focus on this insect-plant interaction and aim towards a more informed and improved *T.* erytreae control.

S06O3
Determination of the Damage situation and natural enemies Citrus Scale Insects in Citrus orchards in the Eastern Mediterranean Region in Turkiye

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Citrus scale insects (Aonidiella aurantii Maskell, Aonidiella citrina (Coq.) (Hemiptera: Diaspididae) is one of the most economically important pests species in Turkey. Due to the intense use of chemical pesticides, the exportation of citrus products is affected negatively. In addition, chemicals have negative impacts on biodiversity and cause resistance problems. This study was conducted to determine the damage to the Citrus scale insects in the Eastern Mediterranean Region (Adana, Mersin, Hatay) between 2021 and 2022. In addition, parasitoids and predators of this pest were determined within this study.

According to the results of the survey in Citrus orchards, this pest caused more damage to Orange and mandarin species than lemon and grapefruit species. Especially home orchards, less chemical used orchards were found more diverse than conventional citrus orchards in terms of natural enemies. Two different parasitoids, Aphytis melinus DeBach (Hymenoptera: Aphelinidae) and Comperiella bifasciata How. (Hymenoptera: Encyrtidae) were found during surveys. In addition, some predator species were found and these natural enemies are in the identification process. Generally, these natural enemies were determined from home orchards, and less chemical used in citrus orchards. According to our observation, %80 of parasitized scale insects were detected in the less chemical-used orchards. Consequently, the overuse of chemical pesticides affects the population of natural enemies negatively in citrus orchards, and natural parasitism and natural balance were more protected in the less chemical used orchards.

S06O4
First results of the new mass-trapping device against *Ceratitis capitata* (Diptera: Tephritidae): Med trap

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Mediterranean fruit fly (medfly), Ceratitis capitata (Diptera: Tephritidae), is an important pest, especially citrus, affecting local markets and export markets. Mass trapping has been may be a powerful tool in the control of C. capitata, and its use in Türkiye has increased dramatically as a control method, recently. In this study, three different attractants and control were evaluated to determine the behavioral response of adult C. capitata using a four-arm olfactometer in the laboratory study. Also, three traps and three different attractants were compared under the field. Results demonstrated that Medfly has an importantly higher attraction to Med fly than other attractants and control in the four-arm olfactometer studies. The attractant of the med trap was significantly more effective than hydrolyzed protein bait and Biolure under the field. Also, the med trap caught more adults than other traps. The results show that the med trap may indeed be an effective way of controlling C. capitata in citrus orchards.

S06O5
The Effects of Some Sucking Pest Insecticides on Amblyseius swirskii Athias-Henriot (*Acari: Phytoseiidae*) under Laboratory Conditions

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Pesticides are frequently applied against sucking insects in Turkey and these pesticides cause an effect on predator mites, which are important natural enemies of *Panonychus citri* (McGregor) (Acari: Tetranychidae). Among the predatory mites, *Amblyseius swirskii* Athias-Henriot (Acari: Phytoseiidae) is an important species that feeds not only on *P. citri* but also on pests such as thrips and whiteflies. In this study, the effects of afidopyropen, spirotetramat, and sulfoxaflor, which are authorized in citrus in Turkey, on *A. swirskii* larvae were determined. Dimethoate was used as a toxic pesticide. As a result of the applications, the effects on larvae

were found to be 31.67 %, 78.23 %, and 28.96 % for afidopyropen, spirotetramat, and sulfoxaflor, respectively. While the number of daily eggs per female was 3.73 in control, it was detected as 2.63, 0.80, and 1.36 for insecticides, respectively. The rate of decrease in egg production was found as 29.51 %, 85.30 %, and 56.69 %, respectively. According to these results, afidopyropen and spirotetramat were moderately harmful (M), and sulfoxaflor was determined as harmless (N).

S06O6
Potential management tools for Huanglongbing (HLB) in Florida citrus groves

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Huanglongbing disease (HLB; citrus greening) has devastated the citrus industry in Florida, USA, and continues to spread and threaten other production areas worldwide. Just over a hundred years old, the HLB disease is putatively caused by *Candidatus* Liberibacter asiaticus (CLas) and is primarily transmitted by the insect vector Asian citrus psyllid (ACP; *Diaphorina citri*). With most remedies failing rapidly and no cure in sight, HLB has been the most challenging disease to study and investigate for effective management strategies. Our research goal is to develop practical tools for growers for integrated pest management (IPM) of HLB. To achieve our goal, we have characterized insect-specific viruses (ISVs) in the ACP vector for potential biological controls, assessed the use of individual protective covers (IPCs) on citrus trees as physical barriers for preventing HLB, and identified several novel therapeutics, including antimicrobials and plant defense inducers (PDIs), to delay CLas infection in young citrus trees. Furthermore, toward effectively delivering therapeutics into citrus phloem, we developed a novel delivery method, NATI: needle-assisted trunk infusion/injection. Although ISVs for biological control remain in infancy and newly identified PDIs and therapeutics provide effective control against CLas infection, they are currently not labeled or available to our growers. Nevertheless, while NATI is being developed into an automated trunk injection device, the IPCs are now commonly used on most new plantings by growers throughout Florida. Altogether, our results indicate that these IPM tools can be included in growers' 'toolbox' and may effectively control HLB disease in citrus groves.

S06O7
Regional variation of citrus orchards in the favorability of *Diaphorina citri* reproduction and *Candidatus Liberibacter* asiaticus infection

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The Asian citrus psyllid (ACP) *D. citri* is the insect vector of *Ca.* L. asiaticus (CLas), the bacterium associated with huanglongbing (HLB), is a destructive citrus disease. In Brazil, ACP was found for the first time in 1942 and HLB in 2004. From the initial detection sites, ACP spread throughout the country and HLB to the main citrus areas of the southern regions. However, the spread of HLB has not been uniform. In Sao Paulo State (SPS), much lower diseased tree incidences occur in areas with hotter and drier regions (north and northwest) than in areas with milder temperatures and more frequent rain (center, east and southern regions), conditions that favor flushing dynamics, ACP reproduction, and CLas multiplication and infection. Over two years, we estimated indices of favorability to ACP reproduction on diseased trees (IFR), and to CLas infection on healthy trees (IFI), based on the number and phenological stage of new shoots (NS) observed every two weeks on five adult healthy or diseased sweet orange trees (8 branches per tree). The trees were growing in three SPS regions with distinct climates and disease incidences: Altair (north, 5.3 % HLB in 2021), Rio Claro (east, 61.8 %), and Itaí (south, 29.4 %). The younger the NS stage the higher the favorability to ACP and the higher the vulnerability of healthy trees to CLas infection. The favorability to ACP and vulnerability to CLas, given by IFR and IFI averages and the frequency of NS incidences, were generally lower in 2020 than in 2019, and in Altair than in the other localities, in both years. These regional and annual indices variations may be explained by the climatic conditions to which the trees were exposed. The year 2020 was hotter and drier in most regions of SPS, a situation more common in the northern region where Altair is located, negatively affecting tree phenology. The lower favorability for HLB to spread in the northern region of the main citrus belt of Brazil was confirmed. The work also brings information that could be used to make adjustments in the spraying strategy currently used to control ACP.