

Summary of 2022 Flea Beetle and Onion thrips surfactant trials

Ashley Leach, OSU entomology (OARDC, Wooster, OH)

Objective: Determine impact of **surfactants** paired with insecticide to control flea beetles (complex of *Phyllotreta Cruciferae* and *Phyllotreta striolata*) in Turnip greens ('Alamo') and onion thrips (*Thrips tabaci*) in green onions ('Ishakira improved').

Overview: Surfactants can significantly improve the efficacy of insecticides. This is especially true for waxy vegetable crops (e.g., crucifers, alliums). While the waxy epidermis of these plants is an important botanical feature that can serve to protect the plant and reduce plant disease, it can limit the ability of insecticide compounds to coat the plant surface. As a result, we may end up with sub-par performance of our insecticides. In fact, pest outbreaks may require a greater number of insecticide applications when compared to treatment using surfactant. Overall, we assessed different insecticides paired with and without surfactants to control flea beetles in turnip greens and onion thrips in green onions.

Experimental set up: Trial was designed with 5 replications per treatment with flea beetle and onion thrips counts weekly for a total of 5 weeks. Yield data was taken at the conclusion of the trial, assessing both the severity of beetle damage and the number of feeding holes made by the beetles. Similarly, green onions were assessed at the end of the growing season and assigned a score or 1 = marketable or 0= unmarketable (greater than 30% of leaf area marred by thrips feeding). Plots were 5' x 15' and sprayed with a variable rate experimental sprayer, although electrostatic feature was not engaged during application. Final yield assessments are shown below including the average damage of feeding on leaves (flea beetles and onion thrips) average number of feeding pits or holes on leaves (only flea beetles) (shown below, Fig. 1b). The flea beetle trial ran 6 total weeks from June to early July. The onion thrips trial ran for 8 weeks beginning in August and ending in September.

Location: Willard, OH

FLEA BEETLE INSECTICIDE TRTS: Trial was conducted comparing control of flea beetles with and without surfactant ('Induce' @ 0.1% v:v) when combined with either Harvanta 50SL (*cyclaniliprole*, 16.4 fl. Oz), Hero (*Zeta-cypermethrin* + *bifenthrin*, 10.3 fl. Oz), or Radiant SC (*spinetoram*, 10 fl oz.). This amounted to 6 treatments and an untreated control. Trial shown in Fig 1.

ONION THRIPS INSECTICIDE TRTS: Trial was conducted comparing surfactant ('Induce' @ 0.5% v:v) with Movento (*spirotetramat*, 5 fl. Oz.), Agri-Mek (*abamectin*, 3.5 fl. Oz.) and Radiant (*spinetoram*, 10.0 fl. Oz). This equated to 6 treatments and an untreated control.



Fig.1: Images of the turnip green trial. Early colonization of flea beetles to the field contributed to high levels of beetle damage.

FLEA BEETLE SUMMARY:

- Marketable damage was high in the trial (Fig.2) and Induce use did significantly improve the performance of the insecticide. However, **further evaluation is needed with certain surfactants since we did note high amounts of foliar burn on a subsequent kale planting.** In fact, it was this level of damage that precluded us from following up on a larger surfactant trial. A rate trial would be beneficial in season 2023. PI Leach will be following up with the Oro-Agri field representative to determine if this could be possible.

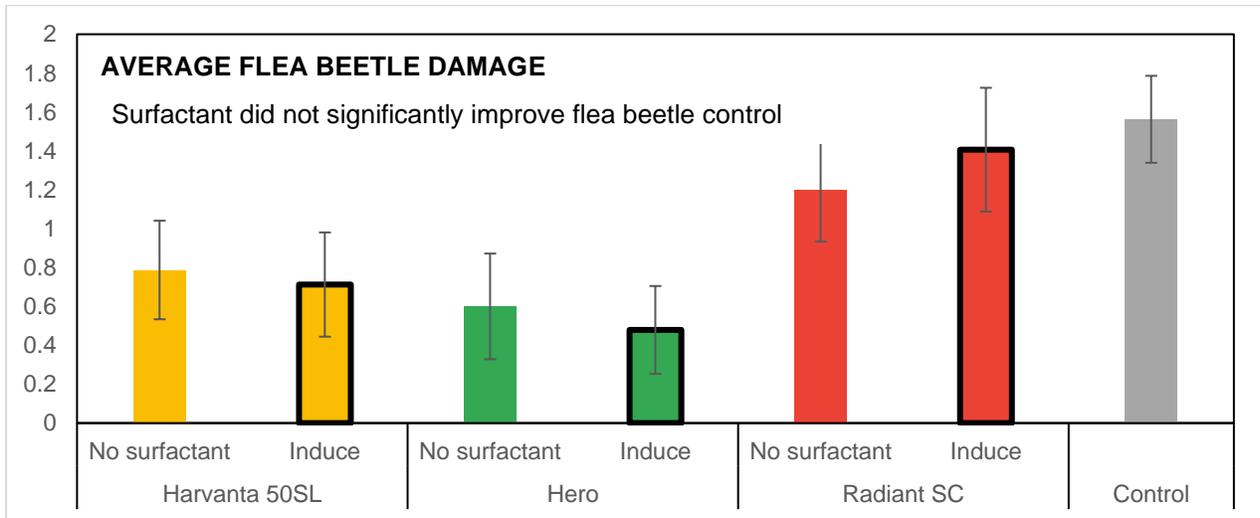


Fig.2: average damage associated with flea beetle feeding. Typically, a rating of 0.5 would render greens unmarketable or increase processing time.

ONION THRIPS SUMMARY:

- Overall, thrips severely damaged green onions in the trial and we had high levels of unmarketable green onions (Fig. 3). Thrips numbers often exceeded 4 thrips per leaf in treated plots. Further evaluation is needed to determine the degree to which previous chemistry and rotation impact thrips infestations.
- Induce did not significantly impact the performance of the insecticides tested (Fig.3). Only Radiant provided high levels of control and had the highest marketable yield (Fig.4).
- Movento performed surprisingly poor compared to the other compounds. While PI Leach has had experience trialing Movento in bulb onions, further testing is needed to perfect timing and frequency in green onion which tolerate lower levels of thrips damage.

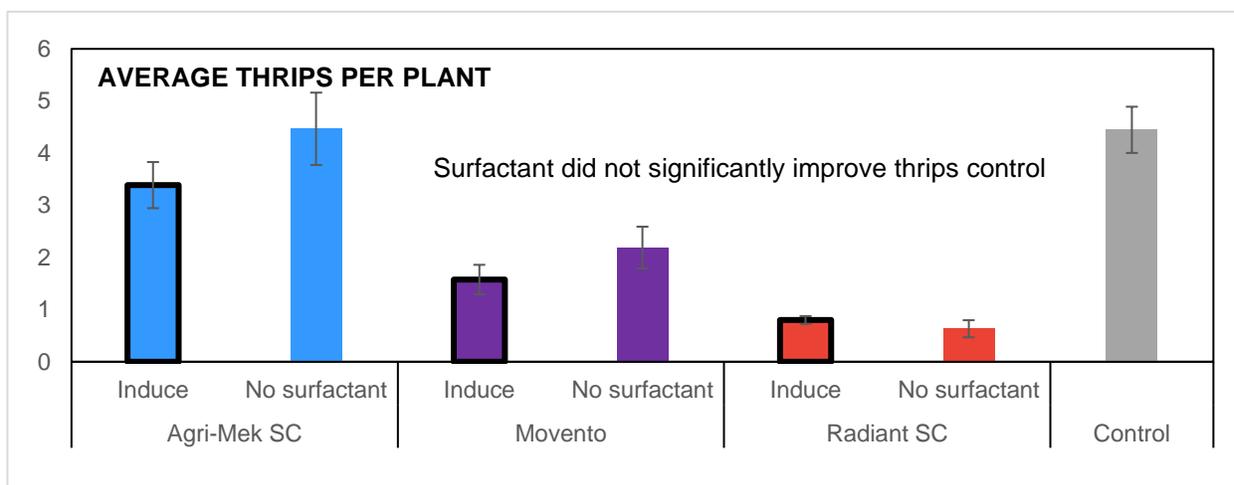


Fig.3: Trial average thrips per plant. Only Movento and Radiant were significantly different from the untreated control.

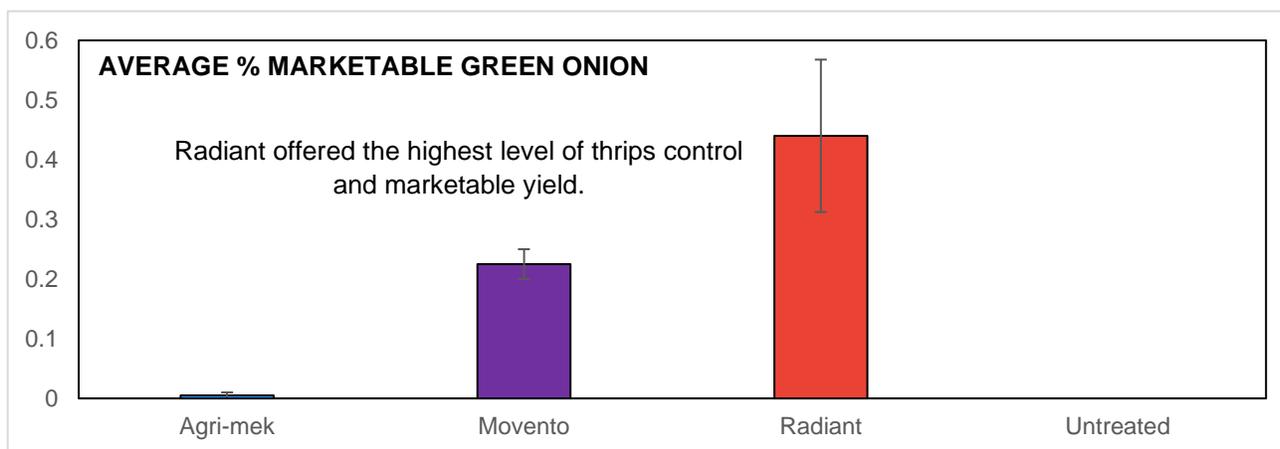


Fig.4: Product was the only significant effect, and Radiant had the highest percent of marketable green onions in 2022.