EXECUTIVE SUMMARY

ORANGE PRODUCTION FORECAST FOR THE 2017-2018 SEASON OF THE SÃO PAULO AND WEST-SOUTHWEST OF MINAS GERAIS CITRUS BELT

ORANGE PRODUCTION FORECAST FOR THE 2017-2018 SEASON OF THE SÃO PAULO AND WEST-SOUTHWEST OF MINAS GERAIS CITRUS BELT
MAY/2017 FORECAST

The 2017-2018 orange production forecast published on May 10, 2017 by Fundecitrus with the cooperation of Markestrat, FEA-RP/USP and FCAV/Unesp[1] is 364.47 million boxes (40.8 kg). This total includes:

- 68.49 million boxes of the Hamlin, Westin and Rubi varieties;
- 17.42 million boxes of the Valencia Americana, Valencia Argentina, Seleta and Pineapple varieties;
  114.52 million boxes of the Pera Rio variety;
- 123.04 million boxes of the Valencia and Valencia Folha Murcha varieties;
- 41.00 million boxes of the Natal variety.

1 – BEARING TREES

The bearing trees of the varieties which make up this forecast total 174.78 million. The information about bearing trees were extracted from the Tree Inventory of the São Paulo and West-Southwest Minas Gerais Citrus Belt: Snapshot of Groves in March/2017, which was updated by the field assessment carried out from January 30 to March 10, 2017.

2 – FRUIT PER TREE

The average number of fruit per tree in April/2017, not considering the droppage to occur during the season, was measured at 753 fruits per tree. The bloom issuance and fruit setting rate of the 2017/2018 season which took place between August and December 2016 benefited from the low yield of the previous harvest, which provided a dormant period in the reproductive cycle, resulting in increased energy reserves in the trees of the general citrus belt. Weather conditions observed in this period also contributed to the increased yield. In July, water and heat stresses caused by cold nights (average of 12 °C in the citrus belt) followed by warm, dry days (average of 27.3 °C) favored floral induction with the arrival of the first rains in August 2016, except those regions of the Triângulo Mineiro, Altinópolis and Matão which had the start of regular rainfall in October.

2,200 trees were stripped, proportionally distributed as to the total trees in the citrus belt stratified according to region, variety, and age. In order to increase the accuracy of the forecast, an additional 360 trees younger than the age bracket of the groves they belong to were stripped. Such trees correspond to resets mainly to offset trees lost due to HLB (huanglongbing or greening), citrus canker and other diseases. Such stripping was carried out between March 17 and April 27, 2017.

The average number of fruit per tree may vary by 14 fruit more or less, which corresponds to 1.9% of the average number of fruit per tree obtained upon stripping. Such figure is in accordance with the expected error of 2% to 3% used in sample sizing. The analysis of the yield deviation distribution of each stripped tree in relation to the stratum average shows that the sample data are randomly distributed according to a normal distribution.

3 – FRUIT LOSS FROM DROPPAGE

The average droppage rate is estimated at 18.5%. The forecast rate is greater than those assessed in the previous seasons and is related to a greater production volume expected for this season, which might cause an extended harvesting period, thus increasing fruit exposure to pests and diseases with potential to cause fruit droppage.

4 – FRUIT SIZE

The average size is estimated at 265 fruits per box of 40.8 kg. Smaller fruit are expected for this season due to the greater quantity of oranges on the trees which limit their growth potential. In addition, according to Somar Meteorologia, the expectation for the second half of 2017 is for a milder El Niño, unlike what happened in 2015, with heavy rains above the historical average which resulted in increased fruit weight.

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[1] Exact Sciences Department of Jaboticabal.

OBJECTIVE SURVEY METHOD FOR ORANGE PRODUCTION FORECAST

In order to carry out this forecast, we maintained the objective method used in the last season, based on quantitative data – field measurements, counting and weighing of fruit – applied in the direct expansion model, whose formula is shown below. The result of this equation needs to be corrected according to variables not considered in the model, such as the different planting densities of blocks, which are not included in the stratification of groves, or the loss of trees along the harvest caused by eradications, abandonment or deaths. The correction factor (CF) represents the average of the indicators used in the 2015-2016 and 2016-2017 seasons.

$$\text{Production forecast} = \frac{\text{Bearing trees} \times \text{Fruit per tree} \times (1 - \text{Fruit loss from droppage}) \times \text{CF}}{\text{Fruit size}}$$

Table 1 shows the orange production forecast and its components by variety group.

Table 1 – Orange production forecast for the 2017-2018 season and its components by variety group

Variety group	Mature groves area	Average density planting[1]	Components of May/2017 forecast				Orange production forecast 2017-2018		
			Bearing trees	Fruit per tree at stripping[2]	Fruit forecasted by box	Fruit loss from droppage forecast	By tree	By area	Total
	(hectares)	(trees/ hectare)	(1,000 trees)	(number)	(number)	(%)	(boxes/ tree)	(boxes/ hectare)	(1,000,000 boxes)
Early season:									
Hamlin, Westin, Rubi..............	62,746	452	27,308	972	310	11.00	2.51	1.092	68.49
Other early season:									
Valencia Americana, Valencia Argentina, Seleta, Pineapple......................	17,883	456	7,950	714	257	12.30	2.19	974	17.42
Mid-season:									
Pera Rio...................................	125,367	495	60,235	666	260	17.50	1.90	913	114.52
Late season:									
Valencia e V.Folha Murcha[3]…	137,416	457	61,181	729	250	23.30	2.01	895	123.04
Natal..	42,113	443	18,105	813	250	22.55	2.26	974	41.00
Average..................................	(X)	**467**	(X)	**753**	**265**	**18.50**	**2.09**	**945**	(X)
Total.......................................	**385,525**	(X)	**174,779**	(X)	(X)	(X)	(X)	(X)	**364.47**

(X) Not applicable.

[1]   The calculation considers the total number of trees of the block, that is, bearing and non-bearing trees (2015 or 2016 resets).

[2]   Weighted average per stratum fruit.

[3]   V.Folha Murcha – Valencia Folha Murcha

The results compiled from the inventory and the stripping of trees, obtained throughout the survey, were restricted, until the date of this publication, to the following professionals: Antonio Juliano Ayres (general manager of Fundecitrus), Fernando Alvarinho Delgado, Renato Tadeu Rovarotto and Roseli Reina (PES supervisors), Vinícius Gustavo Trombin (executive coordinator for Markestrat), Marcos Fava Neves (political-institutional coordinator linked to FEA-RP/USP) and José Carlos Barbosa (coordinator of methodologies linked to the Department of Exact Sciences of FCAV/Unesp). All of them are subject to terms of confidentiality with regard to PES information until its disclosure to the public, pursuant to the confidentiality agreement signed between each one of them and Fundecitrus. Regarding antitrust practices, all of them were complied with throughout the work stages, through the adoption of the measures necessary to prevent any sharing of individual information with a competitive content, among the orange juice companies members of Fundecitrus, and between these and the citrus growers. This team concluded the crop forecast on May 10, 2017 at 9:50 a.m., in a closed meeting, devoid of any communication channel beyond the participants. Fundecitrus chairman, Lourival Carmo Monaco, became aware of the final information and then, at 10 a.m., started the public disclosure at the Fundecitrus auditorium, in Araraquara-SP, with live coverage on the Internet.

This executive summary was approved on May 10, 2017. The full report of the tree inventory and the orange production forecast for the 2017-2018 season of the São Paulo and West-Southwest of Minas Gerais Citrus Belt forecast will be available on 12 May 2017 at www.fundecitrus.com.br.

TABLES

The following tables present the orange forecast for 2017-2018 by sector, age, bloom and variety. The margin of error in the production forecast by strata is greater than that of the production forecast for the citrus belt as a whole. Variations that may occur in fruit size and droppage rates could alter the forecast, and these will be calculated throughout the season by constant monitoring in the field to carry out the production re-forecasts.

Table 2 – Orange production forecast for the 2017-2018 season by sector

Sector	Mature groves area	Average density planting[1] of mature groves	Bearing trees	Fruits per tree at stripping[2]	Orange production forecast 2017-2018		
					By tree	By area	Total
	(hectares)	(trees/ hectare)	(1.000 trees)	(number)	(boxes/ tree)	(boxes/ hectare)	(1,000,000 boxes)
North....................	85,871	472	39,290	801	2.20	1.007	86.49
Northwest............	40,584	439	17,635	673	1.88	818	33.19
Central.................	109,271	466	49,133	723	2.01	903	98.64
South....................	78,469	450	34,216	748	2.07	903	70.83
Southwest.............	71,330	496	34,505	788	2.18	1.056	75.32
Total...................	**385,525**	**467**	**174,779**	**753**	**2.09**	**945**	**364.47**

[1] The calculation considers the total number of trees of the block, that is, bearing and non-bearing trees (2015 or 2016 resets).
[2] Weighted average per stratum fruits.

Table 3.1 – Orange production forecast for the 2017-2018 season by tree age group (continues)

Age of blocks	Mature groves area	Average density planting[1] of mature groves	Bearing trees by group age				Fruits 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.............	48,447	603	28,214	-	-	28,214	**400**	-	-	400
6 – 10 years...........	141,481	516	3,137	67,685	-	70,822	150	**718**	-	693
Over 10 years…...	195,597	397	3,003	4,036	68,705	75,744	159	328	**1,012**	941
Total....................	**385,525**	**467**	**34,354**	**71,721**	**68,705**	**174,779**	**356**	**696**	**1,012**	**753**

[1] The calculation considers the total number of trees in the block, that is, bearing and non-bearing trees (2015 or 2016 resets).
[2] Weighted average per total stratum fruit.

Table 3.2 – Orange production forecast for the 2017-2018 season by tree age group (continued)

Age of blocks	Orange production forecast for the 2017-2018 season by tree age group				Orange production forecast for the 2017-2018 season 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............	1.12	-	-	1.12	**31.59**	-	-	31.59
6 – 10 years...........	0.42	1.99	-	1.92	1.31	**134.89**	-	136.20
Over 10 years……	0.43	0.91	2.79	2.60	1.30	3.66	**191.72**	196.68
Total....................	**1.00**	**1.93**	**2.79**	**2.09**	**34.20**	**138.55**	**191.72**	**364.47**

Table 4 – Orange production forecast for the 2017-2018 season by bloom

Bloom	Orange production forecast 2017-2018	Percentage of orange production forecast by bloom
	(1,000,000 boxes)	(percentage)
1st	265.24	72.77
2nd	65.77	18.05
3rd	29.55	8.11
4th	3.91	1.07
Total...	**364.47**	**100.00**