SPIDER MITE CONTROL IN WALNUTS IN 1996

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Abstract:
The miticide AGRI-MEK which is abamectin 0.15 EC controlled the two-spotted mite, Tetranichus urticae and the European red mite, Panonychus ulmi effectively in a Gustine walnut orchard. Mite levels were low in this orchard even in the unsprayed check. Neither Asana nor Guthion caused increases in walnut aphid populations and Asana applied to the check did not seem to cause an increase in spider mite population.

The Situation:
Walnut growers have a very limited choice of miticides. Pesticides applied for control of codling moth, Laspeyresia pomonella are often disruptive and can cause severe outbreaks of the two-spotted mite, Tetranichus urticae and the European red mite, Panonychus ulmi. Merck and Co. is testing AGRI-MEK, Abamectin 0.15 EC for mite control under an EUP for walnuts in California.

Procedures:
Mature Ashley walnut trees owned by Tom and Ann Wieser and managed by Bill Treshler were selected for this experiment. These walnuts are spaced 24' X 24'. Treatments were applied with an FMC 1087 air-carrier sprayer calibrated to apply 100 gallons per acre. Each treatment totaled 5 acres, so one tank was used per treatment. The plots were 5 X 21 trees with 3 replications per treatment. The checks were 5 X 4 tree blocks at the end of treated plots.

The five treatments with three replications were:
1) Check: 13 oz/A Asana on 6/27/96 with no miticide.
2) AGRI-MEK @ 0.0125 lb ai/A sprayed 6/18, Asana at 13 oz/A on 6/27/96.
3) AGRI-MEK @ 0.0125 lb ai/A sprayed 6/27, Asana at 13 oz/A on 6/27/96.
4) AGRI-MEK @ 0.025 lb ai/A sprayed 6/27, Asana at 13 oz/A on 6/27/96.
5) Moretan at 3 lb/A sprayed 6/27 plus 3 lb Guthion per acre.
Each AGRI-MEK treatment also included paraffinic spray oil at 1 gpa.

Monica Ferson, JR SIMPLOT Co. monitored codling moth traps and calculated degree day accumulations to provide timing of the applications for codling moth. The 6/18/96 application of AGRI-MEK was approximately one week before the anticipated codling moth spray application. This application timing was used to determine whether AGRI-MEK should be applied before or with the codling moth treatment. Counts of mites and mite eggs were made each week by selecting 25 representative leaflets at random from each plot (75 per treatment) and counting these by using a binocular microscope in the UCCE laboratory.

Results:
The spider mite populations were low in this orchard in spite of the earlier pesticide applications made for codling moth control. This orchard has also had a high degree of parasitism of the walnut aphid, Chromaphis juglandicola by the parasitic wasp, Trioxys pallidus.

Figure 1 shows the 2-spotted mite counts and Figure 2 gives the European red mite counts from 18 June through 13 August. European red mites were at slightly higher levels than 2-spotted mites through the course of the experiment. The application of 10 oz/A of AGRI-MEK on 6/18 resulted in a very substantial reduction in the populations of both mites after one week. The mite populations remained near "0" throughout the 8 weeks of counts.
The pre-treatment counts of 2-spotted mites on 6/25 were just over 1 per leaflet, and for European red mites just over 2 per leaflet. All treatments dropped to less than 1/4 mite per leaflet after the application on 6/27/96. The check remained at consistently higher mite numbers than all other treatments through mid-July. By 13 August all treatments and check were at or very near “0” mites per leaflet. There were no significant differences in 2-spotted or European red mite numbers between treatments, but there were significant differences between treated and untreated trees at some dates. The check levels of 2-spotted mites were significantly higher on 9 July, and highly significantly higher on 23 July. The European red mites were significantly higher in the check on 23 July.

Mite egg numbers dropped in all treatments within 2 weeks after treatment, as can be seen in Figure 3. The check had a reduction of mite egg numbers also, but at a much slower rate than the treatments. Even the check had mite egg numbers nearly at “0” by the end of July. Thrips were seen on the sampled leaves in the 25 June reading, but were not noted at later dates. The Western orchard predator mite, *Metaseiulus occidentalis* was not seen at any counting date. In spite of the meager number of mite predators seen, the mite numbers in the checks dropped substantially by 30 July. The orchard floor is maintained in no-tillage with a moderate cover crop of resident plant species. This might serve as a sanctuary and insectary for predators. There were highly significant differences in mite egg numbers between the check and all treatments on 2 July, and 9 July, and significant differences on 16 July.

Figure 4 shows the percentage of leaflets infested by mites. All treatments resulted in post-treatment percentages of 0% to 24% mite-infested leaflets between 2 July and 13 August. The check had 20% to 40% infested leaflets through most of July. Only on 23 July were the numbers of infested leaflets significantly higher in check than in treatments, but numerically the counts were higher throughout the count period until 30 July.

**Conclusions:**
It was very difficult to establish significant differences between the check and treated trees due to low mite infestation and the high variation between treatment reps. There were no differences between miticide treatments. Numbers of mites and percentage of leaflets infested dropped rapidly with all miticide treatments. Number of eggs dropped a bit slower.

The 10 oz and 20 oz ai/A rates of AGRI-MEK were statistically equal. The 10 oz ai/A rate of AGRI-MEK applied one week before codling moth treatment followed by 13 oz/A Asana was statistically equal to the 10 oz and 20 oz rates of AGRI-MEK applied at codling timing with 13 oz Asana per acre. The Morestan at 3 lb/A plus 3 lb Guthion per acre sprayed 6/27 resulted in mite control equivalent to the treatments with AGRI-MEK.

This experiment does show that AGRI-MEK effectively controls both 2-spotted and European red mites at both the 20 oz and 10 oz ai/A rate, and timing the AGRI-MEK application with the codling moth spray was effective. Morestan was also effective in controlling spider mites.

None of the spray applications had any effect on walnut aphid numbers. Very few walnut aphids were found in the sampling, and all populations were very highly parasitized.
Figure 2. EUROPEAN RED MITES
Figure 3: SPIDER MITE EGGS
Figure 4. PERCENTAGE OF MITE INFESTED LEAVES