

Southern Region Small Fruit Consortium – Progress Report

Title: The use of Surround (kaolin) against spotted wing drosophila in Virginia vineyards

Progress Report

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Research Project

Personnel:

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Objectives:

- 1) Determine the efficacy of kaolin applied a berry closure relative to synthetic and other organic insecticides against SWD in ripening grapes,
- 2) Determine impact of kaolin applied at berry closure in minimizing SWD infestation at harvest,
- 3) Determine impact of kaolin on parasitization rates in SWD in the field,
- 4) Determine impact of kaolin on parasitization rates in SWD in sentinel berries

Grape berries become most vulnerable to SWD oviposition when they reach about 15 Brix. Previously, when clusters were dissected at harvest for evaluation of injury, it was noticed that oviposition sites are often in the interior of the cluster. At this time, it is impossible to provide insecticide coverage in these protected areas. This study was to evaluate the effect of a preemptive application of kaolin (at a time before berries become vulnerable), applied just before berries touch in the clusters. A chemical control study was performed in an organic Marquette vineyard block in Albemarle County, and a Pinot Noir block in Amherst Co.

Objectives 1 and 2: Determining the effect of kaolin and additional chemistry applied at berry closure on SWD infestation at harvest

Trials of berry closure sprays were made in two vineyards, in Albemarle County and a certified organic vineyard in Amherst County. The Amherst site used Pinot Noir vines, the Albemarle site used Marquette. All treatments were applied as foliar sprays by hand using a CO₂ powered backpack sprayer set at 40 psi with a single wand equipped with an 8008VS stainless steel spray tip. Treatments were applied in the fruit zone until run-off. Surround was applied at a rate equivalent to 25 lb per acre, with Induce @ 0.8 fl oz per acre in Amherst. At the Amherst site, a pyrethroid insecticide, Mustang Maxx (8 fl oz per acre) was compared with Surround (since the Albemarle vineyard was certified organic, synthetic chemistry was not included. Both sites used an untreated control. At both sites, Nufilm sticker at the rate of 175.6 ml per 100 gal was included. Single vine replicates were used, replicated 5 times in Amherst, and 16 times in Albemarle. Applications were made July 1 in Amherst and 7 July in Albemarle.

At harvest time, one cluster of grapes was collected from each vine; clusters were kept in zippered plastic bags at ambient temperature for approximately 24 hours. All grapes were then dissected and inspected for *Drosophila* damage and/or presence. Percent damaged berries were calculated. Sugar content was calculated for each cluster from 10 randomly selected berries using a refractometer.

Results: In the Albemarle vineyard, after several years of aggressive control measures, damage was very low in 2016. The treatment source of variation for percent damaged berries was not significant ($P > 0.05$), although the untreated control had numerically higher percent damaged berries (Table 1). At the Albemarle site, injury was higher. In this situation, the application of Surround at berry closure reduced SWD injury at harvest by 50%.

Table 1. Effect of berry closure application of kaolin on 5 infested berries at harvest at two commercial vineyards.

Treatment	Loving Cup (Albemarle Co.)	Ankida Ridge (Amherst Co.)
Kaolin applied	3.2a	2.6a
Mustang Maxx	--	2.7a
Untreated control	6.4b	3.7a

Analyses performed on arcsine-transformed data; untransformed means are presented in table. Means followed by the same letter are not significantly different ($\alpha = 0.05$).

Objectives 3 and 4: Effect of kaolin on levels of parasitization.

In several additional vineyards, sentinel traps with fruit preparation with eggs or young larvae of *D. suzukii*, *D. melanogaster*, or *Zaprionus indianus*, were placed in the field. Parasitization by the two invasive drosophilids was negligible in the two invasive species, with no successful emergence of parasitoids; a larval parasitoid, *Leptopilina boulardi*, and a pupal parasitoid, *Pachycrepoideus vindemiae*, were reared from *D. melanogaster*. It is not likely that there will be meaningful reduction of successful parasitization of SWD by kaolin. There was no sign of parasitization in kaolin-treated grapes.