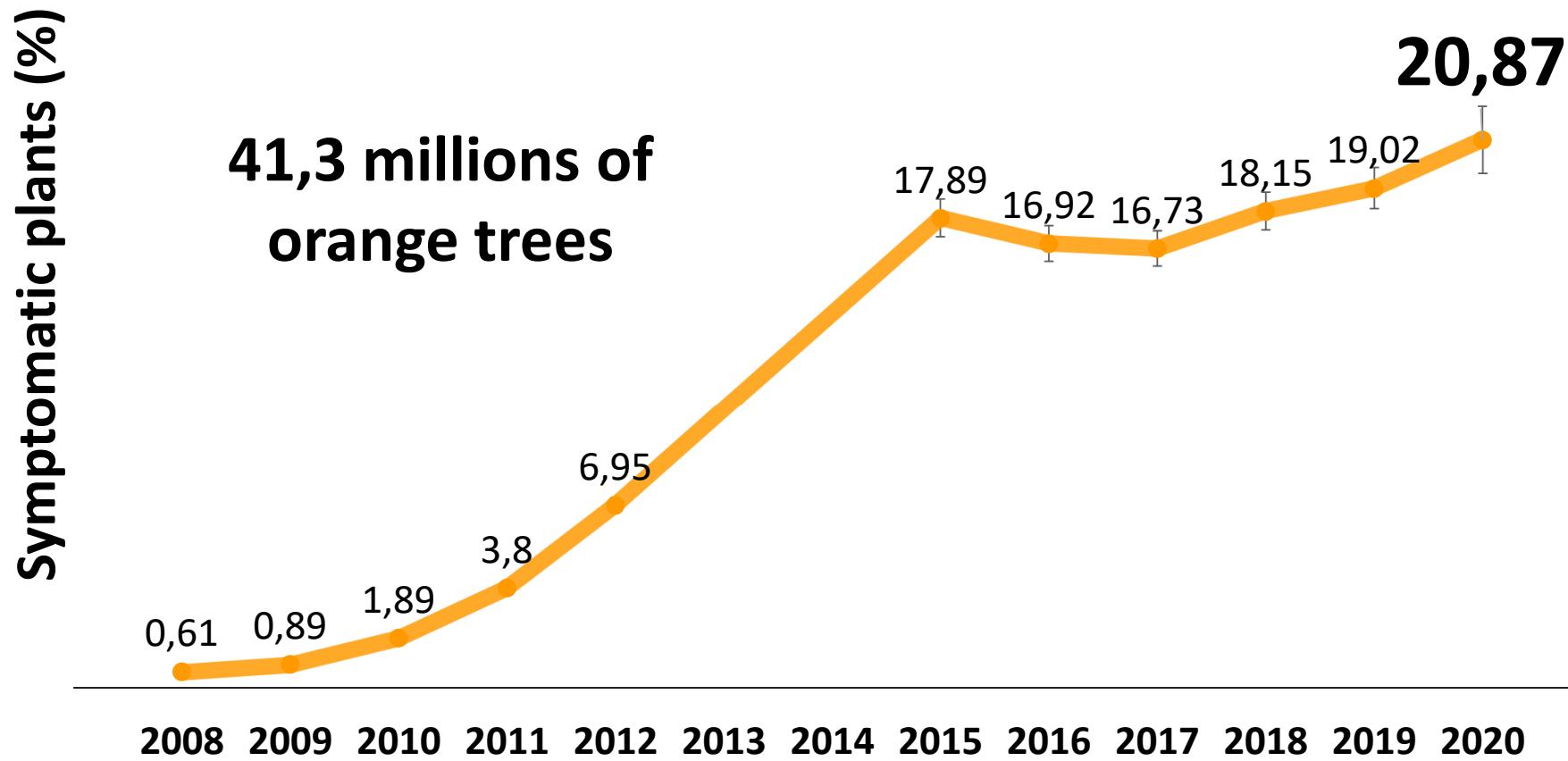


# **Psyllid alert system**

**MSc. Guilherme Rodriguez**  
Technology Transfer



## HLB INCIDENCE (SP)



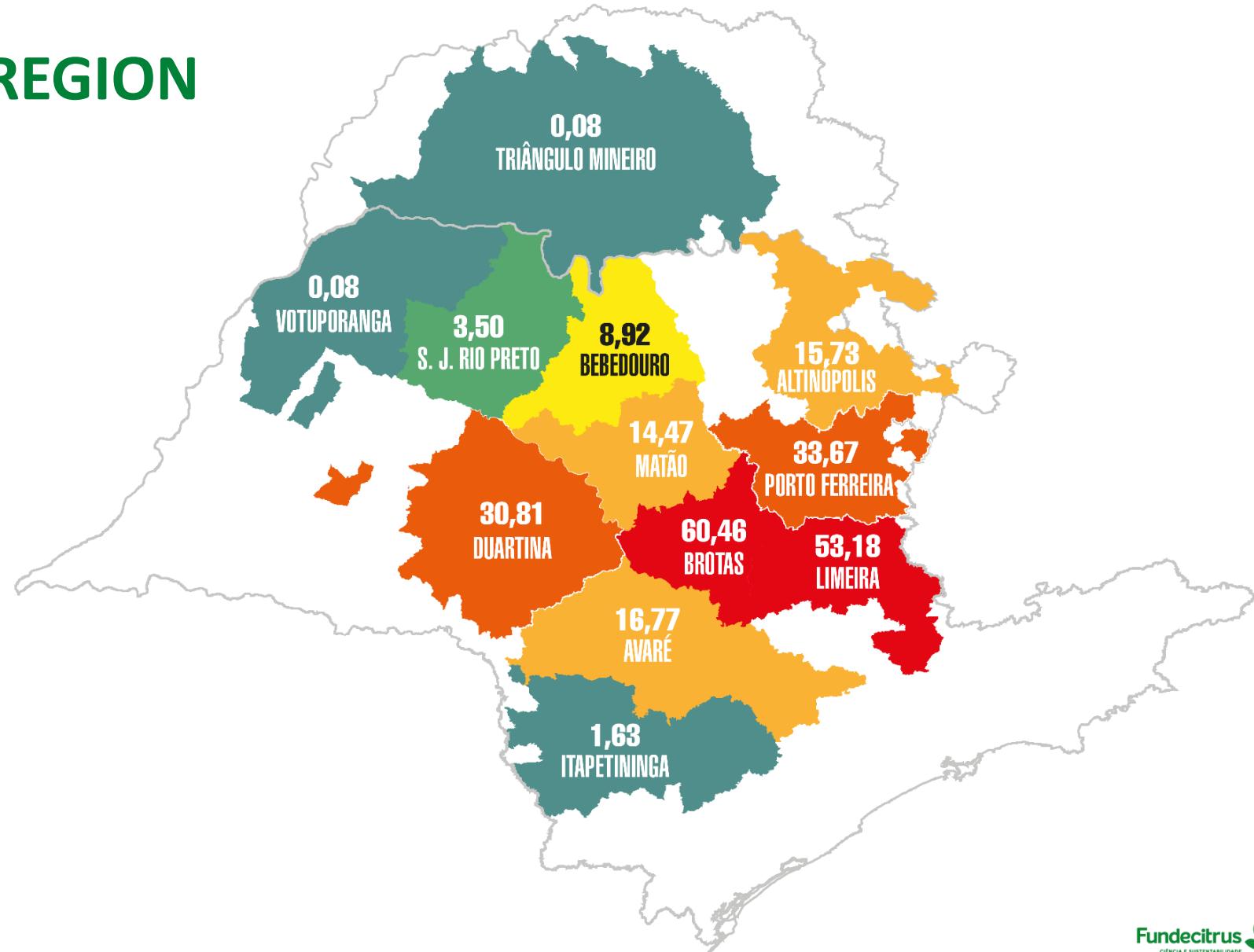
# INCIDENCE BY REGION

Incidence level

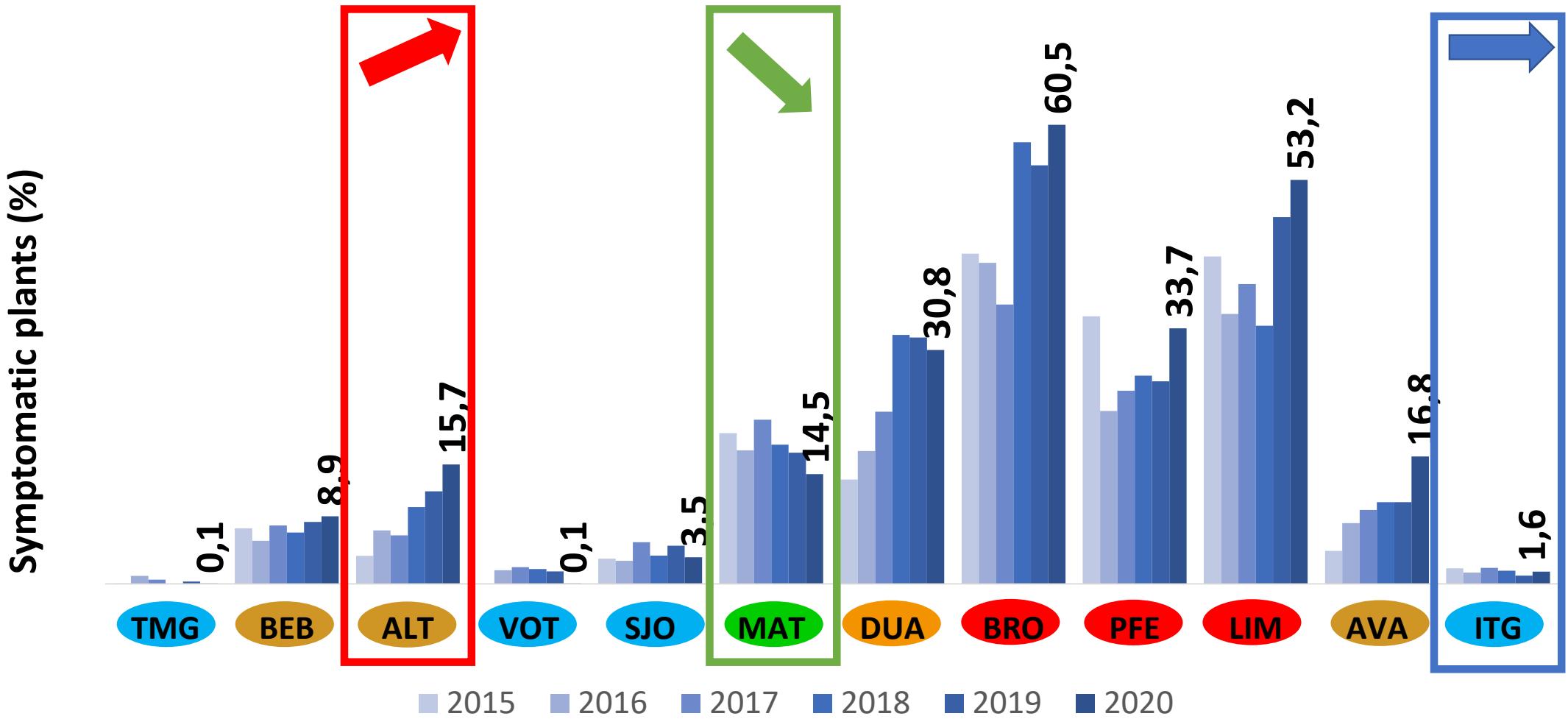
High

Medium

Low



## INCIDENCE BY REGION



# The 10 Commandments against HLB

**FUNDECITRUS**  
FUNDO DE DEFESA DA CITRICULTURA

**INTENSIVE MANAGEMENT AT THE EDGES**  
The first 100 meters of the farm borders are the most exposed to psyllids and HLB infection. Special attention must be paid in this area to avoid high contamination and the penetration of psyllids into the orchard.

**SPEED UP PLANT GROWTH AND PRODUCTION**  
Best cultural practices are necessary to guarantee high yields. Productive orchards support the disease impact longer.

**ELIMINATE DISEASED PLANTS**  
Disease trees must be removed as soon as detected. They are source of inoculum to contaminated new health trees.

**THE 10 COMMANDMENTS FOR HLB MANAGEMENT**

**PLANT HEALTHY NURSERY TREES**  
Healthy nursery trees produced in an insect-proof protected nurseries is the guarantee that the orchard will start with no contamination.

**INSPECT FREQUENTLY FOR HLB-AFFECTED TREES**  
Knowing the evolution of the disease is essential for the proper decisions to be taken in a fast effective manner.

**MONITOR THE PSYLLID PRESENCE**  
Knowing when and where the psyllid is in the orchard helps the grower to plan and set up the insect control. Yellow sticky traps located in the perimeter of orchard are the best tool for scouting psyllids.

**CONTROL THE PSYLLID**  
The presence of *Diaphorina citri* must not be tolerated in the orchards. Just one insect is enough to determine the need of its control.

**PLAN THE PLANTING AND RESETTING**  
Choosing the planting area is the key to success. Avoid regions highly affected by HLB. Large areas with a square shape have less edge areas exposure to external infective psyllids.

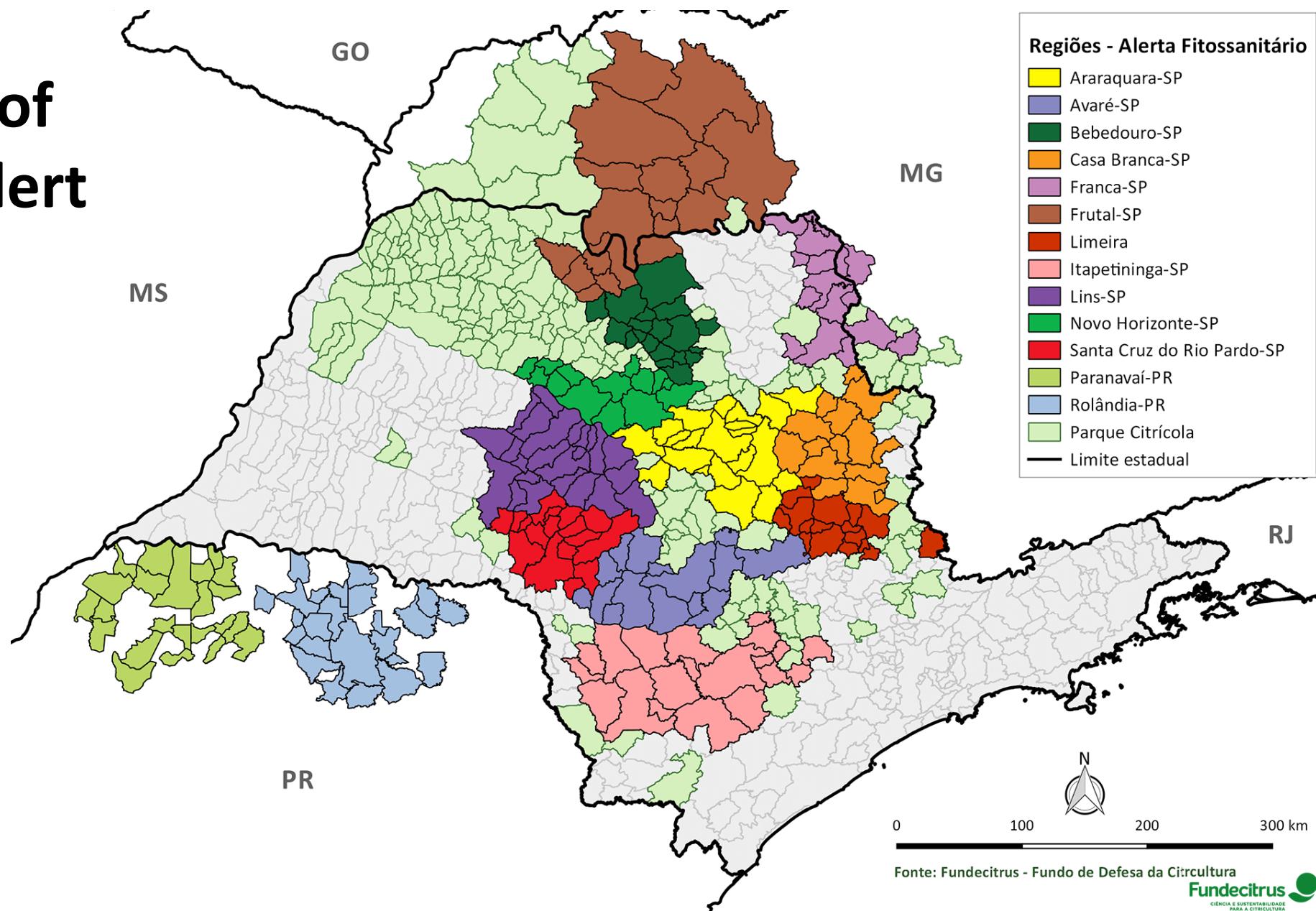
**TAKE PART IN THE REGIONAL MANAGEMENT**  
Infective psyllids can be reared around the orchards in citrus and orange jasmine trees located in orchards and back yards without HLB management causing severe damages to orchards with stringent disease management.

**PARTNER UP WITH YOUR NEIGHBORS**

## » Psyllid monitoring and plant sprouting



# Regions of psyllid alert system





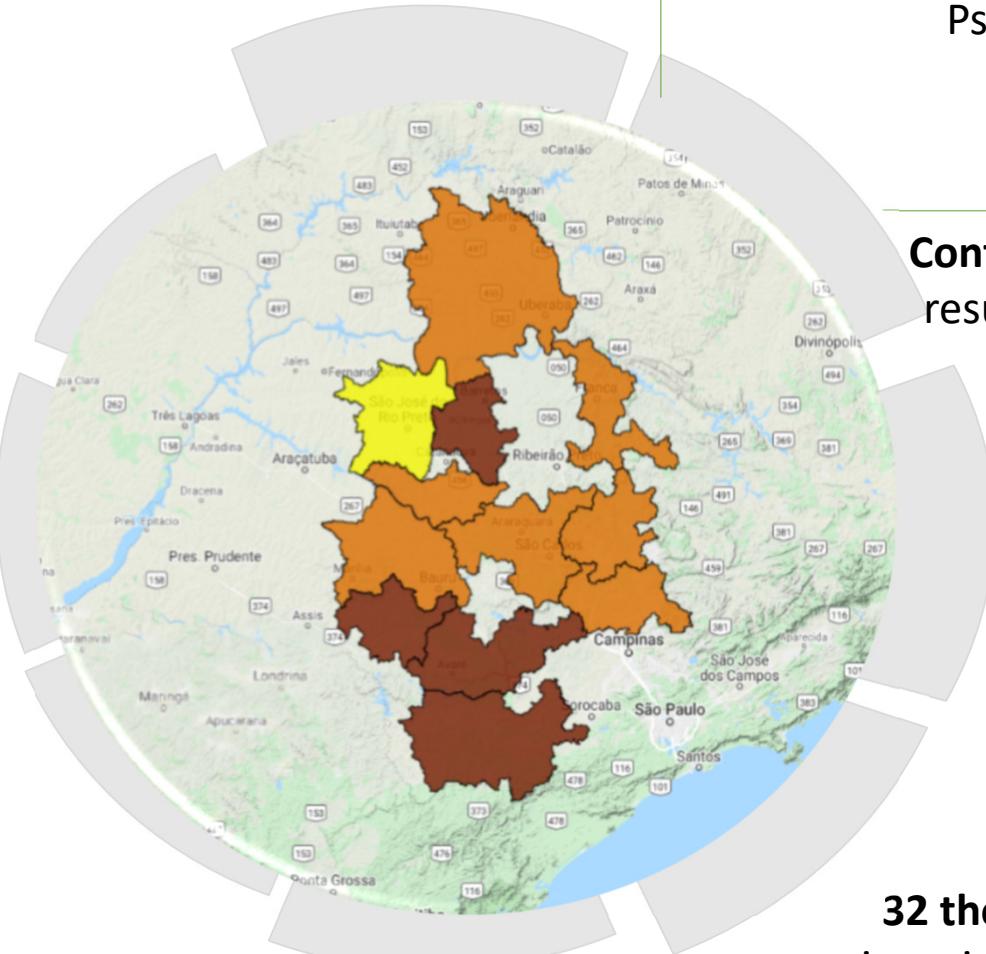
## **Objectives:**

- evaluate the migrant population of the psyllid
- Identify entry points
- Identify the beginning of population growth
- Identify times of larger population

## **Procedures:**

- 1 at least every 500 m
- use the 2 sides of the trap
- do not cut the trap
- weekly/biweekly reading
- exchange maximum fortnightly
- search for adults

# Psyllid alert system



**32 thousand traps, 12  
regions, information every  
15 days**

**Psyllids population  
monitoring**

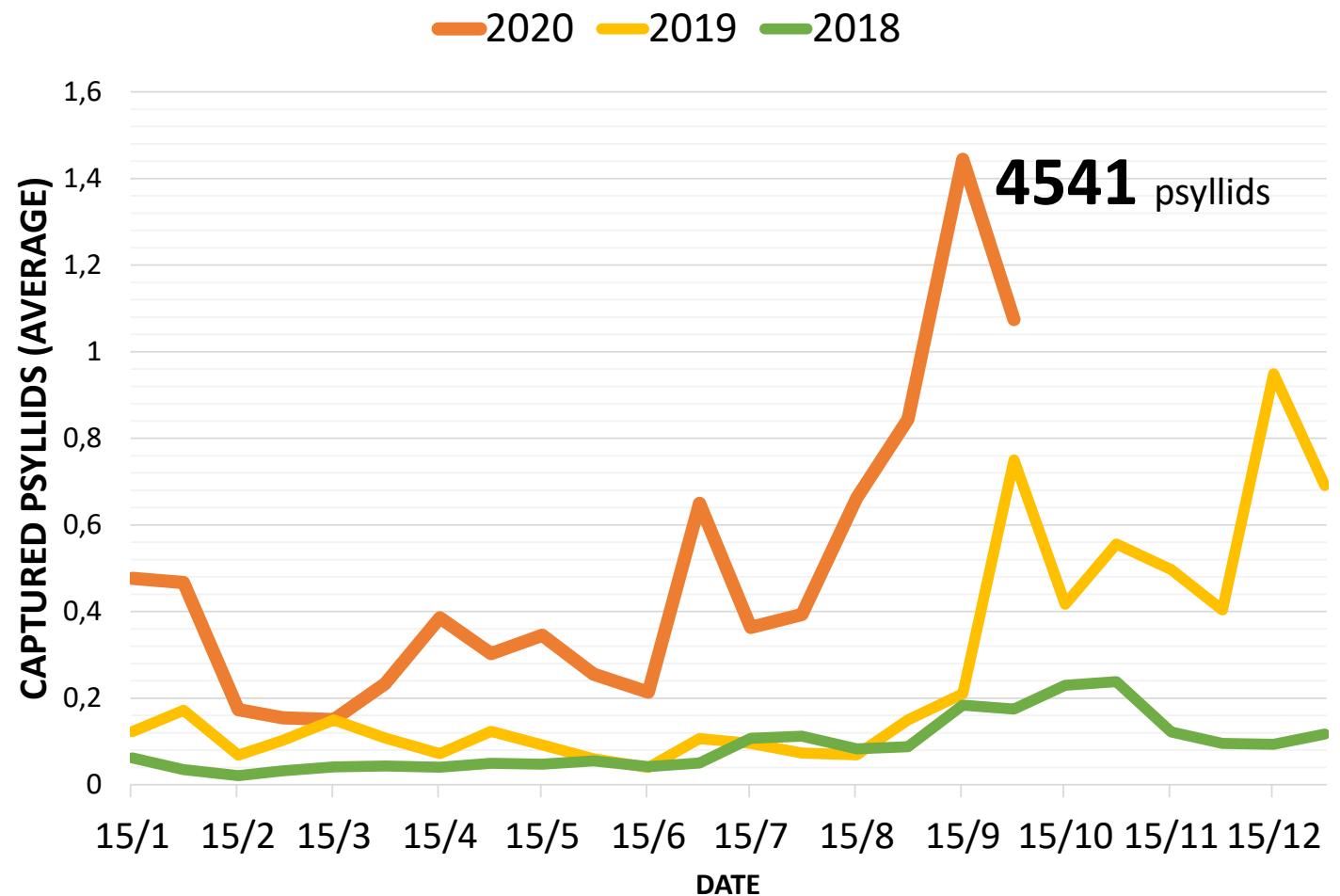
**Continuous analysis of the  
results of External Actions  
and greening control**

**System improvement  
with risk maps**





# Avaré region



## Fases de desenvolvimento vegetativo

V1

Gema inchada (intumescida). A primeira fase de vegetação, visível na junção do ramo com a folha.



Fases do psilídeo:



V2

Chifrinho ou canivete. Brotação em inicio de desenvolvimento, com alongamento das folhas, porém sem expansão lateral.



Fases do psilídeo:



V3

Brotação com cerca de 5 cm, com distanciamento entre as folhas e definição do eixo central.



Fases do psilídeo:



V4

Brotação com aproximadamente 10 cm de comprimento e folhas da base do ramo em expansão lateral, com 4 cm, em média.

Fases do psilídeo:



V5

Brotação com eixo principal medindo aproximadamente 18 cm, com folhas do ponteiro em expansão lateral e folhas da base medindo em torno de 7 cm.

Fases do psilídeo:



V6

Ramo com folhas tenras de coloração verde clara. Folhas de ponteiro em expansão lateral. Folhas da base com cerca de 10 cm.

Fases do psilídeo:



V7

Ramo com folhas maduras, com coloração verde escura e totalmente expandidas.

Fase do psilídeo:

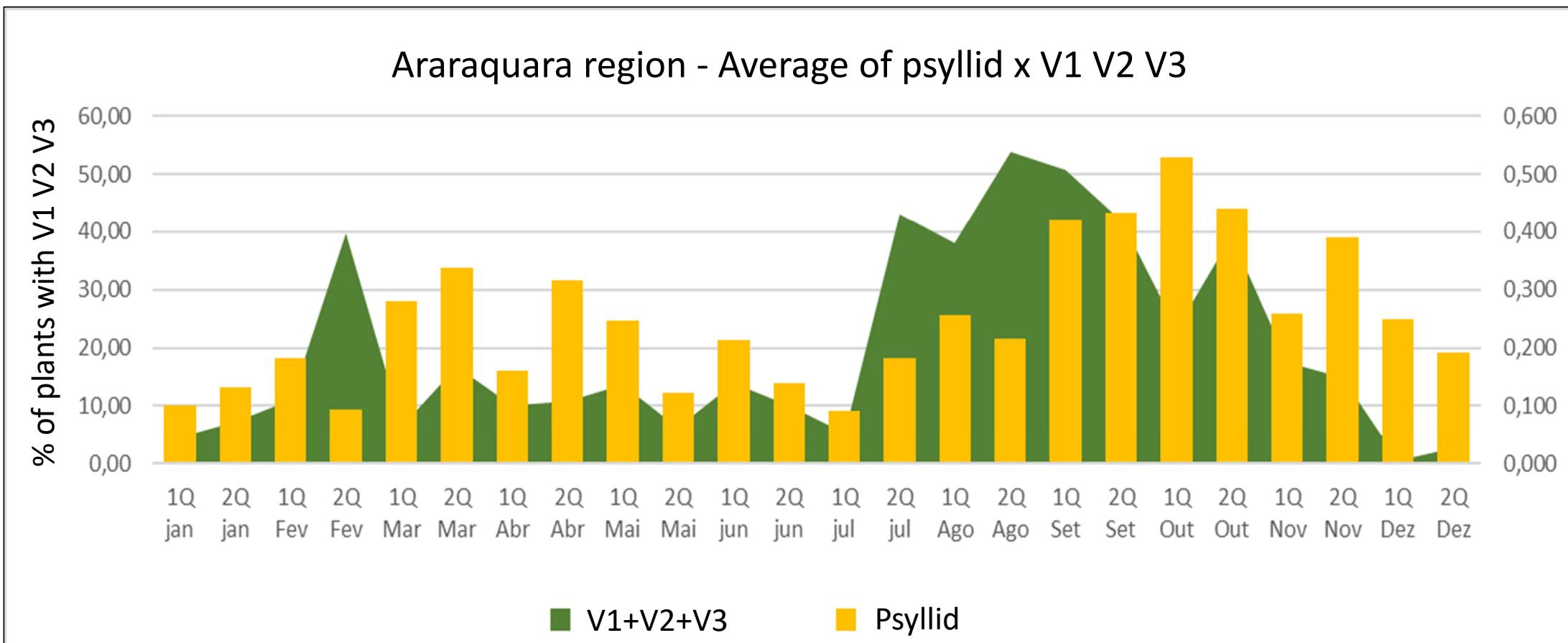


#UNIDOS  
contra o  
GREENING

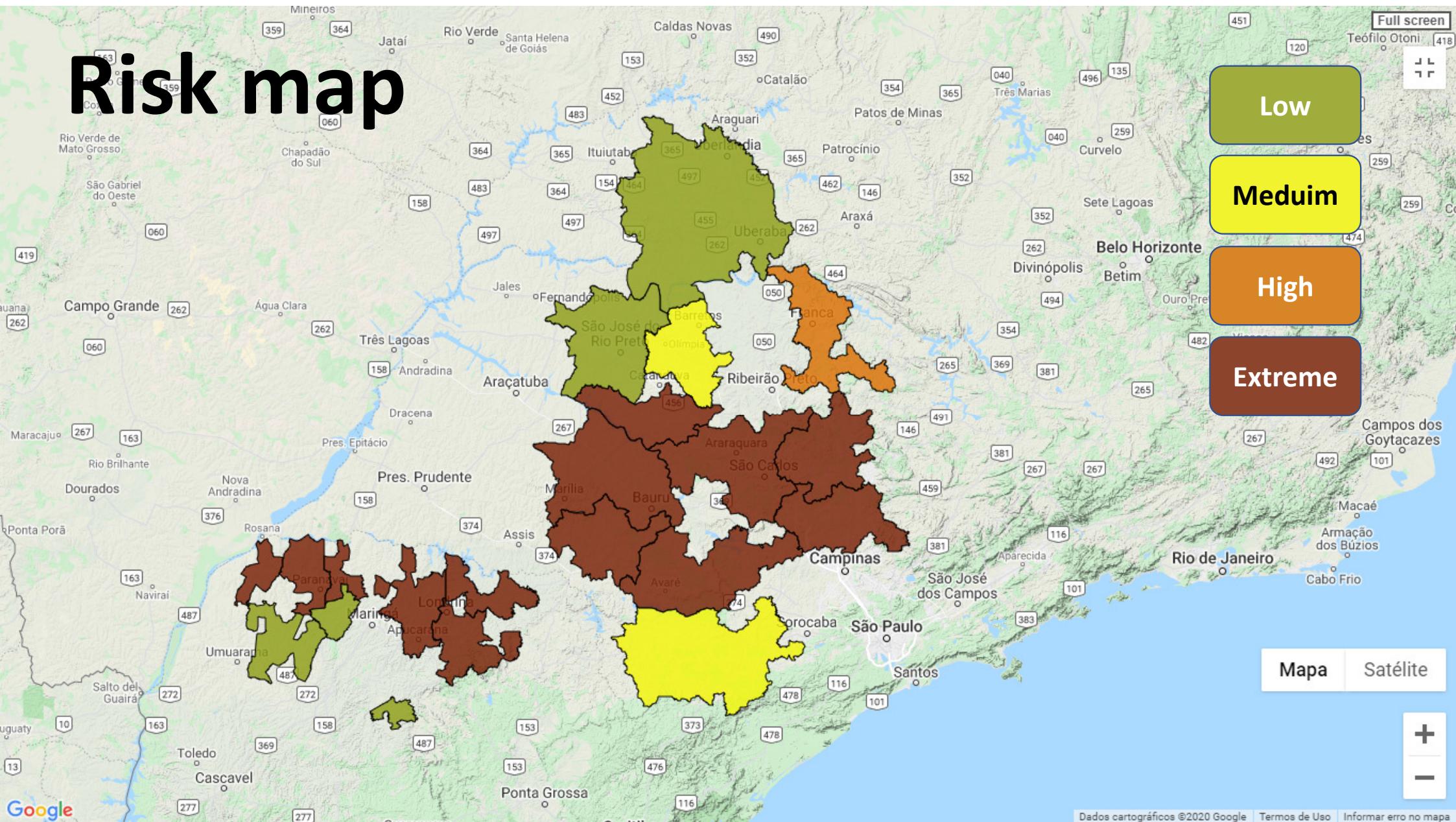


Fundecitrus  
OPERA E INSTITUIÇÃO  
PARA A CITRINÍFERA

## ➤ Sprouting x Psyllid

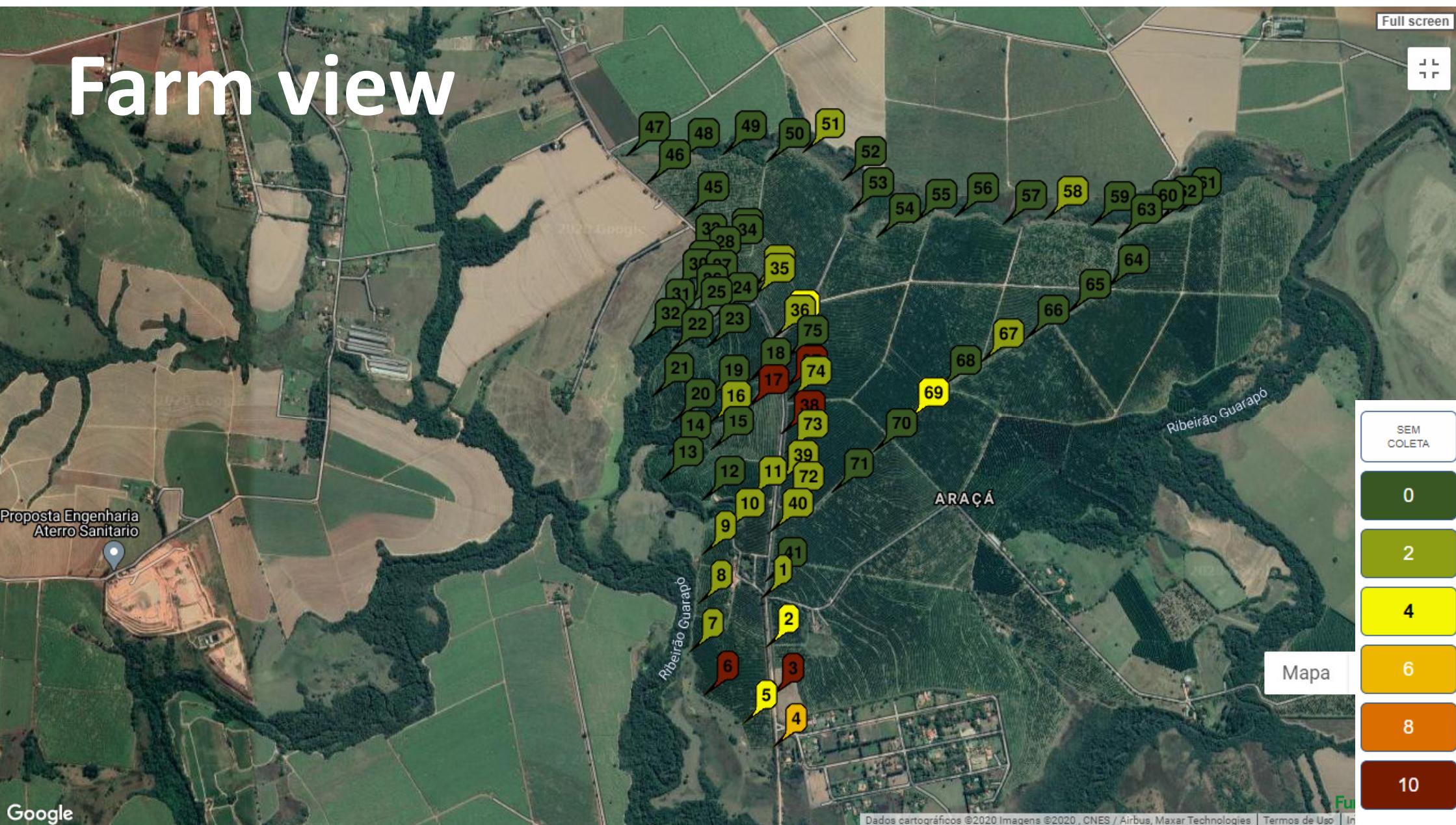


# Risk map



Full screen

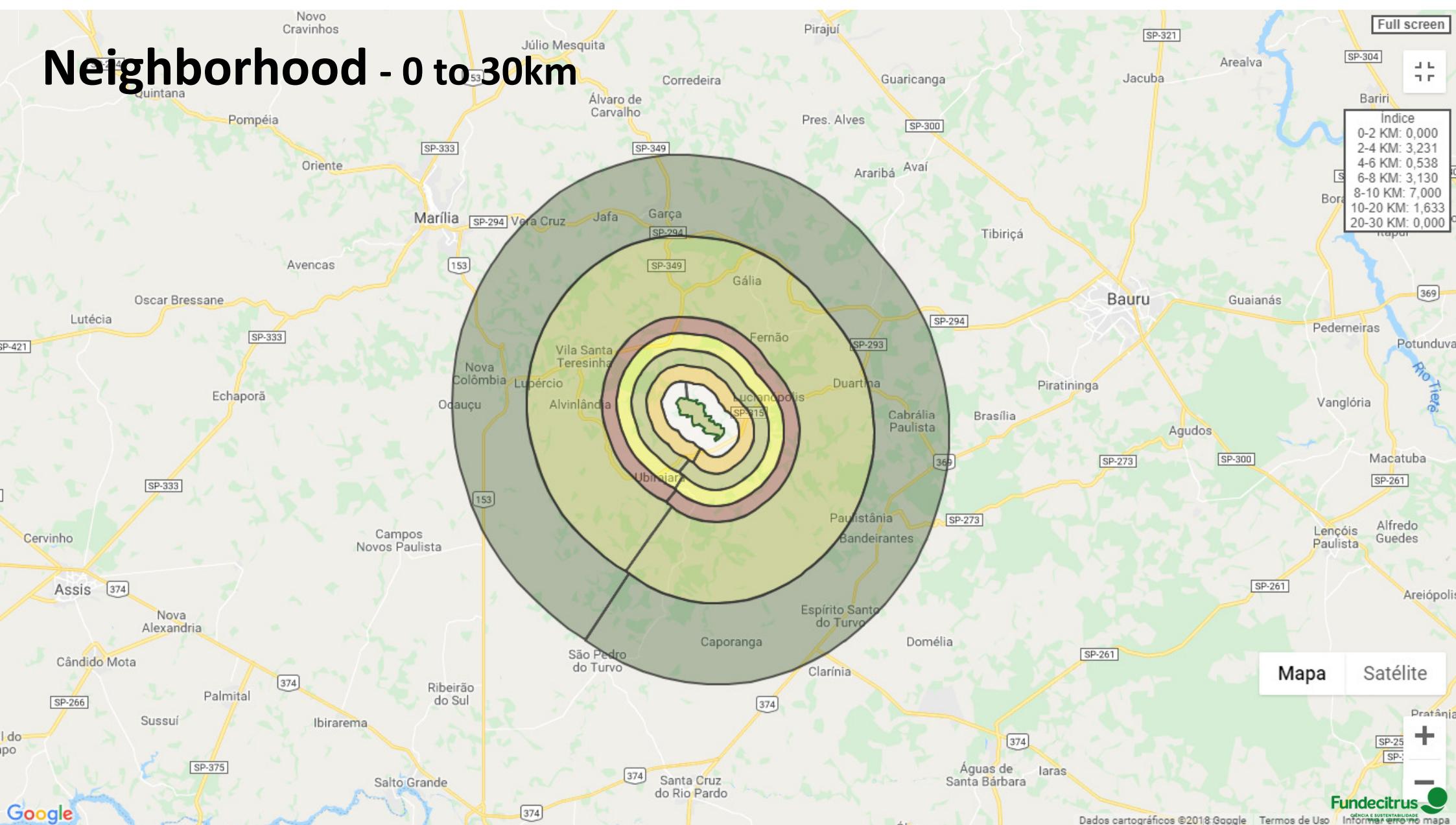
# Farm view



[Full screen](#)

# Neighborhood - 0 to 30km

Indice
0-2 KM: 0,000
2-4 KM: 3,231
4-6 KM: 0,538
6-8 KM: 3,130
8-10 KM: 7,000
10-20 KM: 1,633
20-30 KM: 0,000



# » Psyllid fluctuation in the State/region/microregion/farm

## Fortnightly report - psyllid

Period: 01/08 to 31/12

Producer: Guilherme Rodriguez

Region: Santa Cruz do Rio Pardo

**Total in the region: 6513**

## Microregion

Property	Psyllids	0-2 Km	2-4 Km	4-6 km	6-8 km	8-10 km	10-20 km	20-30 km	Total in the microregion
Farm 1	30	35	613	179	120	229	72	106	1.354
Farm 2	118	197	279	802	138	1.085	91	657	3.249
Farm 3	58	30	22	243	12	55	81	432	875

# Coordinated control

ALERTA  
FITOSSANITÁRIO

MANTENHA O  
PSILÍDEO **LONGE**  
**DO SEU POMAR**



**CONTROLE CONJUNTO 30/08 a 06/09**

Araraquara, Avaré, Santa Cruz do Rio Pardo, Itapetininga, Casa Branca, Lins, Novo Horizonte, Bebedouro, Frutal, Limeira e Franca

Baseado na tendência de aumento da população de psilídeos na região e da presença de um novo fluxo vegetativo, detectados pelo sistema do Alerta Fitossanitário, é indicado uma aplicação coordenada e em conjunto para o controle do psilídeo. Se todos fizerem a pulverização no mesmo período, a população do inseto cai e a sua propriedade fica mais protegida. Participe!

\*Não realize pulverizações em plantas em florescimento

\*Avise os apicultores da sua região sobre o momento das pulverizações



#**UNIDOS**  
contra o  
**GREENING**

Fundecitrus  
CIÊNCIA E SUSTENTABILIDADE  
PARA A CITRINOLDA

# REGIONAL MANAGEMENT MEETINGS

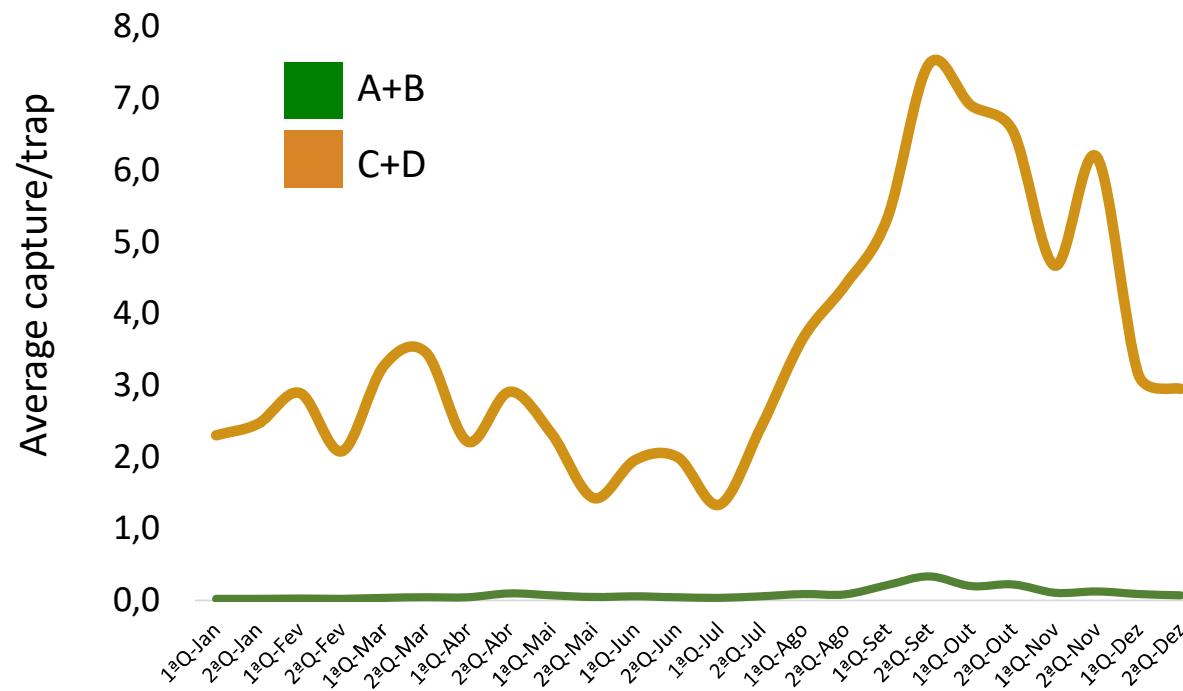




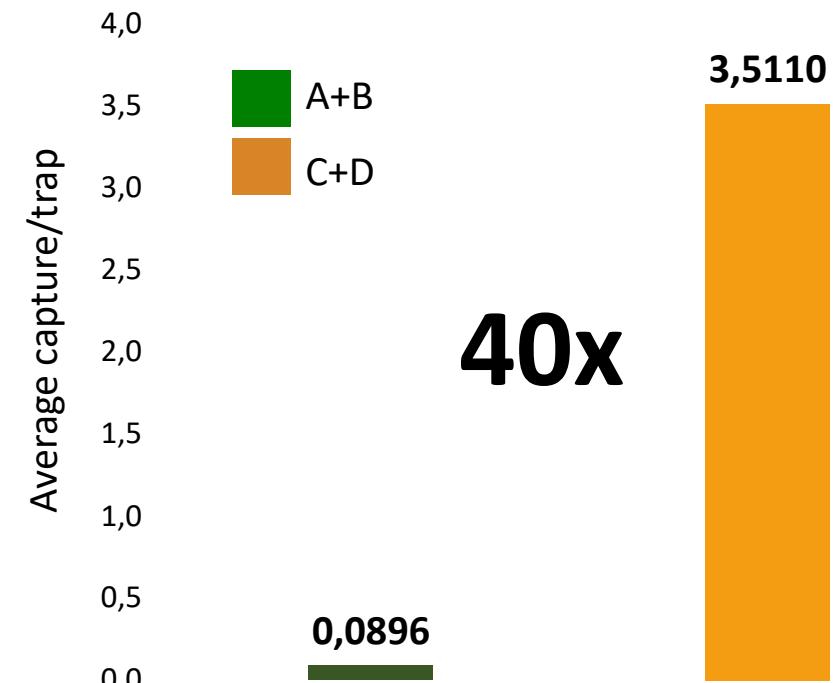
**90% of psyllids are found in 5% of plants  
(non-commercial areas + unmanageable areas)**

# PSYLLID CAPTURE IN MONITORED AREAS

Psyllid by type of management



Psyllid by type of management



A - Psyllid control and plant eradication      B - Psyllid control  
C - Unhandled commercial      D - Yard without handling

# Psyllid Las+

Bimonthly psyllid average with Ca. L. asiaticus (Las+) in B-management and unmanageable properties in the four monitored regions

Region	% of psyllids Las+
Santa Cruz do Rio Pardo	71 a
Avaré	68 ab
Araraquara	66 ab
Bebedouro	56 b

Sassi, 2016 (Mastercitrus)





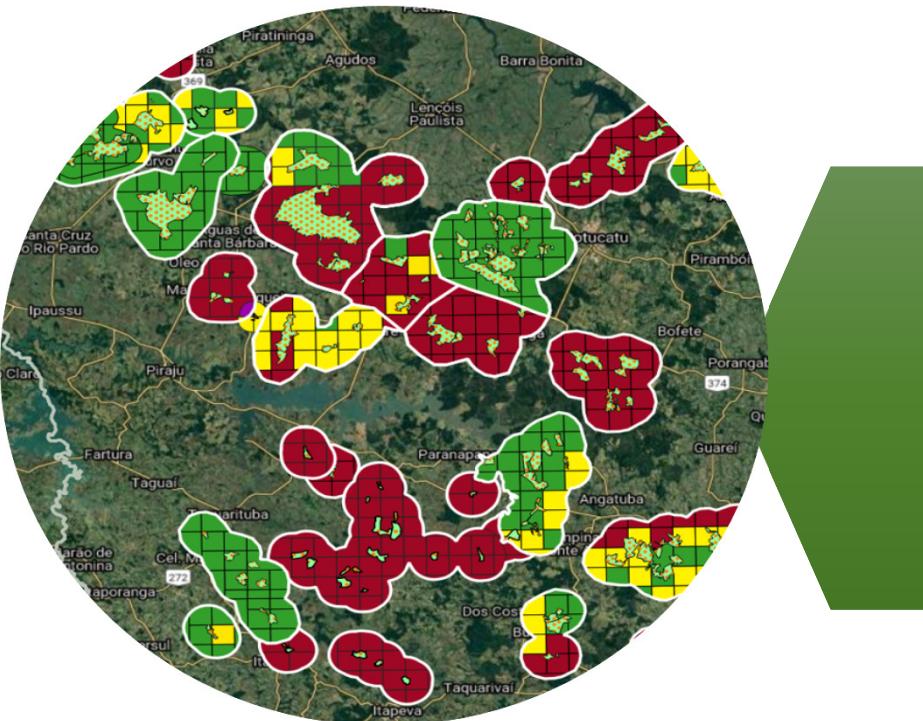
# Internal and external

GMR1

**GMR1**

Guilherme Maniezo Rodriguez; 03/08/2020

# External actions



**Plants found: 1.037.450**

**Plants eliminated: 974.496**

**Efficiency: 94%**

**Area covered: 1.571.258 ha**

**Period: August 2018 to September 2020**

Strategies  
200.000



# Strategies



# Strategies



# Strategies



## Conversa Franca: Fundecitrus lança campanha "Unidos contra o greening"

O Fundo de Defesa da Citricultura (Fundecitrus) lançou uma campanha de incentivo ao controle do greening, a pior doença da citricultura mundial. O objetivo da ação “Unidos contra o greening” é conscientizar os diferentes elos do setor citrícola e da sociedade sobre o impacto da doença que causa perda de frutos e diminui a produtividade dos pomares. O greening foi identificado em 2004 no parque citrícola de São Paulo e Minas Gerais – principal área produtora de citros do Brasil. Nesse período, já causou a erradicação de 100 mil



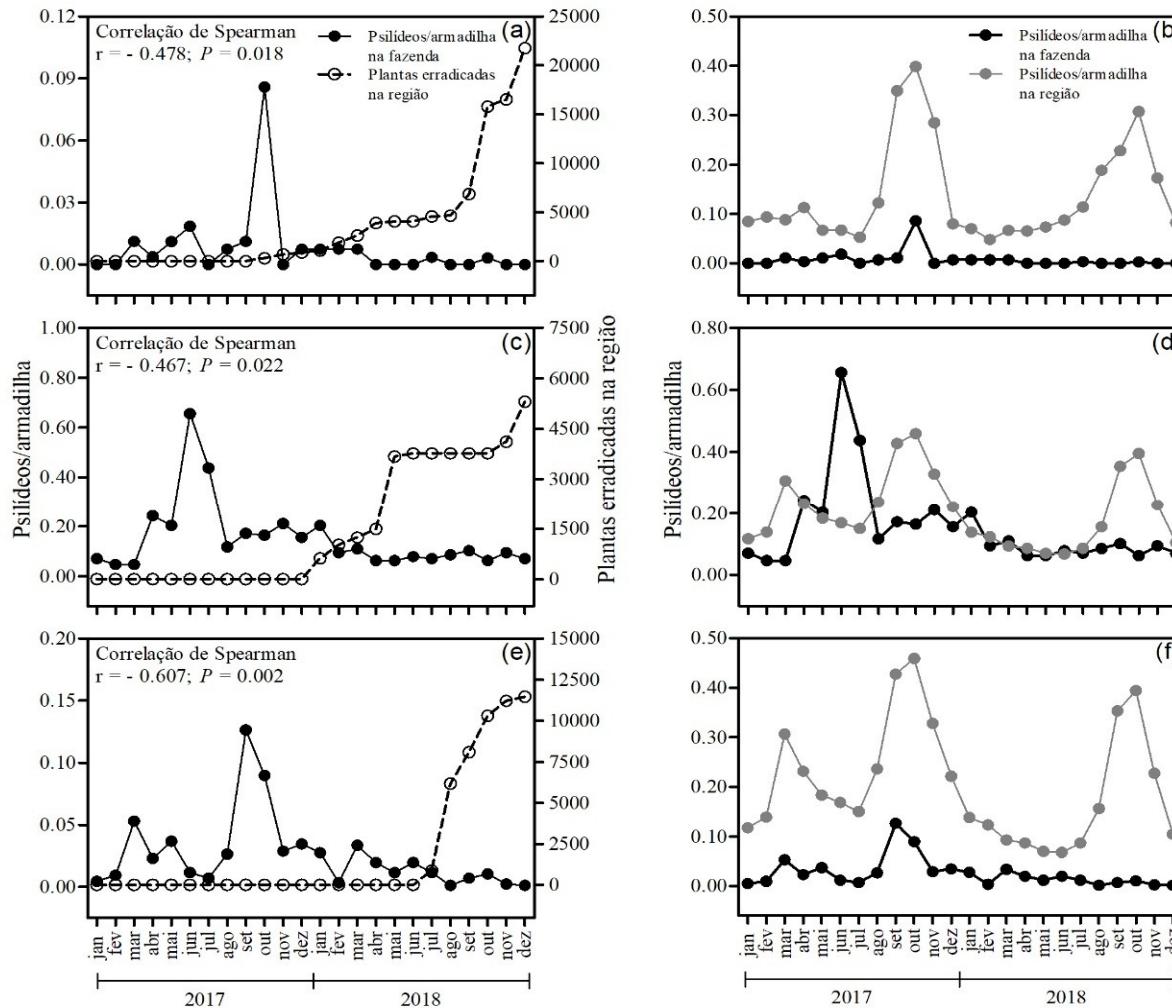




# Results



# Preliminary results - external actions – psyllids population

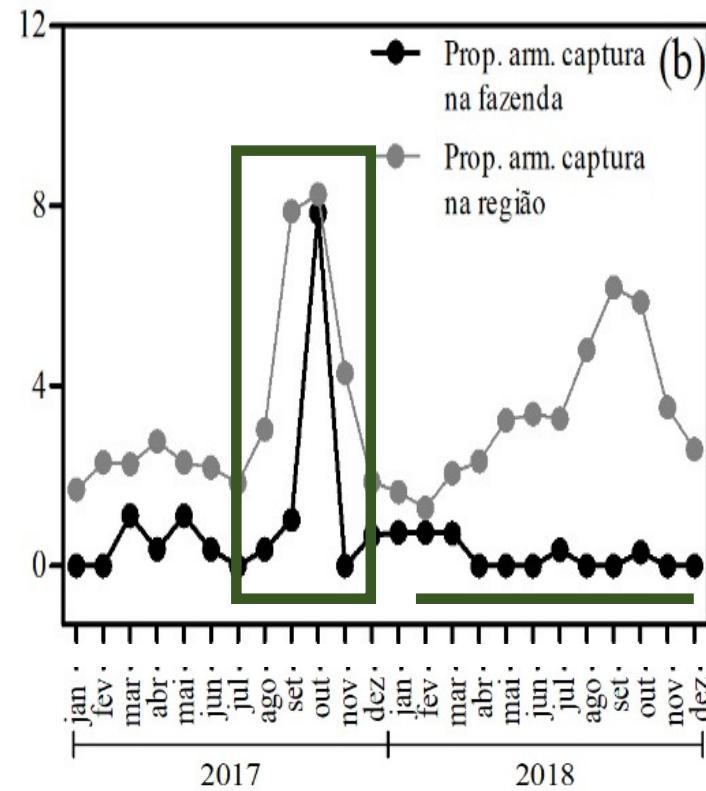
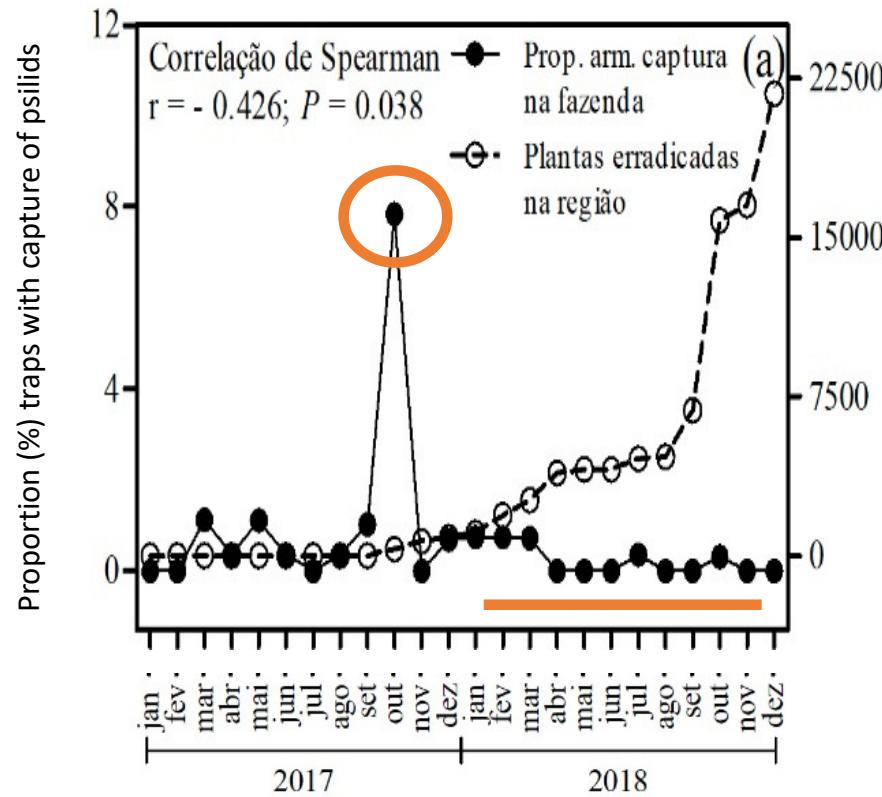


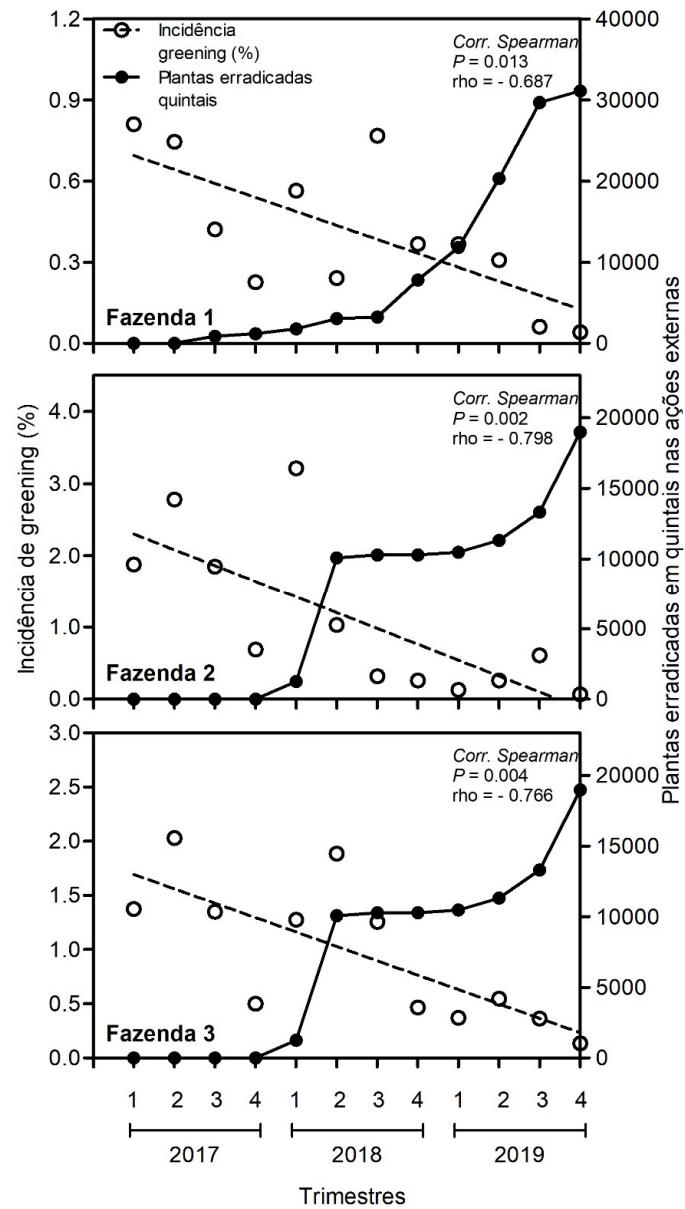
Curtido por pedroyamamoto e outras pessoas

fundecitrus O Minuto da Citicultura de hoje traz um balanço das ações de controle externo do greening, com a apresentação de resultados positivos... mais

<https://www.youtube.com/watch?v=MEBJvsIMJUc>

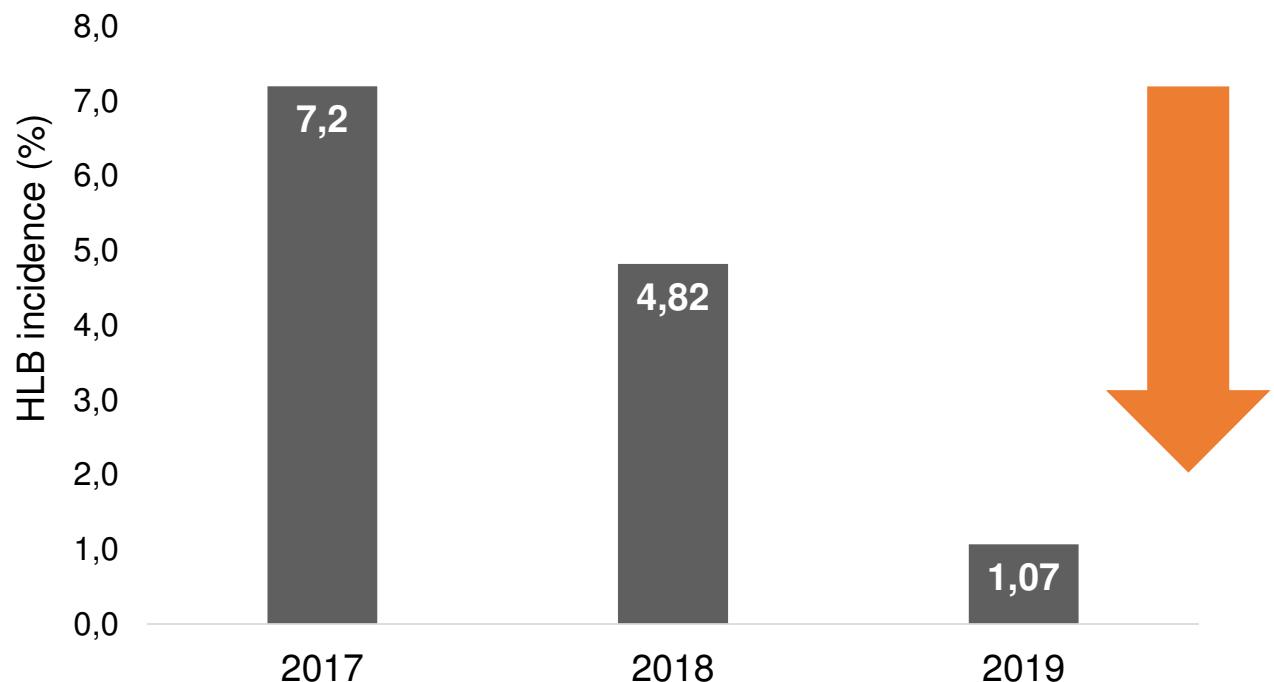
# Relationship between external actions and capture of psyllids



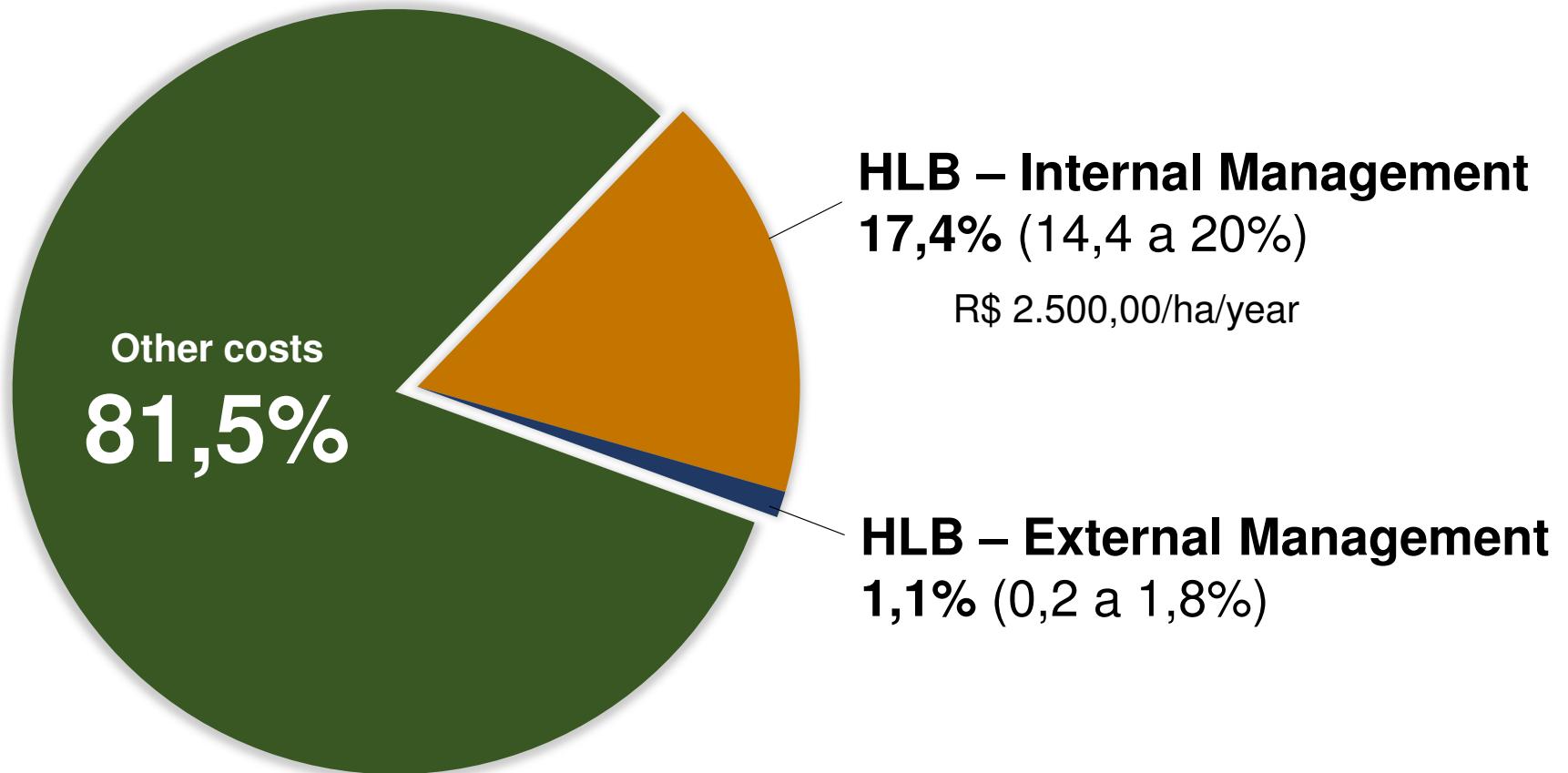


# Results of external actions: HLB

Correlation analysis between accumulated plants eradicated in the region and incidence of HLB



## Cost of internal and external management



Source: Citrus producers (excluding harvest and freight; orange for industry)



/Fundecitrus



/Fundecitrus



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