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# Mites on Cotton

**Purpose**

Spider mites (Tetranychus species) are the most damaging foliar pests in most areas and in most crops. Under favorable conditions, their populations can multiply so rapidly that they can injure a large portion of leaf area. The purpose of this lab is to demonstrate sampling procedures to determine the population of Spider mites on roses, cotton and/or almonds. [[1]](#endnote-1)

**Procedure**

**Materials**

1. 10 to 30x power hand lens for field classroom/observation
2. Lunch size paper bags

**Sequence of Steps**

**I. Sampling ROSES**

*Sampling a commercial field:*

1. Rose leaves are compound, consisting of 5 to 7 leaflets per leaf.
2. To sample a field of roses, walk 40 to 50 paces from the edge of the field and stop.
3. Turn to the right and at random select a leaf (5 to 7 leaflets) from the bottom third of that bush.
4. The ‘sample leaf’ is then stored in the lunch bag.
5. Turn left and take a leaf (5 to 7 leaflets) from the middle third of that bush and put the sample into the same bag.
6. Still standing in the same location turn back to the right and take a sample from the top third of the bush.
7. Walk another 40 to 50 paces and repeat the process until 30 to 36 samples have been gathered.

Sampling on a school campus: Describe any changes you will make to the procedure to fit your situation.

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**II. Sampling COTTON**

Walk into a cotton field 50 paces. Each sample in this case is one leaf from the MAINSTEM of the plant. Walk at least 20 paces from the plant-to-plant or sample-to-sample. When plants have less than 9 main stem nodes, pick the lowest leaf. When plants have more than 9 main stem nodes, pick the 8th leaf from the top, counting the newest partly unfurled leaf as number 1. Pick at least 10 samples (leaves) from each growing unit (field). The treatment threshold of 50% of infested leaves is conservative. Some researchers believe that economic injury does not begin in cotton until more than 80% of the samples are infested.

**III. Sampling ALMONDS**

To sample almond trees, choose 15 leaves at random both around the circumference of the tree and within the tree canopy. Place the leaves from each tree into separate bags and mark the location. At least 5 trees should be sampled form each orchard unit.

A threshold of 22% infested leaves in the absence of predators or 45% in the presence of predators calls for action.

**PROCEDURE for INTERPRETING DATA COLLECTED**

1. Using a dissecting microscope, zoom power microscopy lens, or a hand lens look for mites. Check for mites on the entire upper and lower surface of the leaf, including near the veins and in folds where mites may be hidden.
2. If one or more LIVE mites or eggs are detected, the leaf is considered infested.
3. If no mites or eggs are found, even if there is mite damage on the leaf, do not count that leaf as being infested. (An absence of mites or eggs usually means predators have eliminated the mites/eggs). The predators of mites include thrips, green lacewing larva, minute pirate bugs, bigeyed bugs, and predatory mites (*Metaseiulus occidenntalis*).
4. Using the table below, calculate the percentage of infested leaves by dividing the number of infested leaves by the number of leaves sampled.
5. Graft the results against the dates of sampling.

|  |  |  |  |
| --- | --- | --- | --- |
| **Percentage of Mite Infested Leaves** | | | |
| **Date** | **# of Leaves Infested** | **# of Leaves Sampled** | **% Infestation** |
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Sampling usually occurs weekly in commercial fields. If the percentage of infested leaves is increasing rapidly, sampling is increased to more than once a week, but treatment does not occur until the threshold percentage is reached.

* Complete the Table for Thresholds to determine whether the roses, cotton, or almonds sampled are in need of treatment.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Table for Thresholds** | | | | | |
| Leaf Number | Mites Present  (Check marks) | Talley of Mites Present | Don’t Treat | Treat | Predator (Check if Present) |
| 1 |  |  |  |  |  |
| 2 |  |  |  |  |  |
| 3 |  |  |  |  |  |
| 4 |  |  |  |  |  |
| 5 |  |  |  |  |  |
| 6 |  |  |  |  |  |
| 7 |  |  |  |  |  |
| 8 |  |  |  |  |  |
| 9 |  |  |  |  |  |
| 10 |  |  | 3 | 7 |  |
| 11 |  |  | 4 | 7 |  |
| 12 |  |  | 4 | 8 |  |
| 13 |  |  | 4 | 9 |  |
| 14 |  |  | 5 | 9 |  |
| 15 |  |  | 5 | 10 |  |
| 16 |  |  | 6 | 10 |  |
| 17 |  |  | 6 | 11 |  |
| 18 |  |  | 7 | 11 |  |
| 19 |  |  | 7 | 12 |  |
| 20 |  |  | 8 | 12 |  |
| 21 |  |  | 8 | 13 |  |
| 22 |  |  | 9 | 13 |  |
| 23 |  |  | 9 | 14 |  |
| 24 |  |  | 9 | 15 |  |
| 25 |  |  | 10 | 15 |  |
| 26 |  |  | 10 | 16 |  |
| 27 |  |  | 11 | 16 |  |
| 28 |  |  | 11 | 17 |  |
| 29 |  |  | 12 | 17 |  |
| 30 |  |  | 12 | 18 |  |

1. Dickson, Chris (2008). Mites on Cotton. *North High School, Bakersfield, Agriculture Department* [↑](#endnote-ref-1)