

Luring *Drosophila suzukii* with its host plants to mitigate infestation in vineyards

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The polyphagous invasive spotted wing drosophila (SWD), *Drosophila suzukii* Maturama (Diptera: Drosophilidae), has rapidly spread worldwide within the last decade, affecting stone fruit, berry and grape production. Our research explored the potential application of trap crops for protecting grapes from SWD damage, an environmentally friendly but so far neglected control approach. In the first year, we screened a large range of host plants to assess SWD preference for oviposition and developmental performance in their fruits in no-choice and multiple-choice experiments. In the second year, we selected plant species and evaluated SWD preference for them compared to grapes and their protection potential against SWD infestation in two-choice experiments under laboratory and semi-field conditions. We assessed the efficacy of one candidate trap crop in a small-scale field experiment and the effect of trap crop abundance on grape infestation under semi-field conditions in the third year. We identified 16 plant species with potential for trap cropping from the first year of experiments. Subsequently, we choose to evaluate 11 candidate trap crops in the two-choice experiments in the second year. We identified one plant species, *Ampelopsis glandulosa* var. *brevipedunculata*, as promising trap crop. This species was strongly preferred for oviposition and SWD developmental performances were weak in its fruits. In addition, it reduced the infestation of adjacent grapes. We could also eliminate from the trap crop selection process three candidate plant species as the infestation of adjacent grapes increased in their presence. In the third year, we tested one candidate trap crop, *Lonicera xylosteum*, in a small-scale field experiment. We demonstrated no protective effect of *L. xylosteum* on grapes in our experimental setup. Nevertheless, we have evidence from the semi-field experiments that the abundance of the trap crop has a critical influence as a too low abundance might increase damage instead of providing crop protection. Our study demonstrates the challenges of trap cropping development and sets the basis for future development of trap cropping in vineyards.

Jury:

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