2024/2025

ORANGE CROP FORECAST

for the São Paulo and West-Southwest Minas Gerais citrus belt

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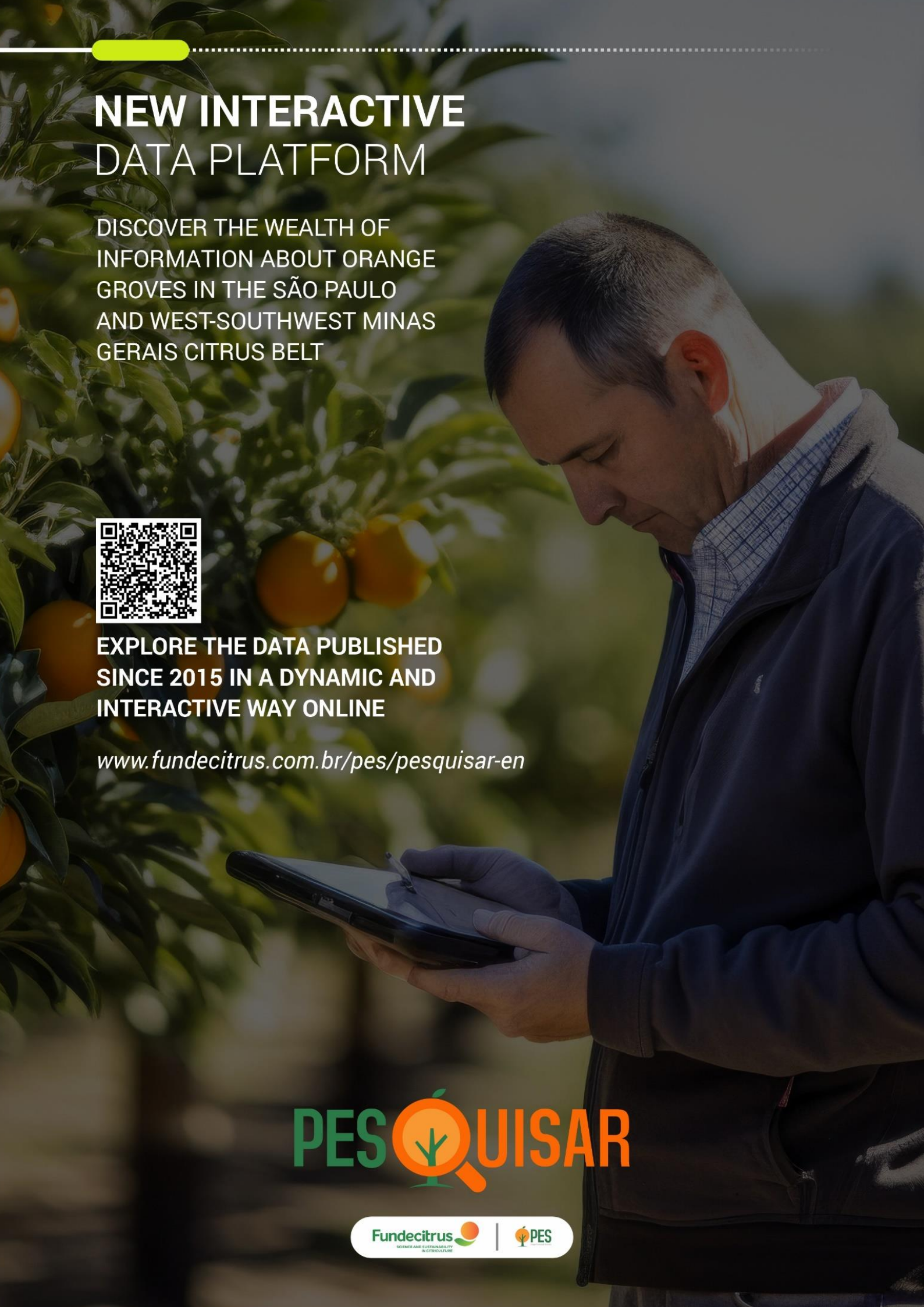
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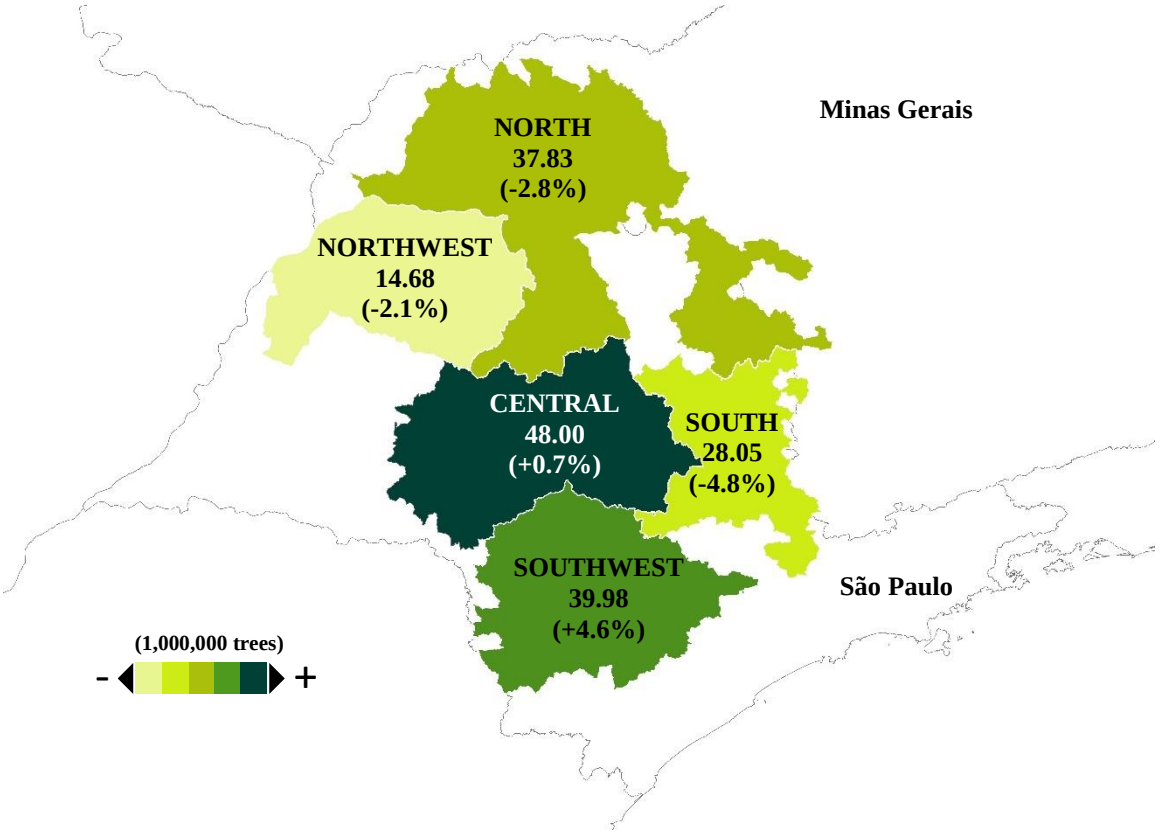
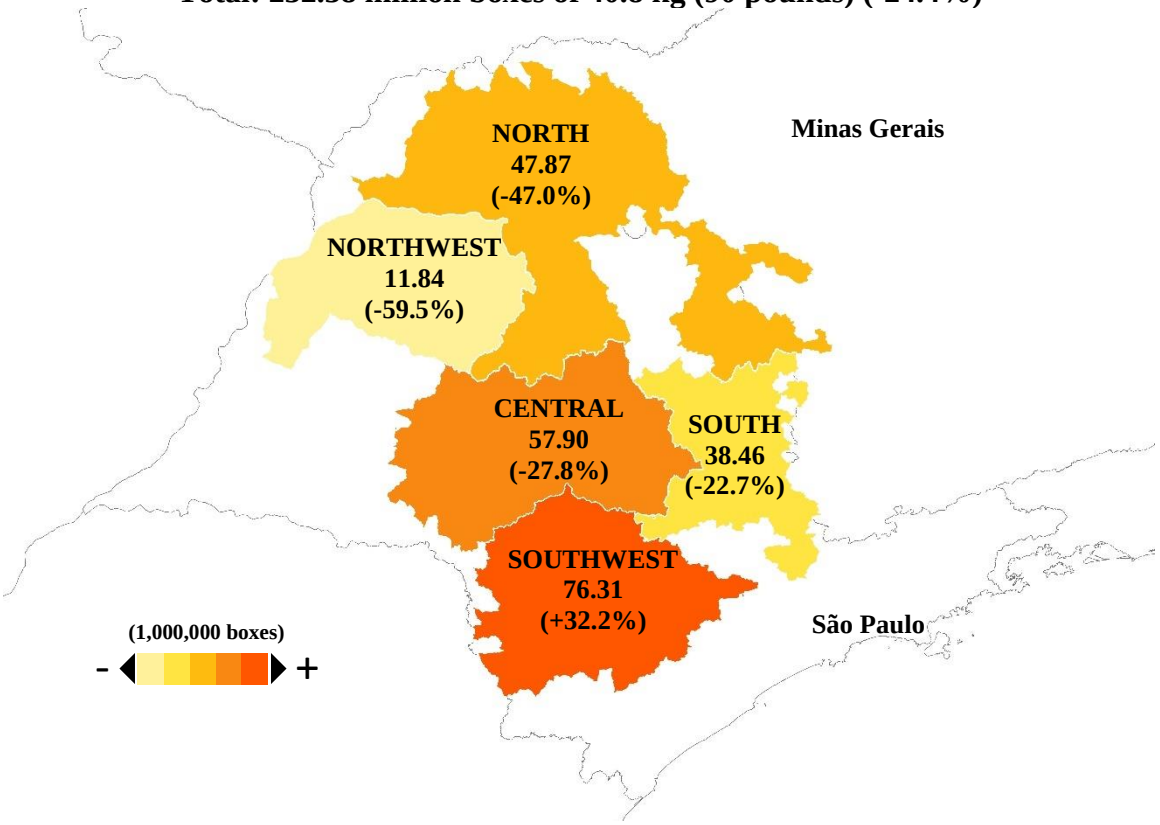
ORANGE BEARING TREES BY SECTOR[1]
AND COMPARASION TO THE PREVIOUS CROP SEASON (-0.4%)
Total: 168.54 million trees



2024-2025 ORANGE CROP FORECAST BY SECTOR[2]
AND COMPARASION TO THE PREVIOUS CROP SEASON
Total: 232.38 million boxes of 40.8 kg (90 pounds) (-24.4%)



[1] Snapshot in March 2024. Varieties: Hamlin, Westin, Rubi, Valencia Americana, Seleta, Pineapple, Alvorada, Pera Rio, Valencia, Valencia Folha Murcha and Natal

[2] Status in May 2024

2024-2025 ORANGE CROP FORECAST FOR THE SÃO PAULO AND WEST-SOUTHWEST MINAS GERAIS CITRUS BELT – MAY FORECAST

Publication Schedule

2024-2025 Crop Year
March 2024 tree inventory: June 10, 2024
Crop forecast: May 10, 2024
1st Crop forecast update: September 10, 2024
2nd Crop forecast update: December 10, 2024
3rd Crop forecast update: February 10, 2025
Final crop forecast: April 10, 2025

Production forecasts are subject to uncertainty, especially due to climatic conditions, which may not materialize as predicted. For that reason, the forecast is updated throughout the crop year based on data on early fruit drop and fruit size obtained through surveys carried out by Fundecitrus. Hence, using the most recent publication available on the website www.fundecitrus.com.br is recommended. Moreover, in order to meet the demands of the citrus sector and the press, we reserve the right to expand and deepen the information previously published.

Performed by FUNDECITRUS in cooperation with MARKESTRAT and full professors from FEA-RP/USP and the department of Math and Science of FCAV/Unesp

2024-2025 ORANGE CROP FORECAST FOR THE SÃO PAULO AND WEST-SOUTHWEST MINAS GERAIS CITRUS BELT

OUTLOOK IN MAY 2024

Fundecitrus
Araraquara, São Paulo
2024

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338.1 2024-2025 orange crop forecast for the São Paulo
E816 and west-southwest Minas Gerais Citrus Belt:
Outlook in May / Fundo de Defesa da
Citricultura... [et al.]. – Araraquara, SP:
Fundecitrus, 2024.
31 p.

ISSN 2446-7707(printed)

ISSN 2446-7715 (online)

1. Economy – Forecast 2. Orange I. Fundecitrus
II. Markestrat III. FEA-RP/USP IIII. FCAV/Unesp.

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SUMMARY

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1 – 2024-2025 ORANGE CROP FORECAST

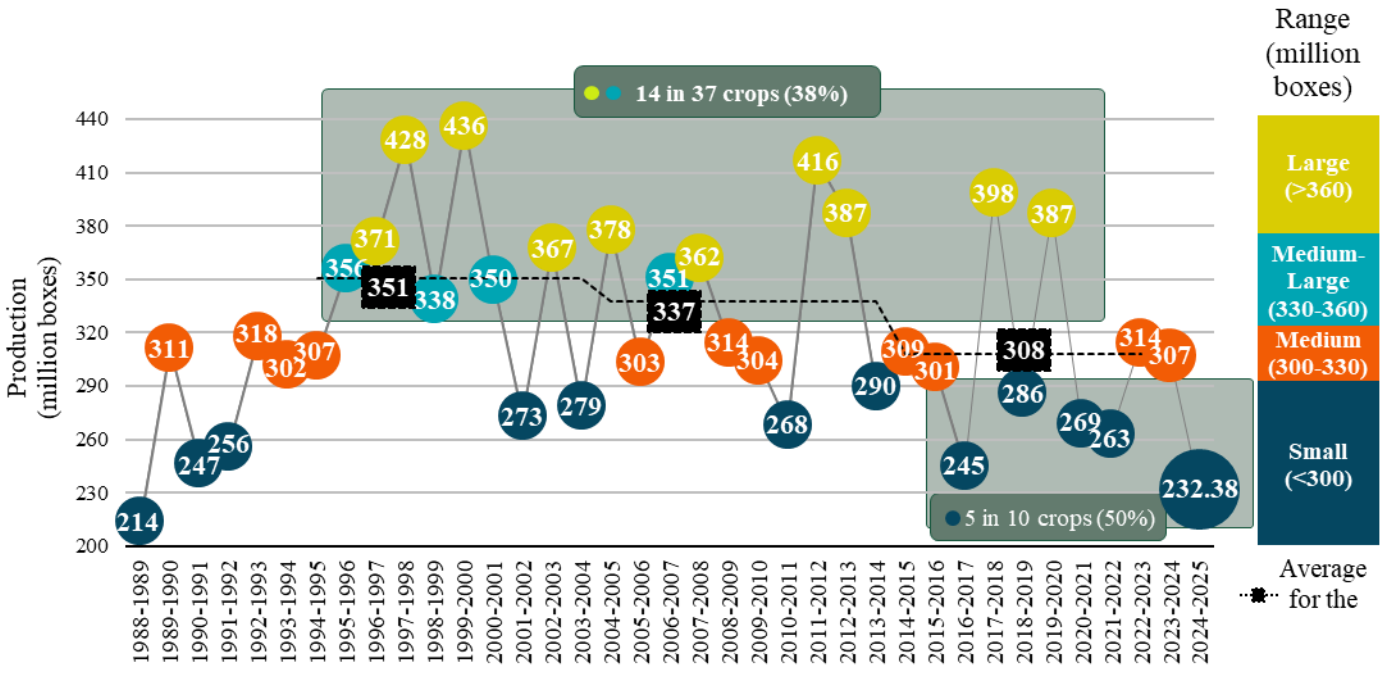
The 2024-2025 orange crop forecast for the São Paulo and West-Southwest Minas Gerais citrus belt, published on May 10, 2024, by Fundecitrus in cooperation with Markestrat and full professors at FEA-RP/USP[1] and FCAV/Unesp[2], is 232.38 million boxes of 40.8 kg (90 lbs) each. This production is divided as follows (figures in parentheses indicate the drop in production as compared to the previous crop):

- 37.12 million boxes of the Hamlin, Westin, and Rubi varieties (-36.10%);
- 15.72 million boxes of the Valencia Americana, Seleta, Pineapple and Alvorada varieties (-15.07%);
- 70.97 million boxes of the Pera Rio variety (-27.30%);
- 81.58 million boxes of the Valencia and Valencia Folha Murcha varieties (-22.45%);
- 26.99 million boxes of the Natal variety (-2.91%).

Approximately 14.61 million boxes are expected to be produced in the Triângulo Mineiro (-47.48%).

Overall, the projected volume represents a significant drop of 24.36% as compared to the previous crop that totaled 307.22 million boxes, a value close to the average for the last decade. Consequently, there is no substantial difference when comparing the current crop with the average volume harvested in the last 10 years. Should this production forecast hold true, this will be the second smallest crop since 1988-1989, when forecasts using the objective method began to be performed in the citrus belt.

The production data from the historical series, which comprises 37 crop seasons, points to a gradual downward trend over time, closely related to adverse climate. As Graph 1 shows, “medium to large size” and “large size” crops were more common, accounting for 14 of the 37 crop seasons, which is equivalent to 38%. However, when examining the most recent period, the last 10 years, a change in the scenario is observed: the “small size” crops have become predominant, representing 50% of the events in the period.



Graph 1 – Orange production from 1988-1989 to 2023-2024 and 2024-2025 crop forecast
Sources: CitrusBR (1988-1989 to 2014-2015) and Fundecitrus (2015-2016 to 2024-2025)

[1] Marcos Fava Neves, Part-time Full Professor at FEA-RP/USP.
[2] José Carlos Barbosa, (voluntary) Full Professor at FCAV/Unesp.

The gradual decrease in orange production becomes evident when observing the data: between 1994-1995 and 2003-2004, the average harvest was 351 million boxes, which dropped down to 337 million in the following decade (2004-2005 to 2013-2014) and reached 308 million in the most recent decade (2014-2015 to 2023-2024). This progressive decline is mainly attributed to increasingly challenging climatic conditions for orange production.

The several extreme weather events that began to affect the citrus belt with greater frequency and intensity could have caused even further damage to production, had it not been for the significant investment in groves, which intensified from the 2000s onwards and substantially improved the yield of the citrus planted area. Among the most relevant events are the migration of groves to the Southwest, a region with more favorable climatic conditions for growing oranges, technological developments such as the expansion of the irrigated area that currently accounts for 36% of the total area, and the renovation of groves with better quality and more efficient combinations of scion and rootstock, as well as the phytosanitary control, particularly relevant for the successful management of Citrus Variegated Chlorosis (CVC).

In this crop season, the conditions necessary for flower induction began with the drought during the month of May 2023, which resulted in plant stress due to water shortage and an accumulation of reserves. After this period of water stress, conditions became favorable for flowering, either due to the rains that fell on May 31 and between June 14 and 16, 2023, with an accumulated volume of approximately 80 millimeters on average in the citrus belt, or owing to the water supply through irrigation. This environmental stimulus induced the first bloom, which stood out as the most intense of this season, reaching its peak in the second half of August.

The favorable climate was abruptly interrupted by the arrival of a heatwave on September 17, initially affecting municipalities in the regions located in the North and Northwest and spreading until it reached all the extent of the citrus belt on September 24, except for the Itapetininga region. During that period, the average maximum temperature was 37°C, reaching a record for this season in Votuporanga, where thermometers registered 42°C. The highest maximum temperatures were recorded in the regions of Votuporanga, with an average of 40°C, São José do Rio Preto, with an average of 39°C, and Bebedouro, with an average of 38°C. Next came: Duartina and Matão, with average maximum temperatures of 37ºC, Triângulo Mineiro, Porto Ferreira, Limeira and Altinópolis, with an average of 36ºC, Brotas and Avaré, with 35ºC, and finally, Itapetininga, with an average of 33ºC. The high temperatures persisted in October, although less intense, in the regions of Brotas, Porto Ferreira, Limeira, Avaré and Itapetininga. This first heatwave affected the setting of the first bloom.

The hot weather increased the evapotranspiration rate, a condition that was aggravated by the low volumes of rain observed in July, August, and September, totaling approximately 50 millimeters. This combination resulted in another water stress on the plants due to water shortage. Conditions for a new flowering were established with the arrival of rains in October, with an average volume of 157 millimeters in the citrus belt. This second bloom, overall, was less vigorous than the first, reaching its peak at the end of October. The development of this bloom was compromised by a second heatwave that swept through the citrus belt. The damage caused by this event was even more severe than that caused by the first one, because the heat also affected the newly formed fruit from the first bloom. This heatwave began on November 7 and gradually expanded until it completely covered the citrus belt, dissipating on November 19. Average maximum temperatures reached 36°C, with thermometers registering the highest temperatures in the regions of São José do Rio Preto, Votuporanga, Bebedouro, Matão and Triângulo Mineiro. Southwestern regions, comprising Avaré and Itapetininga, were less affected due to the event's lower intensity and shorter duration there.

Picture 1 – Examples of plots with significant drop of newly formed fruit after the first and second heatwave, at a lower intensity in the region of Itapetininga

The successive heatwaves caused a significant drop in the newly formed fruits, known as fruitlets, as shown in the example above, in the regions of Brotas, Mogi Guaçu, and at lower intensity in Itapetininga. However, the accumulated rainfall, with an average of 134 millimeters in November, brought new vigor to the plants, stimulating a third bloom. Nevertheless, this bloom, peaking in early December, was not very significant. Subsequently, another heatwave swept through most of the citrus belt between December 12 and 21. This third event was less intense and of shorter duration than the previous ones, especially in the regions of Itapetininga, Avaré, and Altinópolis.

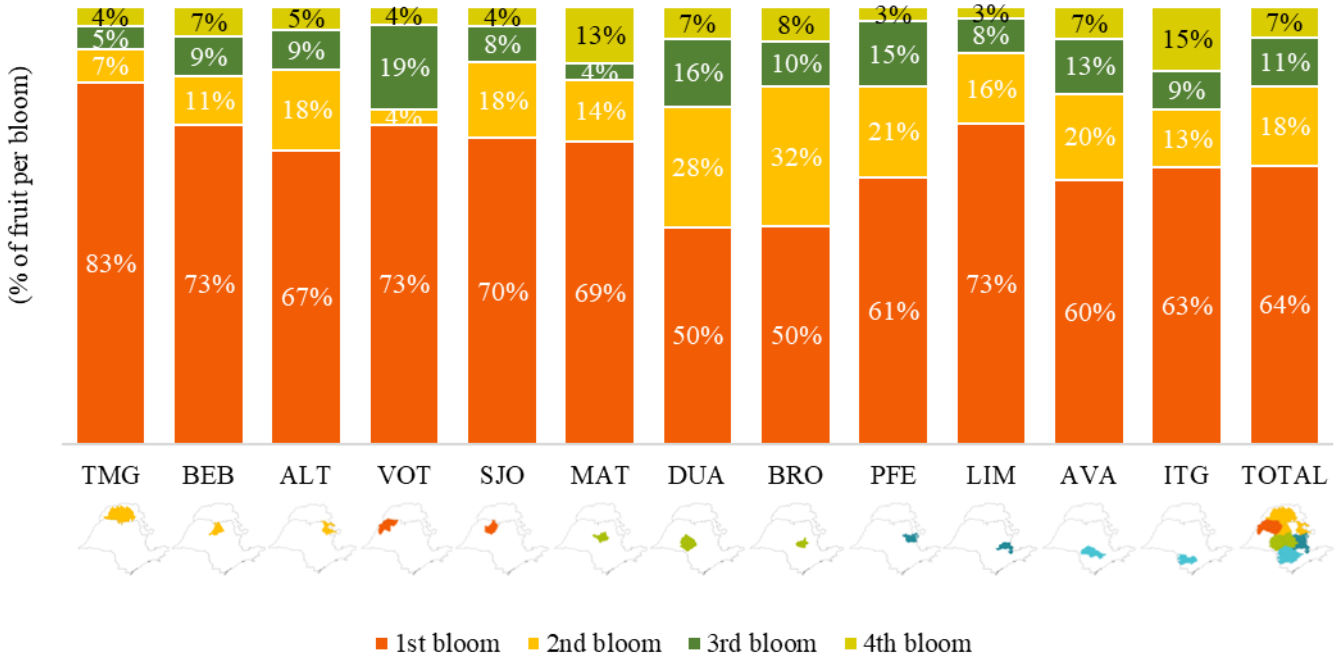
The rains that fell in December 2023, January and February 2024, totaling an average of 102 millimeters, 139 millimeters and 137 millimeters, respectively, were of importance. This rainfall not only helped to set the fruit that had resisted the high temperatures and drought, but also stimulated its growth. In addition, they led to an extraordinarily late fourth bloom.

Fruits from the fourth bloom, at the time of stripping, are normally in the fruitlet stage, with approximately 20 millimeters in diameter. However, atypically, the fourth bloom this season peaked between the end of February and the beginning of March 2024, at least a month behind the historical pattern. Since fruit stripping began in mid-March and lasted until the end of April, fruits from the fourth bloom were still at a very early stage of development, with smaller sizes than usual, ranging from 5 to 15 millimeters for the most part. In addition, some of the trees in the sample were still flowering when they were stripped.

Flowers were found on 227 trees that were stripped, corresponding to 9% of the sample. When analyzing the varieties, flowers were found on 12% of the Pera Rio samples, 10% of the Natal samples, 8% of the Valencia and Folha Murcha samples, 6% of the Hamlin, Westin and Rubi samples and 4% of the other early varieties samples. In terms of location, four regions stood out: there were flowers on 16% of the samples from Altinópolis, 15% of the samples from Brotas, 14% of those from Avaré and 13% of the samples from Duartina. Considering only the trees that had flowers, an average of 213 flowers were counted per plant. However, when weighting the entire sample, i.e. including trees without flowers, the average drops to 19 flowers per plant.

In order to take the flowers and fruits from the fourth bloom into account when calculating the production estimate, the assumption made this season was that 10% of the flowers would turn into fruitlets. This rate is more conservative than those suggested in the studies mentioned by Professor Sentelhas (2005)[3], which range from 15 to 20%. Additionally, the fruitlet setting rate was defined at 33%, a lower value as compared to the one adopted in the previous crop, due to forecasts of drier and hotter weather this year. Applying both rates, it is assumed that every 33 flowers in the fourth bloom result in just one fruit, which corresponds to a conversion rate of flowers into fruits of around 3%. This rate is in line with field research by Professor Guardiola (1997)[4], which mentions that it can reach 3%, but it is more conservative than that obtained in studies cited by Professor Sentelhas (2005), which reached 6%.

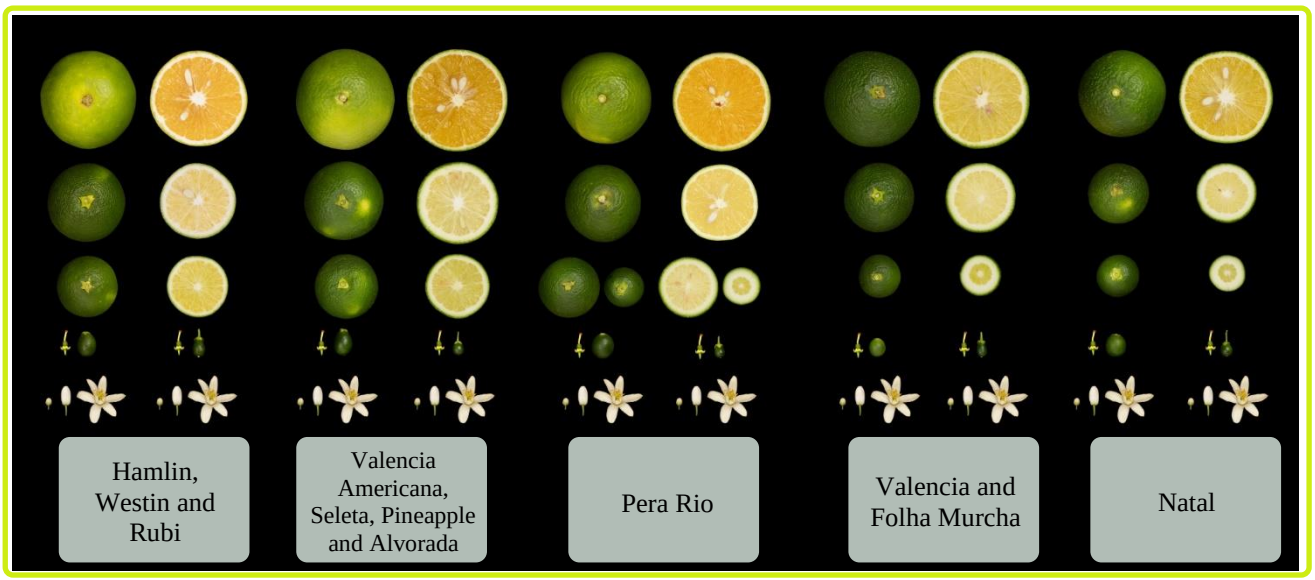
Despite the expectation of a lower setting of the fourth bloom as compared to that in the previous year, its contribution to production is notably higher in this crop, representing on average 7% of the total among regions. As Graph 2 shows, in some specific regions, such as Itapetininga, Matão and Brotas, the share of the fourth bloom exceeds the average for the citrus belt, reaching 15%, 13% and 8%, respectively. Most of the production results from the first bloom, representing a significant 64% of the total, which contrasts significantly with the last four years, in which the share of the first bloom was around 30%. The second bloom, in turn, contributes 18%. In Brotas and Duartina, the low setting of the first bloom was offset by the second bloom, resulting in an increase in the share of the latter, reaching 32% and 28%, respectively. Together, in the citrus belt, the first and second blooms account for a significant 82% of the crop. The third bloom represents 11%, and as previously mentioned, the fourth bloom accounts for 7% of the total.



Graph 2 – Distribution of fruits per bloom in each region

Picture 2 below shows the classification standard for fruits in this crop season for the different varieties also including late blooming flowers.

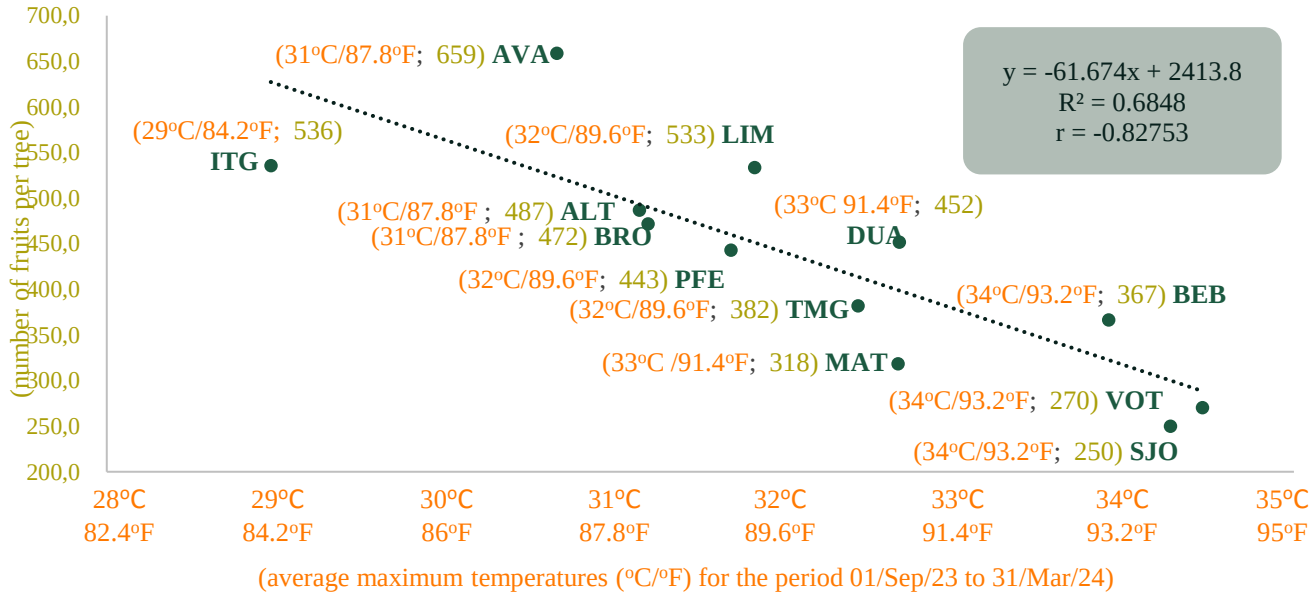
[3] SENTELHAS, P.C. Agrometeriologia dos citros. In: MATTOS JUNIOR, D.; DE NEGRI, J.D.; PIO, R.M.; POMPEU JUNIOR, J. (Org). Citros. Campinas: IAC/FUNDAG, 2005. P. 319-344.
[4] GUARDIOLA, J.L. 1997. Overview of flower bud induction, flowering and fruit set, p.5-21. In: Futch, S.H and Kender, W.J. (eds). Citrus flowering and fruit short course. Citrus Res. And Ed. Center, Lake Alfred, Fla.



Picture 2 – Classification standard by bloom for each variety

Therefore, the data shows that, once again, the climate emerges as the main cause of the significant drop in production. Since June 2023, the citrus belt has been affected by the El Niño phenomenon, classified by the World Meteorological Organization (WMO) as one of the five most intense ever recorded. The previous most recent event, even more severe than the current one, occurred in 2015, exerting a severe impact on the subsequent 2016-2017 crop. During this period, there was an 18% drop in production, resulting in 245.31 million boxes harvested. This season, the combination of high temperatures, high evapotranspiration rates and an intense water shortage in the citrus belt during the crucial period of flowering and fruit setting resulted in a low number of fruits per tree. The relation between the number of fruits per tree and the average maximum temperature in the different regions of the citrus belt becomes evident in Graph 3.

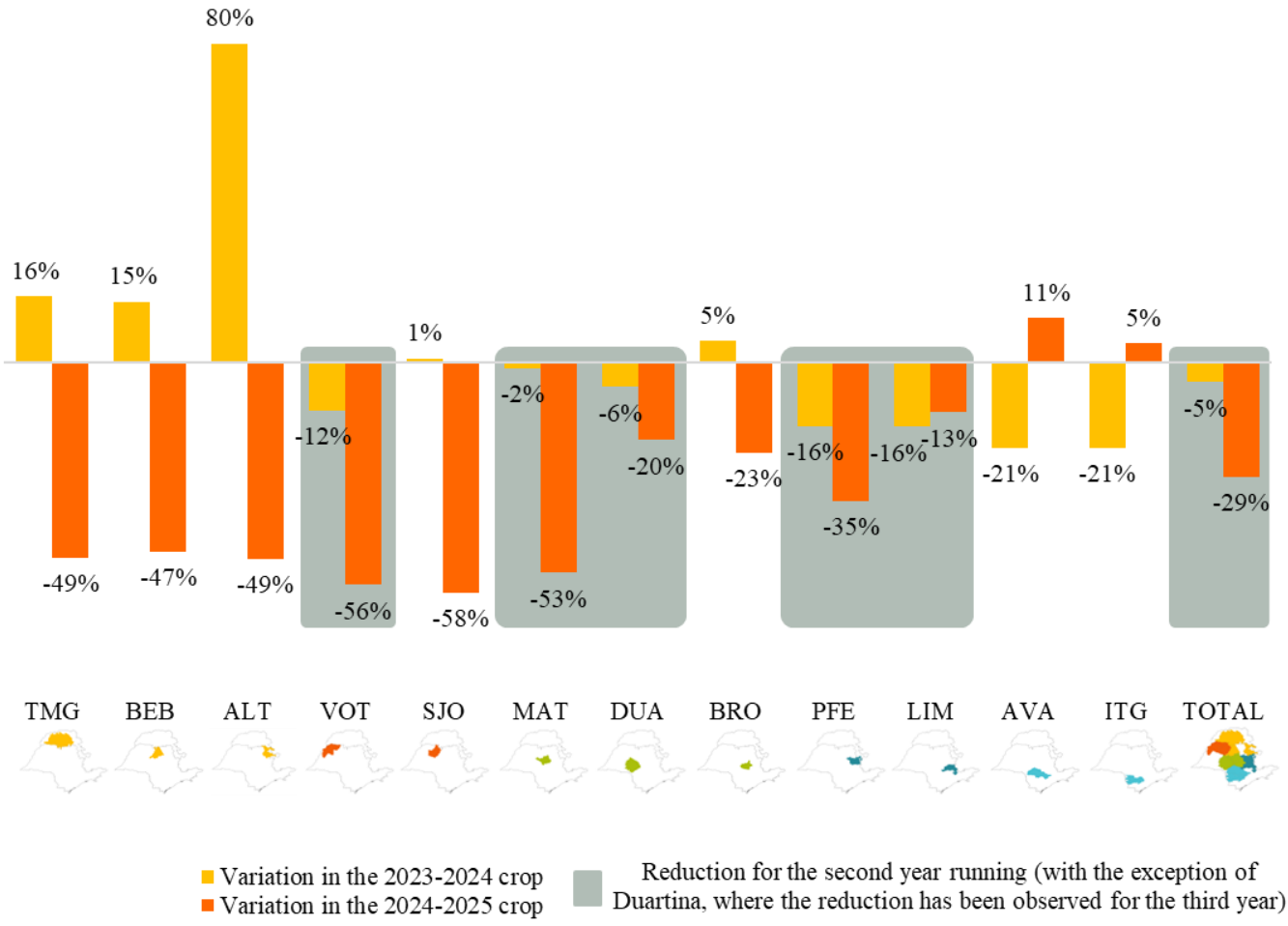
The correlation coefficient obtained in the regression analysis is -0.83, pointing to a strong and inverse correlation between the two variables, evidencing that as the temperature rises, the number of fruits per tree drops.



Graph 3 – Negative correlation between maximum temperatures and the number of fruits per tree in each region

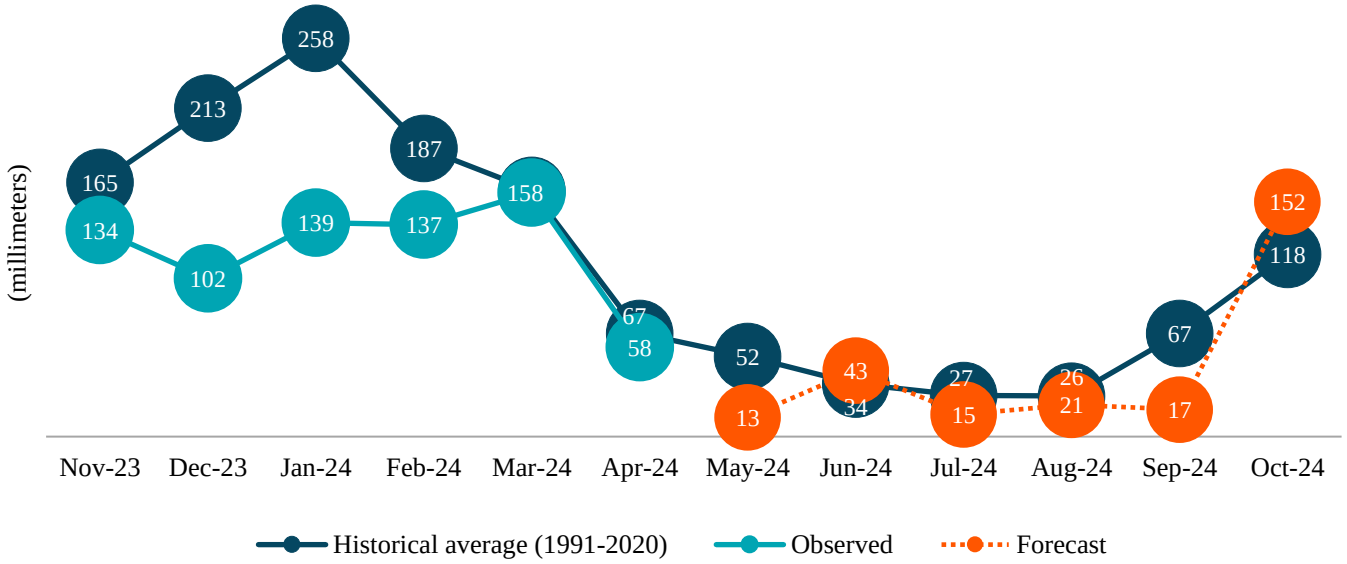
The unfavorable climatic conditions triggered a drop in the number of fruits per tree for the second consecutive year, marking yet another negative cycle. This year, the reduction was even more pronounced, reaching an average of 29%, as compared to the 5% recorded in the previous crop. This consecutive drop represents a break in the biennial cycle, characterized by alternating high and low fruit loads.

As shown in Graph 4, five regions in the citrus belt - Votuporanga, Matão, Duartina, Porto Ferreira and Limeira - experienced a decrease in fruit load for the second year, while seven regions - Triângulo Mineiro, Bebedouro, Altinópolis, São José do Rio Preto, Brotas, Avaré, and Itapetininga - showed an alternation from positive to negative. Only the Southwest regions - Avaré and Itapetininga - recorded an increase in the number of fruits in this crop. This growth is directly linked to more favorable climatic conditions as compared to other regions in the citrus belt, as well as to the accumulation of reserves due to the low production last season.



Graph 4 – Variation in the number of fruits per tree in each region

In addition to the already observed climatic adversities, which resulted in a reduction in the number of fruits per tree, the forecast of drier weather over the next six months is expected to continue impacting the crop, further hindering fruit growth and increasing the challenge of keeping groves supplied with water even where irrigation systems are installed. According to data from Climatempo, shown in Graph 5 the expected rainfall should be 20% below the historical average of the accumulated volume from May to October 2024. This condition was incorporated into the regression model used to project fruit size.



Graph 5 – Rainfall observed from November 2023 to April 2024 and forecast for May to October 2024

At the time of fruit stripping, fruits have an average weight of approximately 96 grams, slightly greater than in the same period of the last crop, when they weighed an average of 90 grams. This is because most of the fruits result from the first bloom, which occurred in August, while in the previous crop, most resulted from the second bloom, which occurred in October. Therefore, the fruits in this crop are, on average, two months ahead as compared to those in the previous crop. Additionally, the number of fruits per tree is lower, reducing competition among them. This results in greater availability of carbohydrates, nutrients, and water for fruit growth.

Thus, the projected weight of oranges at harvest is 169 grams/5.96 ounces (241 fruits per box), representing an increase of 6% as compared to the average weight of 160 grams/5.64 ounces recorded in the previous crop (255 fruits per box) and 4% above the average weight of the last 10 crops (162 grams/5.73 ounces, resulting in 251 fruits per box). The regression model used to project the average fruit size is explained in section "2.4 - Fruits per Box".

Although this crop has a smaller volume of fruit to be harvested, and a high proportion of fruit from the first bloom, the early fruit drop rate is expected to remain high and is projected at 18.5%, just 0.5 percentage point lower than in the previous crop. The main reason for that is the increased intensity of citrus greening, which in the previous crop was responsible for 8.35 percentage points of the total 19% early drop, resulting in an estimated loss of 32 million boxes solely due to the disease. Additionally, other factors are expected to continue impacting this season, such as fruit fly and fruit borer attack, fruit peel cracking, especially in regions with higher water shortage, as there is a higher share of fruits from the fourth bloom, and fruit drop caused by mechanical damage resulting from frequent machinery movement in plots with high density of plants.

At this point in the crop season, it is already possible to observe early fruit drop, especially in early varieties, in groves with a higher incidence of citrus greening and in trees contaminated by the disease, especially at the edges of plots, where there is a higher concentration of symptomatic plants. Other factors contributing to fruit loss include citrus black spot and infestations of fruit flies and fruit borers. Occasionally, in some locations in the North and Northwest sectors, atypical fruit drop has also been observed due to the infestation of Black parlatoria scale (BPS). This early drop is also associated with the advanced ripening of the fruit, which was accelerated by the heat and the earliness of the main bloom. Despite the internal

ripening, fruits still have a greener peel than normal for this time of year, due to the lack of cold nights, which are essential for the skin pigmentation process to take place.

The average yield this season is 691 boxes per hectare and 1.38 boxes per tree, a decrease of 24.14% as compared to the 911 boxes per hectare and 1.81 boxes per tree harvested in the 2023-2024 crop.

When analyzing yield by variety, a sharp drop of 37.3% in production of the Hamlin, Westin and Rubi varieties stands out. The other early varieties, along with Pera, Valencia and Folha Murcha, showed yield drops similar to the average for the citrus belt, of approximately 24%. On the other hand, the yield of the Natal variety remained stable, with a slight decrease of only 1.9%. It's worth remembering that the Natal variety recorded the greatest drop in yield last season, but now it stands out for presenting the smallest decrease. Tables 1 and 2 show the yields by variety and the variations in relation to the previous season.

Table 1 – Yield per hectare and variety for the 2019-2020 crop to the 2024-2025 crop[e]

Group of varieties	2019-2020	2020-2021	2021-2022	2022-2023	2023-2024	2024-2025[e]
	(boxes/ hectare)	(boxes/ hectare)	(boxes/ hectare)	(boxes/ hectare)	(boxes/ hectare)	(boxes/ hectare)
Hamlin, Westin and Rubi…	1,319	797	819	1,021	1,047	657
Other earlies.....	1,121	827	804	925	987	755
Subtotal for earlies.....	1,273	804	815	998	1,032	683
Pera Rio.....	943	671	653	811	837	625
Valencia and V.Folha Murcha.	998	739	838	940	969	754
Natal.....	1,082	803	734	978	738	724
Total.....	**1,045**	**737**	**760**	**912**	**911**	**691**

[e] Estimate

Table 2 – Variation in yield per hectare for varieties as compared to previous season's

Group of varieties	2020-2021 in comparison to 2019-2020		2021-2022 in comparison to 2020-2021		2022-2023 in comparison to 2021-2022		2023-2024 in comparison to 2022-2023		2024-2025[e] in comparison to 2023-2024	
	(boxes/ hectare)	%	(boxes/ hectare)	%	(boxes/ hectare)	%	(boxes/ hectare)	%	(boxes/ hectare)	%
Hamlin, Westin and Rubi…	-522	-39.6%	22	2.8%	202	24.7%	26	2.5%	-390	-37.3%
Other earlies.....	-294	-26.2%	-23	-2.8%	121	15.0%	62	6.7%	-232	-23.5%
Subtotal for earlies.....	-469	-36.9%	11	1.4%	183	22.5%	34	3.4%	-349	-33.8%
Pera Rio.....	-272	-28.8%	-18	-2.7%	158	24.2%	26	3.2%	-212	-25.3%
Valencia and V.Folha Murcha.	-259	-26.0%	99	13.4%	102	12.2%	29	3.1%	-215	-22.2%
Natal.....	-279	-25.8%	-69	-8.6%	244	33.2%	-240	-24.5%	-14	-1.9%
Total.....	**-308**	**-29.5%**	**23**	**3.1%**	**152**	**20.0%**	**-1**	**-0.1%**	**-220**	**-24.1%**

[e] Estimate

Regarding yield by sector, the main highlight is the Southwest, which includes the regions of Avaré and Itapetininga. It is expected that this region will achieve the highest yield in the citrus belt, with 979 boxes per hectare, representing an increase of 25.3% as compared to the previous crop. Should this projection hold true, the Southwest will regain its leadership position, lost only in the last season, among the ten crop forecasts carried out by Fundecitrus. The sector facing the most challenging situation is the Northwest, comprising the regions of Votuporanga and São José do Rio Preto. In that locality, considerably low yield is expected, reaching only 392 boxes per hectare, representing a yield drop of 57.9% as compared to the previous crop, which is the most pronounced yield drop in the citrus belt. Tables 3 and 4 present yields by sector and variations in relation to the previous season.

Table 3 – Yield per hectare of sectors for the 2019-2020 crop to the 2024-2025 crop[e]

Sector	2019-2020	2020-2021	2021-2022	2022-2023	2023-2024	2024-2025[e]
	(boxes/ hectare)	(boxes/ hectare)	(boxes/ hectare)	(boxes/ hectare)	(boxes/ hectare)	(boxes/ hectare)
North.....	1,070	648	804	868	1,117	601
Northwest.....	924	468	646	750	932	392
Central.....	1,032	667	729	928	879	632
South.....	936	725	699	926	831	676
Southeast.....	1,217	1,106	869	1,008	782	979
Total.....	**1,045**	**737**	**760**	**912**	**911**	**691**

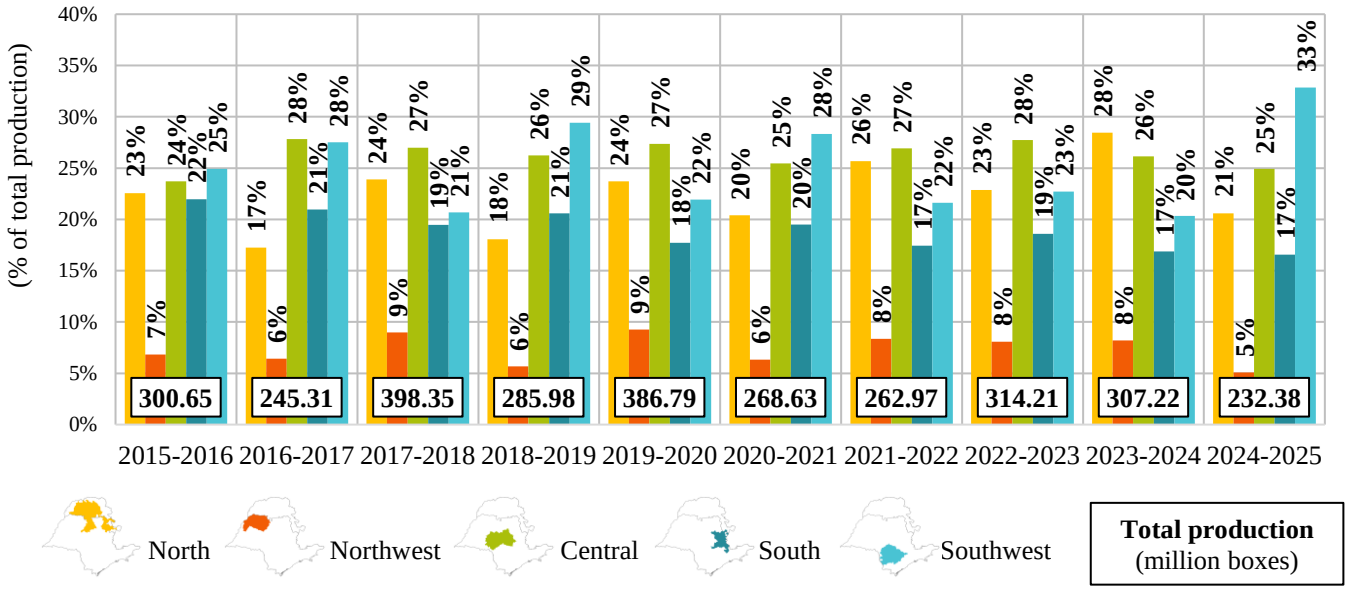
[e] Estimate

Table 4 – Variation in yield per hectare of sectors in relation to the previous crop season's

Sector	2020-2021 in comparison to 2019-2020		2021-2022 in comparison to 2020-2021		2022-2023 in comparison to 2021-2022		2023-2024 in comparison to 2022-2023		2024-2025[e] in comparison to 2023-2024	
	(boxes/ hectare)	%	(boxes/ hectare)	%	(boxes/ hectare)	%	(boxes/ hectare)	%	(boxes/ hectare)	%
North.....	-422	-39.4%	156	24.1%	64	8.0%	249	28.7%	-516	-46.2%
Northwest.....	-456	-49.4%	178	38.0%	104	16.1%	182	24.3%	-540	-57.9%
Central.....	-365	-35.4%	62	9.3%	199	27.3%	-49	-5.3%	-247	-28.1%
South.....	-211	-22.5%	-26	-3.6%	227	32.5%	-95	-10.3%	-155	-18.7%
Southwest.....	-111	-9.1%	-237	-21.4%	139	16.0%	-226	-22.4%	197	25.3%
Total.....	**-308**	**-29.5%**	**23**	**3.1%**	**152**	**20.0%**	**-1**	**-0.1%**	**-220**	**-24.1%**

[e] Estimate

As shown in Graph 6, the distribution of production among sectors shows significant changes. The Southwest stands out with a substantial increase, from 19% to 33%. The Central sector, on the other hand, remains stable, with a slight reduction from 26% to 25%. However, the North suffers a considerable drop, from 29% to 21%. Meanwhile, the South maintains a similar proportion, with a slight variation from 16% to 17%. Finally, the Northwest records the most significant change, decreasing from 10% to 5%. This data shows a significant redistribution of production among the different sectors.



Graph 6 – Share of sectors in total orange production in the 2015-2016 to 2024-2025 crops

2 – OBJECTIVE SURVEY METHOD FOR THE ORANGE CROP FORECAST

In order to perform this estimate, the objective method used in previous crop seasons was maintained, which is based on quantitative data – field measurements, counting and weighing of fruit – applied to the equation represented below.

$$\text{Forecast production} = \frac{\text{Bearing trees} \times \text{Fruit per tree} \times (1 - \text{Drop rate \%}) \times (1 - \text{CF \%})}{\text{Fruit per box}}$$

where CF is the correction factor

Compiled results from the tree inventory and fruit stripping obtained throughout the survey were restricted, until the date of this publication, to the following professionals: Antonio Juliano Ayres (Fundecitrus general manager); Fernando Alvarinho Delgado (technical supervisor); Roseli Reina (specialist); Vinícius Gustavo Trombin (executive coordinator linked to Markestrat); Marcos Fava Neves (political-institutional and methodological coordinator linked to Markestrat and Part-time Full Professor at FEA-RP/USP); and José Carlos Barbosa (methodology analyst and Voluntary Full Professor at the department of Math and Science of FCAV/Unesp).

All of them were subject to confidentiality obligations with regard to PES information before its announcement was made public, according to agreements signed between each of them and Fundecitrus. As for antitrust practices, they were all complied with through the adoption of measures necessary to prevent any communication or sharing of individual information with competitive content among the orange juice companies that collaborate with Fundecitrus in this project or between these and citrus growers.

Together with Fundecitrus president Lourival Carmo Monaco, the crop forecast was finalized on May 10, 2024, at 9:30 a.m., in an in-person meeting at Fundecitrus, with no external communication channel beyond participants. This year Professor Marcos Fava Neves participated by videoconference in only the presentation and discussion of the data. Following that, at 10 a.m., Fundecitrus president began the public announcement of the crop forecast at the Fundecitrus auditorium in Araraquara - SP, broadcast live at the Fundecitrus channel on YouTube (www.youtube.com/fundecitrus). Next, Fundecitrus general manager, Antonio Juliano Ayres and the Crop Forecast Survey coordinator, Vinícius Trombin, presented the detailed data. After the crop forecast announcement, this report was made available on the Fundecitrus website.

2.1 – BEARING TREES

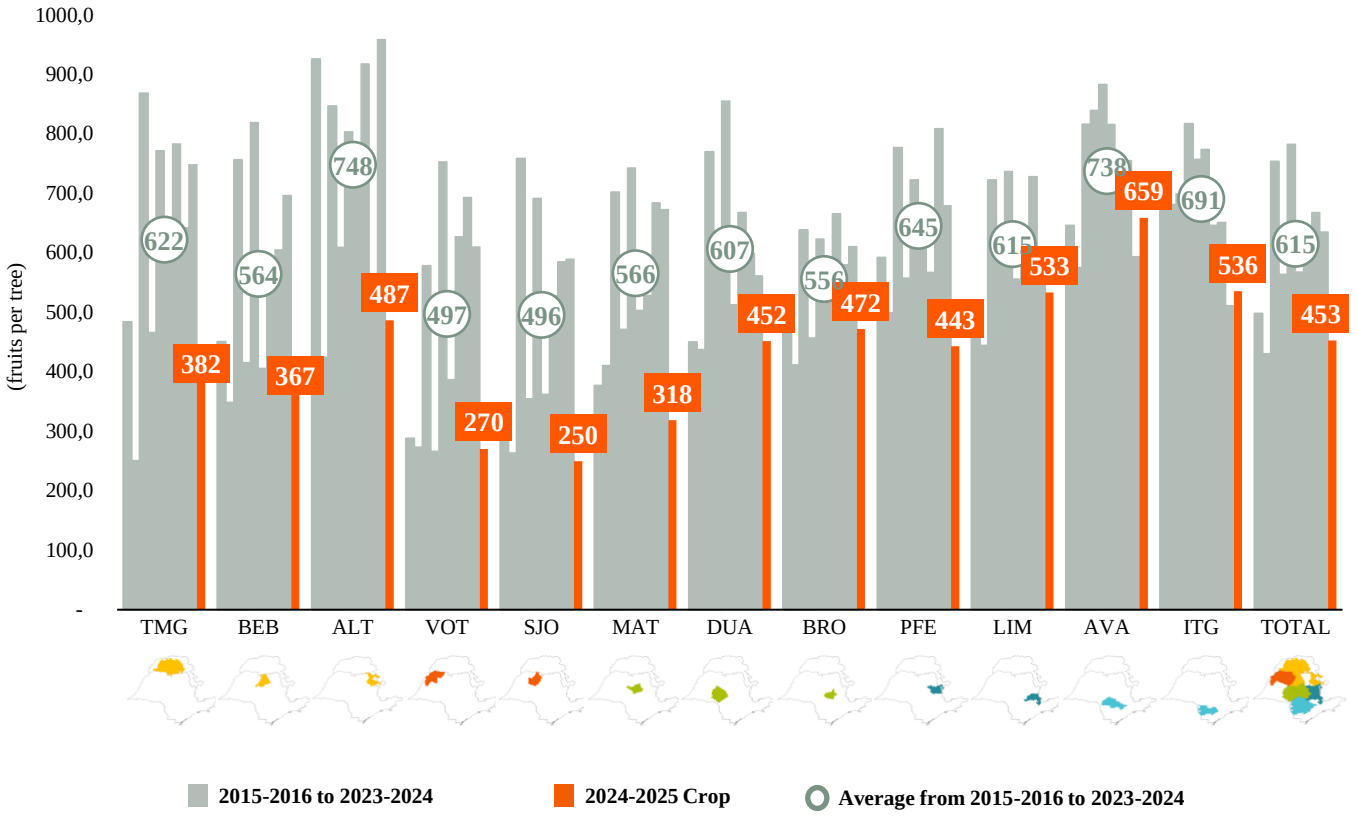
Bearing trees total 168.54 million and occupy an area of 336,267 hectares in this crop season. These figures represent a decrease of 748 thousand trees, equivalent to 0.44% above the 2023 inventory and a decrease in the bearing area of 0.24%.

Varieties included in this forecast are present in 97% of the area of orange groves in the citrus belt. Information on bearing trees was obtained from the “Tree inventory of the São Paulo and West-Southwest Minas Gerais citrus belt: Snapshot in March 2024”, taken from the 2022 primary base – created by mapping groves from August 16, 2021 to January 28, 2022 – and from counting existing trees in approximately 5% of orange plots from January 08 to March 08, 2024.

2.2 – FRUIT PER TREE

The average number of fruits per tree in April 2024, without considering the drop that occurs throughout the season, is 453, which represents a decrease of 28.66% in relation to the previous crop. The average number of fruits per tree may have a variation of plus or minus 11 units, which is equivalent to ± 2.3% of the average number of fruits per tree at stripping. This figure is within the expected error of 2% to 3% used in sizing the sample.

Graph 7 shows the number of fruits per tree at stripping from 2015 to 2024, separately for the 12 regions. Data precision for regions is smaller than that of the general average due to a lower number of samples per stratum. The error in the average number of fruits per tree is ± 9.2% in the Triângulo Mineiro, ± 8.3% in Bebedouro, ± 9.7% in Altinópolis, ± 13.8% in Votuporanga, ± 11.9%; in São José do Rio Preto, ± 8.5% in Matão, ± 6.0% in Duartina, ± 10.9% in Brotas, ± 7.3% in Porto Ferreira, ± 6.9% in Limeira, ± 5.8% in Avaré, and ± 8.6% in Itapetininga.

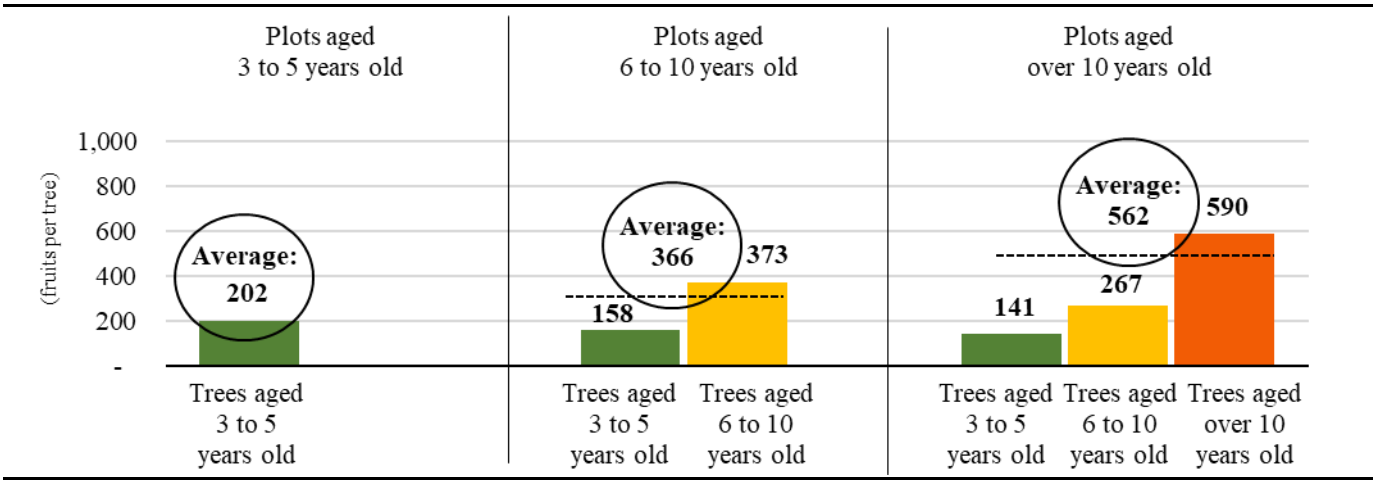


Graph 7 – **Number of fruits per fruit-stripped tree by region from 2015 to 2024**

For the forecast calculation, fruits from the first, second and third blooms were considered in full. A fruit set rate of 33% was applied to fruits from the fourth bloom. In this crop there was an uncommon phenomenon at the fourth bloom, which peaked a month after the usual time, between late February and early March 2024. As a result, fruits were at an initial developmental stage during stripping, presenting a smaller size than what it typically is, and varying from 5 to 15 millimeters. For that reason, their setting rate is presumed to be lower than that considered in the previous crop. Furthermore, a total of 227 trees still presented flowers at stripping. In order to take the flowers and fruits from the fourth bloom into account when estimating the number of fruits per tree, it was considered that 10% of the flowers would turn into fruitlets, to which a setting rate of 33% was applied, resulting in a conversion rate of flowers into fruits of approximately 3%.

In the separation of fruits per bloom, off-season fruits were also identified and resulted from late and sporadic flowers from the previous crop season, not accounted for in the current crop forecast.

Three to five-year-old plots present yield of 202 fruits per tree this crop season. For six to 10-year-old plots, an average of 366 fruits per tree is estimated, with 373 fruits per tree for original plantings and 158 fruits per tree for three to five-year-old resets. Plots over 10 years old have an average of 562 fruits per tree and a yield of 590 fruits per tree for original plantings, 267 fruits per tree for six to 10-year-old resets and 141 fruits per tree for three to five-year-old resets. Yield rates are presented in Graph 8.



Ages and planting years: 3 – 5 years (2019 to 2021), 6 – 10 years (2014 to 2018) and over 10 years (2013 and previous years)
Graph 8 – **Age-stratified number of fruits per tree in the plot**

An average of 493 fruits per tree for the late Natal variety; 485 were counted for the group of earlies Hamlin, Westin and Rubi; 482 fruits per tree for the late season Valencia and Valencia Folha Murcha varieties; 450 fruits per tree for other earlies and 401 fruits per tree for the mid-season Pera Rio variety.

The stratification of the data considering the presence or absence of an irrigation system in the plot shows that the trees of irrigated groves present, in this crop, 24% more fruits compared to the trees in rainfed groves. The distinction between the impact of irrigation and the effect of climatic conditions has become more complex this season. The complexity is greater because the regions with the highest number of irrigated trees are in towards the North of the citrus belt, which have suffered the most from adverse climate and therefore have the lowest fruit loads. For this reason, it was decided to use the simple arithmetic mean to compare the average number of fruits from irrigated plots with those from non-irrigated plots. It is therefore necessary to limit the analysis to stratification by region.

However, it is important to emphasize that this analysis is merely exploratory and is not an experiment aimed at proving the contribution of irrigation to productivity. This analysis was limited only to tabulating data based on the presence or absence of an irrigation system, without considering specific information on irrigation use. The conclusion that irrigation is responsible for the increase in fruit production (25% more) cannot be drawn solely on the basis of this exploratory analysis. Therefore, this assessment points to a higher fruit load in irrigated plots as compared to non-irrigated plots in the same region, but more in-depth studies, considering additional variables and employing an appropriate experimental design, can provide more conclusive and reliable results regarding the impact of irrigation.

The method used consists in fruit stripping, that is, the advanced harvest of all fruits in the tree, regardless of the bloom they are from. In this crop season, fruits were stripped from trees from March 14 to April 26, 2024. Fruits harvested were taken to a fruit stripping laboratory in Araraquara, where each sample was separated into the different blooms it was from. Fruits were quantified by automatic counting equipment and then weighed. Sample size was 2,560 trees selected by a drawing. The sample size has returned to 2,560

trees randomly drawn, after four years of its being 1,560 trees. The decrease occurred during the Covid-19 pandemic and did not compromise the overall accuracy. However, due to the increased incidence of greening, it was decided to return to the original sample size of the crop forecast survey (PES) sampling method, aiming to ensure greater reliability in the strata. An initial drawing by the method of stratified random sampling included 2,200 trees distributed proportionally amongst all orange trees in the citrus belt and stratified according to their region, variety and age. An additional drawing included 360 resets of ages lower than the age groups of their groves. These resets correspond to replacements made mainly to offset tree losses caused by citrus greening, citrus blight, gomosis and other diseases. The tree population in this last drawing comprises plots that were counted in full to update the inventory and that meet the stratification criteria.

The stratification factor "region" is comprised of 12 groups encompassing the 320 cities where there are farms with mature orange groves. In addition to the subdivision into the 12 regions, the following charts present the five subdivisions of the factor "variety" and the six subdivisions of the factor "age". Combinations of these factors result in 360 strata.

Chart 1 – Regions of the citrus belt included in the drawing, by sector

Sector	Region	Abbreviation
North.....	Triângulo Mineiro	TMG
	Bebedouro	BEB
	Altinópolis	ALT
Northwest.....	Votuporanga	VOT
	São José do Rio Preto	SJO
Central.....	Matão	MAT
	Duartina	DUA
	Brotas	BRO
South.....	Porto Ferreira	PFE
	Limeira	LIM
Southwest.....	Avaré	AVA
	Itapetininga	ITG

Chart 2 – Variety groups included in the drawing, by maturity time

Maturity time	Variety group
Early.....	Hamlin, Westin and Rubi
Other early.....	Valencia Americana, Seleta, Pineapple and Alvorada
Mid-season.....	Pera Rio
Late.....	Valencia and Valencia Folha Murcha
	Natal

Chart 3 – Age groups from the combined age of plots and age of trees

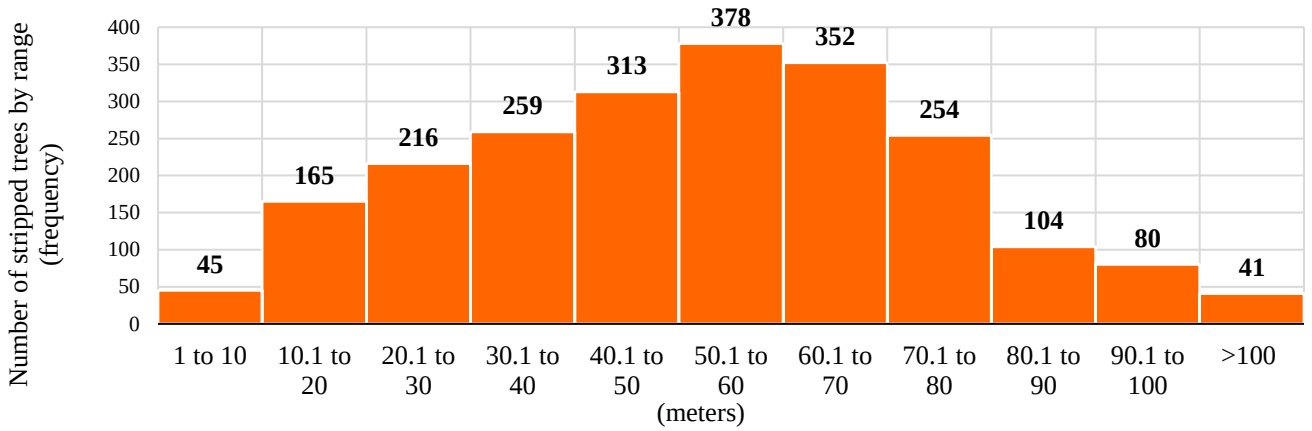
Age of plots[1]	Age of trees
3 to 5 years.....	3 to 5 years
6 to 10 years.....	3 to 5 years
6 to 10 years.....	6 to 10 years
Over 10 years.....	3 to 5 years
Over 10 years.....	6 to 10 years
Over 10 years.....	Over 10 years

[1] Ages and planting years: 3 to 5 years (2019 to 2021), 6 to 10 years (2014 to 2018) and over 10 years (2013 and previous years)

For the 2,200 trees in the first drawing, the location in the plot of the tree to have fruit stripped from is predetermined and varies every crop season. This makes the selection of the tree unbiased, that is, free from interference of the survey agent. Otherwise, the choice could be skewed towards trees with more or less fruit. For the 2024-2025 crop, the tree in the drawn plot was the one located in the 25th planting hole in the 15th row. If there was a vacancy or dead tree in that position, or yet a tree of an age different from that of trees originally planted in the plot, the third plant down was selected. Should that situation repeat itself,

three more plants down were counted, until a tree of the drawn age was found. If the plot did not have 15 or more planting rows, the counting restarted in the existing rows until number 15 was reached. For the second drawing of 360 resets, the tree was found in the plot after visual aspects were considered, such as trunk circumference and size of canopy.

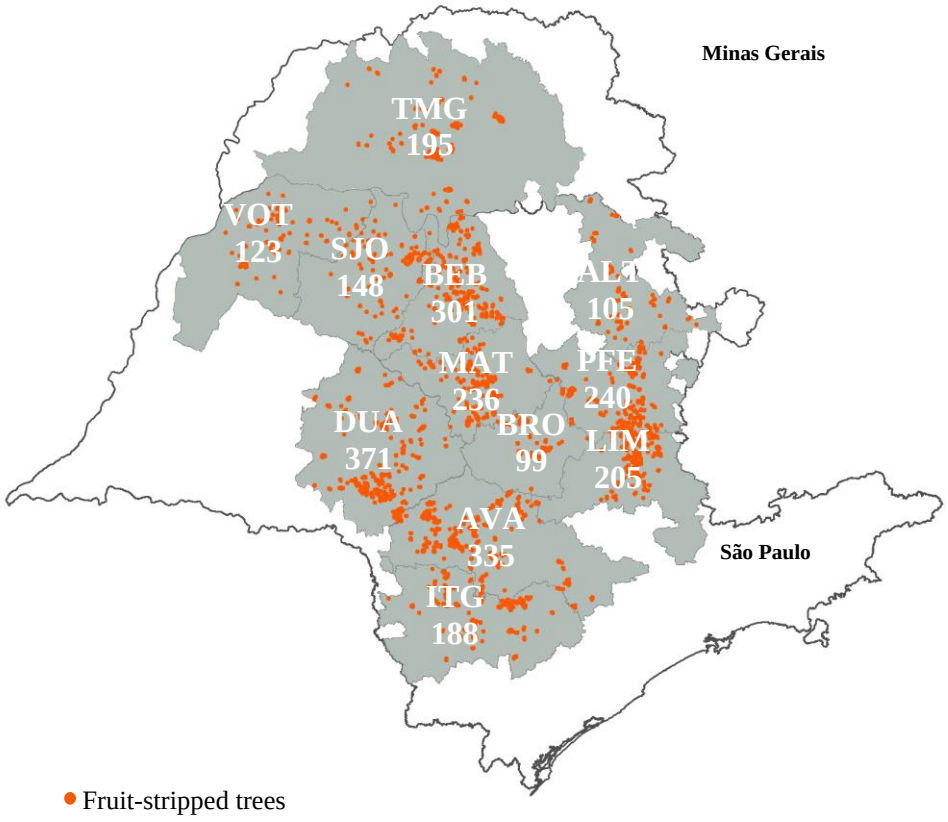
Graph 9 presents the distance (in meters) from the fruit-stripped tree originally planted in the plot to the nearest border of the plot, which shows the majority of classes with similar frequencies, with a central figure between 40 and 70 meters of distance from the fruit-stripped tree to the nearest border.



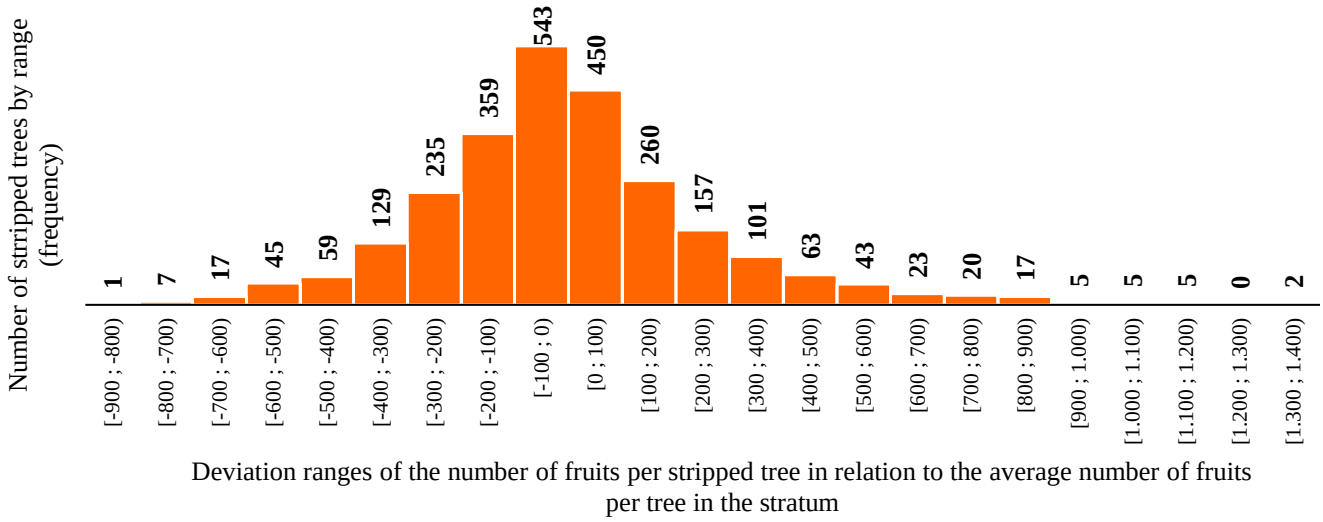
Graph 9 – Histogram of distances from the fruit-stripped tree to the nearest border of the plot

Figure 1 shows the location and number of fruit-stripped trees in each sector of the citrus belt.

Figure 1 – Location and total number of fruit-stripped trees per region



The yield deviation distribution analysis for each fruit-stripped tree in relation to the stratum average shows that sample data are randomly distributed according to a normal distribution, as presented in Graph 10. Out of the total samples, fourteen were discarded upon showing great discrepancy in relation to the others.



Graph 10 – Histogram of deviations of fruits per tree at stripping

Graph 11 shows the dispersion of deviations of each fruit-stripped tree in relation to the stratum average. It is observed that 95% of samples fall within the average (453 fruits) ± 2 standard deviations.

Graph 11 – Deviation on the number of fruits at each stripping in relation to the stratum average

The tree harvested upon permit from citrus growers is indemnified at R$ 60.00 through an online payment system where citrus growers can register and redeem the amount due.

2.3 – DROP RATE – fruit drop index from tree stripping to final plot harvest

The projected average drop rate is 18.50%, distributed as follows: 9.50% for the early Hamlin, Westin and Rubi varieties, 10.70% for other early varieties, 18.40% for the mid-season Pera Rio variety, 22.70% for the late Valencia and Valencia Folha Murcha varieties, and 23.90% for the late Natal variety. This rate is applied to the number of fruits in the tree in April 2024, when fruits were stripped. The result of this calculation is the estimate of the number of fruits that will be available in the tree at harvest, since part of the oranges in the tree in the beginning of the crop season will fall due to physiological drop, damage caused by machines, pests and diseases, and adverse climatic conditions. As shown in Table 5, the South sector has the highest drop rate at an average 21.20%, whereas the North sector has the lowest one at 15.10%.

Table 5 – Projected fruit drop rates by sector and variety

Group of varieties	Sector					
	North	Northwest	Central	South	Southwest	Total
	(percentual)	(percentual)	(percentual)	(percentual)	(percentual)	(percentual)
Hamlin, Westin and Rubi……..	8.30	12.10	10.40	12.10	8.10	**9.50**
Other earlies.....	8.00	14.90	10.90	17.10	8.90	**10.70**
Pera Rio.....	15.50	13.00	22.10	19.80	16.90	**18.40**
Valencia and V. Folha Murcha..	21.20	24.10	24.20	25.00	21.10	**22.70**
Natal.....	12.90	23.30	22.10	27.20	27.20	**23.90**
Total.....	**15.10**	**16.10**	**19.90**	**21.20**	**18.30**	**18.50**

Monthly and continuous monitoring carried out by Fundecitrus as of May 2024 in 1,200 orange plots visited up to their complete harvest serves as basis to correct the drop rate projected at the time of this publication and consequently to correct the production estimate as well.

2.4 – FRUIT PER BOX – fruit size, that is, number of oranges to reach the weight of 40.8 kg (box) at harvest

The final fruit size projection is 241 fruits per 40.8 kg box (169 grams/5.96 ounces per fruit), namely 281 fruits per box for the group of early varieties comprising Hamlin, Westin and Rubi (145 grams/ 5.12 ounces per fruit), 249 fruits per box for the group of other early varieties (164 grams/5.78 ounces per fruit), 247 fruits per box for the mid-season Pera Rio variety (165 grams/5.83 ounces per fruit), 218 fruits per box for the late Valencia and Valencia Folha Murcha varieties (187 grams/6.60 ounces per fruit), and 232 fruits per box for the late Natal variety (176 grams/6.20 ounces per fruit). Table 6 presents projected fruit sizes by variety and sector.

Table 6 – Projected fruit sizes by sector and variety

Group of varieties	Sector					
	North	Northwest	Central	South	Southwest	Total
	(Fruits estimated per box)	(Fruits estimated per box)	(Fruits estimated per box)	(Fruits estimated per box)	(Fruits estimated per box)	(Fruits estimated per box)
Hamlin, Westin and Rubi……..	281	275	277	288	282	**281**
Other earlies.....	244	240	240	262	265	**249**
Pera Rio.....	239	245	251	255	244	**247**
Valencia and V. Folha Murcha..	202	217	224	229	216	**218**
Natal.....	222	241	235	241	230	**232**
Total.....	**235**	**242**	**244**	**249**	**239**	**241**

The final fruit size was estimated by a regression model that considered the final fruit size (fruits per box at harvest) as the dependent variable, and the number of fruits per tree counted at stripping, the initial fruit size (fruits per box at stripping), the sum of the production percentages of the first and second blooms in relation to the total production and the rainfall accumulated from May to July as independent variables. Data from eleven crops, 2012-2013 to 2023-2024, were used in the regression and are presented in Table

6. Data from the 2021-2022 crop were not used because that was a period of totally atypical climate conditions, with the worst drought in almost a century and high-intensity frosts. The result obtained shows an adjusted R^2 of 0.89. This means that the four independent variables together explain 89% of the variation in the final fruit size (fruits per box at harvest), which shows how important these variables are for the final fruit size. The comparison between the final fruit size estimated by this model and the final fruit size observed in these eleven crops presents an average absolute error of 2.4%.

Data relative to final fruit size (fruits per box at harvest), number of fruits per tree counted at stripping, initial fruit size (fruits per box at stripping), the sum of the production percentages from the first and second blooms in relation to the total production for the series from 2012-2013 to 2014-2015 were provided by orange juice companies associated to Fundecitrus – Citrosuco, Cutrale and Louis Dreyfus –, which separately have estimated the production for the citrus region since 1988, with the use of objective methodology. Data were supplied individually and under a formal confidentiality agreement to an independent consulting firm for the determination of the average. Individual data supplied by each company were kept confidential. Data relative to the 2015-2016 to 2024-2025 crops come from results of estimates developed by Fundecitrus. Data on rainfall accumulated from May to July were supplied by Somar Meteorologia/Climatempo.

Data used in the model to estimate the final fruit size in this crop comprise figures from the 2024 stripping and the rainfall from May to July 2024 in a volume equivalent to 70 millimeters (Climatempo forecast). This size (243 fruits per box) obtained in the first regression was corrected by the second regression that used the observed size as the dependent variable and the estimated size as the independent variable, resulting in a projection of 241 fruits per box.

Table 7 – Data for the 2012-2013 crop to the 2023-2024 crop used to estimate the final fruit size in the 2024-2025 crop

Crop	Fruits per tree at stripping	Initial fruit size at stripping	Sum of productions from first and second blooms	Accumulated rainfall from May to July	Final fruit size observed at harvest	Final fruit size estimated by the model	Error	Absolute error
	(number)	(fruits/box)	(%)	(millimeters)	(fruits/box)	(fruits/box)	(%)	(%)
2012/13....	764	439	95%	268	250	236	-5%	5%
2013/14....	515	338	87%	247	224	220	-2%	2%
2014/15....	646	373	92%	102	256	245	-4%	4%
2015/16....	498	391	90%	204	226	233	3%	3%
2016/17....	430	358	90%	214	222	224	1%	1%
2017/18....	753	393	91%	184	246	251	2%	2%
2018/19....	564	446	82%	36	259	254	-2%	2%
2019/20....	783	411	94%	95	261	265	1%	1%
2020/21....	568	511	85%	96	258	253	-2%	2%
2022/23....	668	462	86%	59	256	264	3%	3%
2023/24....	635	452	82%	90	255	255	-0,1%	0.1%
2024/25....	453	426	82%	70	(X)	243	(X)	(X)

Sources: Fundecitrus (2015-2016 crop to 2024-2025 crop), CitrusBr (2012-2013 crop to 2014-2015 crop), Climatempo
(X) Not applicable

The result of the equation used in the crop estimate is corrected by the application of a correction factor. That is necessary because of variables not accounted for in the calculations, such as harvested fruits that wind up not being used, diverse planting densities that are not considered in the stratification of groves, and losses of trees throughout the crop season caused by eradications, abandonments or deaths. The correction factor of 0.10 applied in this crop is the same used since the 2017-2018 crop, which represents the average of the indexes for the 2015-2016 and 2016-2017 crops estimated by Fundecitrus.

3 – TABLES OF DATA

The following tables present the 2024-2025 orange crop forecast per sector, age, bloom and variety. The margin of error of the production estimate in the strata is higher than that of the production estimate in the citrus belt as a whole. Possible subsequent variations in fruit size and fruit drop rate may change the forecast and will be accounted for throughout the crop season by ongoing field monitoring for production estimate updates.

Table 8 – 2024-2025 Orange crop forecast by sector

Sector	Mature groves area	Average density[1] of mature groves	Bearing trees	Fruit per tree at stripping[2]	2024-2025 Orange crop forecast		
					Per tree	Per hectare	Total
	(hectares)	(trees/ hectare)	(1,000 trees)	(number)	(boxes/ tree)	(boxes/ hectare)	(1,000,000 boxes)
North.....	79,706	484	37,829.00	386	1.27	601	47.87
Northwest.....	30,181	500	14,682.62	258	0.81	392	11.84
Central.....	91,572	539	48,003.81	409	1.21	632	57.90
South.....	56,898	511	28,046.20	482	1.37	676	38.46
Southwest.....	77,910	532	39,981.04	619	1.91	979	76.31
Total.....	**336,267**	**516**	**168,542.67**	**453**	**1.38**	**691**	**232.38**

[1] Calculation considers the total number of trees in the plot, that is, bearing and non-bearing trees (2022 and 2023 resets)
[2] Weighted average per total stratum fruit

Table 9 – 2024-2025 Orange crop forecast by tree age group (continues below)

Age of plots	Mature groves area	Average density[1] of mature groves	Bearing trees by age group				Fruit per tree at stripping by age group of trees[2]			
			3 – 5 years	6 – 10 years	Over 10 years	Total	3 – 5 years	6 – 10 years	Over 10 years	Total
	(hectares)	(trees/ hectare)	(1,000 trees)	(1,000 trees)	(1,000 trees)	(1,000 trees)	(fruit/ tree)	(fruit/ tree)	(fruit/ tree)	(fruit/ tree)
3 – 5 years.....	57,970	584	31,057.51	-	-	31,057.51	**202**	-	-	202
6 – 10 years.....	61,653	620	1,180.35	36,056.57	-	37,236.92	158	**373**	-	366
Over 10 years…..	216,644	469	2,064.22	5,752.59	92,431.43	100,248.24	141	267	**590**	562
Total.....	**336,267**	**516**	**34,302.08**	**41,809.16**	**92,431.43**	**168,542.67**	**197**	**358**	**590**	**453**

[1] Calculation considers the total number of trees in the plot, that is, bearing and non-bearing trees (2022 and 2023 resets)
[2] Weighted average per total stratum fruit

Table 9 – 2024-2025 Orange crop forecast by tree age group (continued)

Plots age	2024-2025 Orange crop forecast by tree age group				2024-2025 Orange crop forecast by tree age group			
	3 – 5 years	6 – 10 years	Over 10 years	Total	3 – 5 years	6 – 10 years	Over 10 years	Total
	(boxes/ tree)	(boxes/ tree)	(boxes/ tree)	(boxes/ tree)	(1,000,000 boxes)	(1,000,000 boxes)	(1,000,000 boxes)	(1,000,000 boxes)
3 – 5 years.....	0.61	-	-	0.61	**19.01**	-	-	19.01
6 – 10 years.....	0.47	1.13	-	1.11	0.56	**40.78**	-	41.34
Over 10 years…..	0.43	0.82	1.80	1.72	0.89	4.70	**166.44**	172.03
Total.....	**0.60**	**1.09**	**1.80**	**1.38**	**20.46**	**45.48**	**166.44**	**232.38**

[1] Calculation considers the total number of trees in the plot, that is, bearing and non-bearing trees (2022 and 2023 resets)

Table 10 – 2024-2025 Orange crop forecast by bloom

Bloom	2024-2025 Orange crop forecast	Percentage of the orange crop forecast by bloom
	(1,000,000 boxes)	(percentage)
1st.....	148.66	64.0%
2nd	42.02	18.1%
3rd.....	25.29	10.9%
4th	16.41	7.1%
Total.....	**232.38**	**100.0%**

Table 11 – 2024-2025 Orange crop forecast in percentage of bloom by region

Bloom	North[1]				Northwest[2]			Central[3]				South[4]			Sothwest[5]			Total
	TMG	BEB	ALT	**AVE**[6]	VOT	SJO	**AVE**[6]	MAT	DUA	BRO	**AVE**[6]	PFE	LIM	**AVE**[6]	AVA	ITG	**AVE**[6]	
	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
1st.....	82.8	73.2	67.2	**75.2**	73.0	70.0	**71.2**	69.2	49.5	49.8	**54.7**	61.0	73.2	**66.9**	60.4	63.3	**61.2**	**64.0**
2nd.....	7.5	11.1	18.5	**11.1**	3.7	17.5	**11.8**	14.2	27.6	32.1	**24.5**	20.9	16.4	**18.7**	19.8	13.2	**18.0**	**18.1**
3rd.....	5.3	9.0	9.0	**7.9**	19.2	8.2	**12.7**	3.6	15.7	10.3	**12.0**	14.9	7.9	**11.5**	12.6	8.8	**11.6**	**10.9**
4th.....	4.4	6.8	5.3	**5.8**	4.1	4.2	**4.2**	12.9	7.1	7.8	**8.7**	3.2	2.5	**2.9**	7.2	14.6	**9.3**	**7.1**

[1] North: TMG – Triângulo Mineiro, BEB – Bebedouro, ALT – Altinópolis
[2] Northwest: VOT – Votuporanga, SJO – São José do Rio Preto
[3] Central: MAT – Matão, DUA – Duartina, BRO – Brotas
[4] South: PFE – Porto Ferreira, LIM – Limeira
[5] Southwest: AVA – Avaré, ITG – Itapetininga
[6] AVE – Weighted average per total stratum fruit

Table 12 – 2024-2025 Orange crop forecast and its components by variety group

Variety group	Mature groves area	Average density[1] of mature groves	Components of May/2024 forecast				2024-2025 crop forecast		
			Bearing trees	Fruit per tree at stripping[2]	Fruit estimated per box	Estimated drop rate	Per tree	Per hectare	Total
	(hectares)	(trees/ hectare)	(1,000 trees)	(number)	(number)	(%)	(boxes/ tree)	(boxes/ hectare)	(1,000,000 boxes)
Early:									
Hamlin, Westin and Rubi.....	56,530	482	26,437.06	485	281	9.50	1.40	657	37.12
Other early:									
Valencia Americana, Seleta, Pineapple and Alvorada……	20,822	549	10,834.96	450	249	10.70	1.45	755	15.72
Mid-season:									
Pera Rio.....	113,498	542	59,601.12	401	247	18.40	1.19	625	70.97
Late:									
Valencia and VFolha Murcha[3]	108,155	501	53,100.14	482	218	22.70	1.54	754	81.58
Natal.....	37,262	515	18,569.39	493	232	23.90	1.45	724	26.99
Total.....	**336,267**	**516**	**168,542.67**	**453**	**241**	**18.50**	**1.38**	**691**	**232.38**

[1] Calculation considers the total number of trees in the plot, that is, bearing and non-bearing trees (2022 and 2023 resets)
[2] Weighted average per total stratum fruit
[3] V.Folha Murcha – Valencia Folha Murcha

Table 13 – 2024-2025 Orange crop forecast by variety group and sector

Variety group	2024-2025 crop forecast					
	Sector					
	North	Northwest	Central	South	Southwest	Total
	(1,000,000 boxes)	(1,000,000 boxes)	(1,000,000 boxes)	(1,000,000 boxes)	(1,000,000 boxes)	(1,000,000 boxes)
Early:						
Hamlin, Westin and Rubi.....	9.88	1.27	8.75	5.93	11.29	37.12
Other early:						
Valencia Americana, Seleta, Pineapple and Alvorada	3.24	1.70	5.99	0.91	3.88	15.72
Mid-season:						
Pera Rio.....	12.89	5.77	18.56	13.26	20.49	70.97
Late:						
Valencia and V.Folha Murcha[3]	17.40	2.47	18.23	14.58	28.90	81.58
Natal.....	4.46	0.63	6.37	3.78	11.75	26.99
Average.....	**47.87**	**11.84**	**57.90**	**38.46**	**76.31**	**232.38**

Table 14 – 2024-2025 Orange crop forecast by variety group – North Sector

Variety group	Mature groves area	Average density[1] of mature groves	Components of May/2024 forecast				2024-2025 crop forecast		
			Bearing trees	Fruit per tree at stripping[2]	Fruit estimated per box	Estimated drop rate	Per tree	Per hectare	Total
	(hectares)	(trees/ hectare)	(1,000 trees)	(number)	(number)	(%)	(boxes/ tree)	(boxes/ hectare)	(1,000,000 boxes)
Early:									
Hamlin, Westin and Rubi.....	15,427	453	6,872.89	490	281	8.3	1.44	640	9.88
Other early:									
Valencia Americana, Seleta, Pineapple and Alvorada……	4,497	514	2,146.81	447	244	8.0	1.51	720	3.24
Mid-season:									
Pera Rio.....	22,904	540	12,164.10	333	239	15.5	1.06	563	12.89
Late:									
Valencia and VFolha Murcha[3]	28,370	457	12,734.31	391	202	21.2	1.37	613	17.40
Natal.....	8,508	464	3,910.89	324	222	12.9	1.14	524	4.46
Total.....	**79,706**	**484**	**37,829.00**	**386**	**235**	**15.1**	**1.27**	**601**	**47.87**

Table 15 – 2024-2025 Orange crop forecast by variety group – Northwest Sector

Variety group	Mature groves area	Average density[1] of mature groves	Components of May/2024 forecast				2024-2025 crop forecast		
			Bearing trees	Fruit per tree at stripping[2]	Fruit estimated per box	Estimated drop rate	Per tree	Per hectare	Total
	(hectares)	(trees/ hectare)	(1,000 trees)	(number)	(number)	(%)	(boxes/ tree)	(boxes/ hectare)	(1,000,000 boxes)
Early:									
Hamlin, Westin and Rubi.....	4,344	486	2,043.73	216	275	12.1	0.62	292	1.27
Other early:									
Valencia Americana, Seleta, Pineapple and Alvorada……	3,491	575	1,906.61	281	240	14.9	0.89	487	1.70
Mid-season:									
Pera Rio.....	14,767	488	6,993.74	258	245	13.0	0.83	391	5.77
Late:									
Valencia and VFolha Murcha[3]	5,400	488	2,613.54	301	217	24.1	0.95	457	2.47
Natal.....	2,179	531	1,125.00	196	241	23.3	0.56	289	0.63
Total.....	**30,181**	**500**	**14,682.62**	**258**	**242**	**16.1**	**0.81**	**392**	**11.84**

[1] Calculation considers the total number of trees in the plot, that is, bearing and non-bearing trees (2022 and 2023 resets)
[2] Weighted average per total stratum fruit
[3] V.Folha Murcha – Valencia Folha Murcha

Table 16 – 2024-2025 Orange crop forecast by variety group – Central Sector

Variety group	Mature groves area	Average density[1] of mature groves	Components of May/2024 forecast				2024-2025 crop forecast		
			Bearing trees	Fruit per tree at stripping[2]	Fruit estimated per box	Estimated drop rate	Per tree	Per hectare	Total
	(hectares)	(trees/ hectare)	(1,000 trees)	(number)	(number)	(%)	(boxes/ tree)	(boxes/ hectare)	(1,000,000 boxes)
Early:									
Hamlin, Westin and Rubi.....	13,819	503	6,775.50	444	277	10.4	1.29	633	8.75
Other early:									
Valencia Americana, Seleta, Pineapple and Alvorada……	7,805	551	4,208.31	428	240	10.9	1.42	767	5.99
Mid-season:									
Pera Rio.....	33,031	560	18,007.25	369	251	22.1	1.03	562	18.56
Late:									
Valencia and VFolha Murcha[3]	27,388	542	14,350.90	419	224	24.2	1.27	666	18.23
Natal.....	9,529	504	4,661.85	459	235	22.1	1.37	668	6.37
Total.....	**91,572**	**539**	**48,003.81**	**409**	**244**	**19.9**	**1.21**	**632**	**57.90**

Table 17 – 2024-2025 Orange crop forecast by variety group – South Sector

Variety group	Mature groves area	Average density[1] of mature groves	Components of May/2024 forecast				2024-2025 crop forecast		
			Bearing trees	Fruit per tree at stripping[2]	Fruit estimated per box	Estimated drop rate	Per tree	Per hectare	Total
	(hectares)	(trees/ hectare)	(1,000 trees)	(number)	(number)	(%)	(boxes/ tree)	(boxes/ hectare)	(1,000,000 boxes)
Early:									
Hamlin, Westin and Rubi.....	9,666	498	4,586.72	471	288	12.1	1.29	613	5.93
Other early:									
Valencia Americana, Seleta, Pineapple and Alvorada……	1,275	512	637.46	501	262	17.1	1.43	714	0.91
Mid-season:									
Pera Rio.....	20,537	539	10,649.26	440	255	19.8	1.25	646	13.26
Late:									
Valencia and VFolha Murcha[3]	20,547	480	9,649.05	515	229	25.0	1.51	710	14.58
Natal.....	4,873	548	2,523.71	552	241	27.2	1.50	776	3.78
Total.....	**56,898**	**511**	**28,046.20**	**482**	**249**	**21.2**	**1.37**	**676**	**38.46**

Table 18 – 2024-2025 Orange crop forecast by variety group – Southwest Sector

Variety group	Mature groves area	Average density[1] of mature groves	Components of May/2024 forecast				2024-2025 crop forecast		
			Bearing trees	Fruit per tree at stripping[2]	Fruit estimated per box	Estimated drop rate	Per tree	Per hectare	Total
	(hectares)	(trees/ hectare)	(1,000 trees)	(number)	(number)	(%)	(boxes/ tree)	(boxes/ hectare)	(1,000,000 boxes)
Early:									
Hamlin, Westin and Rubi.....	13,274	482	6,158.22	626	282	8.1	1.83	851	11.29
Other early:									
Valencia Americana, Seleta, Pineapple and Alvorada……	3,754	576	1,935.77	651	265	8.9	2.00	1.034	3.88
Mid-season:									
Pera Rio.....	22,259	555	11,786.77	567	244	16.9	1.74	921	20.49
Late:									
Valencia and VFolha Murcha[3]	26,450	526	13,752.34	642	216	21.1	2.10	1.093	28.90
Natal.....	12,173	542	6,347.94	651	230	27.2	1.85	965	11.75
Total.....	**77,910**	**532**	**39,981.04**	**619**	**239**	**18.3**	**1.91**	**979**	**76.31**

[1] Calculation considers the total number of trees in the plot, that is, bearing and non-bearing trees (2022 and 2023 resets)
[2] Weighted average per total stratum fruit
[3] V.Folha Murcha – Valencia Folha Murcha

Table 19 – Fruit per tree at stripping[1] by age group, region and variety – North Sector [April 2024 stripping]

Region and variety groups	Plots 3 – 5 years	Plots 6 – 10 years			Plots over 10 years				Average
	Trees 3 – 5 years	Trees 3 – 5 years	Trees 6 – 10 years	Average	Trees 3 – 5 years	Trees 6 – 10 years	Trees over 10 years	Average	
	(number)	(number)	(number)	(number)	(number)	(number)	(number)	(number)	(number)
TMG[2]									
Early:									
Hamlin, Westin and Rubi.....	168	84	632	599	113	127	756	687	664
Other early varieties[3].....	105	257	540	537	65	149	732	726	335
Mid-season:									
Pera Rio.....	171	77	445	439	7	47	287	243	279
Late:									
Valencia and V.Folha Murcha[4]....	143	125	269	264	35	167	371	353	346
Natal.....	206	66	363	325	87	6	396	390	381
Average[1].....	**162**	**85**	**435**	**427**	**58**	**106**	**441**	**407**	**382**
BEB[5]									
Early:									
Hamlin, Westin and Rubi.....	133	246	167	170	159	139	468	449	388
Other early varieties[3].....	204	74	337	335	96	312	681	659	449
Mid-season:									
Pera Rio.....	324	220	316	314	90	149	381	372	347
Late:									
Valencia and V.Folha Murcha[4]....	166	68	377	374	14	382	401	395	369
Natal.....	260	78	224	222	105	156	361	354	309
Average[1].....	**232**	**184**	**311**	**309**	**66**	**248**	**424**	**413**	**367**
ALT[6]									
Early:									
Hamlin, Westin and Rubi.....	97	40	151	150	56	245	610	600	549
Other early varieties[3].....	12	110	356	341	109	152	819	744	725
Mid-season:									
Pera Rio.....	131	98	322	318	89	111	497	493	417
Late:									
Valencia and V.Folha Murcha[4]....	177	9	110	109	98	366	633	628	566
Natal.....	108	110	286	279	277	398	148	159	191
Average[1].....	**132**	**91**	**249**	**245**	**132**	**280**	**563**	**556**	**487**
Average sector.....	**204**	**146**	**331**	**328**	**70**	**164**	**450**	**432**	**386**

[1] Weighted average per total stratum fruit
[2] TMG – Triângulo Mineiro
[3] Valencia Americana, Seleta, Pineapple and Alvorada
[4] V.Folha Murcha – Valencia Folha Murcha
[5] BEB – Bebedouro
[6] ALT – Altinópolis

Table 20 – Fruit per tree at stripping[1] by age group, region and variety – Northwest Sector [April 2024 stripping]

Region and variety groups	Plots 3 – 5 years	Plots 6 – 10 years			Plots over 10 years				Average
	Trees 3 – 5 years	Trees 3 – 5 years	Trees 6 – 10 years	Average	Trees 3 – 5 years	Trees 6 – 10 years	Trees over 10 years	Average	
	(number)	(number)	(number)	(number)	(number)	(number)	(number)	(number)	(number)
VOT[2]									
Early:									
Hamlin, Westin and Rubi.....	98	10	93	93	ND	151	81	84	90
Other early varieties[3].....	286	24	156	154	69	ND	277	275	276
Mid-season:									
Pera Rio.....	215	57	271	261	130	189	356	347	291
Late:									
Valencia and V.Folha Murcha[4]....	147	10	197	193	161	244	265	265	250
Natal.....	31	39	178	174	23	ND	236	222	95
Average[1].....	**197**	**56**	**253**	**245**	**125**	**186**	**327**	**320**	**270**
SJO[5]									
Early:									
Hamlin, Westin and Rubi.....	362	43	141	140	55	72	259	244	237
Other early varieties[3].....	187	48	153	151	156	204	477	463	281
Mid-season:									
Pera Rio.....	70	66	265	261	61	127	246	229	191
Late:									
Valencia and V.Folha Murcha[4]....	211	119	333	333	90	121	318	309	312
Natal.....	109	86	240	239	31	67	217	187	220
Average[1].....	**141**	**62**	**240**	**239**	**64**	**115**	**310**	**295**	**250**
Average sector.....	**169**	**58**	**244**	**241**	**87**	**130**	**317**	**305**	**258**

1 Weighted average per total stratum fruit
2 VOT – Votuporanga
3 Valencia Americana, Seleta, Pineapple and Alvorada
4 V.Folha Murcha – Valencia Folha Murcha
5 SJO - São José do Rio Preto

Table 21 – Fruit per tree at stripping[1] by age group, region and variety – Central Sector [April 2024 stripping]

Region and variety groups	Plots 3 – 5 years	Plots 6 – 10 years			Plots over 10 years				Average
	Trees 3 – 5 years	Trees 3 – 5 years	Trees 6 – 10 years	Average	Trees 3 – 5 years	Trees 6 – 10 years	Trees over 10 years	Average	
	(number)	(number)	(number)	(number)	(number)	(number)	(number)	(number)	(number)
MAT[2]									
Early:									
Hamlin, Westin and Rubi.....	163	54	350	349	89	314	297	289	281
Other early varieties[3].....	100	43	477	466	98	572	286	322	273
Mid-season:									
Pera Rio.....	254	60	273	266	213	105	377	360	303
Late:									
Valencia and V.Folha Murcha[4]....	129	58	274	264	117	361	525	504	399
Natal.....	182	36	310	306	87	365	412	407	293
Average[1].....	**174**	**57**	**307**	**299**	**135**	**343**	**407**	**397**	**318**
DUA[5]									
Early:									
Hamlin, Westin and Rubi.....	211	56	587	557	31	161	702	645	532
Other early varieties[3].....	245	235	486	477	125	395	1.022	964	619
Mid-season:									
Pera Rio.....	213	353	407	404	45	175	466	443	384
Late:									
Valencia and V.Folha Murcha[4]....	200	169	355	348	158	237	697	645	425
Natal.....	263	282	465	458	203	246	675	659	581
Average[1].....	**213**	**268**	**413**	**405**	**92**	**212**	**627**	**590**	**452**
BRO[6]									
Early:									
Hamlin, Westin and Rubi.....	120	ND	105	105	167	442	567	565	488
Other early varieties[3].....	162	165	338	330	ND	415	465	464	391
Mid-season:									
Pera Rio.....	262	206	267	265	127	329	884	798	522
Late:									
Valencia and V.Folha Murcha[4]....	218	71	236	225	74	531	553	549	435
Natal.....	137	16	322	308	ND	590	822	817	429
Average[1].....	**199**	**136**	**273**	**267**	**96**	**416**	**659**	**637**	**472**
Average sector.....	**200**	**199**	**360**	**353**	**109**	**280**	**561**	**534**	**409**

1 Weighted average per total stratum fruit
2 MAT – Matão
3 Valencia Americana, Seleta, Pineapple and Alvorada
4 V.Folha Murcha – Valencia Folha Murcha
5 DUA – Duartina
6 BRO – Brotas

Table 22 – Fruit per tree at stripping[1] by age group, region and variety – South Sector [April 2024 stripping]

Region and variety groups	Plots 3 – 5 years	Plots 6 – 10 years			Plots over 10 years				Average
	Trees 3 – 5 years	Trees 3 – 5 years	Trees 6 – 10 years	Average	Trees 3 – 5 years	Trees 6 – 10 years	Trees over 10 years	Average	
	(number)	(number)	(number)	(number)	(number)	(number)	(number)	(number)	(number)
PFE[2]									
Early:									
Hamlin, Westin and Rubi.....	137	105	295	280	74	514	551	525	369
Other early varieties[3].....	308	162	269	267	82	66	485	462	376
Mid-season:									
Pera Rio.....	228	182	395	388	242	641	679	642	447
Late:									
Valencia and V.Folha Murcha[4]....	219	150	338	334	83	112	661	587	484
Natal.....	330	33	402	391	32	258	588	508	419
Average[1].....	**226**	**134**	**366**	**358**	**148**	**347**	**641**	**587**	**443**
LIM[5]									
Early:									
Hamlin, Westin and Rubi.....	295	56	565	528	150	334	690	643	582
Other early varieties[3].....	151	191	389	389	ND	270	926	919	667
Mid-season:									
Pera Rio.....	180	62	346	327	88	454	598	574	430
Late:									
Valencia and V.Folha Murcha[4]....	247	117	438	418	183	316	659	633	553
Natal.....	128	33	620	617	189	392	1.023	961	807
Average[1].....	**211**	**79**	**433**	**412**	**145**	**368**	**679**	**647**	**533**
Average sector.....	**221**	**108**	**390**	**378**	**147**	**354**	**660**	**616**	**482**

1 Weighted average per total stratum fruit
2 PFE – Porto Ferreira
3 Valencia Americana, Seleta, Pineapple and Alvorada
4 V.Folha Murcha – Valencia Folha Murcha
5 LIM – Limeira

Table 23 – Fruit per tree at stripping[1] by age group, region and variety – Southwest Sector [April 2024 stripping]

Region and variety groups	Plots 3 – 5 years	Plots 6 – 10 years			Plots over 10 years				Average
	Trees 3 – 5 years	Trees 3 – 5 years	Trees 6 – 10 years	Average	Trees 3 – 5 years	Trees 6 – 10 years	Trees over 10 years	Average	
	(number)	(number)	(number)	(number)	(number)	(number)	(number)	(number)	(number)
AVA[2]									
Early:									
Hamlin, Westin and Rubi.....	212	209	830	804	125	301	776	728	634
Other early varieties[3].....	120	264	292	292	335	714	1.130	1.102	868
Mid-season:									
Pera Rio.....	250	129	657	633	181	378	742	717	587
Late:									
Valencia and V.Folha Murcha[4]....	210	226	351	349	242	429	835	800	710
Natal.....	250	93	467	460	221	180	792	737	661
Average[1].....	**230**	**147**	**548**	**535**	**206**	**350**	**804**	**766**	**659**
ITG[5]									
Early:									
Hamlin, Westin and Rubi.....	212	ND	607	607	ND	ND	983	983	600
Other early varieties[3].....	149	356	441	441	86	569	916	915	518
Mid-season:									
Pera Rio.....	195	101	571	566	126	259	712	688	528
Late:									
Valencia and V.Folha Murcha[4]....	108	69	510	510	74	155	600	576	467
Natal.....	132	45	481	476	54	130	890	842	632
Average[1].....	**162**	**93**	**530**	**528**	**84**	**176**	**744**	**716**	**536**
Average sector.....	**202**	**135**	**537**	**531**	**181**	**328**	**789**	**754**	**619**

[1] Weighted average per total stratum fruit
[2] AVA – Avaré
[3] Valencia Americana, Seleta, Pineapple and Alvorada
[4] V.Folha Murcha – Valencia Folha Murcha
[5] ITG – Itapetininga

Table 24 – Variation in fruit per tree at stripping (considers only the trees of the original plantings, excludes resets), from non-irrigated and irrigated groves, by sector and region [April 2024 stripping]

Sector and region	Variation between non-irrigated and irrigated groves (trees of the original plantings)	Percentage of bearing trees in irrigated groves in the citrus belt
	(%)	(%)
North		
Triângulo Mineiro.....	167.0%	89.0%
Bebedouro.....	27.6%	76.7%
Altinópolis.....	-14.5%	5.5%
Subtotal	**64.0%**	**71.1%**
Northwest		
Votuporanga.....	121.2%	73.5%
São José do Rio Preto.....	31.4%	56.2%
Subtotal.....	**67.0%**	**63.0%**
Central		
Matão.....	28.8%	58.5%
Duartina.....	13.7%	17.1%
Brotas.....	-41.9%	29.2%
Subtotal.....	**13.9%**	**32.1%**
South		
Porto Ferreira.....	3.7%	27.4%
Limeira.....	29.0%	25.2%
Subtotal.....	**14.8%**	**26.4%**
Southwest		
Avaré.....	-27.4%	10.9%
Itapetininga.....	25.3%	1.7%
Subtotal	**-10.0%**	**7.9%**
Total.....	**24.4%**	**36.9%**

The data in this table are stratified by the presence or absence of irrigation system in the stands of the stripped trees, but Fundecitrus did not have access to information on the use of irrigation, in addition, it is important to consider that other factors such as management practices, age of trees, cultivated varieties, among others, can affect the amount of fruit per tree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