Effect of Wood Chips as a Component of Soilless Media on Growth and Nutrition of Food and Ornamental Crops

Introduction

Peat is the central component of the soilless media mix in all greenhouse crop production but it is expensive. Wood chips provide a local, low-cost alternative, but observations by growers indicate potential growth reductions from the addition of wood to peat-based media. This study tested four different treatments: two controls (peat/vermiculite: 50/50 and 75/25) and two treatments with wood chips (peat/wood chips: 50/50 and 75/25) with three species (sunflowers, soybeans, and cucumbers) in each treatment. All containers were maintained in identical conditions on a greenhouse bench with supplemental light.

The Fresh Masses for both cucumbers and sunflowers were statistically different, while the soybeans were not. This shows that the wood chips affected the sunflower and cucumber growth rates while it did not affect the soybean growth rate.

The EC trends were all fairly similar across all the trials, with small differences here and there. The spikes and dips can be contributed to a small amount of data points being collected (since it was only a four week trial).

The ideal pH is in the 5.5-7 range, and this data shows that all the trials were within range by the end of the experiment.

Table 1: The total amount of components added for the Soilless media.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Peat</th>
<th>Wood Chips/ Vermiculite</th>
<th>Lime</th>
<th>Gypsum</th>
</tr>
</thead>
<tbody>
<tr>
<td>PV 50/50</td>
<td>6 L</td>
<td>6 L</td>
<td>0 g/L</td>
<td>1 g/L</td>
</tr>
<tr>
<td>PV 75/25</td>
<td>9 L</td>
<td>3 L</td>
<td>2 g/L</td>
<td>1 g/L</td>
</tr>
<tr>
<td>PW 50/50</td>
<td>6 L</td>
<td>6 L</td>
<td>4 g/L</td>
<td>1 g/L</td>
</tr>
<tr>
<td>PW 75/25</td>
<td>9 L</td>
<td>3 L</td>
<td>4 g/L</td>
<td>1 g/L</td>
</tr>
</tbody>
</table>

Methods

Treatments were made according to Table 1. The species tested included soybean (Hoyt), cucumber (Straight Eight), and sunflower (Teddy Bear). Treatments were established by planting four seeds of each species 0.25 inches deep into each respective soil media. Each species by soil media combination were replicated three times. Pots were placed in the greenhouse where they grew for four weeks. Multiple tests were conducted on the plants after they were harvested.

Conclusion

The statistical analysis showed that the percentage of wood or vermiculite didn’t really affect the growth rate of the plants, but that there was a significant difference between the wood treatments and the control treatments. The amount of wood or vermiculite wasn’t a key factor, it was the fact that the growing media had wood chips in it that caused some of the plants to be stunted and show slower growth rates.

From this experiment, we can conclude that the addition of wood chips affects different species in different ways. For soybeans, it doesn’t benefit or damage the crops, while for cucumbers it could have larger impacts on yields and health of the crop. When wood chips were added to the peat mix instead of vermiculite it stunted the cucumbers and sunflowers in both the 50/50 and 75/25 peat/wood mixes.

References


