

ASPARAGUS MINER INTEGRATED PEST MANAGEMENT RESEARCH UPDATE

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Research at Michigan State University's Vegetable Entomology Lab focuses on the integrated pest management of the asparagus miner (*Ophiomyia simplex* (Loew), Diptera: Agromyzidae). This insect is a putative vector for pathogenic species of Fusarium fungus, which is the causative agent for "early decline syndrome" in asparagus fields.



Asparagus miner adults mating.

ASPARAGUS MINER DEGREE DAY MODEL DEVELOPMENT

We have been monitoring the abundance of asparagus miners throughout the 2011 field season, by counting the adult flies weekly on yellow sticky cards placed at five commercial asparagus fields in the Hart area. At each trapping site, one trap was placed at ground level and another at canopy level. We started monitoring in early May, and stopped in early October. In three of the five farms, we placed weather stations, which provided site specific data for creating a degree day model. Degree day models can be used to predict the appearance of certain life stages in the field and target management practices more precisely.

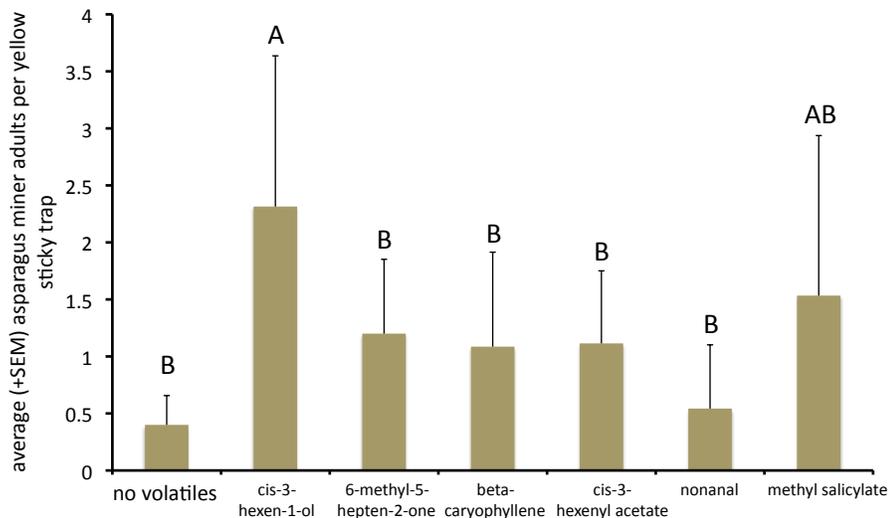
We observed a peak in adult activity in mid- to late-June corresponding to ca. 650 Growing Degree Days and a smaller peak in mid- August, around 1900 Growing Degree Days. Last year we observed a prolonged period of adult activity from mid-July to early-August, which in Degree Days corresponds approximately to the second, smaller peak of adult activity in the 2011 growing season.

Degree Day Event	
200	Flight Beginning
650	1 st adult peak flight
1900	2 nd adult peak flight
2300	Flight Ending

ASPARAGUS MINER MONITORING WITH BAITS

We are exploring the chemical interaction of the asparagus miner with the asparagus. In particular, we are looking for plant volatiles involved in the attraction of the miner to plants. Plant volatiles can be used in management by incorporating them into baits on traps to improve monitoring or using them in the population management of adult miners.

In the 2011 growing season, we tested 7 plant volatiles that were identified from asparagus plants or are known attractants for related insects. The different plant volatiles were attached to yellow sticky traps in the field and the number of adult miners was counted on the traps weekly. Yellow sticky traps baited with cis-3-hexen-1-ol caught about 6 times more adults than most of our other treatments, including the no-volatile control. Methyl salicylate baited traps caught the second highest number of adults on average, but this was not significantly different from any of the other treatments.



ASPARAGUS MINER BIOLOGICAL CONTROL

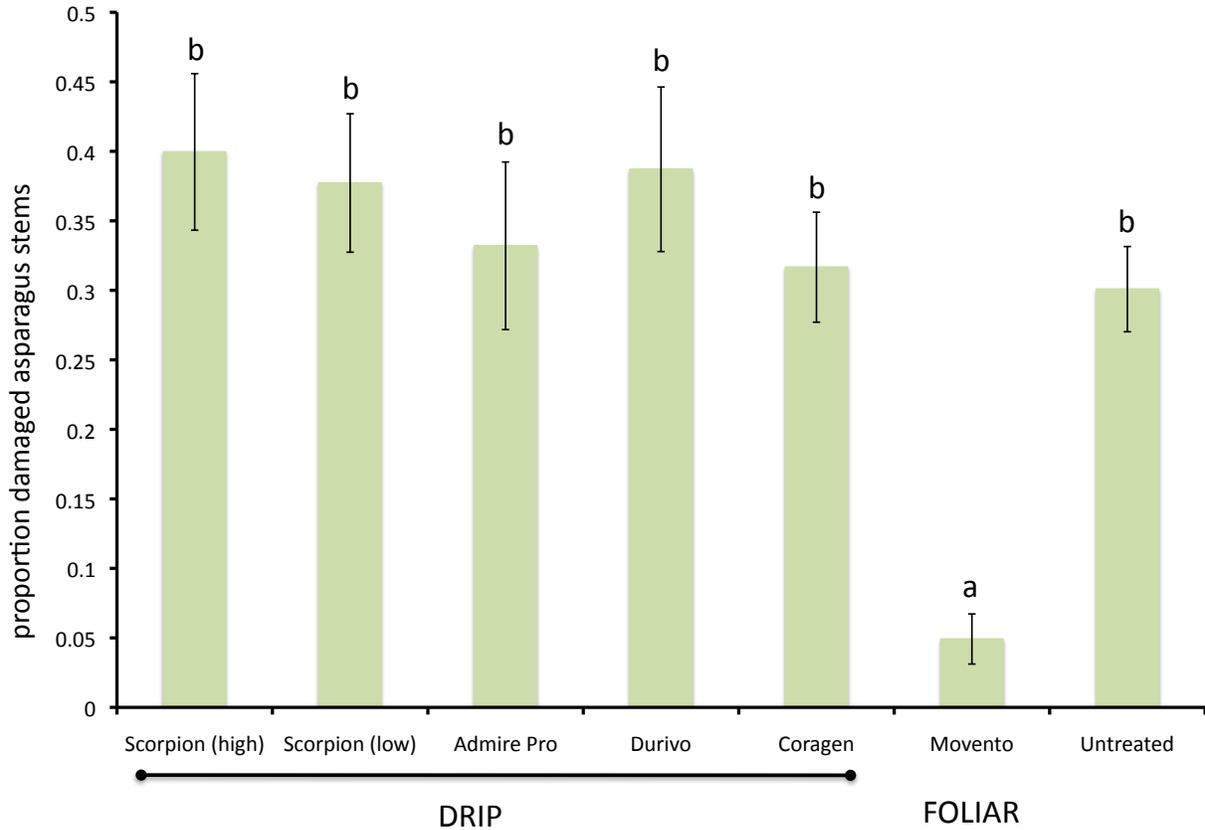
We are currently in the process of identifying naturally occurring arthropod parasitoid species of the asparagus miner pupae, as well as examining their abundance in commercial asparagus fields.

About 12% of the asparagus miner pupae collected from 5 commercial asparagus fields were killed by parasitic wasps in the 2011 growing season.

EVALUATION OF SYSTEMIC AND FOLIAR INSECTICIDES FOR CONTROL OF ASPARAGUS MINER IN ASPARAGUS

In 2011, the MSU Vegetable Entomology Lab conducted an insecticide trial in an experimental asparagus field in Hart, MI. This is a two-year old field, with asparagus crowns planted and a drip irrigation system set up in 2010. In 2010, chemigation treatments were able to suppress asparagus miner damage, indicating that control of this pest could be attained through chemigation. Unlike in 2010, in 2011 the chemigation treatments did not result in suppression of asparagus miner damage. In 2011, the early season foliar application of Movento 240SC significantly reduced the number of damaged stems after three weeks, compared to all other treatments (see figure below). However, despite a second application

of Movento on 14 June (three weeks after the first application), subsequent sampling dates did not result in any significant differences between treatments. Asparagus miner numbers were quite high during this period, leading to heavy damage to all plots. The reason for the second application of Movento providing ineffective control is unclear, but one possibility is that this product is less successful at moving into the older, tougher fern, relative to the young fern earlier in the season. Stem tissue analyses showed that none, or only trace amounts, of the various drip treatments were incorporated into the plant tissue, which explains the lack of control in these treatments.



Percent asparagus stems damaged by asparagus miners on 14 June 2011. Movento was applied on 24 May and the drip treatments on 25 May 2011. Bars with the same letter are not significantly different.