



Current forecast update (variation regarding the May forecast):

September, 10 2021

Total orange crop production forecast: 267.87 million boxes (decreased of 8.9%)

Hamlin, Westin and Rubi: 46.83million boxes (decreased of 8.8%)

Other early season: 14.73 million boxes (decreased of 12.7%)

Pera Rio: 78.03 million boxes (decreased of 7.8%)

Valencia and Valencia Folha Murcha: 97.53 million boxes (decreased of 8.9%)

Natal: 30.75 million boxes (decreased of 10.1%)

**Publication Schedule 2021-2022**

2<sup>nd</sup> Crop forecast update: December 10, 2021

3<sup>rd</sup> Crop forecast update: February 10, 2022

Final crop forecast: April 11, 2022

**Orange crop forecast update by sector and variety group – citrus belt**

Month	Forecast components				Crop forecast 2021-2022			Crop forecast update 2021-2021		
	May/2021 and September/2021 (strike-through values were presented in May, to their left are their respective values updated in September)				May/2021			September/2021		
	Bearing trees	Fruit per tree at stripping	Fruit estimated per box	Estimated drop rate	Per tree	Per hectare	Total	Per tree	Per hectare	Total
Sector and variety group	(1,000 trees)	(number)	(number)	(percentage)	(boxes/tree)	(boxes/hectare)	(1,000,000 boxes)	(boxes/tree)	(boxes/hectare)	(1,000,000 boxes)
<b>CITRUS BELT</b>										
Hamlin, Westin and Rubi....	25,410	780	334 <del>305</del>	12.0	2.02	892	51.37	1.84	813	46.83
Other early.....	9,003	614	291 <del>259</del>	13.5 <del>12.0</del>	2.88	914	16.87	1.64	798	14.73
Pera Rio.....	59,147	531	278 <del>260</del>	23.0 <del>22.0</del>	1.43	739	84.66	1.32	681	78.03
Valencia and Folha Murcha	54,121	696	263 <del>240</del>	24.0	1.98	929	107.07	1.80	846	97.53
Natal.....	18,878	638	267 <del>243</del>	24.0 <del>23.2</del>	1.81	849	34.20	1.63	763	30.75
<b>Total.....</b>	<b>166,560</b>	<b>639</b>	<b>283 <del>259</del></b>	<b>20.9 <del>20.5</del></b>	<b>1.77</b>	<b>850</b>	<b>294.17</b>	<b>1.61</b>	<b>774</b>	<b>267.87</b>
<b>NORTH SECTOR</b>										
Hamlin, Westin and Rubi....	6,620	826	334 <del>305</del>	12.0	2.14	881	14.17	1.95	803	12.92
Other early.....	2,088	770	291 <del>259</del>	13.5 <del>12.0</del>	2.35	1,162	4.91	2.05	1,013	4.28
Pera Rio.....	13,007	540	278 <del>260</del>	23.0 <del>22.0</del>	1.46	791	18.93	1.34	729	17.44
Valencia and Folha Murcha	13,637	765	263 <del>240</del>	24.0	2.18	983	29.68	1.98	896	27.04
Natal.....	4,313	635	267 <del>243</del>	24.0 <del>23.2</del>	1.80	813	7.77	1.62	732	6.99
<b>Subtotal.....</b>	<b>39,665</b>	<b>688</b>	<b>283 <del>259</del></b>	<b>20.9 <del>20.5</del></b>	<b>1.90</b>	<b>899</b>	<b>75.46</b>	<b>1.73</b>	<b>818</b>	<b>68.67</b>
<b>NORTHWEST SECTOR</b>										
Hamlin, Westin and Rubi....	2,245	553	334 <del>305</del>	12.0	1.43	652	3.22	1.31	593	2.93
Other early.....	1,661	512	291 <del>259</del>	13.5 <del>12.0</del>	1.56	759	2.59	1.37	665	2.27
Pera Rio.....	6,697	604	278 <del>260</del>	23.0 <del>22.0</del>	1.62	746	10.88	1.50	689	10.04
Valencia and Folha Murcha	3,597	575	263 <del>240</del>	24.0	1.64	797	5.89	1.49	726	5.36
Natal.....	1,771	411	267 <del>243</del>	24.0 <del>23.2</del>	1.17	562	2.07	1.05	505	1.86
<b>Subtotal.....</b>	<b>15,971</b>	<b>559</b>	<b>283 <del>259</del></b>	<b>20.9 <del>20.5</del></b>	<b>1.54</b>	<b>725</b>	<b>24.65</b>	<b>1.41</b>	<b>661</b>	<b>22.46</b>
<b>CENTRAL SECTOR</b>										
Hamlin, Westin and Rubi....	7,062	791	334 <del>305</del>	12.0	2.05	926	14.47	1.87	844	13.19
Other early.....	3,169	563	291 <del>259</del>	13.5 <del>12.0</del>	1.72	787	5.45	1.50	688	4.76
Pera Rio.....	17,647	485	278 <del>260</del>	23.0 <del>22.0</del>	1.31	680	23.08	1.21	627	21.27
Valencia and Folha Murcha	13,967	680	263 <del>240</del>	24.0	1.93	897	26.99	1.76	817	24.58
Natal.....	4,634	701	267 <del>243</del>	24.0 <del>23.2</del>	1.99	875	9.21	1.79	787	8.28
<b>Subtotal.....</b>	<b>46,479</b>	<b>617</b>	<b>283 <del>259</del></b>	<b>20.9 <del>20.5</del></b>	<b>1.70</b>	<b>816</b>	<b>79.20</b>	<b>1.55</b>	<b>742</b>	<b>72.08</b>
<b>SOUTH SECTOR</b>										
Hamlin, Westin and Rubi....	4,590	687	334 <del>305</del>	12.0	1.78	801	8.16	1.62	731	7.45
Other early.....	494	850	291 <del>259</del>	13.5 <del>12.0</del>	2.59	1,150	1.28	2.27	1,006	1.12
Pera Rio.....	12,310	488	278 <del>260</del>	23.0 <del>22.0</del>	1.32	669	16.20	1.21	616	14.93
Valencia and Folha Murcha	11,123	670	263 <del>240</del>	24.0	1.91	865	21.19	1.74	788	19.30
Natal.....	2,738	565	267 <del>243</del>	24.0 <del>23.2</del>	1.60	786	4.39	1.44	705	3.94
<b>Subtotal.....</b>	<b>31,255</b>	<b>595</b>	<b>283 <del>259</del></b>	<b>20.9 <del>20.5</del></b>	<b>1.64</b>	<b>781</b>	<b>51.22</b>	<b>1.50</b>	<b>713</b>	<b>46.74</b>
<b>SOUTHWEST SECTOR</b>										
Hamlin, Westin and Rubi....	4,894	895	334 <del>305</del>	12.0	2.32	1,056	11.35	2.11	962	10.34
Other early.....	1,591	544	291 <del>259</del>	13.5 <del>12.0</del>	1.66	945	2.64	1.45	823	2.30
Pera Rio.....	9,486	609	278 <del>260</del>	23.0 <del>22.0</del>	1.64	871	15.57	1.51	803	14.35
Valencia and Folha Murcha	11,796	695	263 <del>240</del>	24.0	1.98	1,011	23.32	1.80	921	21.25
Natal.....	5,422	699	267 <del>243</del>	24.0 <del>23.2</del>	1.98	982	10.76	1.78	884	9.68
<b>Subtotal.....</b>	<b>33,189</b>	<b>694</b>	<b>283 <del>259</del></b>	<b>20.9 <del>20.5</del></b>	<b>1.92</b>	<b>972</b>	<b>63.64</b>	<b>1.75</b>	<b>885</b>	<b>57.92</b>

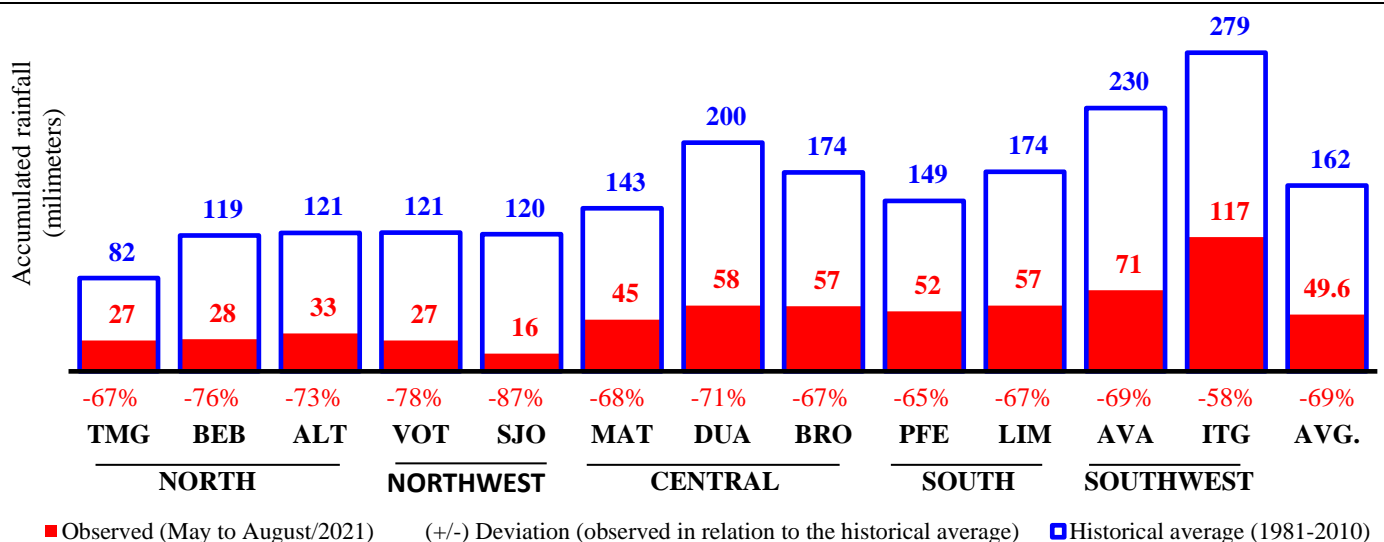


### Orange<sup>1</sup> production forecast update totals 267.87 million boxes

The first 2021-2022 orange crop forecast update for the São Paulo and West-Southwest Minas Gerais citrus belt, published on September 10, 2021, by Fundecitrus – performed in cooperation with Markestrat, FEA-RP/USP and FCAV/Unesp<sup>2</sup> – is 267.87 million boxes of 40.8 kg each, differently from the 294.17 million estimated in May this year. The reduction of 26.30 million in relation to the initial expectation corresponds to -8.9%. The main reason for this crop loss is the poorer rainfall regime constituting the most severe water crisis ever to hit Brazil for the last 91 years<sup>3</sup>. The combination of this drought never before experienced by citriculture and successive frosts in July culminated in a gradual crop decline that has been seen as harvests progress and disclose totally atypical figures. Field surveys also show results other than expected for this time of the year for orange planted areas yet to be harvested. In general, oranges are excessively small, and early fruit drop reaches one of its highest rates. These factors make production go back to the same levels of last crop season that totaled 268.63 million boxes, despite fruit load being 12.50% larger since this is an “on” year. In view of this data and the perspective of climate conditions remaining adverse until harvests end, fruit should present the most critical size and drop rate in historical data. If this scenario is confirmed, there will no longer be an increase in this crop in relation to the previous season, estimated at 9.51% in May, but rather a smaller volume than the production in the last season (- 0,28%). This forecast update depicts the current snapshot and will be further updated on December 10, 2021, February 10 and April 12, 2022, to reflect variations that may take place as the crop progresses. Approximately 23.77 million boxes of the total crop should be produced in West Minas Gerais.

The forecast carried out in May already included effects triggered by rainfall volumes below the climatological normal ranges expected for this crop, although the water deficit was not supposed to be so drastic and result in an implacable drought in the citrus belt. The accumulated volume from May to August 2021 is of only 49.6 millimeters in average for the regions, which is equivalent to approximately 30% of the climatological normal (1981-2020), according to data from Somar/Climatempo Meteorologia. The few rains that fell were scattered, isolated and quite far apart. The situation is even more severe because soil moisture and water availability in rivers and reservoirs were already at alarming levels before the beginning of this season, since rainfall volumes have stayed low for three crop seasons and negative deviations in relation to the historical average have increased with each year. Rainfall shortage is strongly affecting rainfed groves, especially the more densely planted ones whose rootstocks are less tolerant to water stress. Even irrigated groves, which comprise more than 30% of the total citrus belt area, are suffering from the drought because in many cases there is not enough water to fully meet its demand by those groves.

Without significant rains for about five months, regions in the Northwest sector have the lowest accumulated rainfall volumes in the period from May to August 2021: 16 millimeters in São José do Rio Preto (-87% in relation to the historical average) and 27 millimeters in Votuporanga (-78%). That long a period with no significant rains is also seen in the North sector, where accumulated average volumes are 27 millimeters in Triângulo Mineiro (-67%); 28 millimeters in Bebedouro (-76%) and 33 millimeters in Altinópolis (-73%). Rains in the regions in the Central sector have not been significant for approximately three months now, and accumulated volumes are 45 millimeters in Matão (-68%), 58 millimeters in Duartina (-71%) and 57 millimeters in Brotas (-67%). In the South sector, accumulated volumes are 52 millimeters in the region of Porto Ferreira (-65%) and 57 millimeters in Limeira (-67%). Accumulated volumes in the Southwest sector are somewhat higher than those but still excessively low: 71 millimeters in Avaré (-69%) and 117 millimeters in Itapetininga (-58%), as presented in Graph 1.



**Graph 1: Accumulated rainfall (observed and historical average) from May to August 2021 for regions of the citrus belt**  
Source: Fundecitrus, according to data from Somar/Climatempo Meteorologia.



The drought was worsened by frosts that hit the whole state of São Paulo, particularly affecting plots located in lower regions of more susceptible relief and microclimate. Regions of the citrus belt located in the South, Southwest and Central sectors were the most affected by frosts. In isolated cases, frosts were severe and even caused death of plants, especially younger ones, having overall damaged leaves, twigs and fruit.

The harvest pace seen in the last season remains slow in this crop, due to the concentration of second bloom fruit being high, also for the second consecutive year. Field survey data shows that harvest was 27% complete by mid-August, which historically should already be about 35% complete. Harvest of the early varieties Hamlin, Westin and Rubi reached 78% completion. Harvest completion is 58% for the other early varieties Valencia Americana, Seleta and Pineapple, 14% for Pera Rio, 3% for Valencia and Valencia Folha Murcha, and 4% for Natal.

All varieties considered, the average size projected in May 2021, of 259 fruits to fill a 40.8 kg box, which corresponds to an average orange weight of 157.5 grams (5.56 oz), is now updated to 283 fruits per box, equivalent to a weight of 144.2 grams per fruit (5.09 oz), which is 14.7% lower than that of the last five crop seasons (169 grams/5.96 oz average). The average fruit size for the varieties Hamlin, Westin and Rubi projected in May 2021, of 305 fruits per box (134 grams/4.73 oz per fruit) is updated to 334 fruits per box (122 grams/4.30 oz per fruit). The weight of oranges of other early varieties is updated from 259 fruits per box (158 grams/5.57 oz per fruit) to 291 fruits per box (140 grams/4.94 oz per fruit). The projection of 260 fruits per box (157 grams/5.54 oz per fruit) for the Pera Rio variety is updated to 278 fruits per box (147 grams/5.19 oz per fruit). The average fruit size for the Valencia and Valencia Folha Murcha varieties, initially projected at 240 fruits per box (170 grams/6.00 oz per fruit), is updated to 263 fruits per box (155 grams/5.47 oz per fruit). The projection for the Natal variety is updated from 243 fruits per box (168 grams/5.93 oz per fruit) to 267 fruits per box (153 grams/5.40 oz per fruit).

The projected fruit drop rate increases from 20.50% to 20.90% average, all varieties considered, due to the intense water deficit, frosts and the pressure of pests and diseases, all affecting the physiological activities of orange trees. The drop rate distributed among varieties shows a maintained 12,00% for Hamlin, Westin and Rubi; an update to 13.50% (+ 1.50 percentage point) for other early varieties, and to 23% (+ 1 percentage point) for Pera Rio, a maintained 24% for Valencia and Valencia Folha Murcha and an increase to 24% (+ 0.80 percentage point) for Natal.

The method used for the update is the same adopted in the previous crop season. Information was obtained from the monitoring survey started in May on 1,200 plots that are no longer visited when fruit harvest is complete. Other data used in this study is size of fruit received throughout the crop season by orange juice companies associated to Fundecitrus – Citrosuco, Cutrale and Louis Dreyfus – for industrial processing. Each processing company supplies individual data under confidentiality to the independent consulting firm for the calculation of the average size of processed fruit.

<sup>1</sup> Hamlin, Westin, Rubi, Valencia Americana, Seleta, Pineapple, Pera Rio, Valencia, Valencia Folha Murcha and Natal.

<sup>2</sup> Department of math and science, FCAV/Unesp Jaboticabal Campus.

<sup>3</sup> National operator of the energy system – ONS. Data for the Parana River basin, encompassing the states of São Paulo, Minas Gerais, Paraná, Santa Catarina, Rio Grande do Sul, Mato Grosso do Sul, Goiás and Distrito Federal.