Developing Sampling Methods for Pre-Season Mite Detection and Implementing Management Decisions

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Introduction

- Spider mites are common pests in almond orchards in California. Mite feeding may lead to decline in tree health and productivity.
- Spider mites overwinter in orchard floor and move to the trees during the season. In practice, we only know the mite infestation after we see their damage on leaves (leaf stippling) during summer.
- Soil sampling during the winter can estimate the overwintering mite population and this may be useful as an early predictor of the seasonal mite population in the orchard.
- Also, finding ways to trap mites in tree trunk while they are moving to the tree canopy can provide an important information about their movement timing.
- Knowing the mite movement timing will be helpful in finding alternative ways to treat mites during their migration.
- Early-warning sampling methods coupled with insecticides may be useful in managing mites in almond orchards.

Project Objectives

- Characterize mite overwintering locations in the soil in relation to the tree trunk
- Determine the soil depth in which overwintering mites are abundant
- Identify the time of the year in which spider mites are moving from the soil to the trees using trunk-band traps
- Evaluate reduced risk acaricides and other products for trunk application early in the season

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Methods

Soil sampling for overwintered mites:

- We took soil samples in a orchard located in Stanislaus County in winter. Soil samples were taken from three sampling areas of the orchard (front, middle, end of the block).
- Sixty samples were taken from the base of the 12 sample trees. The soil samples were transferred to styrofoam cups (5 cups per sample) that were placed on the sticky cards to recover mites (Fig. 1).
- Soil samples were kept outdoors to allow soil drying which triggers mite emergence.

Tree-band traps for migrating mites:

- Tree-band traps (Fig. 2) were used to recover mites while they are migrating from the soil to the trees.
- The trap consisted of an inner layer of the paper towel, overlapped by a band of 6-inch wide duct tape. A sticky material (i.e. Tanglefoot) was smeared over the tape to trap migrating mites.
- We have placed these traps on the trunk and a primary limb of the almond tree in early March and removed them in May and early June.

Preliminary Results

- In 2016 spring, we conducted preliminary work to refine soil sampling methods and tree-band traps.
- Soil samples collected from an almond orchard were processed to recover overwintered mites.
- Based on 60 soil samples evaluated, the average mite recovery was 0.87 mites per 6 oz. soil.
- We also tested tree-band traps recovered a substantial number of brown mites and spider mites. Trunk traps captured numerically more mites than limb traps (Fig. 3-4).
- Future studies include testing these sampling techniques in orchards that have high mite pressure.
- We will also compare the infestation of mites on leaves with or without band-traps.
- This study will provide information about the effectiveness of the tree-bands in monitoring female mites as well as excluding them from foliage.
- We will also evaluate the efficacy of potential acaricidal products as a tree trunk application.

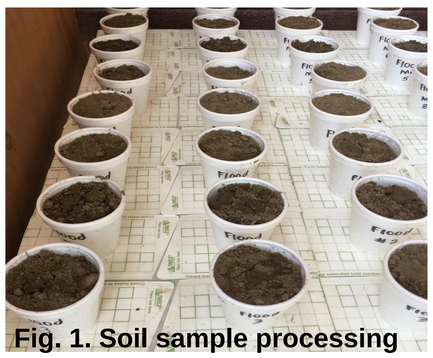

Fig. 1. Soil sample processing

Fig. 2. Tree-band trap on tree

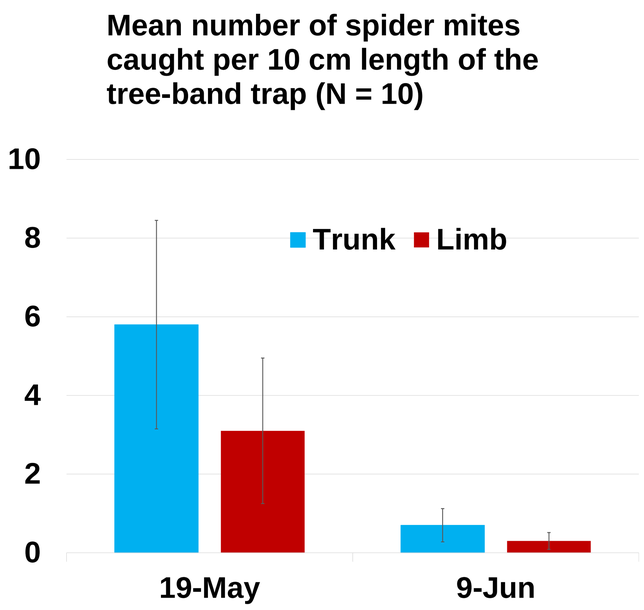

Fig. 3 Abundance of spider mites trapped in tree-band traps deployed on the trunk and limb of the trees, UCCE Stanislaus, 2016

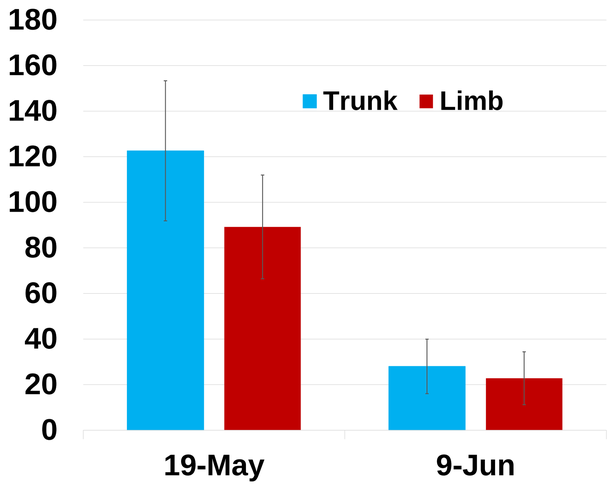

Fig. 4 Abundance of brown mites trapped in tree-band traps deployed on the trunk and limb of the trees, UCCE Stanislaus, 2016