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Induction of Resistance by Jasmonate and Salicylate Application to Control Western Flower Thrips (*Frankliniella occidentalis*) in Tomato and Sweet Pepper

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Abstract

Induction of plant resistance against herbivorous insects can be one strategy of pest management. Herbivore feeding induces defense reaction in host plants which are regulated by signalling pathways. Jasmonic acid (JA) and Salicylic acid (SA) are key signalling compounds. Beside herbivore attack, resistance can be enhanced by an exogenous application of those signalling compounds. Furthermore induced defense mechanism may vary in intensity in relation to interacting plant and herbivore species. Studies were carried out to investigate the effects of resistance induction with exogenous application of Jasmonic acid and (JA) Benzothiadiazole (BTH), a trigger of Salicylic acid, in tomato and sweet pepper plants towards western flower thrips (*Frankliniella occidentalis*). Plants were sprayed with JA and BTH in concentrations of 1.5 mM and 1 mM respectively and water was used as control treatment. Resistance induced was measured in terms of preferences, eggs deposition and fertility, development and feeding behaviour under greenhouse conditions. Plant reaction to the inducers was confirmed by measuring proteinase inhibitors (PI) and peroxidases (POD) activity which are well characterised enzymes responding to activation of JA and SA pathways respectively in plants tissue. In case of the choice experiment, thrips clearly avoided treated plants when released two days after plant treatment. Similarly egg deposition, fecundity and percentage of development of eggs to adults were significantly lower in both, tomato and sweet pepper, resistance induced plants. While studying the feeding behaviour, intensity of feeding damage (percentage of damaged tissue) was found to be significantly lower in case of the treated plants as compared to control.

Keywords: *Frankliniella occidentalis*, Jasmonic acid, resistance, Salicylic acid, tomato, sweet pepper