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Oral Communication Abstract – PH.01

POPULATION CONTROL OF THE GREENHOUSE WHITEFLY TRIALEURODES VAPORARIORUM USING A VIBRATIONAL DISTURBANCE SIGNAL

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The necessity of an environmentally sound farming system is becoming more and more urgent. In this context, the development of alternative techniques of pest control can play a crucial role. The greenhouse whitefly (GW), Trialeurodes vaporariorum, is considered one of the most harmful insect pests in greenhouses worldwide. Its populations are mainly controlled by means of paraffinic oils, a technique that is non-renewable and harmful to the environment. In this study, we developed a new technique for GW control based on the use of vibrations. We started by characterizing the GW vibrational communication in order to design a specific disturbance signal (DS) able to interfere with the mating behaviour; then we performed greenhouse trials with shaking plates that transmitted the DS into plants. In the first instance, we provided a detailed ethogram of the GW mating behaviour and characterized the vibrational signals associated with the pair formation. The ethological analysis showed that the "courtship" stage, when a male exhibits the best quality of his vibrational signals repertoire, is crucial to elicit the female acceptance and thus to achieve mating. In this way, we designed a specific DS to interfere with the male courtship song, to be used in the greenhouse. Trials were carried out on tomato and zucchini potted plants. To transmit the signal, we built a vibrational device, which consisted of a plate on top of a mini-shaker on which the pots were positioned. We evaluated the effectiveness of the DS alone and in combination with two essential oils, namely CT (Serox, Clitoria ternatea extract) and EO (Prev-am, Sweet Orange Essential Oil). A significantly higher reduction of whitefly population was observed for the combination of the mixture of EO+CT with the DS in comparison to the positive (a commercial pesticide) and negative (water) controls and to the other treatments (essential oils and vibrations, separately).