Mites and Lygus bug on strawberries

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Mites

Two-spotted spider mite (*Tetranychus urticae*) is a major pest on strawberries in coastal California. A closely related species, *T. turkestani*, which resembles *T. urticae* may also be present among spider mite populations, but prefers warmer climates. The life cycle includes egg, larva, protonymph, deutonymph and adult. Larvae have three pairs of legs while other mobile stages have four pairs. The duration of the life cycle depends on the temperature. The ratio between male and female mites depends on various factors, but it is usually 1 male for every 2 or 3 females.

Spider mite feeding causes reduction in fruit size and yield. Strawberry plants are very sensitive to mite damage within 2 to 5 months after transplanting. Infestation of 1 mite per leaflet can result in substantial yield reduction during this period. Plants are less sensitive to mite damage after initial berry set. However, substantial losses can occur with 15-20 mites per mid-tier leaflet during this period. Highest infestations can be seen after peak spring harvest after which populations rapidly decline.

Proximity to second year plantings with mite infestation, presence of infested fields upwind, inadequate chilling of day-neutral varieties, dusty conditions and water stress are some of the factors that contribute to mite problems.

Depending on the region and time of the year, monitor for mites every week or every other week. When populations are low, check for the presence or absence of mites by randomly sampling 10 leaflets per acre. When infestation is high 5-10 leaflets per acre can be randomly sampled for counting mites.

Recommended management practices include,

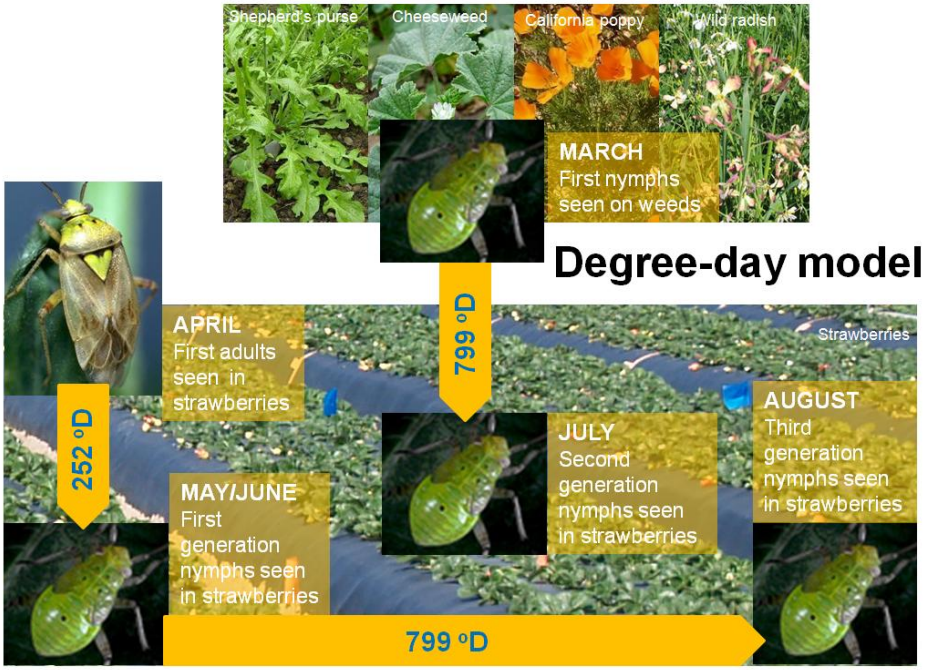
- Promoting vigorous plant growth through adequate chilling, water and nutritional management.
- Avoiding practices that disrupt natural enemy populations and using miticides that are safe to natural enemies.
- Alternating different chemicals to reduce the risk of resistance development where strawberries are continuously grown.
- Slow driving, use of low fences and watering roadways to prevent dusty conditions.

Among the predatory mites, *Phytoseiulus persimilis* is effective early in the season. *Neoseiulus californicus*, which tolerates high temperatures and wide range of humidities, is a predominant species later in the season. Chemical control can be achieved by using UC IPM guidelines. Oberon, Zoro, Agri-mek, Fujimite and Acramite are among effective chemicals in a research study conducted in Watsonville by UC entomologist, Frank Zalom.

Lygus bug

Western tarnished plant bug or Lygus bug, *Lygus hesperus* is a major pest of strawberries in many regions in California. Feeding damage to achenes causes deformation of fruits called cat-facing and reduction in yield and quality. Overwintering adults lay eggs on flowering weed hosts which are the main source of later infestation on strawberries. In the Central Coast area, three generations of nymphs can be seen in a season. The first in May or early June, the second in late June or early July and the third in July or August.

Management of weeds in winter and monitoring for nymphs on weeds and adults on strawberry are important for Lygus bug control. One of the approaches is to calculate degree-days to estimate when nymphs or adults can be seen. Degree-day is the unit of measurement for physiological time for insect maturity. In other words, it is the time an insect takes from one point to another point in its life cycle depending on the temperature. The amount of heat accumulated in 24 hours when the temperature is one degree above the lower developmental threshold is a degree-day (^{o}D). Lygus bug requires 252 ^{o}D (in Fahrenheit) for egg stage and 371 ^{o}D for nymphal stages. Adults require 176 ^{o}D before they start laying eggs. So, it takes a total of 799 ^{o}D from egg to next generation egg. By monitoring the presence of Lygus and daily temperatures, degree-days can be calculated to make treatment decisions against nymphal stages following UC IPM guidelines. This is especially important as many of the available insecticides are not effective against adults.



For example, if Lygus nymphs are first seen in March on weed hosts or adults are first seen in strawberries in April, degree-day model predicts that first generation nymphs from adults can be seen in strawberries around May-June after accumulating 252 ^{o}D. Second generation nymphs, from the nymphs on weeds, can be seen in July in strawberries after accumulating 799 ^{o}D. The third generation nymphs from first generation can also be seen after 799 ^{o}D in August.

Natural enemies of Lygus include big-eyed bug (*Geocoris* spp.), minute pirate bug (*Orius* spp.), damsel bug (*Nabis* spp.), various species of spiders that attack nymphs and an egg parasitoid *Anaphes iole*.

Degree day information can be found at: www.ipm.ucdavis.edu/PHENOLOGY/ma-lygus_bug.html
UC IPM guidelines for strawberries can be found at: www.ipm.ucdavis.edu/PMG/selectnewpest.strawberry.html