



Transform Compost Systems

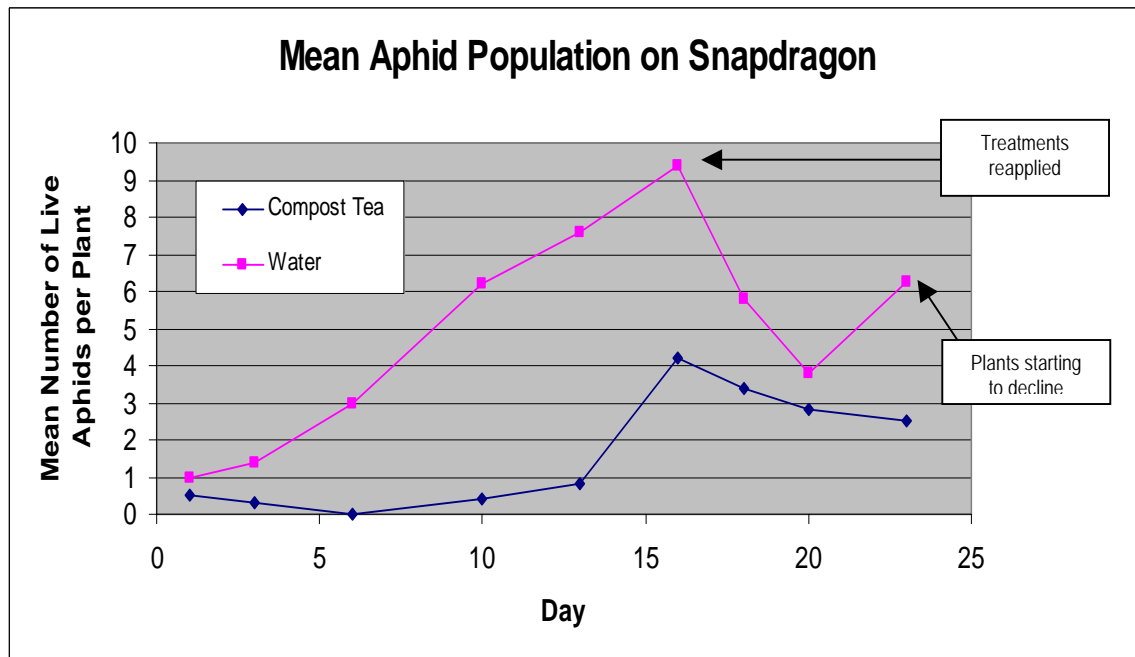
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Aphid Response to Compost Tea

Earlier this year, Transform has undertaken some preliminary research to determine whether Aerated Compost Tea had any impact on aphids. Ten insect free snapdragon plugs were dipped into a bacterial dominated compost tea and allowed to air dry; ten insect-free plants were dipped into tap water and allowed to air dry. The tea treated plants were arranged in a circle with the water treated plants alternating with the tea treated plants. Ten Green Peach Aphids (*Myzus persicae*) obtained from a local greenhouse were placed in the center of this circle and were allowed to choose which plants they wanted to feed on. The entire experimental setup was placed inside two clear Rubbermaid totes - one as a base and the second used as a lid.

The numbers of aphids per treatment were counted and the average number of aphids per plant per treatment was calculated as shown in the graph below



This graph illustrates that compost tea appears to have an inhibitory affect on the reproductive rates of aphids. Between Day 1 and 13, the bacterial dominated compost tea treated plants had no significant change in the number of aphids, while the water treatment had significant increases in aphids.

After a second treatment applied 16 days after the beginning of the trial, the water treatment appeared to have had an adverse impact on the number of aphids per plant, while compost tea reduced the aphid population less dramatically. However, the number of aphids per plant was still lower in the compost tea treatment than in the water treatment. Where the aphids disappeared after the water and compost tea were reapplied could not be determined. After Day 24, the snapdragons went into visible decline and died shortly thereafter, likely due to the adverse environment the plants were in during trial.

The postulated reason for this dramatic suppression in aphid reproduction may be due to an adverse response during parturition, after contact with gustatory cues detected during stylet penetration on plants sprayed with compost tea.

“...Studies that investigate relationships between stylet penetration and parturition have been undertaken only recently. These studies indicate that parturition is stimulated by chemical cues that (a) are detected in peripheral plant tissues before contact with the phloem and hence are effective without major ingestion, (b) are effective at low concentration, and (c) lead to initiation of reproduction before significant ingestion of nutrients...Host plant selection by aphids involves responses to a variety of physical and chemical plant characteristics but is fundamentally affected by gustatory cues detected during stylet penetration of peripheral plant tissues.” (Powell, G. et. al. Host Plant Selection By Aphids: Behavioral, Evolutionary and Applied Perspectives. www.gla.ac.uk/ibls/DEEB/ct/hostplant.pdf)

There are several important benefits to commercial growers by using compost tea to control aphids. First, aphid population growth will be less vigorous and allow time to respond to disease outbreaks. The resulting lower pest infestation levels make the use of biological controls (e.g. *Aphidius*, *Aphidoletes*, etc.) more practical to control aphids since the biological controls will have more time to locate and control smaller pest hotspots. Lastly, the use of compost tea in foliar applications could reduce the chance of other diseases, such as Botrytis and Powdery Mildew from infesting the crop, as is currently being researched by Transform.