

Managing Mites in Almonds with Abamectin - The Almond Doctor thealmonddoctor.com

Written By David Haviland, Kern County UCCE Entomology Advisor

For more than a decade abamectin has played a key role in mite management programs in California almonds. When applied properly, early-season abamectin treatments typically provide good mite control through hull split, and in some cases throughout the season. Unfortunately, recent reductions in the cost of abamectin have led to unnecessary use, and sometimes abuse, of abamectin-based products. This has led to more and more cases of unsatisfactory mite control at a time when mite management has taken an elevated importance due to increased adoption of pyrethroids for control of navel orangeworm. This article covers several considerations that should be made while using abamectin to insure that it works effectively and consistently.

Applications prior to leaf hardening

Abamectin works primarily as a nerve toxin that mites ingest while feeding. Once ingested the toxin causes paralysis to juvenile and adult mites that eventually die through starvation. In order for this to work, abamectin must be applied to the leaves, absorb translamarily into the leaf, and then be expressed in plant tissues where the mites feed. This process works best prior to leaf hardening when leaves are young, tender, and free from dust and other residues. Leaf hardening on mature trees typically occurs around the first of June in the lower San Joaquin Valley, slightly later as you move north, and late in the season on non-bearing trees. Growers that apply prior to these dates typically have very good success with abamectin treatments.

Applications after leaf hardening

Recently there have been an increasing number of growers, particularly in the northern San Joaquin Valley, that have started applying abamectin late in the season. Most growers justify this timing by stating that they know that the timing is not ideal, but that the product is cheap and the control is sufficient to suppress mites through harvest. On the surface this argument makes a lot of sense and I agree that this practice can fit well within and overall approach to mite management. However, there are two main concerns. The first is that hull split is the time of year that predatory thrips populations are often at their highest. Abamectin is extremely toxic to predatory thrips whereas other miticides are generally safe for use when thrips are present. The second concern is that some growers that use abamectin at hull split already used the product earlier within the same season. This is highly inadvisable from the standpoint of resistance management. Therefore, I do believe there is a time and place for late-season abamectin treatments, such as when no predatory thrips are present, abamectin has not yet been used that season, and mite populations are at a density that is low, but treatable. However, outside of this situation a better integrated pest management approach would be to stick to more traditional hull split miticides and or 415° Oil, even if they are a little more expensive.

Combining abamectin with oil

Applications of abamectin are typically made with the addition of 1% 415° Oil. This recommendation to use oil is based on numerous studies that date back more than 15 years when abamectin was first developed by Merck and Co, Inc. As a result of those studies, labels for abamectin products give specific instructions to combine abamectin with oil. For example, the label for Agri-MekSC (accessed 3/25/2013) states, "Always use Agri-MekSC in combination with a horticultural spray oil (not a dormant oil) approved

for use on tree nuts.” A similar statement is included on the ABBA 0.15 EC label (accessed 3/25/2013) with an addendum that states, “If applications are made without Horticultural Spray Oil, reduced efficacy and/or reduced residual control could result.”

Despite guidelines to include oil with abamectin sprays, some growers have started switching over to other additives, such as non-ionic surfactants. The most common reasons cited by growers are that 1) oil is becoming more and more expensive, and 2) that recent changes in regulations have made it more difficult to move bulk containers of oil. Despite the reality of these concerns, it is nevertheless still true that oil makes abamectin more effective for a longer period of time. Growers who skip the oil are compromising their chances for long residual control, especially when applications are being made in May or early June and the grower expects mites to be controlled for at least two to two and a half months until hull split.

Coverage

As with all miticides, coverage on almond trees is important for abamectin treatments. Depending on the size of trees most applications should be made in 100 to 200 gallons of water per acre at a drive speed not to exceed 2 miles per hour. Applications made at greater velocity or less water volume are at risk of decreasing product effectiveness. Additional water volume should be considered in cases where leaves are particularly dusty, such as in the lower San Joaquin Valley in years where there is no rain in March or April.

Effects on biological control

The most effective biocontrol agents against spider mites are thrips, other predatory insects, and predatory mites. Abamectin is highly toxic to thrips, benign to most other predatory insects, and moderately toxic to predatory mites. If predatory thrips are present in an orchard, consider using a different miticide. Also, be very cautious about ‘preventative’ use of abamectin early in the season. Predatory insects and mites need food to survive. It is not logical to use abamectin preventatively in May, which kills predatory thrips and removes food for beneficials, and then expect predators to magically show up late in the season. A more balanced IPM approach would be to only treat early-season mites if they are at a treatment threshold, but if they are below a threshold, consider them as an investment in predator food that will allow the establishment of a predator population that can suppress and or control mite populations throughout the season.

Resistant to abamectin?

Every year I get calls from growers that feel like abamectin did not perform up to expectations in one or more of their almond orchards. These growers often ask if mites are becoming resistant to abamectin. I have investigated many of these cases and have found a trend. Most cases of product failure are not due to resistance, they are the result of poor application practices, such as low water volume and fast drive speeds, applications made without the inclusion of oil, or applications in orchards where leaves were really dusty at the time of application. There have only been a handful of cases where I thought resistance was a true possibility. However, in most of those cases growers worked directly with Syngenta to determine if resistance had occurred by re-applying abamectin to those same fields the following season. In all cases I am aware of abamectin worked just fine in those same fields the next year, suggesting that either no resistance had occurred, or that resistance was not stable within the mite population.

Resistance management practices

Despite a lack of solid evidence that mites are becoming resistant to abamectin it is still important to prevent resistance development in the future. This can be accomplished by using the following steps. 1)

Treat only if you need to. Treating orchards 'preventatively' is not good IPM. Recommendations for monitoring programs and treatment thresholds are available at the UCIPM web site (<http://ucipm.ucdavis.edu/PMG/r3400211.html>). 2) Use good application practices. This means good water volume at a drive speed not to exceed 2 miles per hour. 3) Include oil. Oil by itself is a good miticide, and any mites that are resistant to abamectin will still be susceptible to oil. 4) Rotate chemistries. It is irresponsible to apply abamectin more than once to the same field within the same season, especially considering that many excellent alternatives are available. 5) Utilize biological control. Resistant spider mites taste just as good as susceptible ones to natural enemies. Growers who adhere to these principles should expect excellent results from their mite management programs during this year while they preserve the effectiveness of abamectin and other miticides into the future.



Print Friendly