...	180	448	26	126

All Grapefruit 2.00 Million Boxes

The forecast of all grapefruit production is 2.00 million boxes, 40 percent less than last season's utilization of 3.33 million boxes. The total is comprised of 1.80 million boxes of red grapefruit and 200,000 boxes of white grapefruit.

The **red** grapefruit forecast at 1.80 million boxes is 36 percent less than last season's final production. Bearing trees are down 9 percent from last season's revised bearing tree numbers. The average fruit per tree is 12 pieces less than last season. Fruit droppage is projected to be slightly above average. Fruit size at the final month is expected to be slightly below average.

The **white** grapefruit forecast of 200,000 boxes is 60 percent less than last season's final production. White grapefruit bearing trees declined by 23 percent from last season's revised bearing tree numbers. The average fruit per tree is 22 pieces less than last season, and 13 pieces less than the nine-year season average. Current fruit sizes are below average, and at the rate of growth measured in last month's survey, are expected to be below average at harvest. Final drop is expected to be slightly below average.

Tangerines and Tangelos Total 700,000 Boxes

The forecast for tangerine and tangelos is 700,000 boxes, 7 percent less last season's utilization of 750,000 boxes. This forecast number includes all certified tangerine and tangelo varieties.

Distribution of Estimated Fruit Population, by Type, and Age Groups – Florida: September
[Distribution of fruit population in September as determined by multiplying average fruit per tree from the Limb Count Survey by bearing age trees]

Age groups	Oranges				Grapefruit			
	Non-Valencia		Valencia		Red		White	
	2021-2022	2022-2023	2021-2022	2022-2023	2021-2022	2022-2023	2021-2022	2022-2023
	(percent)	(percent)	(percent)	(percent)	(percent)	(percent)	(percent)	(percent)
3 - 5 years............	3	3	8	7	3	3	(Z)	2
6 - 8 years............	7	7	9	10	7	5	(Z)	1
9 - 13 years..........	15	16	12	12	16	22	1	1
14 - 23 years........	28	28	25	25	11	10	3	2
24 yrs & over........	47	46	46	46	63	60	96	94

Z Less than half of the unit shown.

Forecast Procedures
All citrus forecasts are based on actual fruit counts and measurements. The objective count method uses four components:
  (1) bearing age trees provided from the latest Commercial Citrus Inventory;
  (2) average fruit per tree obtained from the Limb Count survey using randomly selected trees and limbs;
  (3) fruit size from the fruit measurement survey;
  (4) fruit loss from the drop survey.

These measurements are used in the forecast models; regression data are from the 2012-2013 through 2021-2022 seasons.

The latest Tree Inventory is used to determine estimated tree numbers. All trees planted in 2019 and earlier are included for the current season. An attrition factor was applied to these tree numbers (by age and area) to account for losses since the inventory period.

Statistically valid procedures are used to provide unbiased estimates of fruit count. Samples are drawn with known probabilities from the Commercial Citrus Inventory, taking into account the variability in fruit per tree. Limbs are randomly selected from sample trees. Fruit on these limbs is counted in the mid-July to mid-September period.

Expected Gift Fruit Shipments Under the 6-R Program and Non-Certified Usage, by Type – Florida: 2022-2023

Type	1,000 boxes
Navel Oranges	20
Non-Valencia Oranges (excluding Navels)	40
Valencia Oranges...................................	50
Red Grapefruit......................................	40
White Grapefruit	10
Tangerines and Tangelos......................................	40

Maturity

Regular bloom fruit samples (325 orange and 100 grapefruit) were collected from groves on established routes in Florida's five major citrus producing areas and tested by the Florida Agricultural Statistics Service (FASS) from October 4-6, 2022.

Unadjusted Maturity Tests – Florida: 2021-2022 and 2022-2023

[Averages of regular bloom fruit from sample groves. Juice and solids per box are unadjusted and not comparable to juice processing plant test results. Samples were run through an FMC 091B machine using pneumatic pressure. This machine utilizes a 0.025 short strainer and a 1 inch orifice tube for the 3 inch cup and a 1.25 inch orifice tube for the 4 inch and 5 inch cups.]

Fruit type (number of groves) test date	Acid		Solids (Brix)		Ratio		Unfinished juice per box		Solids per box	
	2021-2022	2022-2023	2021-2022	2022-2023	2021-2022	2022-2023	2021-2022	2022-2023	2021-2022	2022-2023
	(percent)	(percent)	(percent)	(percent)			(pounds)	(pounds)	(pounds)	(pounds)
ORANGES										
Early N-V (119-120)										
Sep 1	1.16	1.25	9.11	9.13	7.92	7.37	43.76	43.31	3.99	3.95
Oct 1	0.90	0.91	8.99	9.15	10.06	10.25	48.01	46.80	4.32	4.28
Midseason N-V (54-55)										
Sep 1	1.32	1.36	8.74	8.88	6.78	6.57	44.96	43.36	3.93	3.85
Oct 1	1.02	0.99	8.80	8.94	8.78	9.15	48.75	47.63	4.29	4.26
Valencia (150-150)										
Sep 1	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
Oct 1	2.00	1.94	8.66	8.95	4.37	4.66	46.41	46.80	4.02	4.19
GRAPEFRUIT										
Red Seedless (50-50)										
Sep 1	1.42	1.53	9.70	10.44	6.86	6.86	38.88	39.09	3.77	4.08
Oct 1	1.35	1.38	9.92	10.05	7.37	7.33	44.92	46.03	4.46	4.63
White Seedless (50-50)										
Sep 1	1.55	1.64	9.98	10.57	6.44	6.49	39.04	40.41	3.89	4.27
Oct 1	1.36	1.50	9.97	10.19	7.34	6.83	46.36	46.82	4.62	4.76

NA Not available.

Weather and Crop Progress

The citrus growing region experienced two consecutive weeks with cold fronts at the start of the bloom period. One in late January, the other in early February. Temperatures dropped to the mid-20s to low 30s across the citrus belt. As a result, there were widespread reports of freeze damage to leaves, twigs, and bloom in many groves.

Dry weather followed for the next several weeks leading to moderate drought in all areas. In June, the citrus belt received widespread rainfall, with some reports of locally heavy precipitation appearing in orange groves statewide. Drought conditions improved immensely across the citrus region. Reports from the field indicated they were pushing dead and dying trees and putting out fertilizer and spraying. Mowing during late summer was sporadic, and in most cases less than usual.

Fruit set on oranges and grapefruit appeared to be less than most seasons. Size surveys showed fruit sizes were smaller than normal on all varieties and close the minimum of the previous ten seasons on oranges. Ratios on oranges were improved from the previous season, but lower on grapefruit. Harvest of early tangerines (Fallglo) began in late September.

Citrus Size Frequency Measurement Distributions, by Type – Florida: September 2022

Type and number of fruit per 4/5 – bushel containers	2020	2021	2022	Type and number of fruit per 4/5 – bushel containers	2020	2021	2022
	(percent)	(percent)	(percent)		(percent)	(percent)	(percent)
NON-VALENCIA ORANGES [1]				**RED GRAPEFRUIT**			
64 or less	0.1	0.0	0.0	32 or less...	1.8	0.4	0.2
80..	1.2	0.3	0.3	36	4.0	2.1	0.8
100..	8.8	4.2	2.7	40	8.9	5.5	1.7
125..	25.4	18.0	14.4	48	11.4	9.7	5.5
163 or more	64.5	77.5	82.6	56	13.7	14.9	11.1
NAVEL ORANGES				63 or more	60.2	67.4	80.7
64 or less	38.7	27.1	26.6				
80..	28.8	30.8	32.7	**WHITE GRAPEFRUIT** [2]			
100..	19.4	27.5	27.1	32 or less...	1.1	0.2	0.2
125..	9.5	10.7	10.2	36	3.7	2.6	0.5
163 or more	3.6	3.9	3.4	40	8.2	8.7	3.2
VALENCIA ORANGES				48	16.8	14.1	6.3
64 or less	0.1	0.0	0.0	56	15.6	20.0	15.5
80..	1.0	0.4	0.2	63 or more	54.6	54.4	74.3
100..	7.4	4.7	2.7				
125..	20.2	17.9	15.2				
163 or more	71.3	77.0	81.9				

[1] Excludes Navels.
[2] Excludes seedy variety.

Fruit Size Frequency Measurements, Non-Valencia Oranges [1], by Diameter - Florida: September
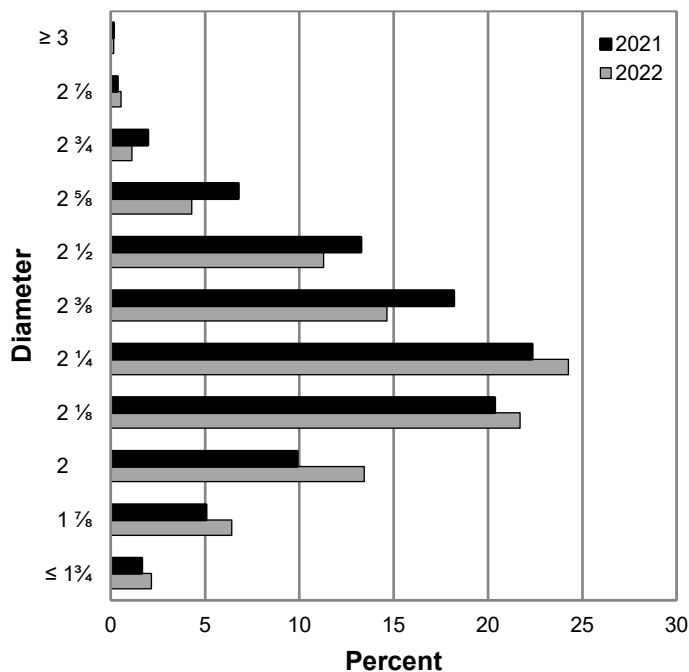
[1] Excludes Navel variety.

Fruit Size Frequency Measurements, Red Grapefruit, by Diameter - Florida: September