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Citricultor

Fundecitrus
SCIENCE AND SUSTAINABILITY
IN CITRICULTURE

Too little rain, too much sun

DROUGHT AND HEAT IMPACTED GROVES IN 2020. SOME CIRCUMSTANCES WORSENERD THE SCENARIO BUT PLANNING AND THE ADOPTION OF JOINT ACTION CAN MITIGATE THE EXTREME EFFECTS OF THE ADVERSE CLIMATE

Citricultor

CITRICULTOR magazine is a free publication edited by the Fundo de Defesa da Citricultura - Fundecitrus. Fundecitrus, a world reference in science for citriculture, is a non-profit private institution established in 1977 and maintained by citrus growers and processors in the state of São Paulo, Brazil, to foster the sustainable development of the Brazilian citrus belt.

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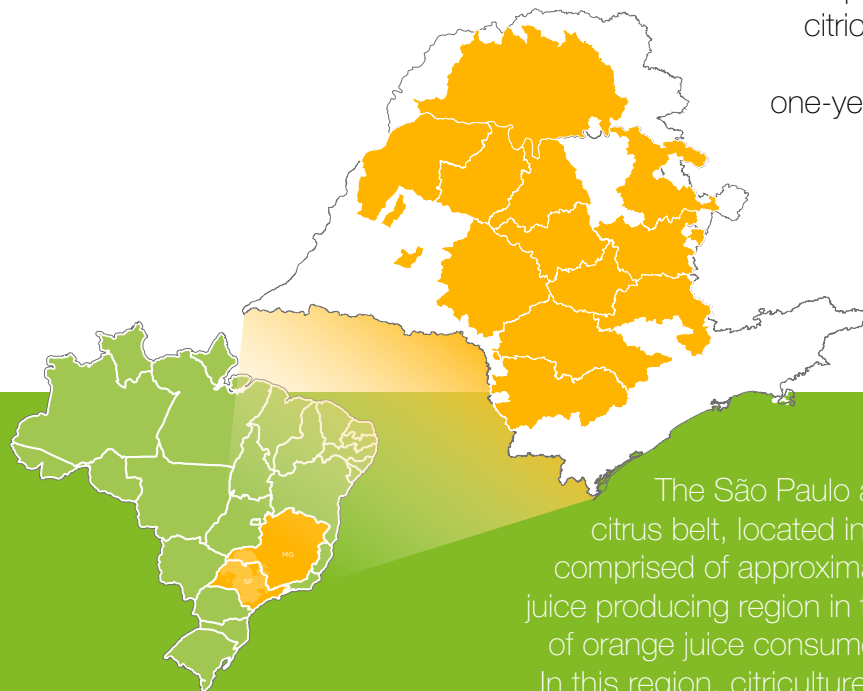


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BRAZILIAN CITRUS BELT

The São Paulo and West-Southwest Minas Gerais citrus belt, located in the Southeast region of Brazil and comprised of approximately 350 cities, is the main orange juice producing region in the planet: three out of five glasses of orange juice consumed in the world are produced here. In this region, citriculture creates 200 thousand direct and indirect jobs and collects 189 million dollars in taxes.



Technology at the service

WATER RESOURCES
MANAGEMENT
SPECIALIST REINFORCES
THE IMPORTANCE OF
OPTIMIZING WATER
USE TOWARDS
MORE EFFICIENT
AND SUSTAINABLE
AGRICULTURAL SYSTEMS

Agriculture corresponds to approximately 70 percent of global water consumption, according to the Food and Agriculture Organization of the United Nations. In this regard, good management aimed at the rational use of water resources is fundamental to a sustainable food production.

On his interview to **Citricultor** magazine, researcher at Instituto Internacional de Ecologia

"THE USE OF WATER IN AGRICULTURE CAN BE OPTIMIZED BY TECHNOLOGICAL PROJECTS AND AUTOMATIC CONTROL OF THE AMOUNT OF WATER USED FOR IRRIGATION. LARGE SAVINGS CAN BE MADE BY USING INFORMATION TECHNOLOGY"

FERNANDO MOURI



(IIE) José Galizia Tundisi talks about the role of science and technology in water efficiency in agricultural systems. Professor at IEA-USP and UFSCar, full member of the Academia Brasileira de Ciências and author of more than 30 books on water, its good use, preservation and recovery, Tundisi is recognized as one of the major global experts in water resources management.

THE YEAR OF 2020 MARKED A HISTORICAL DROUGHT FOR CITRICULTURE IN SÃO PAULO AND MINAS GERAIS, WHICH ASSOCIATED TO HIGH TEMPERATURES CAUSED MUCH DAMAGE SUCH AS DEATH OF PLANTS AND AN ESTIMATED 30 PERCENT REDUCTION IN THE 2020-2021 ORANGE CROP. IS THERE AN UPWARD TREND FOR THESE

EVENTS? HOW DOES HUMAN ACTIVITY IMPACT THAT?

Yes, there is an upward trend for such events since they relate to ongoing global change. It may get worse. Human activity impacts that because of the emission of greenhouse gases that cause warming, droughts and heavy rainfalls. Deforestation also contributes to that.

IN VIEW OF THE NEED TO PRODUCE MORE FOOD WITH FEWER RESOURCES, HOW TO OPTIMIZE THE USE OF WATER?

The use of water in agriculture can be optimized by the implementation of technological projects and the automatic control of the water amount needed for irrigation. Large water savings

of water



can be made by using information technology in agriculture. That is accessible in Brazil.

A FUNDECITRUS STUDY IDENTIFIED THAT CITRUS FARMS IN SÃO PAULO AND MINAS GERAIS HAVE 1 HECTARE OF PRESERVED WOODS TO EVERY 2.5 HECTARES OF CITRUS. HOW IMPORTANT ARE THOSE AREAS?

The preservation of forests with native species is fundamental because they conserve water sources and considerable water amounts, maintain biodiversity and make a very healthy and important adjustment between agricultural production and protection of water resources. It is fundamental to a sustainable food production.

"THE PRESERVATION OF FORESTS WITH NATIVE SPECIES IS FUNDAMENTAL BECAUSE THEY CONSERVE WATER SOURCES AND CONSIDERABLE WATER AMOUNTS, MAINTAIN BIODIVERSITY AND MAKE A VERY HEALTHY AND IMPORTANT ADJUSTMENT BETWEEN AGRICULTURAL PRODUCTION AND PROTECTION OF WATER RESOURCES"

IN MANY CITIES IN INLAND SÃO PAULO STATE IT IS POSSIBLE TO SEE THAT THE WATER LEVEL OF IMPORTANT RIVERS IS MUCH LOWER THAN THAT OF DECADES AGO. WHAT CAN BE DONE?

Decreased river flow and water volume have several causes: global changes and warming, with increased evaporation; multiple water uses that reduce reservoirs and natural volumes; and deforestation, with diminished recharge from water sources. Reforestation, decrease in water volumes used and control of water demand are important initiatives to correct the problem.

IN 2020, DEFORESTATION IN THE AMAZON PICKED UP AGAIN: ACCORDING TO THE INSTITUTO NACIONAL DE PESQUISAS ESPACIAIS, 11,088 KM² WERE DEFORESTED FROM AUGUST 2019 TO JULY 2020, WHICH IS THE HIGHEST RATE SINCE 2008. HOW DOES THAT REGION RELATE TO AND WHAT IS ITS IMPORTANCE TO THE RAINS IN THE SOUTHEAST?

The Amazon Forest is a magnet for moisture from the Atlantic Ocean and therefore the volume of rain in the region is immense. It plays a fundamental role because through a process called "flying rivers" this moisture is transported to the Southeast so that a fundamental part of the water cycle in this region starts from the transported moisture. With extensive deforestation, there is a risk of a decreased rainfall volume in the Southeast.

IN THE LAST YEARS, MUCH WORK CARRIED OUT BY FUNDECITRUS HAS AIMED TO MAKE PRODUCTION MORE SUSTAINABLE AND REDUCE THE USE OF WATER. AS COMPARED TO TEN YEARS AGO, PSYLLID CONTROL IS DONE WITH UP TO 70 PERCENT LESS WATER AND PRODUCT. SYSTEMS TO FORECAST DISEASES AND MONITOR THE POPULATION OF PESTS HAVE ALLOWED FOR A REDUCED NUMBER OF APPLICATIONS AND AMOUNT OF WATER. WHAT IS THE IMPORTANCE OF SUCH INITIATIVES TO A MORE EFFICIENT AND SUSTAINABLE AGRICULTURE?

Those initiatives have an inestimable value for agriculture to be more efficient and sustainable. Results and tools show how important it is to use science and technology in agricultural systems. 🍊

Climate and grove management

MEASURES CAN MITIGATE IMPACTS OF WATER STRESS AND HIGH TEMPERATURES

Drought and intense heat seen in 2020 in the São Paulo and West-Southwest Minas Gerais citrus belt had a major negative impact on orange production. Although rains resumed in December, the 2020-2021 crop should be 30.45 percent smaller in comparison to the previous season (*see side box*).

Adverse climatic conditions were caused by the phenomenon La Niña that – together with the atmospheric pressure wave Atlantic Multidecadal Oscillation that changes the sea surface temperature in a five to eight decades interval – resulted in a drier and hotter climate when only 30 percent of the production had been harvested.

“Owing to extremely adverse climatic conditions of high temperatures, low rainfall and poor distribution of rains, 2020 was one of the most difficult years citriculture has experienced”, says Fundecitrus general manager Juliano Ayres.

In addition to the action of na-

ture, other factors further worsened the effects of drought and high temperatures. However, citrus growers have learned throughout the years that planning and technology are good allies and that having them around helps mitigate the extreme consequences of the climate.

IN SEARCH OF A MORE DROUGHT-TOLERANT ROOTSTOCK AND CARE FOR DENSER PLANTING

Between 1960 and 2000, Rangpur lime was the main rootstock used in citriculture in São Paulo state due to its tolerance to drought and citrus tristeza virus, among other traits. However, its susceptibility to citrus blight and sudden death demanded the use of rootstocks tolerant to those diseases, such as Swingle citrumelo and Sunki and Cleopatra mandarins, all of which are more susceptible to drought.

Researcher retired from Centro de Citricultura Sylvio Moreira of the Instituto Agrônômico de

Campinas (IAC) Jorgino Pompeu Junior explains that water deficiency in plants negatively affects nutrient absorption, photosynthesis and respiration, besides causing anatomic changes, affecting growth and fruit production. “The susceptibility to water deficit of the Swingle citrumelo became evident and impacted the citrus growing region, causing defoliation in plants, fruit drop and consequent reduced yield in groves”.

There are still no commercial rootstocks that are more resistant to drought than Rangpur lime. According to researcher at Embrapa Eduardo Girardi, however, some rootstocks may have good potential and result in less damage in plants under no irrigation. “Sunki Tropical, some citrandarins such as IAC 1710 and other recent IAC and Embrapa hybrids are being assessed”, he comments.

Citrus grafting also depends on other elements to produce good results and more drought-tolerant plants. “Denser planting without knowledge about traits of root-



HARD YEAR FOR CITRICULTURE

stocks used should increase losses caused by water deficit", warns Pompeu Jr.

From 1980 to 2020, the average planting density in the citrus belt grew from 337 to 616 plants per hectare. Denser planting was one of the factors that led to increased yield: despite the reduction of 40 percent in the planted area, there was an increase of more than 200 percent in production per hectare, according to data from the Tree Inventory of the Crop Forecast Survey (PES) carried out by Fundecitrus.

Girardi emphasizes that in subtropical conditions typical of the citrus belt, plants grow bigger and therefore the seasonal reduction in rainfall may affect extremely high-density plantings because of an increased competition for water. "The association of extensive use of drought-intolerant rootstock such as Swingle citrumelo with higher planting density probably intensifies the susceptibility to water shortage", he asserts.

The researcher highlights that yearly pruning since grove establishment and proper choice of scion and rootstock combinations with vigor compatible to the spacing used are fundamental. "Conscious high-density planting should also take into account the location of the plot at the edge, regional greening incidence, use of irrigation, soils with larger water capacity and fertility, and use of more drought-tolerant varieties", he completes.

The 2020-2021 orange crop forecast for the São Paulo and West-Southwest Minas Gerais citrus belt was updated in February 2021 to 269.01 million boxes. The reduction is of 18.75 million boxes in relation to the initial forecast carried out in May 2020 that once confirmed after harvest is complete will result in the largest crop loss since 1988. The projected fruit drop rate increased from 21.10 to 21.20 percent, all varieties considered.

In many groves the intense heat and long-lasting drought caused irreversible loss such as death of plants throughout the plot. More drastic cases were seen in some non-irrigated plots, mainly in the North, Northwest and Central sectors, where considerable part of adult orange trees died. New updates will be released at the final crop forecast on April 12.



Groves in the North of the citrus belt were significantly affected by shortage of rain and high temperatures in 2020

PESTS AND DISEASES WORSEN THE SITUATION

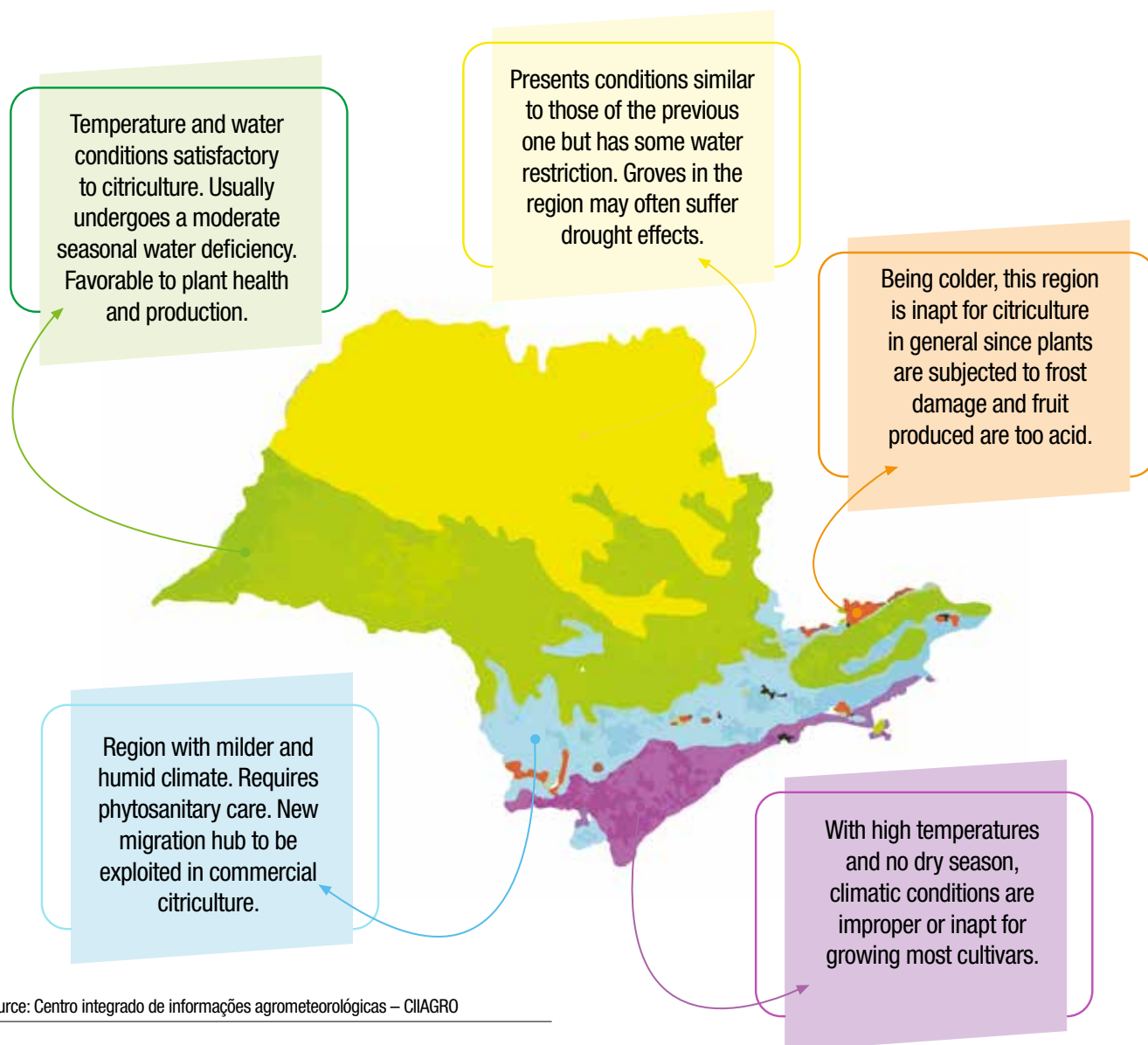
Plants stressed by drought, heat or cold suffer more from the attack of pests and diseases for being weaker and more vulnerable, which also collaborates to a more intense fruit drop.

In plants under water deficit, the citrus leprosis mite, for instance, multiplies more and causes more lesions. In the case of CVC, symptoms are more severe in non-irrigated groves and regions with more intense water deficit. As for greening, contam-

inated plants have a smaller root system than healthy plants, which makes searching for water in soil difficult and render them less tolerant to drought. Consequently, empirical observation shows that fruit drop in diseased plants is greater in drier years.

Regarding black spot, the more stressed plants are, the more intense fungal reproduction, leaf drop and twig die-back tend to be – it is worth highlighting that the presentation of symptoms is favored by solar radiation combined with high temperatures.

CLIMATIC ZONING OF THE CITRUS BELT



Source: Centro integrado de informações agrometeorológicas – CIAGRO

SOUTHWEST SUFFERS LESS

The Southwest, encompassing the regions of Avaré and Itapetininga, presents milder temperatures (*see illustration above*) that favor flowering and fruit setting, and better distribution of rains throughout the year, which influenced the migration of citriculture to that sector in the last years.

In October 2019, for example,

heat was less intense in the regions of Avaré and Itapetininga, favoring setting of newly formed fruit. Conversely to the rest of the citrus belt, no more than three consecutive days of temperatures above 35°C were recorded for those regions, which contributed to preventing a high loss of first bloom fruit.

Since 1988, the Southwest has had two citrus production migration leaps: one in the

mid-1990s and other in late 2000. According to the IBGE, in 1988, the Southwest, then with 15,553 hectares, represented two percent of the citrus belt area. Currently with 75,028 hectares, it represents 19 percent, with almost 35 million bearing trees, according to PES data.

When the climate is favorable in all the citrus planted area, as seen in the 2019-2020 crop season, sectors that concentrate the

largest number of trees also present the largest productions. However, when climatic conditions are adverse, the Southwest takes the lead in total production. "In years of extreme conditions the region suffer less due to its climatic characteristics, and we see a lower drop in production", comments agronomist at Fundecitrus Guilherme Rodriguez.

In the 2020-2021 crop, the Southwest should produce 10.19 percent less as compared to the previous crop, differently from the other sectors that had drops in production of 23.8 percent and 52.57 percent.

IRRIGATION REDUCES RISKS, BUT IS NO GUARANTEE

According to PES, the irrigated area increased in the last 20 years,



Irrigation may prevent losses in years of intense drought but depends on factors such as enough water volume availability to meet crop needs

reaching 30 percent of the citrus belt and surpassing 60 percent of the area in the North sector. "The

increased number of irrigated regions collaborate to a reduced risk of drought, although the system depends on other factors, such as proper management and enough water flow for guaranteed advantages", says PES coordinator Vinícius Trombin. "In 2020, owing to the extreme drought, some citrus growers informed that although they had an irrigation system available, they did not have enough water volume to meet crop requirements", he adds.

According to researcher at IAC Regina Célia de Matos Pires, irrigation is a tool that can prevent losses in case of a severe water deficit. "Irrigation, depending on climatic conditions, year and region of farming, enables flowering and fruit setting to be advanced, besides increasing yield. When flowering can be advanced, by the time temperatures are high and the relative air humidity is low, fruit has already grown enough to reduce its drop rate due to adverse climatic conditions", she explains. 🍊



Denser planting must consider, among other points, combinations between scion and rootstock with vigor compatible to planting spacing

Processed kaolin reduces psyllids and greening in groves

RESEARCH AT FUNDECITRUS PROVES EFFICACY OF ALTERNATIVE AND SUSTAINABLE MANAGEMENT OF THE INSECT

Citriculture has invested in the development of sustainable measures to control pests and diseases. One of them is the application of processed kaolin to manage psyllids.

Research carried out at Fundecitrus found out that spraying processed kaolin on border orange trees in the grove reduces the entry of the insect. The product used was Surround® WG, a white aluminum silicate that is non-toxic and non-abrasive, specifically formulated for use in agriculture.

When mixed to water and applied on trees it forms a white protective layer that repels the psyllid by directly interfering with its feeding and therefore with the transmission of greening (huanglongbing/HLB) to the plant.

STUDIES

Two experiments with application of processed kaolin were carried out at a laboratory in 2016 to assess the landing of psyllids and their feeding behavior on plants with shoots.

The product at a concentration of 3 percent resulted in a decrease of 40 percent in the number of psyllids landing on treated trees and of 50 percent in the number of insects that were able to feed on the phloem (where greening-associated bacteria grow).



“Results suggest that spraying nursery plants with processed kaolin may reduce greening transmission since psyllids acquire and transmit the bacteria during feeding on the phloem”, explains researcher at Fundecitrus and experiment coordinator Marcelo Miranda.

Three field experiments were carried out in a trial grove to determine the effect of processed kaolin on landing of psyllids. Applications were carried out at a concentration of 3 percent ten days before and on the day of the release of the insects at grove borders (simulating an abandoned grove). Product sprayings resulted in a reduction of 98 percent (experiment 1) and 91 percent (both experiments 2 and 3 with the presence of shoots, experiment 3 with a greater number of insects released).

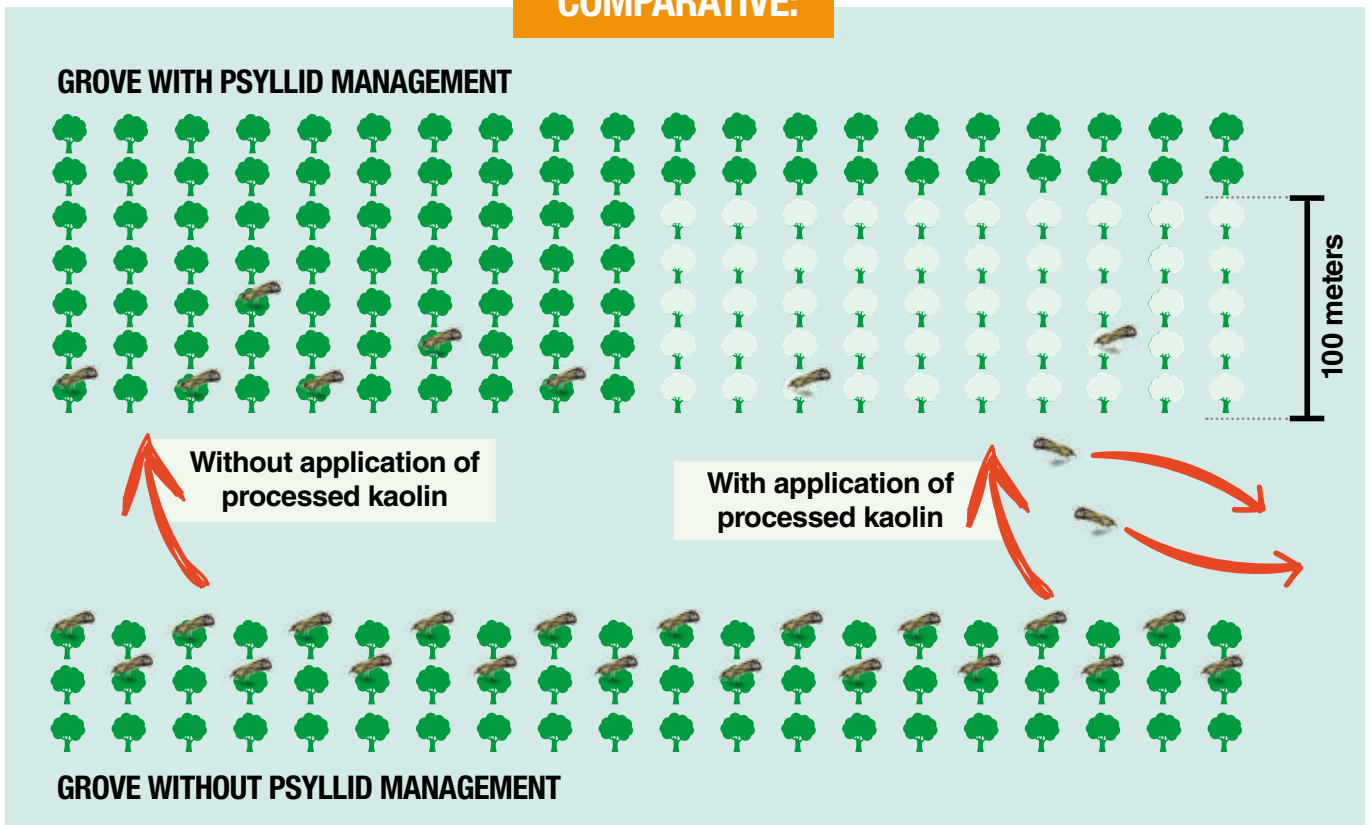
Subsequently, a second study also in a trial grove sought to determine the product application frequency (weekly or half-monthly) at the concentration of 2 percent. Two experiments were carried out (late winter and during spring). In both cases the grove was at the vegetative stage.

In general, when processed kaolin was sprayed every seven days (in the rainier periods) and every 14 days (period of lower rainfall), the strategy resulted in a reduction of 80 percent in psyllid dispersion in the treated area as compared to the one under no alternative management.

FAPESP

A large research project co-funded by Fundação de Amparo à Pesquisa do Estado de São Paulo

COMPARATIVE:



(Fapesp) started in 2017 to assess the effect of processed kaolin on the natural population of psyllids in commercial groves, the incidence of plants with greening and the development of orange trees.

Processed kaolin (2 percent) was sprayed in the initial 100 meters of a young grove on a farm and a bearing grove on another farm. In the young grove the product was applied every fifteen days throughout the whole year.

By contrast, two procedures were performed in the adult grove: monthly application from December to June and half-monthly from July to November, when the psyllid population peaks.

After three years, the young grove presented a reduction of 49 percent in psyllids and 48 percent in greening. In the bearing grove there were 37 percent and 36 percent fewer insects and diseased plants, respectively.

"The study is underway but proves the efficacy of processed

kaolin as an ally and a more sustainable alternative for managing psyllids", asserts Miranda.

Moreover, a new research project is being developed in the professional master's course at Fundecitrus (MasterCitrus) to assess smaller product concentrations. "The lower the concentration, the cheaper and more accessible the product is to citrus growers", he emphasizes.

APPLICATION

Citrus growers can already manage psyllids by using processed kaolin in addition to other conventional measures: monitoring, chemical control and regional management.

"It is worth mentioning that there are other types of kaolin whose application on plants is not recommended, since they do not attain the same results and can still damage sprayers", warns Miranda. Therefore, new prod-

ucts that can be applied on plants are being assessed by Fundecitrus. "We expect to have more options available to citrus growers in the future", he comments.

So far, research results point out that the application of processed kaolin (2 percent) every 14 days within the first 100 meters of grove borders is enough to reduce psyllid incidence and greening.

However, it is necessary to define the best strategy to be adopted by citrus growers: application throughout the year for a prolonged protection or only in periods of greater psyllid dispersion (late winter and spring). According to Miranda, this decision depends on the situation in the surroundings.

"The greater the number of unmanaged farms consequently having more psyllid dispersion to commercial groves, the greater the need for the application of processed kaolin", he recommends. ●



More efficient biological control

NEW PROTOCOL TO RELEASE *TAMARIXIA RADIATA* CONSIDERS LAYOUT OF TREES THAT FAVORS PARASITISM



Access the full survey on the Fundecitrus website

Despite known techniques for mass production of *Tamarixia radiata* small wasps and a large number of them being produced in Brazil to control psyllid nymphs, their release had so far been based on a protocol developed in Mexico that consists in releasing 100 wasps per site, for four sites (100 meters apart from each other) in a hectare, starting and ending release at grove borders.

In order to adjust this protocol to Brazilian conditions, an experiment was carried out in a grove in Itapeitinga (SP) as a research project in the Fundecitrus master's program MasterCitrus.

The release of five different numbers of wasps was assessed: 200; 400; 800; 1,600 and 3,200 per hectare. For each of them, nursery orange plants infested with 35 psyllid nymphs were placed in circles of radius distant 7.5, 15, 22.5 and 30 meters from the release site, located in the center of each circle.

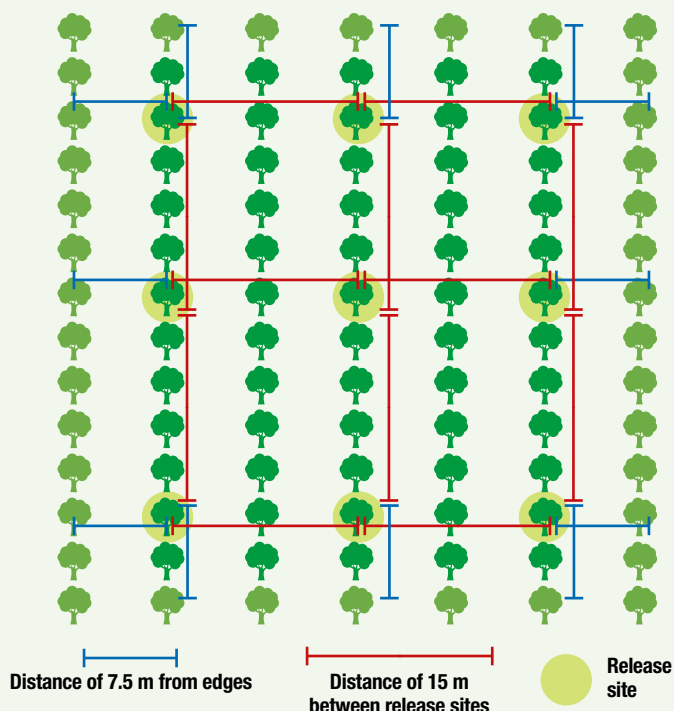
Two days later, nymphs present in nursery plants farther apart from release sites (22.5 and 30 m) were not parasitized regardless of the number of wasps, suggesting the latter do not cover such distances.

As for 800; 1,600 and 3,200 wasps/ha and distances of 7.5 and 15 m from the release site, parasitism was greater as the number of wasps released increased, but lower as the distance from the release site increased: for the radius of 15m, 35 percent of nymphs were parasitized after the release of 226 wasps per site (3,200 parasitoids/ha). However, the greatest nymph control (approximately 75 percent) resulted from the release of 57 wasps at every 7.5 meters (3,200 parasitoids/ha).

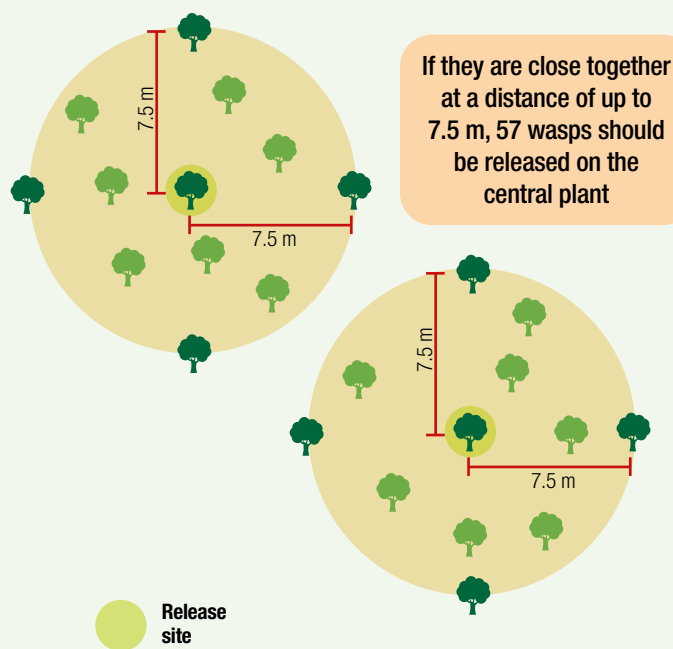
NEW PROTOCOL

A new protocol was developed from those results for the release of *Tamarixia radiata*: 56 sites, with 57 wasps/site per hectare in abandoned

FOR ABANDONED GROVES



FOR AREAS WITH PLANTS LAID OUT WITHIN A RADIUS OF UP TO 7.5 M

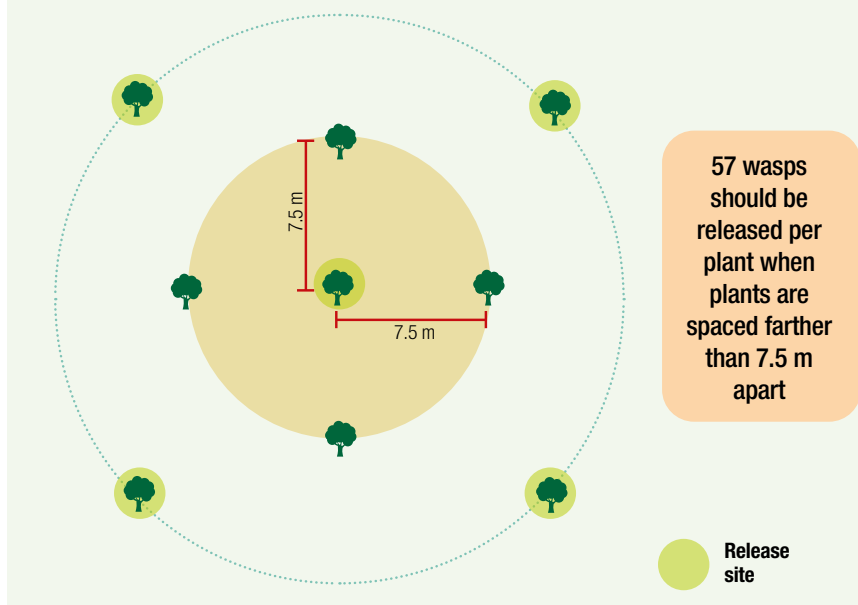


groves. Wasps cover a radius of 7.5 m, equivalent to a total distance of 15 m between release sites.

Furthermore, in urban areas such as cottages and backyards, the layout of citrus plants and/or orange jasmine plants should be assessed. In case they are close together at a distance of up to 7.5 m to one another, 57 wasps should be released on the central plant. If they are spaced farther apart, 57 wasps should be released per tree.

New experiments are being carried out in the other regions of the citrus belt to further optimize releases. Nevertheless, the new protocol has already been followed by Fundecitrus and other producing units. 🍊

FOR AREAS WITH PLANTS LAID OUT WITHIN A RADIUS GREATER THAN 7.5 M



Haroldo Xavier Linhares Volpe, professor and researcher at Fundecitrus (advisor)

Denis Rogério Marin, MasterCitrus student/farm manager at Citrosuco Agroindústria S.A.

Wellington Ivo Eduardo, postdoctoral student at Fundecitrus

Marcelo Pedreira de Miranda, professor and researcher at Fundecitrus

Alexandre José Ferreira Diniz, postdoctoral student at Esalq/USP

Odimar Zanuzo Zanardi, professor at the Instituto Federal de Santa Catarina - São Miguel do Oeste (IFSC-SMO) campus

Arthur Fernando Tomaseto, agronomist at Fundecitrus

José Roberto Postali Parra, professor and researcher at Esalq/USP (co-advisor)



One year of ProteCitrus

PROGRAM CONNECTS CITRUS GROWERS TO GLOBAL REQUIREMENTS FOR A MORE SUSTAINABLE FOOD PRODUCTION

THROUGH THE ONLINE PLATFORM, CITRUS GROWERS ACCESS INFORMATION ON ALL AUTHORIZED AGROCHEMICALS ACCORDING TO REGULATORY REQUIREMENTS IN BRAZIL, THE UNITED STATES, EUROPE, JAPAN, CANADA, CHINA AND CODEX ALIMENTARIUS

ProteCitrus – Citrus Protection Products has just turned one-year-old. This Fundecitrus program was developed to replace the former PIC list. However, the new model is no longer a list of recommended agrochemicals but became a voluntary citriculture protection program in the industry.

“ProteCitrus helps citrus growers connect their work with requirements from governments and customers to meet the global demand for food production with the least environmental impact possible and even more improved sustainable techniques used in Brazilian citriculture”, agronomist at Fundecitrus and member of ProteCitrus’s technical committee Marcelo Scapin states.

Among this program’s main differences are greater requirements to enter a product into the list and anticipation of trends and regulations in diverse foreign consumer markets for Brazilian orange and orange juice.

Through the online platform, cit-

rus growers may access information on all agrochemicals authorized for phytosanitary protection of groves according to regulatory requirements in Brazil, The United States, Europe, Japan, Canada, China and Codex Alimentarius.

Product are classified as miticides, insecticides, fungicides, herbicides, plant hormones, plant activators, pheromones, formicides, biological agents and alternative use agrochemicals. In order to make search easier, it is possible to enter either the active ingredient or the trade name. It is also possible to download a bilingual PDF list from the same page.

The program focus is on citrus growers whose production is intended for juice processing, although fresh fruit growers can also follow ProteCitrus recommendations.

UPDATE

ProteCitrus is updated every four months, in Abril, August and De-



11 thousand visits



43 countries

Countries with the most visits: Brazil, the United States, Netherlands, Sweden, France, The United Kingdom, Austria, Germany, Argentina and Japan



626 cities



6,615 downloads of ProteCitrus



1,737 downloads of the MRL List



Access all information on
www.fundecitrus.com.br/protocitrus



ember, or in special situations whenever necessary. "This year we have included 47 new commercial products, in that three correspond to new active ingredients to control psyllids, among other pests, and 19 are biological products", recalls Scapin.

Since December 2019, the ProteCitrus website has had more than 11 thousand visits from 43 different countries, as well as 8,352 downloads of lists of allowed agrochemicals and of Maximum Residue Level (MRL) (*see side infographic*).

TECHNICAL COMMITTEE

ProteCitrus is currently managed by a technical committee comprised of Fundecitrus, Citrosuco, Cutrale, Louis Dreyfus, Agroterenas, CitrusBR, Coopercitrus, Fundação de Pesquisas Agroindustriais de Bebedouro, Grupo de Consultores em Citros (GCONCI) and Unesp-Jaboticabal campus (SP).

The committee meets regularly to update the list and follow the regulatory status of each molecule. "Furthermore, there are previous discussions, initiatives and contributions on domestic and foreign legislations regarding the regulation of those products", highlights Scapin. 🍊

IN ORDER TO MAKE IT EASIER TO SEARCH FOR A PRODUCT, IT IS POSSIBLE TO ENTER EITHER THE ACTIVE INGREDIENT OR THE TRADE NAME