

Brazilian Citrus Overview

VINICIUS TROMBIN

EXECUTIVE COORDINATOR OF THE ORANGE CROP FORECAST SURVEY FOR THE
THE SÃO PAULO AND WEST-SOUTHWEST MINAS GERAIS CITRUS BELT

FUNDECITRUS / MARKESTRAT

Fundecitrus
CIÊNCIA E SUSTENTABILIDADE
PARA A CITRICULTURA

PES
PROJETO DE ESTIMATIVA DE SAÍDA

markestrat
Group

Fundecitrus



CIÊNCIA E SUSTENTABILIDADE
PARA A CITRICULTURA



RESEARCH AND
INNOVATION



EDUCATION IN
CITRUS PROTECTION



TECHNOLOGY
TRANSFER



CROP FORECAST
SURVEY



COMMUNICATION



SUSTAINABILITY

AGENDA

BRAZILIAN CITRUS SECTOR

2023-2024 ORANGE CROP FORECAST FOR THE
BRAZILIAN CITRUS BELT

WHAT TO EXPECT FROM THE BRAZILIAN ORANGE
PRODUCTION

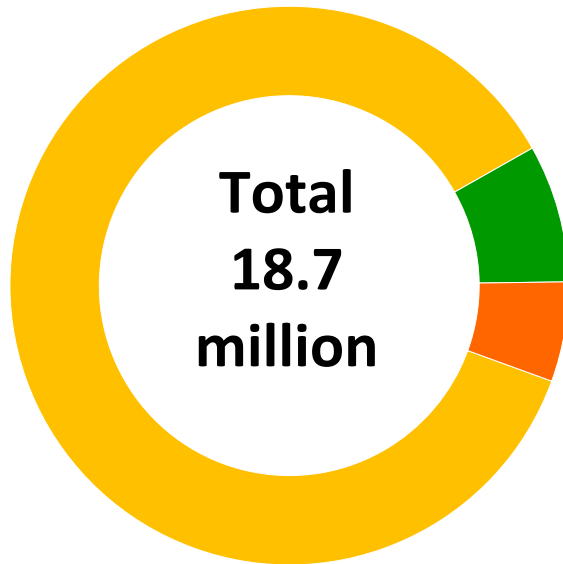


BRAZILIAN CITRUS PRODUCTION



16.2 million
87%

Production
(Metric Tons)

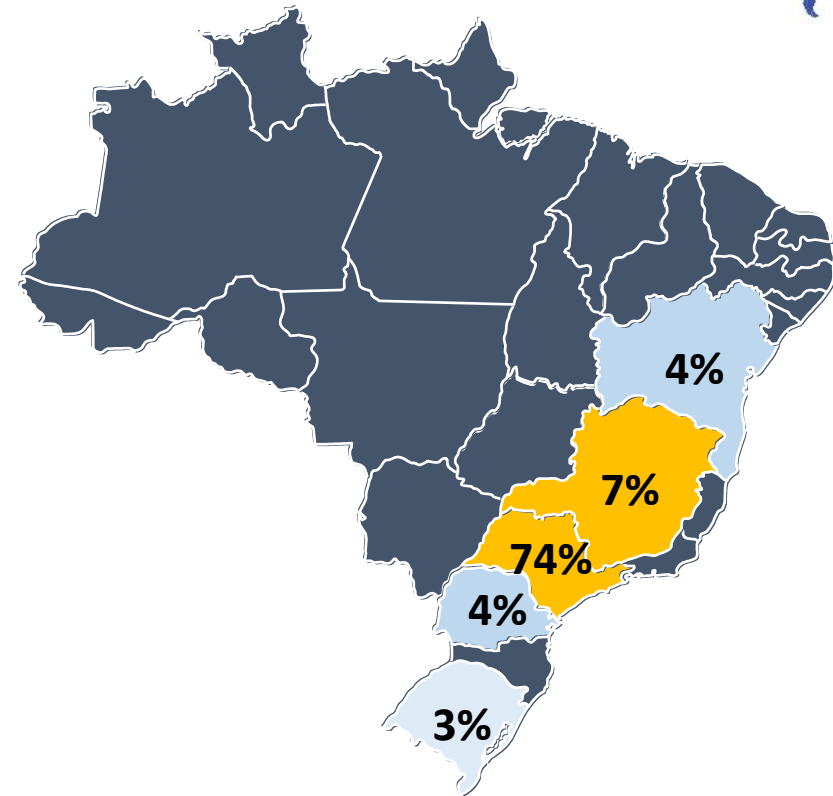


1.5 million
8%

1.0 million
5%

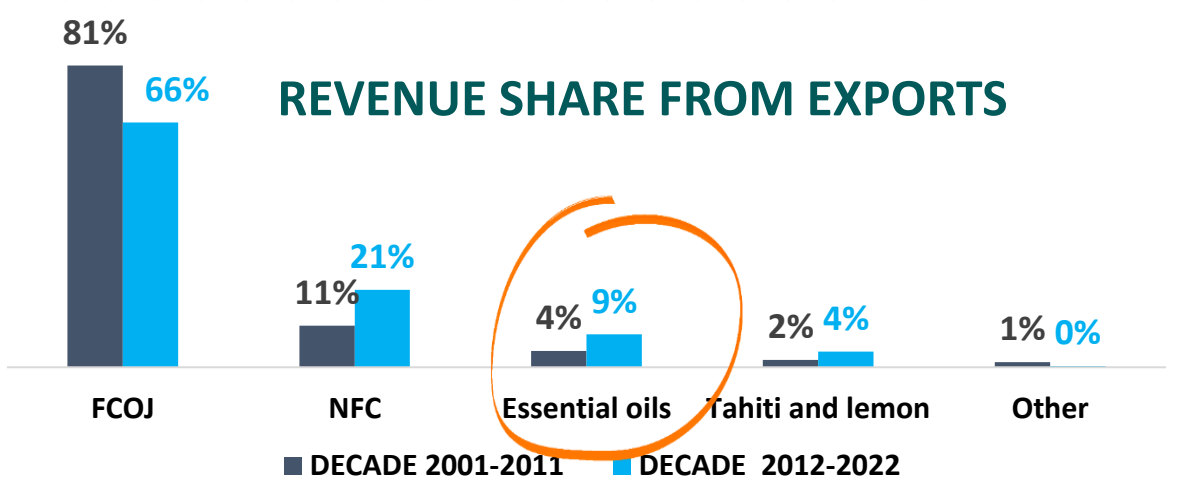
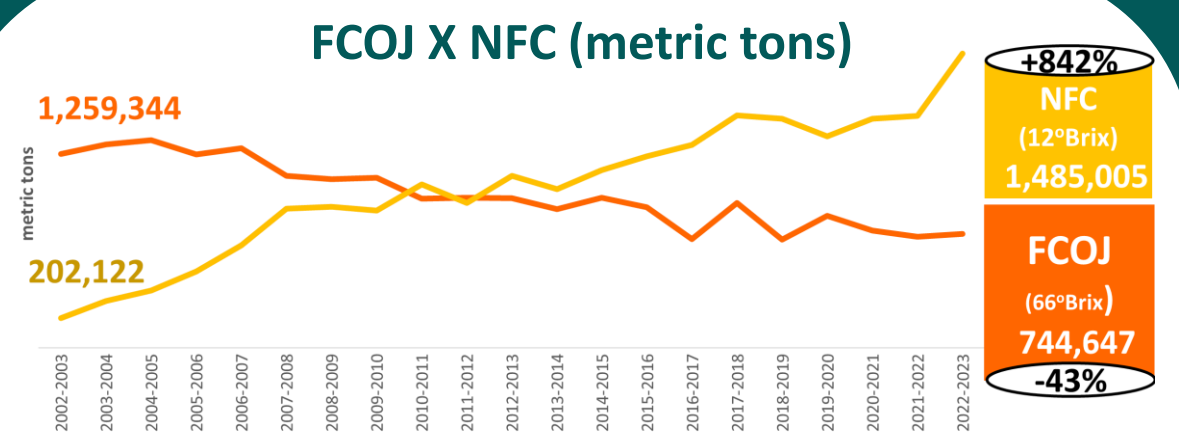
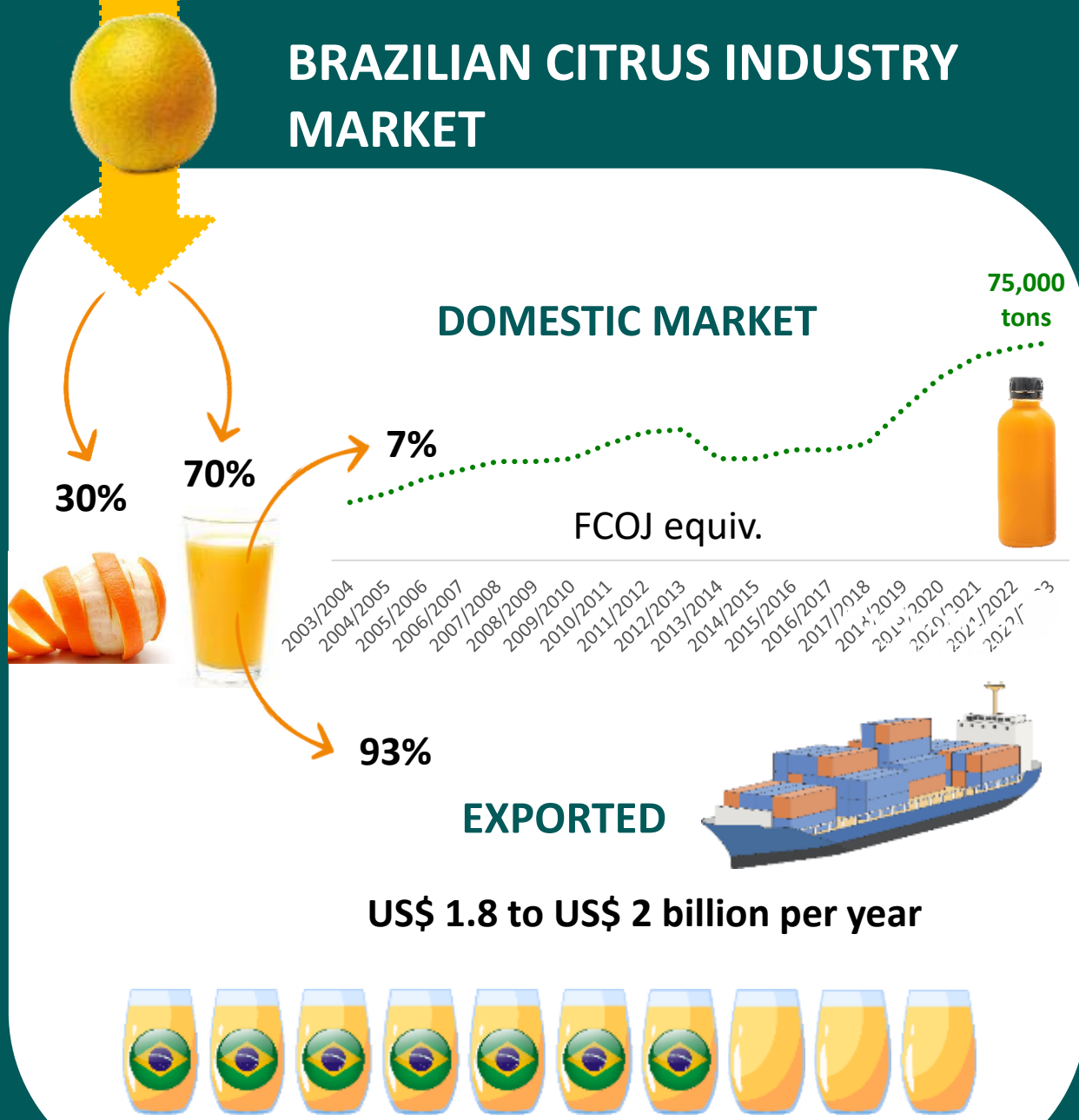


Main citrus-growing regions in Brazil:
94% of the production



Source: IBGE, 2021.

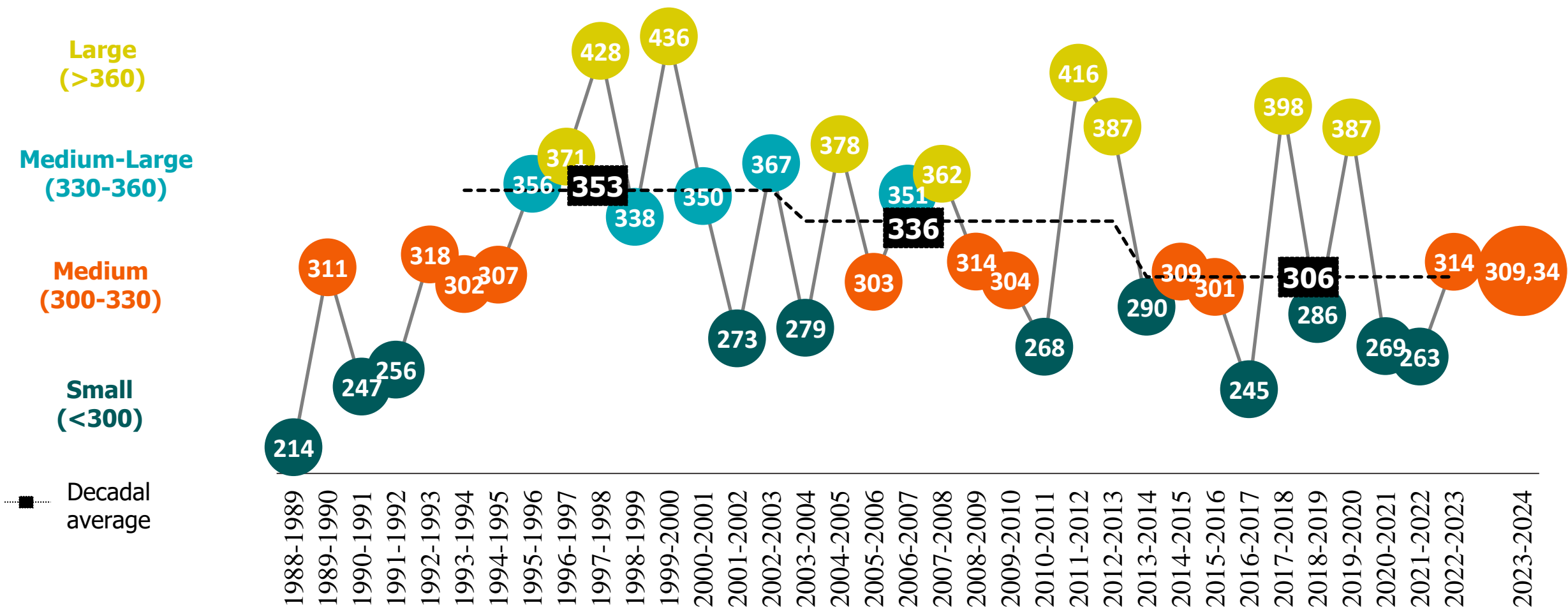
BRAZILIAN CITRUS INDUSTRY MARKET



MORE THAN 98% OF EXPORTS COMES FROM THE CITRUS BELT

Fonte: USDA, Secex.

SÃO PAULO AND MINAS GERAIS CITRUS BELT ORANGE CROP PRODUCTION



Source: CitrusBR (1998/89 to 2014/15) and Fundecitrus (2015/16 to 2023/24).



OBJECTIVE METHOD



TECHNICAL COMMITTEE



**FORECAST
PRODUCTION**

$$\begin{array}{c} \text{BEARING TREES} \times \text{FRUIT PER TREE} \times (100\% - \text{DROP RATE \%}) \times (100\% - \text{CF\%}) \\ \hline \text{FRUIT PER BOX} \end{array}$$

CF = Correction Factor

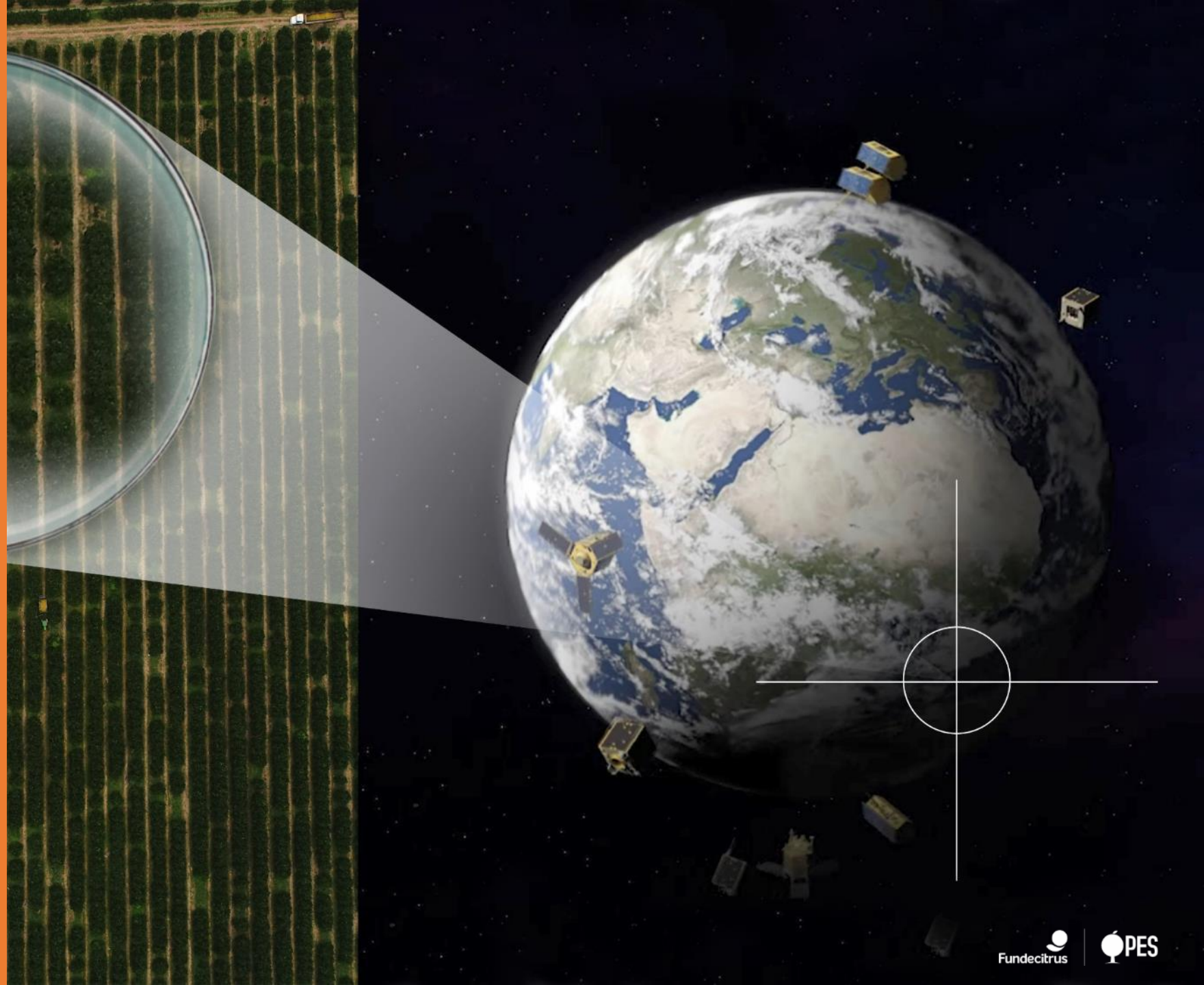
**FORECAST
PRODUCTION**

$$\begin{array}{c} \text{BEARING TREES} \times \text{FRUIT PER TREE} \times (100\% - \text{DROP RATE \%}) \times (100\% - \text{CF\%}) \\ \hline \text{FRUIT PER BOX} \end{array}$$

CF = Correction Factor

EVERY THREE YEARS

**EVERY THREE YEARS,
NEW HIGH-DEFINITION
SATELLITE IMAGES ARE
PURCHASED TO GUIDE
THE FIELD SURVEY**



EVERY THREE YEARS

ALL CITRUS PLOTS ARE VISITED FOR A NEW *IN LOCO* DATA COLLECTION

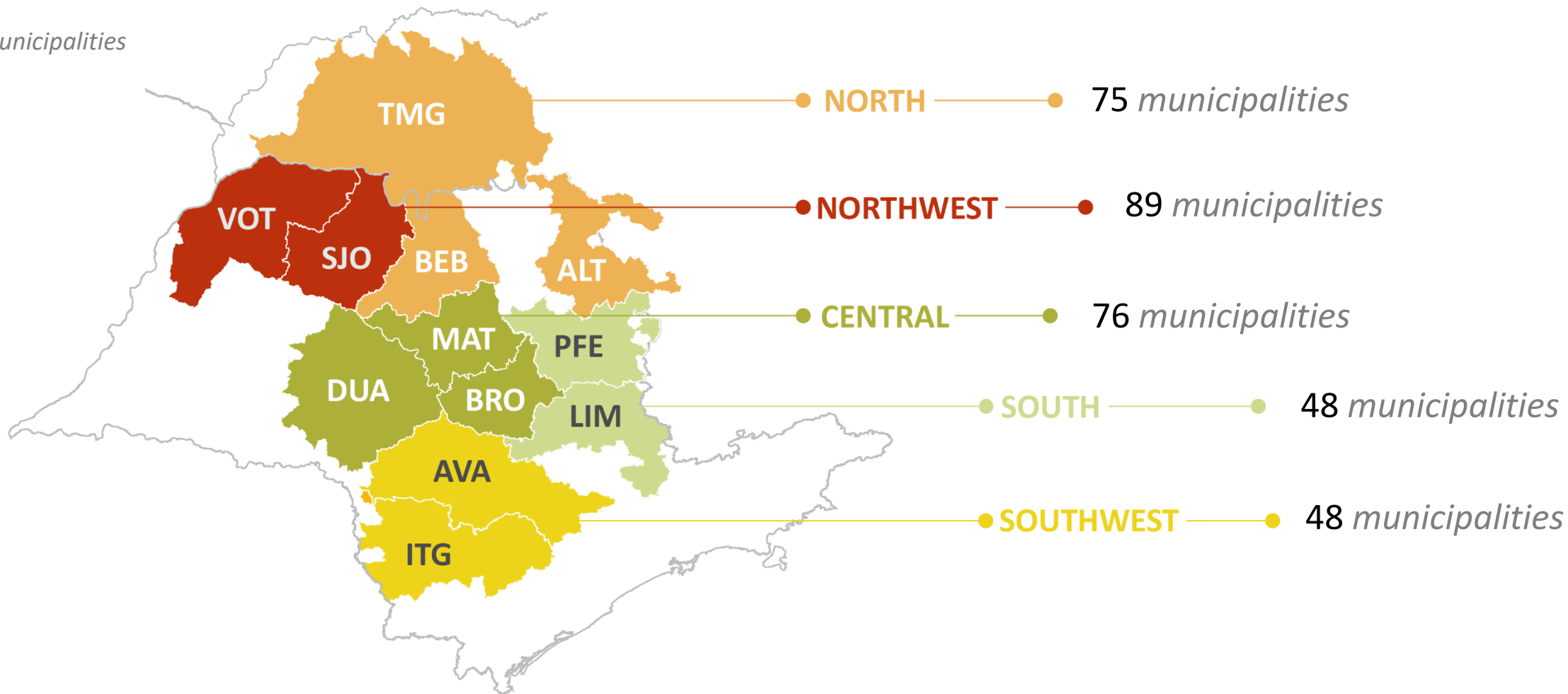
- **OUTLINE THE PLOT**
- **VARIETY**
- **PLANTING YEAR**
- **SPACING**
- **IRRIGATION SYSTEM**

DATA IS AUDITED IN LOCO DURING MAPPING



Sectors and regions

336 municipalities



EVERY YEAR

KEEP THE NUMBER OF TREES UPDATED

5% OF THE MAPPED
PLOTS ARE RANDOMLY
SELECTED BY STRATIFIED
SAMPLING

JAN
FEB
MAR



eradicated



abandoned



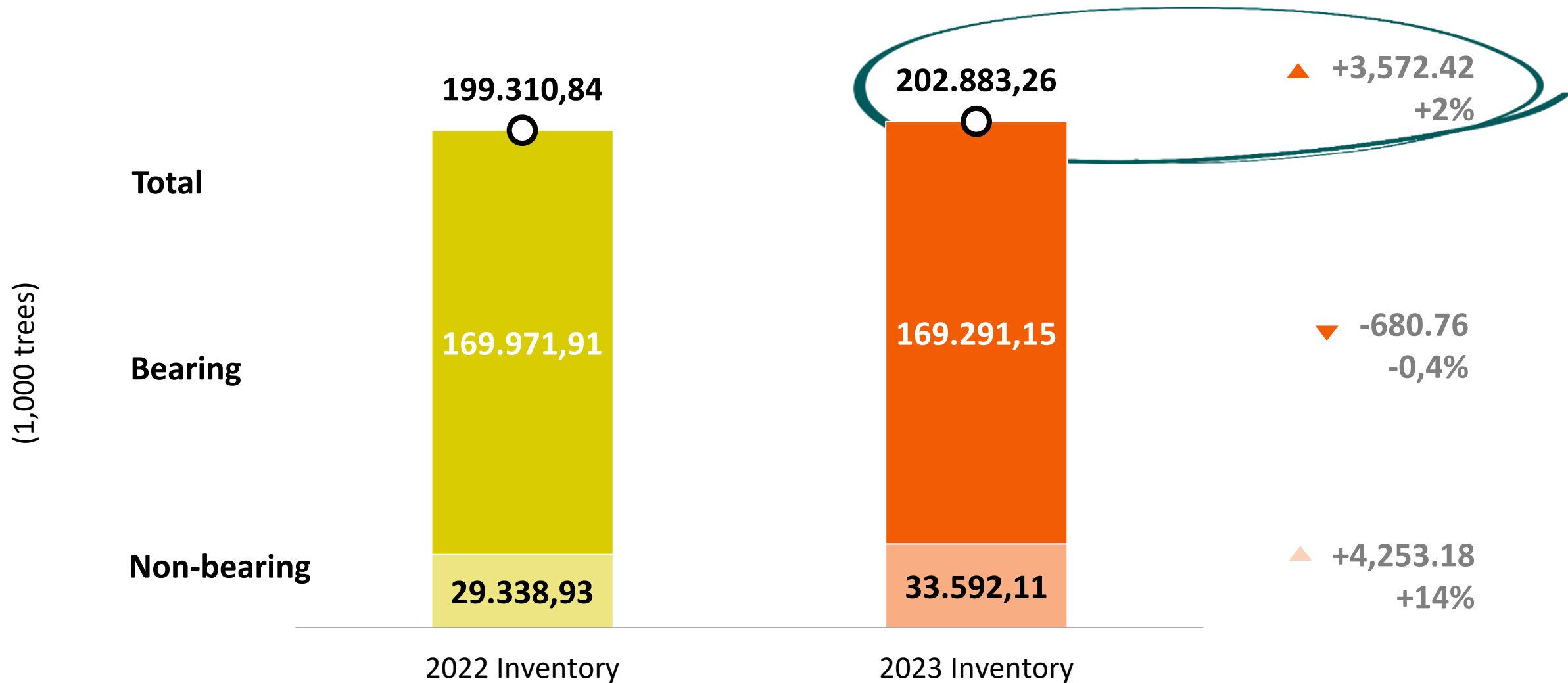
newly planted



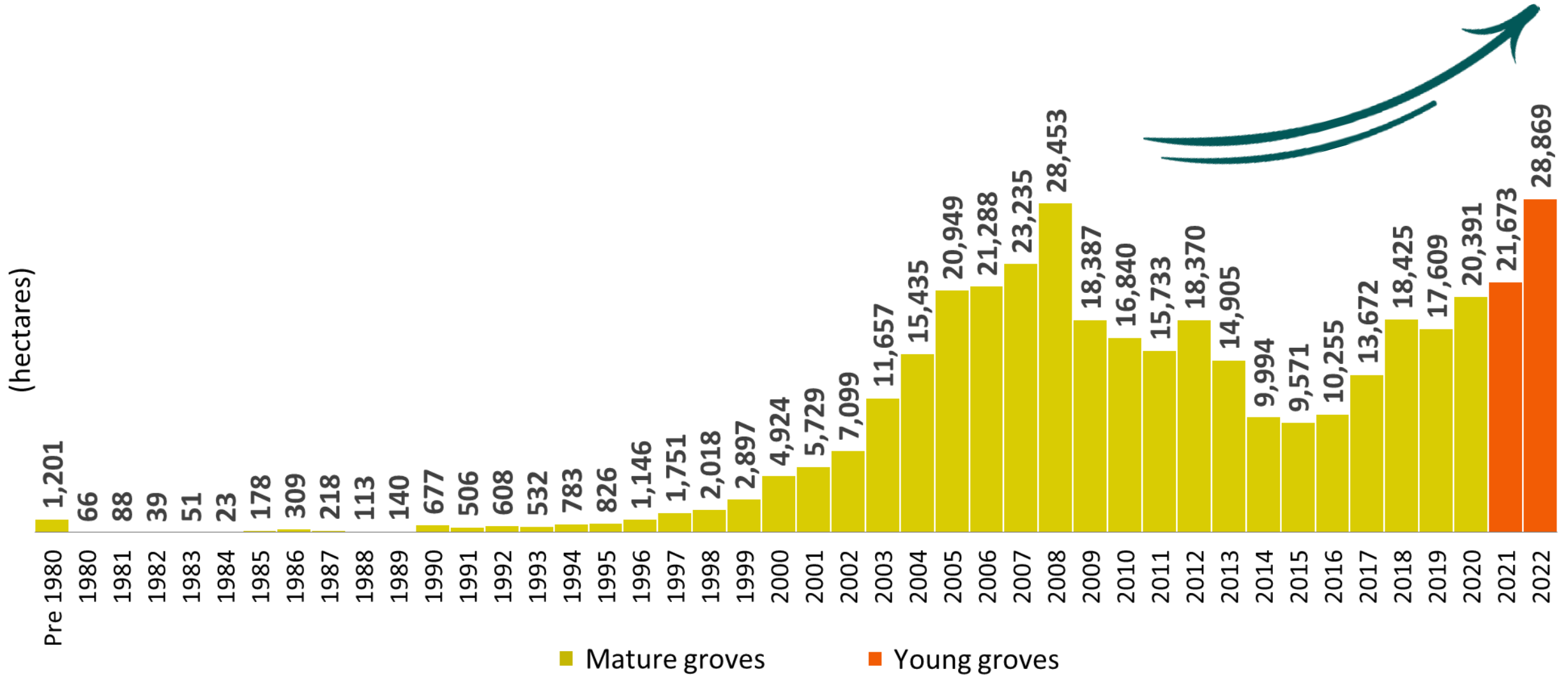
how many trees were cut or replanted



ORANGE TREES



AREA OF ORANGE BY YEAR SET



**FORECAST
PRODUCTION**

$$\begin{array}{c} \text{BEARING TREES} \times \text{FRUIT PER TREE} \times (100\% - \text{DROP RATE \%}) \times (100\% - \text{CF\%}) \\ \hline \text{FRUIT PER BOX} \end{array}$$

CF = Correction Factor

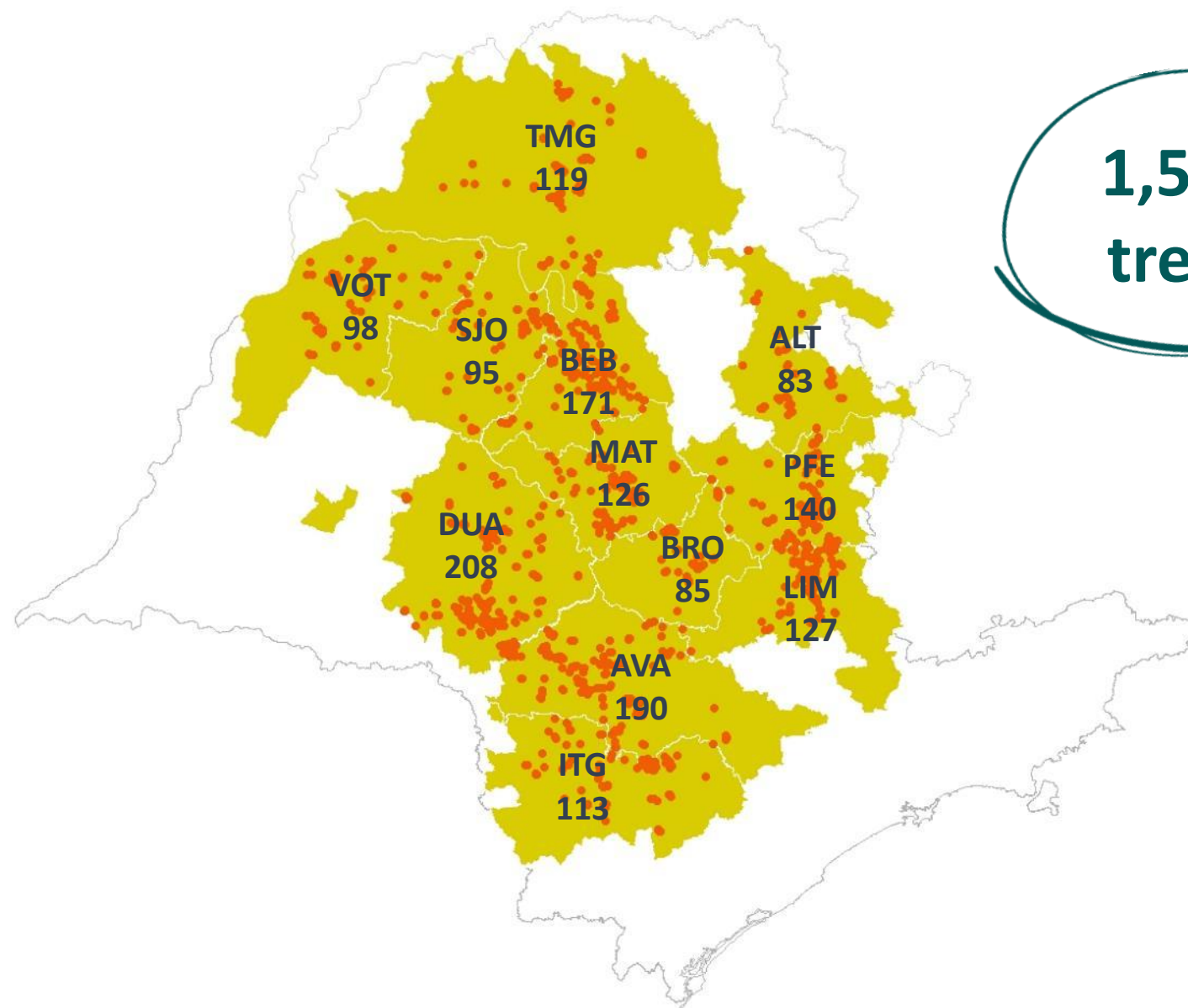
EVERY YEAR

MAR
APR

STRIP FRUIT OFF TREES
IN PLOTS SELECTED BY
STRATIFIED SAMPLING

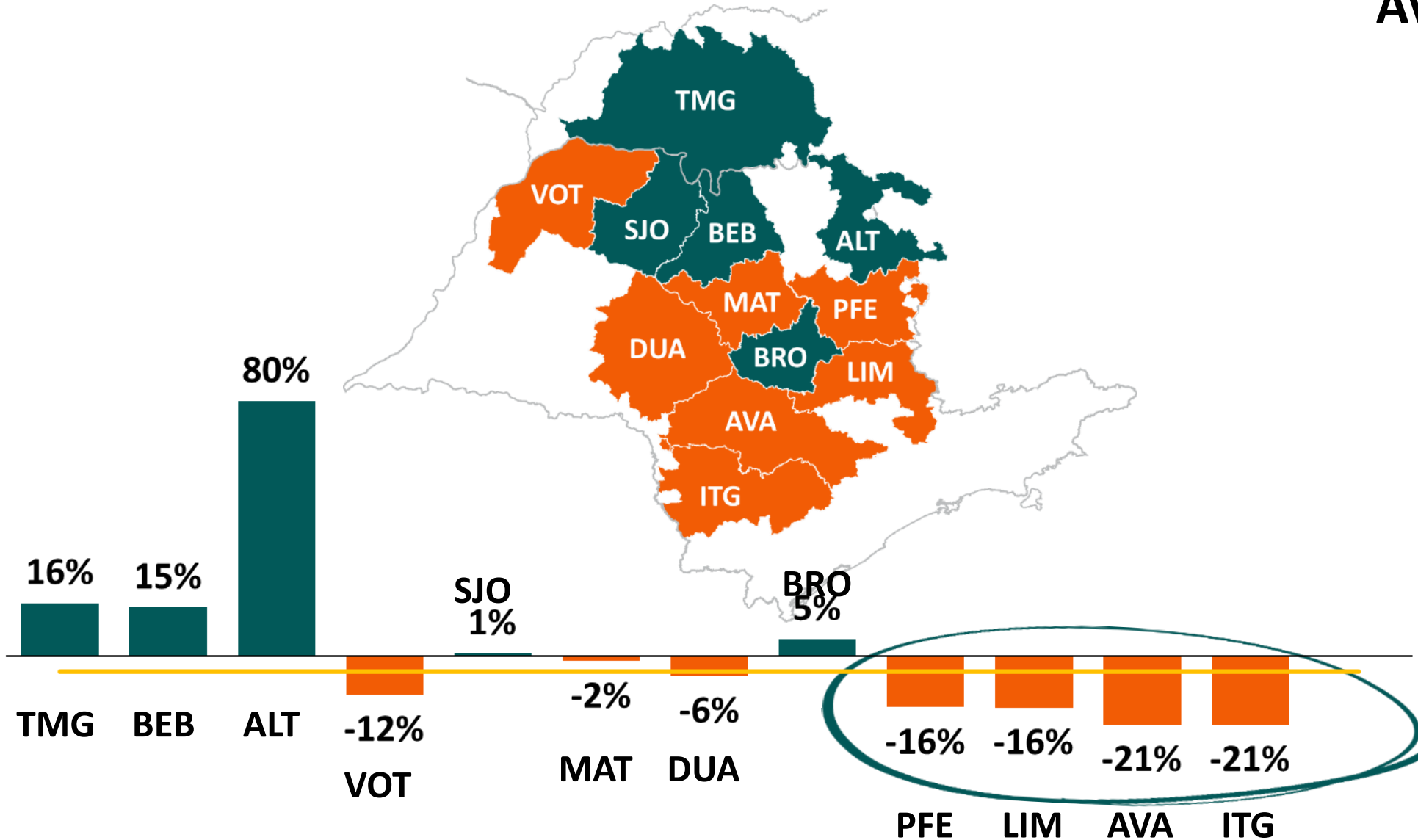


LOCATION OF RANDOMIZED TREES STRIPPED



1,560
trees

NUMBER OF FRUITS PER TREE COMPARED TO THE PREVIOUS CROP



Average fruits per tree

2022/2023

668



2023/2024

635

FORECAST PRODUCTION =

$$\frac{\text{BEARING TREES} \times \text{FRUIT PER TREE} \times \text{PROJECTION } (100\% - \text{DROP RATE } \%) \times (100\% - \text{CF}\%)}{\text{FRUIT PER BOX} \times \text{PROJECTION}}$$

CF = Correction Factor

PROJECTED FRUIT DROP FOR 2023-2024

21%



FAVORABLE WEATHER

**GREENING INCREASE
CAUSING FRUIT DROP**

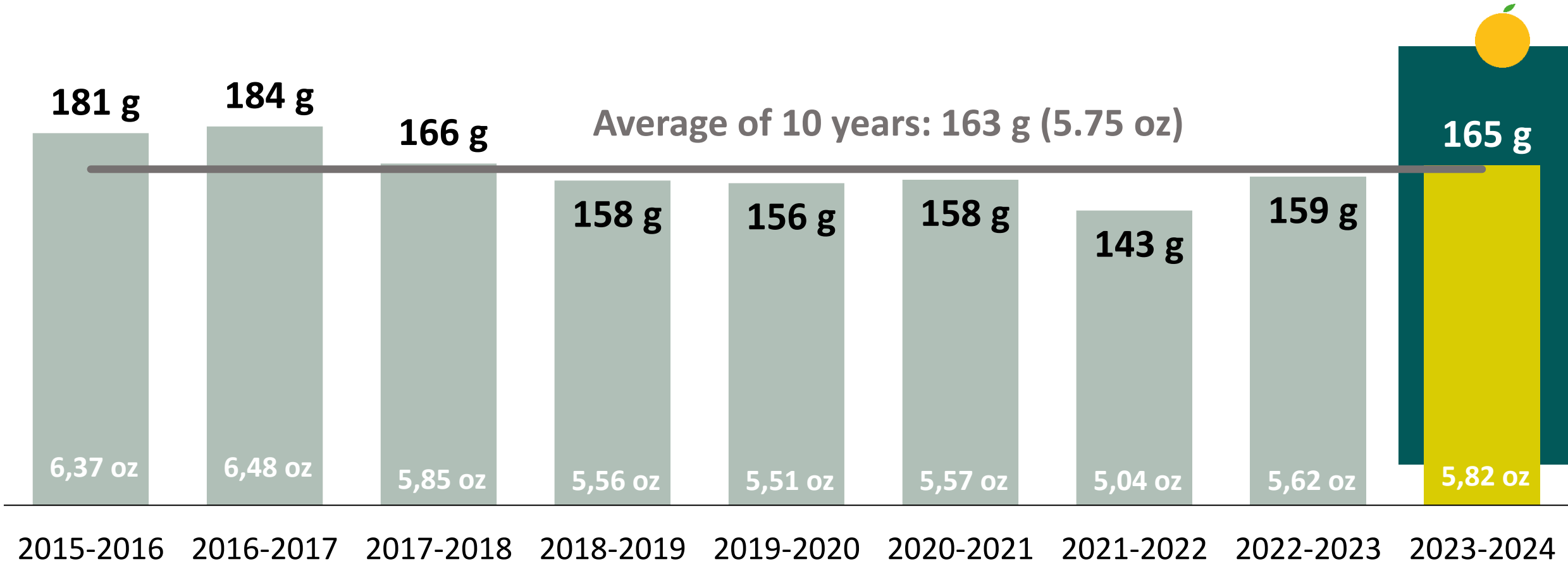


**FORECAST
PRODUCTION**

$$\text{FORECAST PRODUCTION} = \frac{\text{BEARING TREES} \times \text{FRUIT PER TREE} \times (100\% - \text{DROP RATE \%}) \times (100\% - \text{CF\%})}{\text{FRUIT PER BOX}}$$

CF = Correction Factor

FRUIT SIZE IS PROJECTED BY A REGRESSION



HARVEST PROGRESSES

MAY, 10

CROP FORECAST

JUNE

JUL

AUG

SEP, 11

UPDATE

OCT

NOV

DEC, 11

UPDATE

JAN

FEB, 09

UPDATE

MAR

APR, 10

UPDATE

FRUIT SIZE AND
FRUIT DROP RATE



MAY AND SEPTEMBER

$$\text{FORECAST PRODUCTION} = \frac{169.29 \text{ million} \times 635 \times (100\% - 21\%) \times (100\% - 10\%)}{247} = 309.34 \text{ million boxes}$$

CF = Correction Factor

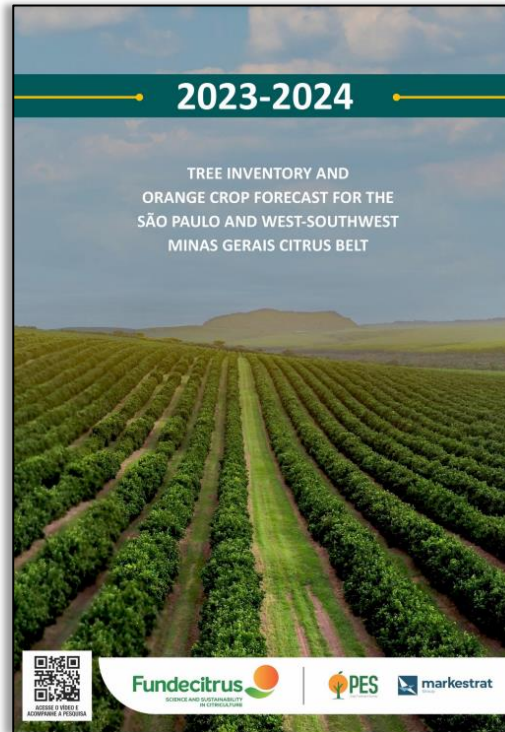
PUBLIC ANNOUNCEMENT / BROADCAST LIVE



Home / PES / Estimativa

Arquivos para download

- 2023/24
- 2022/23
- 2021/22
- 2020/21
- 2019/20
- 2018/19
- 2017/18
- 2016/17
- 2015/16



2023-2024

TREE INVENTORY AND
ORANGE CROP FORECAST FOR THE
SÃO PAULO AND WEST-SOUTHWEST
MINAS GERAIS CITRUS BELT

Fundecitrus PES markestrat

PES 2023-2024 ORANGE CROP FORECAST UPDATE FOR THE SÃO PAULO AND WEST-SOUTHWEST MINAS GERAIS CITRUS BELT - SEPTEMBER 2023

Current forecast update (variation regarding the May forecast): September, 11 2023

Total average crop production forecast: 309.24 million boxes (unchanged)
Hamilton, Weston and Rabi: 58.09 million boxes (increased of 2.35%)
Other early season: 18.51 million boxes (increased of 1.65%)
Para Rio: 96.68 million boxes (decreased of 2.25%)
Valencia and Folha Murcha: 105.23 million boxes (unchanged)
Natal: 30.83 million boxes (unchanged)

Publication Schedule: 2023-2024
2nd Crop forecast update: December 11, 2023
3rd Crop forecast update: February 09, 2024
Final crop forecast: April 10, 2024

Table 1 - Orange crop forecast update by sector and variety group - citrus belt

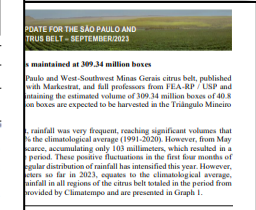
Month	Forecast components				Crop forecast 2023-2024		Crop forecast update 2023-2024			
	May 2023	September 2023	May 2023	September 2023	Per tree (boxes)	Per hectare (boxes)	Per tree (boxes)	Per hectare (boxes)		
Sector and variety group	Bearing trees (1,000 trees)	Fruit per tree at stripping (tonnes)	Fruit estimated per box (tonnes)	Per tree (boxes)	Per hectare (boxes)	Total (1,000,000 boxes)	Per tree (boxes)	Total (1,000,000 boxes)		
CITRUS BELT										
Hamilton, Weston and Rabi	25,716.04	828	292.00	10.80	2.18	1,012	56.11	2,266	1,087	58.09
Other early	9,866.33	397	251.22	12.00	1.81	971	18.22	1,388	987	18.51
Para Rio	61,508.67	563	249.24	22.50	1.61	848	98.95	1,577	829	96.68
Valencia and Folha Murcha	53,648.92	653	222	25.50	1.96	970	105.23	1,966	970	105.23
Natal	18,511.19	573	227	26.50	1.66	818	30.83	1,666	818	30.83
Total	169,291.15	655	247	21.80	1.83	918	309.24	1,83	918	309.24
NORTH SECTOR										
Hamilton, Weston and Rabi	6,503.91	1,085	289.00	7.30	2.66	1,149	17.33	2,888	1,242	18.74
Other early	2,191.81	779	286.22	9.00	2.51	1,378	5.59	2,581	1,395	5.66
Para Rio	13,535.28	592	242.22	19.50	1.78	947	24.07	1,768	939	23.86
Valencia and Folha Murcha	12,526.93	798	214	22.80	2.58	1,185	33.33	2,581	1,185	33.33
Natal	3,774.50	655	219	23.90	2.04	932	7.69	2,084	932	7.69
Subtotal	38,952.43	746	241.24	17.70	2.26	1,088	88.01	2,291	1,104	89.28
NORTHWEST SECTOR										
Hamilton, Weston and Rabi	1,994.68	582	276.22	7.30	2.49	711	2.98	1,758	833	3.49
Other early	1,718.19	414	244.00	15.80	1.22	643	2.09	1,281	677	2.20
Para Rio	6,669.81	611	242.22	17.50	1.81	833	12.09	1,837	858	12.44
Valencia and Folha Murcha	3,058.93	725	229	29.50	2.00	993	6.12	2,060	993	6.12
Natal	1,556.96	508	246	28.00	1.32	631	2.05	1,321	631	2.05
Subtotal	14,998.59	597	244.23	20.80	1.69	808	25.33	1,758	839	26.30
CENTRAL SECTOR										
Hamilton, Weston and Rabi	6,606.99	747	289.22	9.80	1.97	977	12.99	2,098	1,036	13.77
Other early	3,473.28	677	287.00	13.00	2.09	1,089	7.25	2,114	1,114	7.42
Para Rio	17,027.80	570	248.22	25.20	1.55	847	27.85	1,54	840	27.61
Valencia and Folha Murcha	15,036.66	574	226	26.00	1.67	870	25.12	1,677	870	25.12
Natal	4,631.97	567	235	23.10	1.66	813	7.69	1,66	813	7.69
Subtotal	47,676.70	603	247.24	21.80	1.78	887	88.90	1,71	895	81.61
SOUTH SECTOR										
Hamilton, Weston and Rabi	4,866.73	855	302.22	17.60	2.18	1,024	10.83	2,09	979	10.36
Other early	542.88	342	274.22	17.00	0.90	433	0.49	0.52	442	0.50
Para Rio	11,764.73	530	250.22	23.60	1.43	763	17.01	1.42	751	16.73
Valencia and Folha Murcha	9,392.07	732	230	26.40	2.10	971	20.14	2.10	971	20.14
Natal	2,585.87	538	233	28.50	1.41	728	3.76	1.41	728	3.76
Subtotal	29,452.88	648	255	23.68	1.77	872	52.23	1,758	859	51.49
SOUTHWEST SECTOR										
Hamilton, Weston and Rabi	5,643.73	781	298.22	11.40	2.12	973	11.98	2,08	953	11.43
Other early	1,940.37	481	272.22	11.20	1.44	764	2.80	1.41	745	2.73
Para Rio	11,611.05	526	259.22	23.90	1.54	831	17.83	1.36	743	16.08
Valencia and Folha Murcha	13,034.33	524	221	26.00	1.57	833	20.52	1.57	833	20.52
Natal	6,081.87	558	236	29.60	1.61	834	9.61	1.61	834	9.61
Subtotal	38,331.35	566	249.23	22.48	1.64	852	62.87	1,59	821	66.66

UPDATE FOR THE SÃO PAULO AND TRUS BELT - SEPTEMBER 2023

3 maintained at 309.24 million boxes

São Paulo and West-Southwest Minas Gerais citrus belt, published with Markestrat, and full professors from FEA/RP / USP and increasing the estimated volume of 309.24 million boxes of 40.8 boxes are expected to be harvested in the Triângulo Mineiro.

Rainfall was very frequent, causing significant volumes that to the climatological average (1991-2020). However, from May source, accumulating only 103 millimeters, which resulted in a period. These positive fluctuations in the first four months of regular distribution of rainfall has intensified this year. However, here so far in 2023, respect to the climatological average, rainfall in all regions of the citrus belt totaled in the period from recorded by Climatempo and are presented in Graph 1.



May to August 2023

mm

Legend:
■ Actual (mm)
■ Climatological average (mm)
■ Difference (mm)
■ Q1 and Q3 (1991-2020)

mm

Legend:
■ Actual (mm)
■ Climatological average (mm)
■ Difference (mm)
■ Q1 and Q3 (1991-2020)

mm

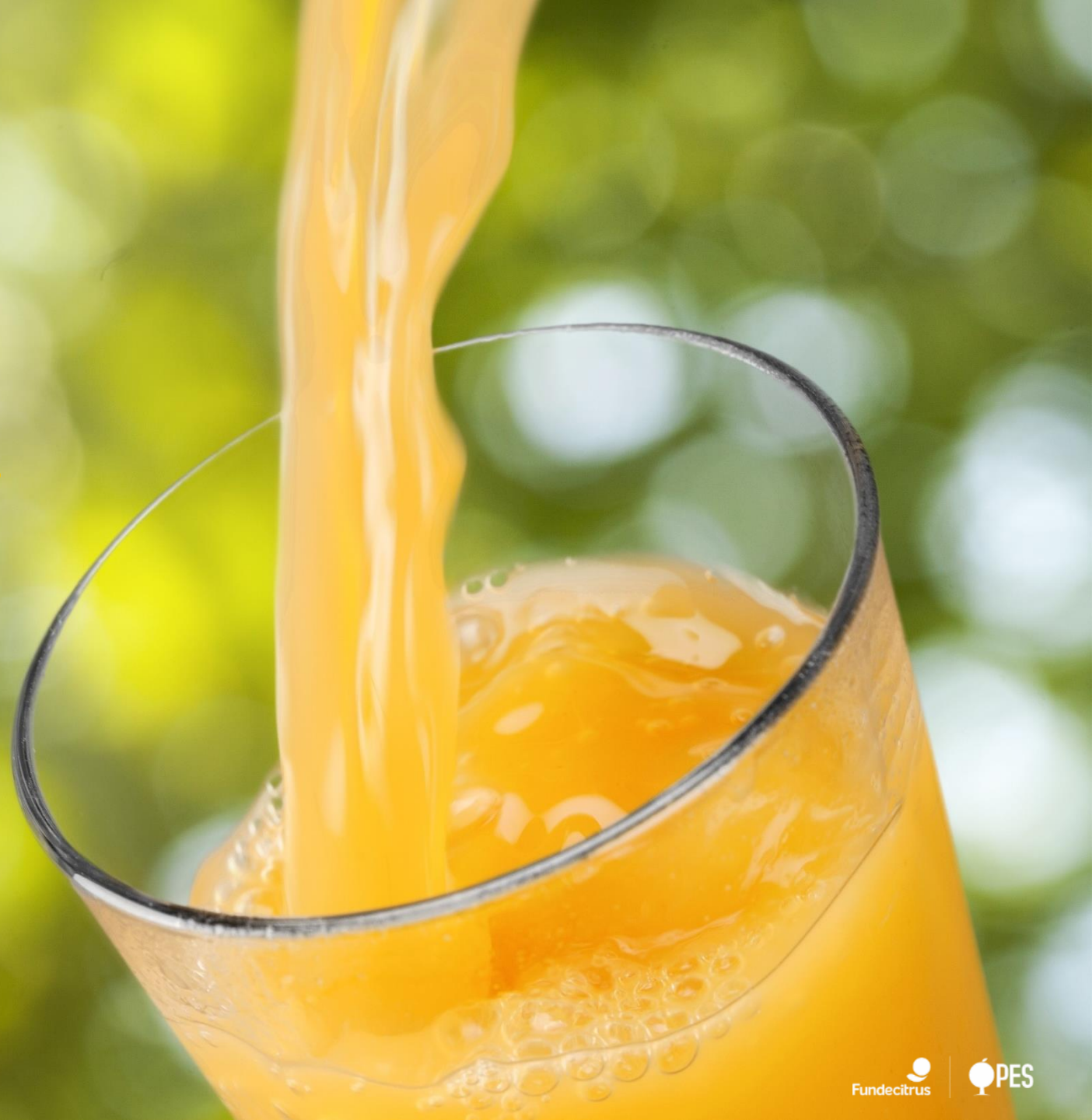
Legend:
■ Actual (mm)
■ Climatological average (mm)
■ Difference (mm)
■ Q1 and Q3 (1991-2020)

mm

Legend:
■ Actual (mm)
■ Climatological average (mm)
■ Difference (mm)
■ Q1 and Q3 (1991-2020)

fruits to compose a 40.8 kg box. This is equivalent to oranges of 185 grams x 8.2 oz, weight slightly above the average of the last 10 years, which is 103 grams x 7.5 oz. The sizes by sector and variety are shown in Table 2.

WHAT TO EXPECT FROM BRAZIL AS A GLOBAL SUPPLIER OF ORANGE JUICE?



BRAZIL HAS COMPETITIVE ADVANTAGES

CLIMATE AND SOIL



EXPERTISE



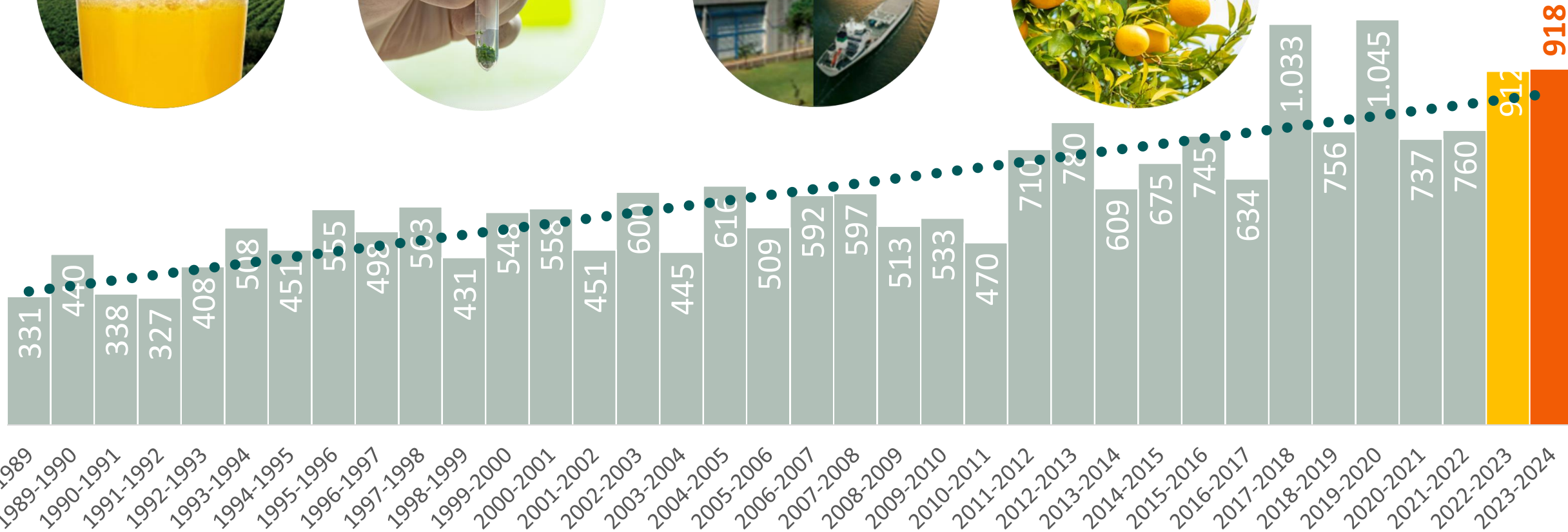
INFRASTRUCTURE



ENTREPRENEURS WITH ABILITY TO INVEST



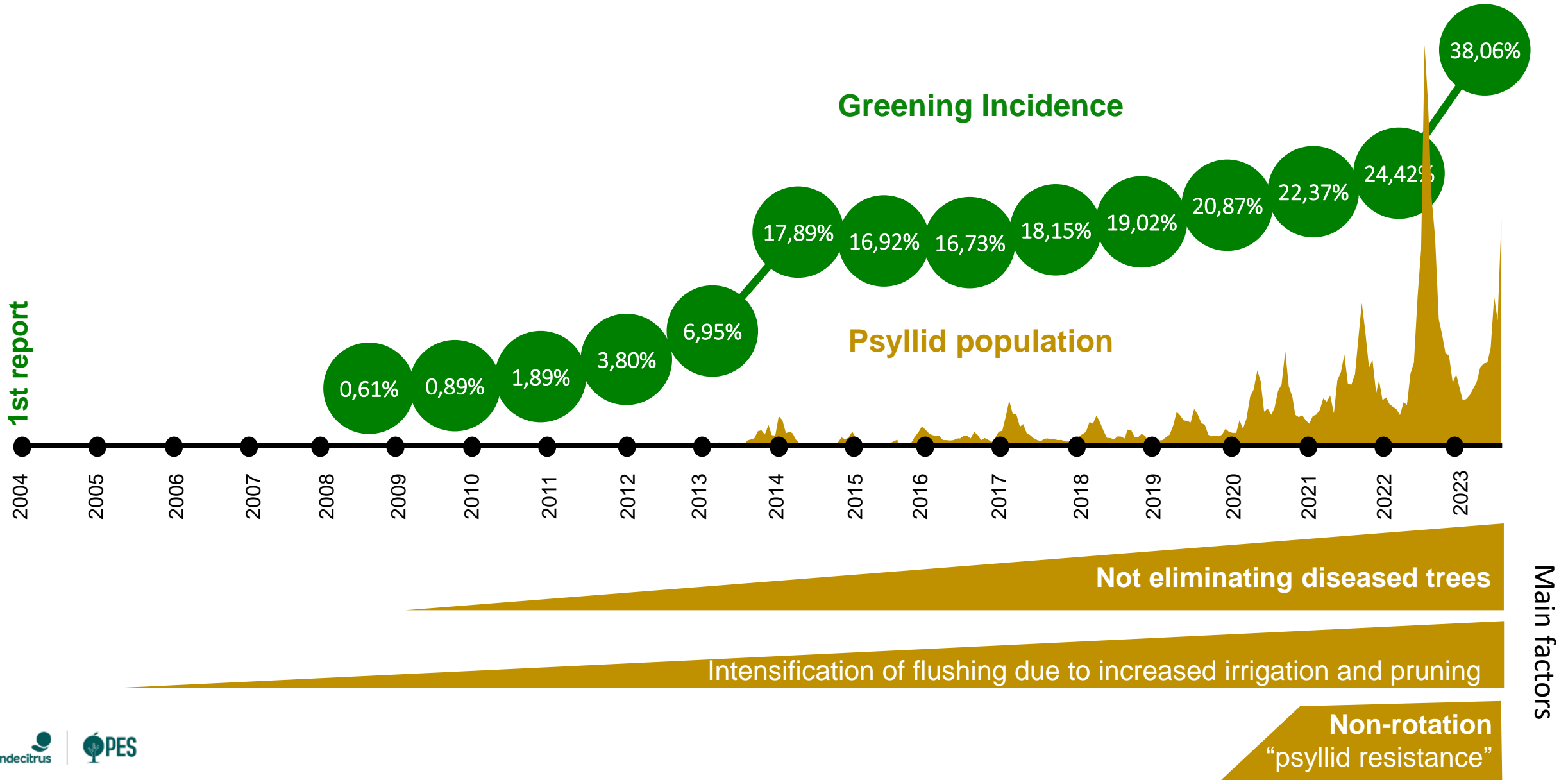
(boxes per hectare)




BUT HOW GREENING IS IMPACTING PRODUCTION?

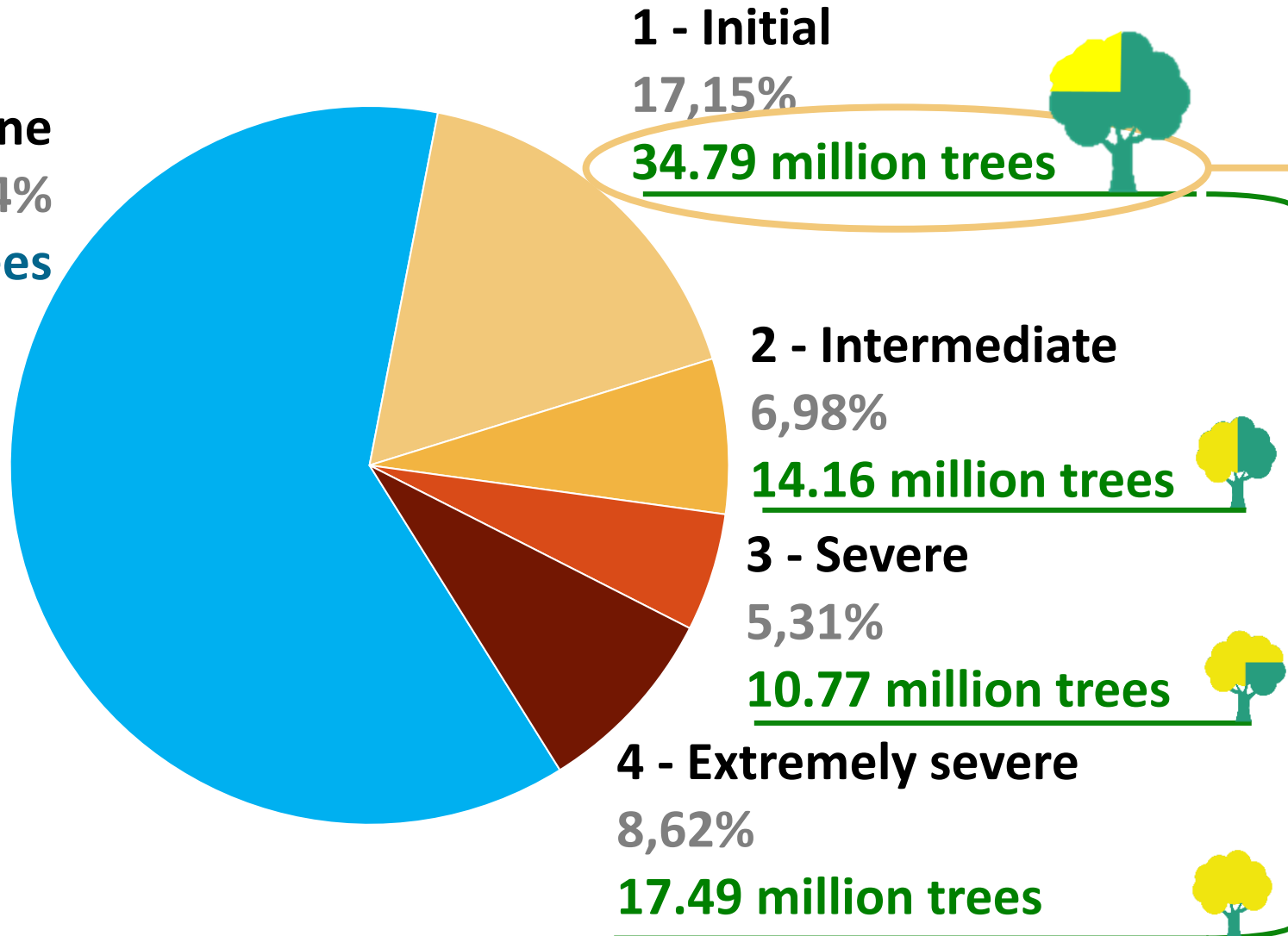


GREENING INCIDENCE HAS SIGNIFICANTLY INCREASED THIS YEAR



SEVERITY IS STILL LOW


0 - None
61,94%
125.67 million trees



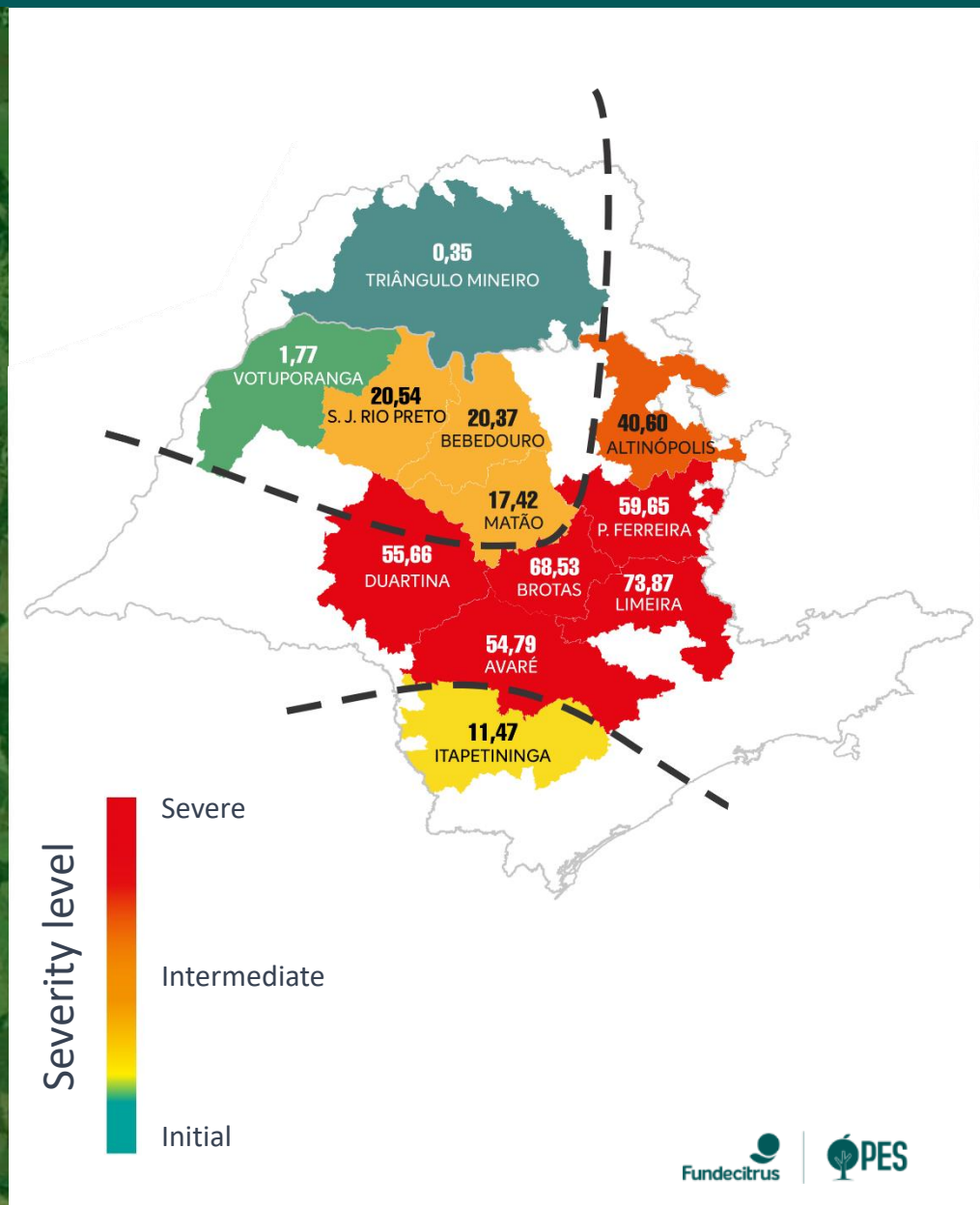
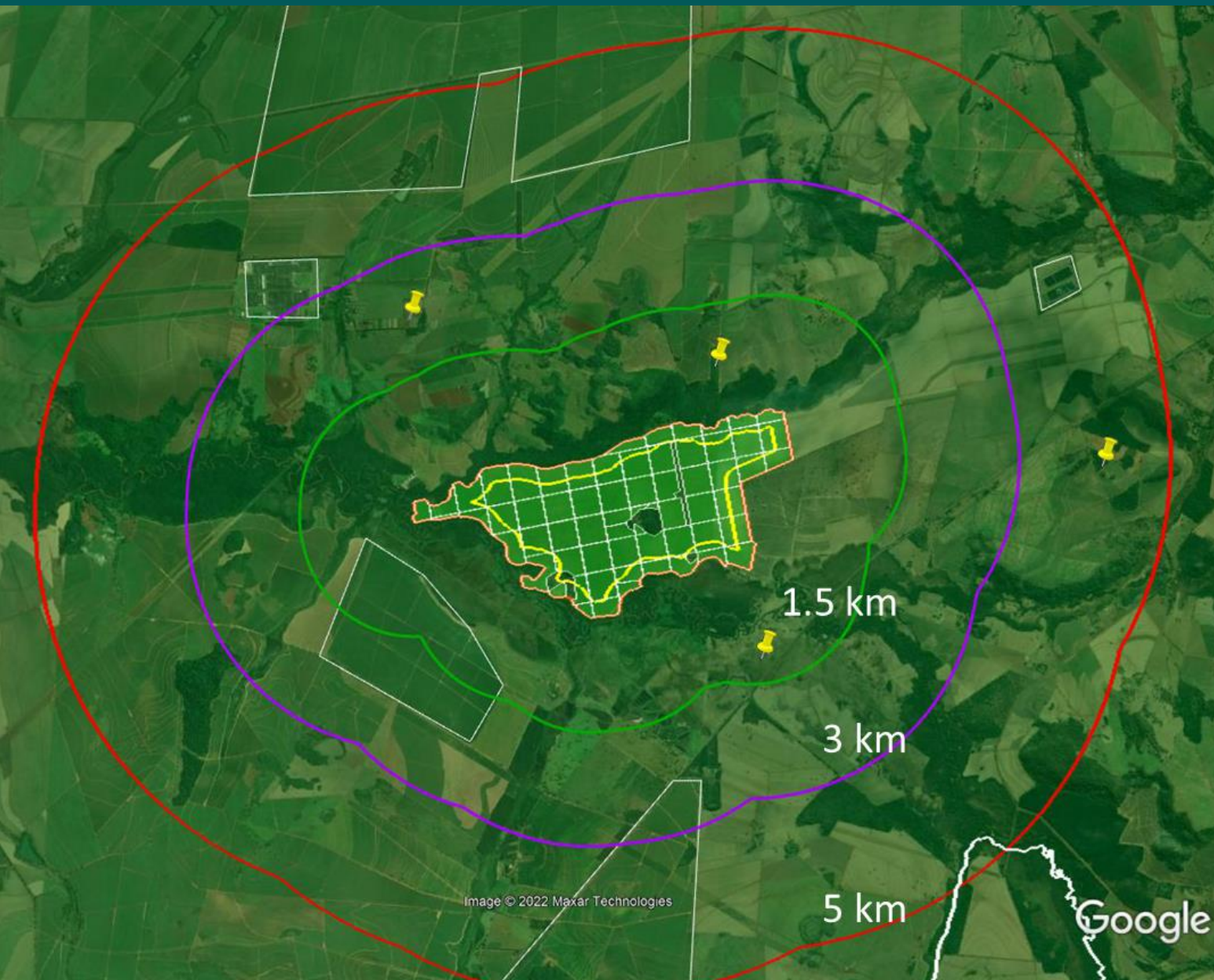
45% of the contaminated trees are still in the initial severity stage

77.22 million trees are contaminated

WHAT ARE CITRUS GROWERS DOING NOW TO MAINTAIN PRODUCTION STABILITY IN THE FUTURE?

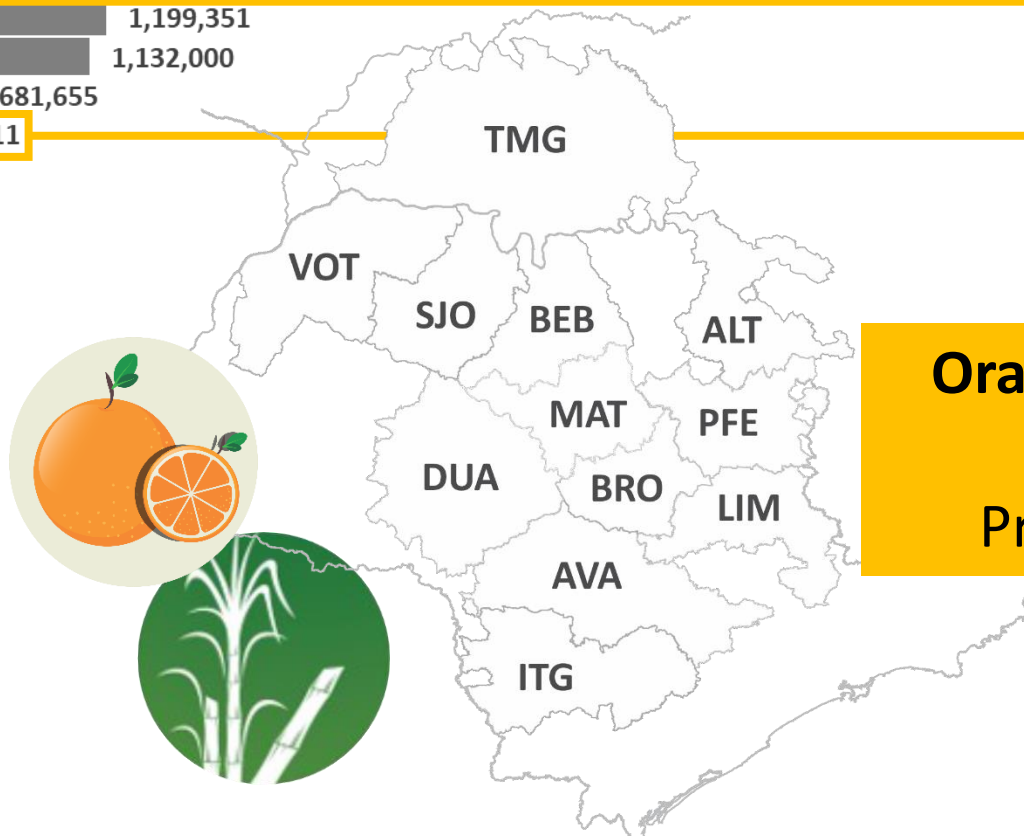
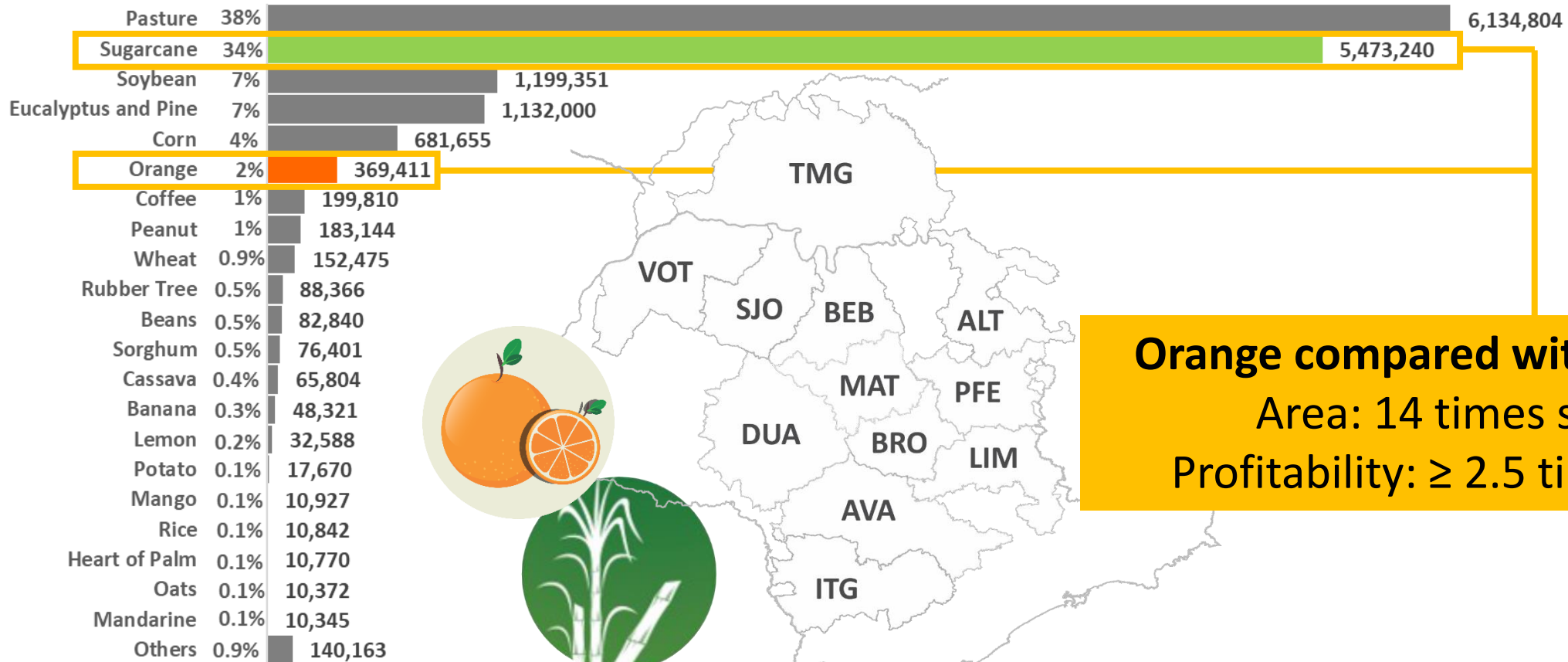


AREAS WITH LOW GREENING INCIDENCE WITHIN THE BELT AND ISOLATED



AREAS USED FOR OTHER CROPS AND LIVESTOCK IN SÃO PAULO THAT CAN BE CONVERTED TO ORANGE PRODUCTION

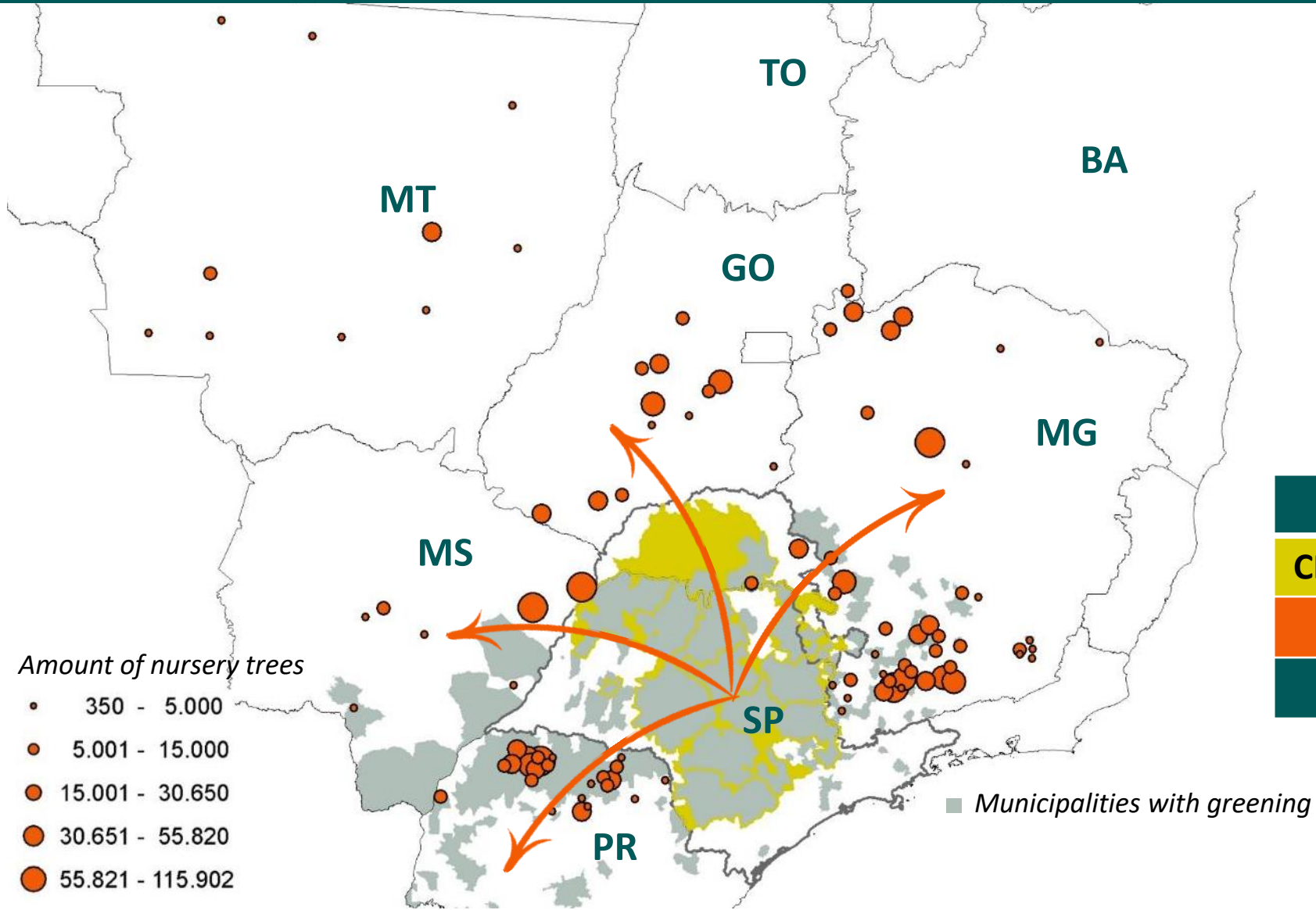
(hectares)



Orange compared with Sugarcane
 Area: 14 times smaller
 Profitability: ≥ 2.5 times higher

AREAS OUTSIDE THE BELT WITHOUT GREENING

ORANGE PLANTINGS IN 2022, LOCATED OUTSIDE THE CITRUS BELT, WITH NURSERY TREES ORIGINATING FROM SÃO PAULO



\$
Trade-off
It will lead to increased costs: logistics, irrigation and workforce attraction

REGION	NURSERY TREES	%
CITRUS BELT	15.363.102	91%
OUTSIDE	1.533.233	9%
TOTAL	16.896.335	100%

Source: CDA-SP
Municipalities that received more than 300 nursery trees

ADOPTING EFFICIENT CONTROL MEASURES



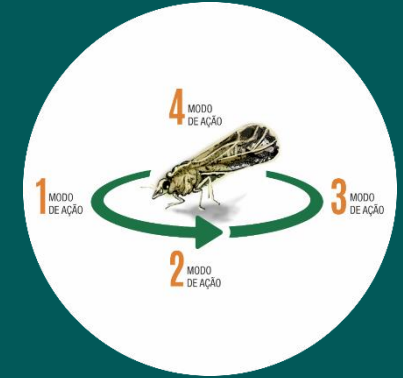
HEALTHY NURSERY TREES



PREVENTING PSYLLID ENTRY



MONITORING PSYLLID AND FLUSHING



PSYLLID CONTROL THROUGH INSECTICIDE ROTATION



GROVE PLANNING



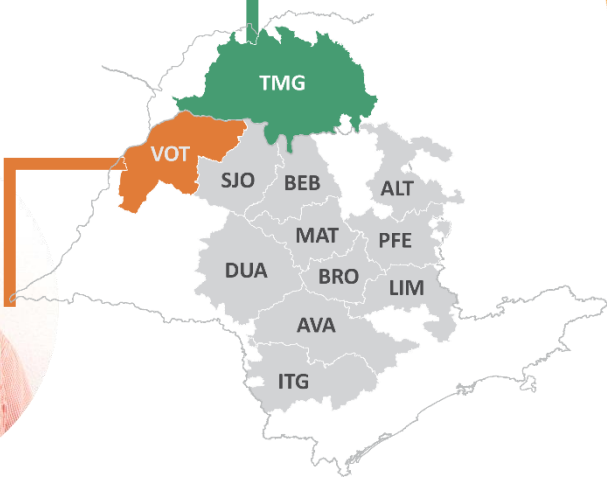
REGIONAL MONITORING AND COORDINATED CONTROL



FREQUENT INSPECTION AND IMMEDIATE REMOVAL OF DISEASED PLANTS

SEEKING MORE SUPPORT FROM FUNDECITRUS

STRENGTHENED THE TEAM IN THE AREAS WITH LOW INCIDENCE



COMMUNICATION



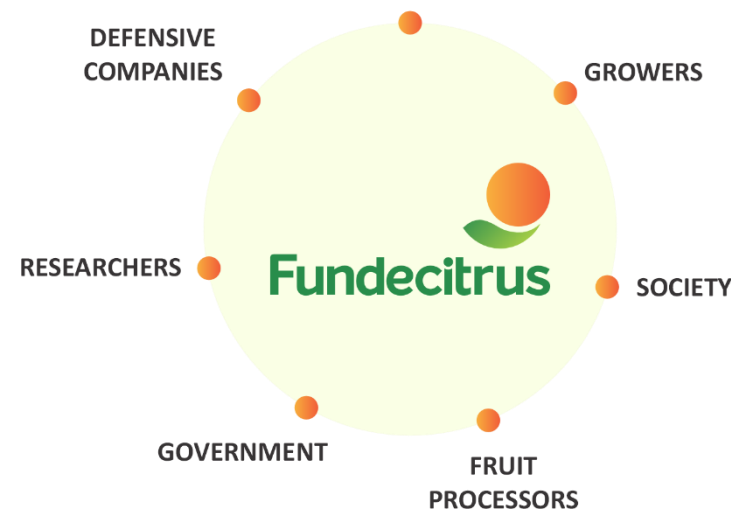
GREENING É COISA SÉRIA



TESTING NEW PRODUCTS AGAINST THE VECTOR AND BACTERIA



TECHNICIANS, AGRONOMISTS, CONSULTANTS





From a sustainability perspective,
WHY IS IT IMPORTANT TO
MAINTAIN THE
ORANGE PRODUCTION
STABLE?

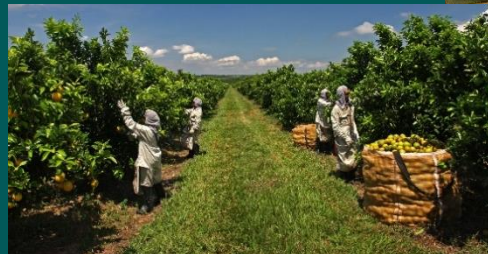
— 200,000
direct and indirect jobs

One job per 80 hectares



Orange creates 8 times more
jobs than sugarcane per
hectare

One job per 9 hectares



NATURE PRESERVATION

Same amount emitted by the city of São Paulo over the course of 8 years



Forests cover a total of 160,000 hectares

133 million tons of CO₂ eq. removed from the atmosphere

CO₂

O₂

C

C

Thanks to *Innocent Drinks* for funding this research!

STABLE AND SECURE LANDSCAPES FOR WILDLIFE





*KEEP TRACK
OF THE SURVEY*

vinicius.trombin@gmail.com



DES



markestrat

