Pacific Spider Mite, Navel Orangeworm and Fire Ant Control in the lower San Joaquin Valley

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Pacific Spider Mite

Introduction Spider mite is a significant pest of almonds, especially late in the season during hot, dry weather as tree stress increases close to harvest. During 2013 we completed three replicated field trials in Shafter, CA to evaluate different aspects of spider mite control.

Miticide Screening Trial All miticides (dark green bars, Fig. 1) were applied with 1% 415 ° Oil and caused a significant reduction in mite density compared to the untreated check. Oil-based products (light green bar) and biologicals (purple bar) reduced mite density by approximately 50%. The pyrethroids (red bars) controlled mites until 7DAT but mean mite-days were not significantly different than the Oil and/or Untreated Check.

Use of KNO_3 All miticides with 1% 415° Oil or with 1% 415° Oil + 10lb/ac KNO_3 resulted in significant reductions in mites compared to the Untreated Check (Fig. 2). Mite densities in plots treated with miticides + Oil + KNO_3 were statistically equivalent to when the same treatments were used without the KNO_3.

Vintre as an additive All miticides with 1% 415° Oil or with Vintre resulted in significant reductions in mites compared to the Untreated Check. Mite densities in plots treated with miticides + Oil were statistically equivalent to mite densities in plots where Oil was replaced by Vintre.

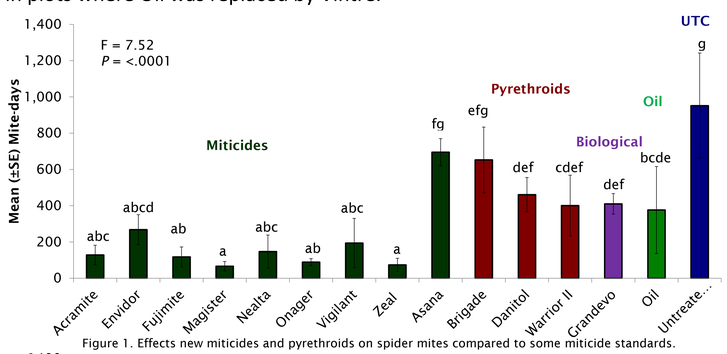

Figure 1. Effects new miticides and pyrethroids on spider mites compared to some miticide standards.

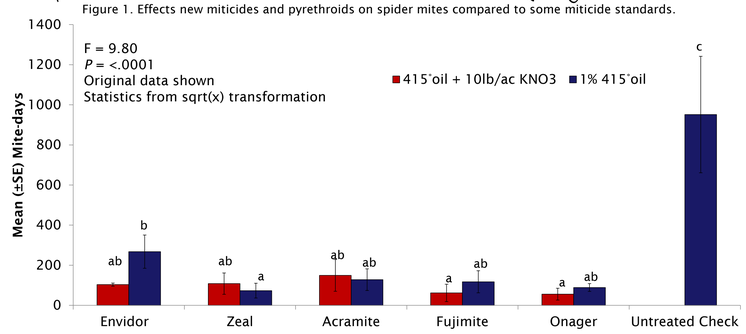

Figure 2. Effects of KNO_3 + 415° oil with five miticides on spider mite density.

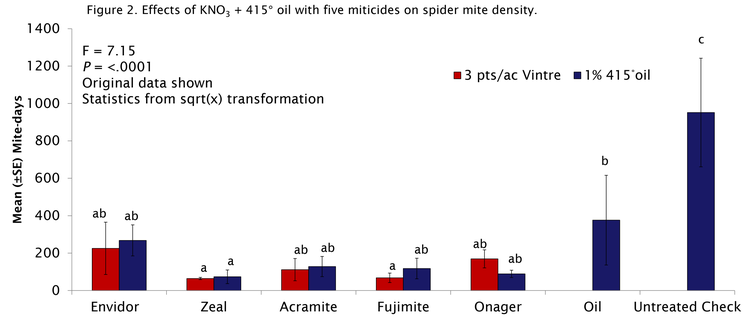

Figure 3. Effects of 415 oil vs. Vintre with five miticides on spider mite density.

Southern Fire Ant

Introduction Almond growers currently rely on three ant baits for control of southern fire ant (Clinch, Esteem and Extinguish). However, a lag time for effectiveness has caused many growers to adopt calendar-based application programs. Recently a faster-acting ant bait (Altrevin) was registered. Our objective was to see how fast and how long it works, as well as evaluate it with other season-long ant management programs using replicated 5-acre plots of almonds.

Procedures Clinch, Esteem, Lorsban and Altrevin were applied at three timings: May - Early (E), June - Mid (M) and July - Late (L). Hot dog baits were used to assess ant populations during harvest of Nonpareil (9Aug) and Monterey (12Sep). Three of the plots (Lorsban Late, Altrevin Late, and the Untreated Check) were evaluated weekly over an 8-week period to see how fast and how long Altrevin works.

Results Comparison of late treatments showed that Lorsban reduced fire ant density over the 8 week period compared to the untreated check (Fig. 4). Altrevin reduced fire ant density for 2 weeks, after which they were the same as in the untreated check from weeks 3 to 8 after application.

During Nonpareil harvest (Fig. 5) the lowest ant densities were in treatments that included Esteem early or mid-season, as well as plots treated late with Lorsban or mid-season with Altrevin. Programs utilizing Clinch had moderate reductions in ant density. For the Monterey harvest (Fig. 6) all programs using Esteem early or mid-season were effective, as were the two programs that included Lorsban late.

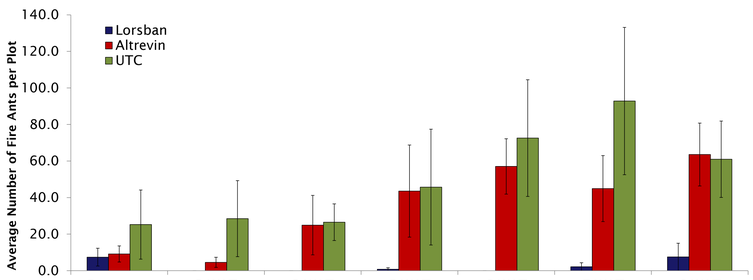

Figure 4. Effects of late applications of Lorsban or Altrevin on fire ant density in almonds over an 8-week period.

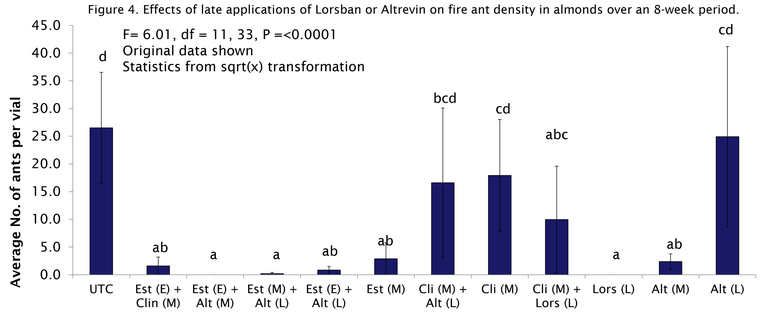

Figure 5. Effects of different ant bait programs on southern fire ant density during Nonpareil harvest..

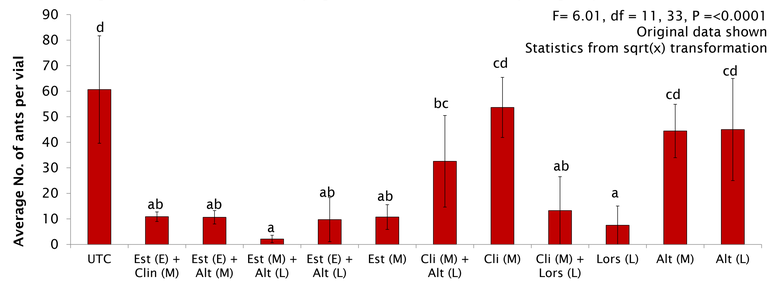

Figure 6. Effects of different ant bait programs on southern fire ant density during Monterey harvest.

Navel Orangeworm

Introduction Navel orangeworm is the most important pest of almonds in California due to its direct impact on the kernel and relationship with aflatoxins. Growers typically manage navel orangeworm through a combination of winter sanitation and one or more insecticide applications. Our trials used replicated single-tree plots to evaluated a range of insecticides for navel orangeworm at hull split.

Results Damage in the untreated check was 17.8% compared to 5.6 to 14.7% in treated plots (Fig 7). The tank mixes of a diamide and a pyrethroid had 48 to 69% reductions in damage, diamides alone had 36 to 65% reductions, the other larvicides had 46 to 64% reductions and pyrethroids had 17 to 65% reductions in damage compared to the untreated check. Pyrethroid treatments resulted in more variable results in the trial, likely due to the fact that single-tree plots have limited abilities to fully evaluate insecticides that work against the highly-mobile adult moths. This means that efficacy of larvicides is likely to be relatively accurate whereas the full effectiveness of adulticides like pyrethroids on a commercial scale are likely to be underestimated.

Analysis of data by mode of action showed that all modes of action caused a significant reduction in damage by navel orangeworm compared to the untreated check (Fig. 8).

Figure 7. Effects of insecticide treatments on the percentage of kernels infested by navel orangeworm.

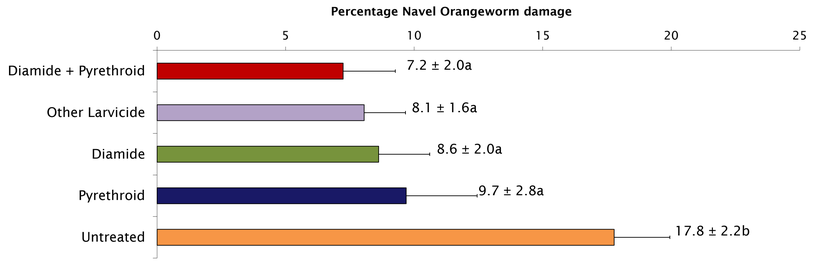

Figure 8. Effects of insecticide treatments from the same mode of action on the percentage of kernels infested by navel orangeworm.