

# Agri-Mek: A 1996 Field Trial in a Commercial Apple Orchard

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The 1996 growing season witnessed the introduction of a new pest-management tool with the federal registration of Agri-Mek (Merck and Co.) for managing both leafminer and mite in apples and pear psylla in pears. Following the withdrawal of Omite from the marketplace in April, most apple producers were pleased to have another option for European red mite (ERM) control. However, Agri-Mek's late-spring registration combined with the absence of experimental work conducted in New England left most field consultants and growers with limited information on how this product would be utilized best in the rapidly approaching season.

The active ingredient in Agri-Mek, abamectin, is a naturally derived substance produced by a soil microorganism and is effective at extremely low rates. Agri-Mek is not related to other currently registered materials and therefore should prove useful in managing tolerant pest populations and prolonging the effective life of presently available compounds when used in a rotational program. Abamectin is absorbed into the leaf tissue where it forms a reservoir of active ingredient against foliar feeding pests. As a result, Agri-Mek is currently recommended within six weeks after petal fall and in combination with horticultural oil in order to maximize absorption. Affected individuals essentially are paralyzed, stop feeding, and die within a few days.

Optimal timing is critical to the cost-effective use of this material. Ideally, one would

expect a single application to provide season-long suppression of ERM and leafminer populations. The focus of our trial was European red mite, as this pest would likely be the primary target for most Northeast growers considering the use of this material. The two most vulnerable periods for ERM within the recommended application time frame are 1) petal fall, when the majority of overwintering egg hatch has been completed and 2) first-generation egg hatch approximately 3-4 weeks later. ERM populations are fairly synchronous at these two times and are more easily disrupted than when multiple life stages are present. The following study was conducted to determine which of these two application timings would prove more effective in managing ERM populations.

## *Procedure*

Treatments were applied to adjacent, non-replicated plots in a commercial apple orchard

Table 1. Materials, rates and application dates for Agri-Mek trial, 1996. Materials were delivered in 150 gal /acre of water. All plots received 3 gal/acre oil on April 24. Check plot was treated July 7 with 18 oz/acre Carzol SP, July 25 with 5 lbs/acre Omite 30W, and August 9 with 3 pts /acre Vydate.

Trt.	Material + rate (product/acre)	Timing
1	Savey @ 3 oz	May 9
2	Agri-mek @ 10oz + oil @ 1 gal	May 23
3	Agri-mek @ 10 oz + oil @ 1 gal	June 17
4	Check	-----

owned and operated by Marshall Farms Inc., Fitchburg, MA. Each 1.5-acre plot consisted of three rows of primarily McIntosh trees approximately 12 feet high, planted on 16 x 24 foot spacing with a dilute tree row volume of 280 gallons per acre. Treatments were made with a Hardie airblast sprayer calibrated to deliver 150 gal per acre while operating at 2.5 miles per hour according to the treatment schedule outlined in Table 1.

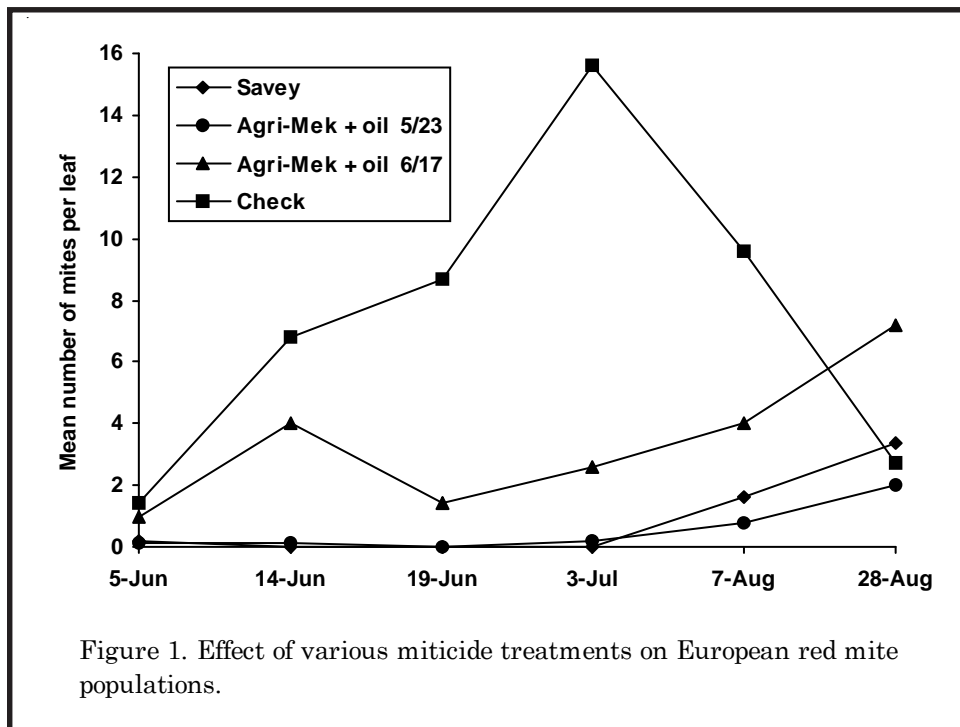
European red mite populations were evaluated by selecting randomly 15 leaves per tree from each of 4 trees per treatment. Composite samples then were brushed unto glass plates and populations estimated using standard leaf-brushing protocol.

### Results & Discussion

There were no substantial differences between treatments with respect to European red mite control in this study. Both Agri-Mek timings as well as the prebloom Savey application, included for comparison, were successful in suppressing ERM populations below injurious levels through the last week of August. Estimated mite populations in these

plots ranged from 2.0 - 7.2 per/leaf on August 28 (Figure 1) with little or no foliar damage evident. ERM populations in the check plot, which received only a prebloom oil treatment, built rapidly after first-generation egg hatch and exceeded 15.0 mites per/leaf by early July. Moderate foliar damage was noted at this time and rescue treatments of miticide were applied July 7 and July 25 to prevent excessive damage. A third treatment was made on August 9 to suppress late-season build up.

It is interesting to note that, although both treatments were successful in suppressing ERM populations below injurious levels, trees receiving the later Agri-Mek treatment applied on June 17 had more motile forms consistently throughout the growing season. Pre-treatment counts on June 14 revealed approximately 4.0 mites per/leaf, and although our application was successful in reducing that population, there were still significant numbers of motile forms on July 3 when one would expect to see full expression of the treatment. In contrast, the petal-fall treatment applied May 23 suppressed ERM numbers to barely detectable levels until early August and final counts on August 28 were less than 50% of the later



treatment.

It is unclear why this later treatment did not perform as well as the petal-fall treatment. The increased amount of foliage present in mid June may have adversely affected spray penetration and allowed for greater survival of mites in the inner tree canopy. Perhaps hardening off of the leaf tissue was a factor. This event may have decreased absorption of active ingredient to the extent that nymphs hatching several days post-application were not well controlled.

### ***Conclusion***

It appears from the data presented here that either a petal-fall application of Agri-Mek or an application timed to coincide with first-generation egg hatch can, under favorable

conditions, provide satisfactory season long suppression of European red mite similar to that provided by a prebloom application of Savey.

The treatment directed at first-generation egg hatch was less effective possibly due to decreased spray coverage or decreased absorption of Agri-Mek into the leaf tissue. This difference was of little consequence in this trial, as summer weather conditions were relatively cool with ample rainfall and season-long suppression was ultimately achieved. However, had weather conditions been more conducive to rapid mite build up, additional summer miticides may have been necessary to manage the residual population left by the later treatment.

Based on these data, we suggest the petal-fall application as the more desirable of the two options presented here.

