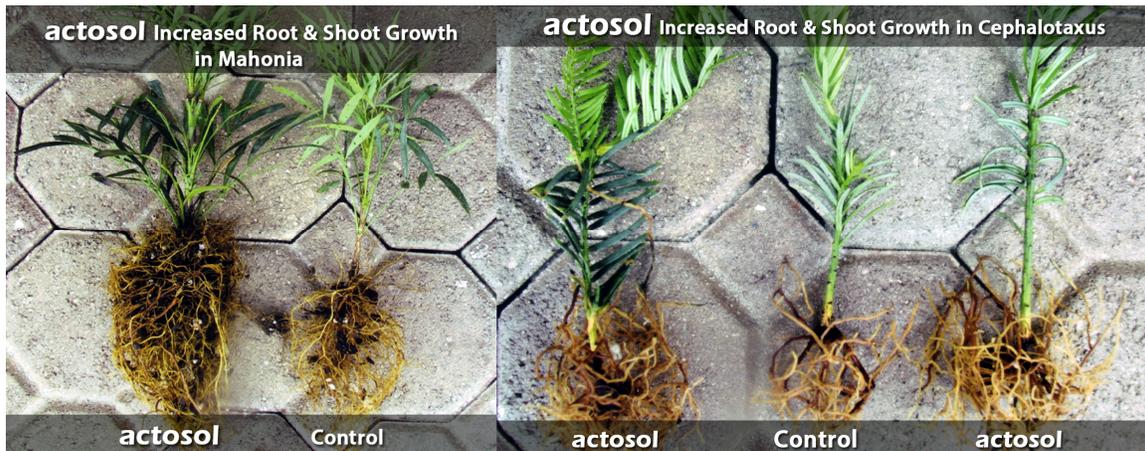


## **Effect of actosol<sup>®</sup> on plant quality, root & shoot growth, & Nutrient retention of 5 species of Ornamental Liners**

The use of plant biostimulants have been investigated by various commercial agricultural organizations and research institutions over the last 15 to 20 years. Crops that have been treated by either foliar or drench applications have shown improvement in root development, increase in vegetative growth and in horticultural food crops higher yields and improved disease to tolerance. The use of Biostimulant are typically classified as a green sustainable product and are derived from Leonardite (carbon source: coal), a rich source of humates. Humates are the living entity of organic matter and results in improvement of stress tolerance, increase in phosphorus uptake, effective chelating agent for improvement of fertilizer uptake, stimulates microbial activity, and reduces salinity thus reduce plant injury.

The objective of this trial/study was to evaluate the effect of actosol, a plant bio stimulant on the effect of plant quality, root and shoot growth and nutrient retention on 5 ornamental liners.



### **Procedure:**

A study was initiated on January 25, 2010 on 5 species of liners growing at Carolina Nursery in Monks Corner, SC. The plants tested consisted of Pieris "Temple Bell", Cephalotaacus Prostrata, Ilex crenat "Steed's". Ilex vomitoria "Pride of Houston" and Mahonia eurybracteata "Soft". Two

blocks of each plant groups were selected growing side by side in an enclosed greenhouse. A treatment of actosol at a rate of 1.5 gallons/75 gallons of water was applied (drench) on January 25, March 9th, and April 26, 2010. On June 30, 2010 samples were selected from treated and non-treated areas of each plant block and plant quality, root and shoot growth was measured (fresh weight) and soil samples were taken to evaluate plant nutrient retention. Plant quality was determined by overall growth of roots and shoots and randomly assigned the following values: 10 best; 7 commercially acceptable, below 7 unacceptable commercially. Shoot and root growth was measured by removing (cutting) roots and washing out the potting media and measuring the weight of the roots. Shoots and foliage were also removed at the soil line and measured based on fresh weight. Soil samples were taken from the plants sampled and nutrient retention and pH taken.

**TEST RESULTS:**

**Plant Quality:**

The results from the trial showed that overall quality was the best when plants were treated with actosol. In two plant genera (Cephalotaxus and Mahonia) we considered the plants unacceptable commercially (untreated) compared to the actosol treatment. We noted significantly less root growth in both of the plants.

**Root and Shoot Growth:**

Results from the trial showed that Pieris, Mahonia, Cephalotaxus, and Ilex “steed”, were statistically significant in producing more roots when treated with actosol then in non treated plants of the same plant types. In some cases root weight was 50% more than the untreated. The most notable differences occurred in mahonia, Cephalotaxus, and Pieris. No difference was noted with Ilex vomitoria “Pride of Houston”.Results on shoot growth also noted significant differences in 3 of the 5 plant liners. It appears that majority of plants in this test did respond to actosol and that shoot root relationship can be attributed to actosol stimulating roots which ultimately resulted in better shoot growth weight. The combination of both we believe will improve liner production and improve plant growth once transplanted to the planting field.

<b>Effects of actosol on Plant Quality, Vegetative and Root Growth on 6 Liners of Ornamentals</b>						
<b>Plant</b>	<b>Plant Quality (1) (grams)</b>		<b>Shoot Growth (2) (grams)</b>		<b>Root Growth (2) (grams)</b>	
	<b>actosol</b>	<b>ck</b>	<b>Actosol</b>	<b>ck</b>	<b>actosol</b>	<b>ck</b>
<b>Pieris japonica “Temple Bells”</b>	<b>9</b>	<b>7</b>	<b>19(a)</b>	<b>7(b)</b>	<b>109(a)</b>	<b>74(b)</b>
<b>Cephalotaxus prostrata</b>	<b>9</b>	<b>3</b>	<b>9(a)</b>	<b>4(b)</b>	<b>74(a)</b>	<b>11(b)</b>
<b>Ilex crenata Steed’s “Upright”</b>	<b>8</b>	<b>7</b>	<b>49(a)</b>	<b>46(a)</b>	<b>38(a)</b>	<b>31(b)</b>
<b>Ilex vomitoria “Pride of Houston”</b>	<b>8</b>	<b>7</b>	<b>17(a)</b>	<b>15(a)</b>	<b>20(a)</b>	<b>17(a)</b>
<b>Mahonia Eurybracteata “Soft”</b>	<b>9</b>	<b>5</b>	<b>24(a)</b>	<b>10(b)</b>	<b>50(a)</b>	<b>25(b)</b>



**Soil Analysis:**

Results from the trial showed that actosol does not increase pH of potting media but does impact nutrient retention of essential nutrient. We noted that phosphorus, potassium and calcium and iron were greater in actosol treatments vs. non-treated. It appears that actosol not only retained the nutrients in the potting media but also makes them more efficient for take up since the plants noted also had better plant quality but also better root and shoot development.

- |   |
|---|
| <b>1. Visual quality based on root: shoot relationship. Values based on 10 best; 1 worst; below 7 commercially unacceptable.</b>                  |
| <b>2. Based on fresh weight. Measured in grams. Letters within the same species that are different are significantly different statistically.</b> |

<b>Effects of actosol<sup>®</sup> on Nutrient Retention of potting media based on 3 Species of Ornamentals</b>						
	<b>Pieris</b>		<b>Cephalotaxus</b>		<b>Mahonia</b>	
	<b>actosol</b>	<b>ck</b>	<b>actosol</b>	<b>ck</b>	<b>actosol</b>	<b>ck</b>
<b>pH</b>	6.6	6.8	6.6	6.7	6.5	6.7
<b>Phosphorous (ppm)</b>	4.0	2.7	7.2	3.7	.9	.3
<b>Potassium (ppm)</b>	24	18	22	15	18	12
<b>Calcium (ppm)</b>	85	83	121	91	83	67
<b>Magnesium (ppm)</b>	15	15	19	14	21	15
<b>Iron (ppm)</b>	9	2	8	4	7	3

**Conclusion:**

Plants treated with actosol showed significantly improvement in plant growth of the liners which were tested. We also noted better root and shoot growth denoting without good roots there is less vegetative shoot growth. We also concluded that the retention of the nutrients found in the potting media were greater when plants were treated with actosol vs. no-treated thus providing better utilization of fertilizer to the plant liner.

