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# Presence/Absence Sampling Method for Mites on Roses, Cotton and Almonds

**Purpose**

Spider mites (Tetranychus species) are the most damaging pests to the foliage (leaves) of plants in many crops. Under good conditions, their populations can multiply quickly injuring a large portion of the leaf area. To make pesticide recommendations a PCA license is required. The purpose of the lab is to demonstrate the presence/absence sampling method to evaluate the population size of mites. [[1]](#endnote-1)

**Procedure**

**Materials**

1. Lunch size paper bags
2. Microscope or hand lens

**Sequence of Steps**

General notes for roses, cotton and almonds:

1. A field of 40-160 acres is called a ‘growing unit’. For a classroom setting, just use what rose bushes are around the school.
2. Randomly select bushes and carefully sample (pull off and put in the paper bag) a leaf (with 5-7 leaflets) from the bottom third of a bush, a sample from the middle, and a sample from the top third of the bush.
3. In the lab, remove the leaves from the bag one at a time and, using a microscope or hand lens, look for mites.
4. 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.
5. C:\Users\Angela\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\DRP2N1IJ\MCj04242300000[1].wmfIf you find one or more live mites or eggs, the leaf is infested. If you see no mites, even if there is mite damage on the leaf, do NOT count the leaf. (This usually means predators have gotten to the mites). Predators include thrips, green lacewing larva, minute pirate bugs, bigeyed bugs and predatory mites (Metaseiulus occidentalis).
6. Record your observations in Table 1.
7. To figure the percentage of infested leaves, divide the number of infested by the number of leaves sampled.
8. You should sample your plants weekly. If the percentage of infested leaves increases rapidly, sampling should be increased to more than once a week. However, treatment does not occur until the threshold percentage is reached.

Roses

Rose leaves are compound, consisting of 5-7 leaflets per leaf. To sample a field of roses, walk 40 to 50 paces from the edge of the field and stop. Turn to your right and sample (pull off and put in the paper bag) at random a leaf (with 5-7 leaflets) from the bottom third of that bush. Turn to your left and sample a leaf from the middle third of that bush and then turn back, still standing at the same location, and sample a leaf from the upper third of that bush. Walk another 40-50 paces. Repeat the process until you have sampled 30-36 leaves. The treatment threshold of 25% infested leaves is most common.

Cotton

Walk in about 50 paces. Each sample in this case is ONE leaf from the MAIN STEM of the plant. Walk at least 20 paces from 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 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% is reached.

Almonds

To sample almond trees, choose 15 leaves at random both around the circumference of the tree and within the tree canopy above the sprinkler line. Place the leaves from each tree into separate bags and mark the location. At least 5 trees should be sampled from each orchard unit. A threshold of 22% infested leaves in the absence of predators or 45% in the presence of predators calls for action.

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**Observations**

**Table 1.**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Leaf Number** | **Check Mites Present** | **Talley of Checks of Mites Present** | **Don’t Treat** | **Treat** | **Predator (Check if present)** |
| **1** |  |  |  |  |  |
| **2** |  |  |  |  |  |
| **3** |  |  |  |  |  |
| **4** |  |  |  |  |  |
| **5** |  |  |  |  |  |
| **6** |  |  |  |  |  |
| **7** |  |  |  |  |  |
| **8** |  |  |  |  |  |
| **9** |  |  |  |  |  |
| **10** |  |  |  |  |  |
| **11** |  |  |  |  |  |
| **12** |  |  |  |  |  |
| **13** |  |  |  |  |  |
| **14** |  |  |  |  |  |
| **15** |  |  |  |  |  |

1. Describe your observations using complete sentences.
2. Analyze any changes to the plant population you sampled resulting from changes in mite population size.
3. Based on your observations, formulate your recommendations for management of this field.

1. Dickson, Christine *The inside story: How agriculture uses the microscope*. Bakersfield, CA: North High School Agriculture Department. [↑](#endnote-ref-1)