



## Multicote (by TRI Pro) Fertilizer Evaluations

Dr. James T. Midcap  
Department of Horticulture  
The University of Georgia  
Athens, GA 30602

### Nature of Work:

TRI-Pro's Multicote 17-5-11 with minors is a 12 month release controlled release fertilizer. It was compared to Osmocote 17-7-12 (another 12 month product) with 1.5# Micromax per cubic yard at a medium rate of 2.5# Nitrogen per cubic yard and a high rate of 3.5# Nitrogen per cubic yard. Multicote 18-6-12 with minors is a 9 month controlled release fertilizer. It was compared to Osmocote 18-6-12 (another 9 month product) with 1.5# Micromax per cubic yard at two rates, a medium rate of 1.75# Nitrogen and a high rate of 2.5# Nitrogen per cubic yard. All fertilizer treatments were incorporated into the potting mix prior to planting.

Uniform 2 1/4" liners of Delaware Valley White Azalea and Green Luster Japanese Holly were selected and transplanted into a pine bark:sand (6:1) potting mix that was amended with 4# of dolomitic limestone per cubic yard. The 9 and 12 month fertilizer treatments were completely randomized within each crop with 20 single plant replicates for each treatment. The 12 month trials were started on April 11, 2000 and the 9 month trials started on May 30, 2000. A double border row was placed around the randomized blocks of each crop to eliminate any edge effects. Plants were grown under standard nursery practices and were maintained in good health and pest free.

A complete nutrient analysis of the potting mix and leaf tissue samples were done in late October at the end of the trial. A combined sample from three pots in each treatment were collected for both the potting mix and the leaf samples. These analysis should show the nutritional status of the media and the plants at seasons end.

A visual quality rating by nurserymen and myself were done on ten plants of each treatment for each crop. The quality rating helps to determine if the treatments would be acceptable in the nursery trade. The quality rating was completed at the end of the growing season on October 31, 2000. Ten plants of each crop and each treatment will be carried over until February 2001 and will be evaluated again for plant quality to determine any leaf drop or quality loss occurs in winter due to low nutrition.

The crops were harvested in late October with ten replicates for each treatment. All top growth was removed at the soil line, placed in paper bags and placed in a walk-in dryer for two weeks at 120°F. The plant stems and leaves were completely dry and were weighed to record the plant dry weight. This dry weight accurately reflects the growth of the crops during the production season and is used to statistically compare growth of the treatments.

## Results and Discussion:

The nutritional analysis of the potting mix was done in late October. The analysis was done for each treatment within each crop. The results of the 12 month Holly treatments are reported below. The pH of the potting mix was rather low due to a lower initial rate of lime. The nutrient levels of the 2.5# N Multicote 17-5-11 has all the potting mix nutrients low. The leaf tissue has acceptable levels of nitrogen (N), calcium (Ca), Magnesium (Mg), and iron (Fe). The phosphorous (P), potassium (K) and copper (Cu) levels were all low. The manganese (Mn) and zinc (Zn) were high while the boron (B) was slightly low.

The Osmocote 17-7-12 at 2.5# N potting mix analysis had acceptable nutrients levels of nitrogen ( $\text{NO}_3$  &  $\text{NH}_4$ ), phosphorous, potassium while the calcium and magnesium was slightly low and low respectively. The leaf tissue had low phosphorous, potassium and boron while other nutrients were acceptable or high.

The 3.5# N Multicote 17-5-11 potting mix had acceptable phosphorous, slightly low nitrogen and potassium and low calcium and magnesium. The leaf tissue levels were acceptable for nitrogen, calcium, magnesium, iron, manganese and zinc; slightly low for boron and copper; and low for phosphorous and potassium. The 3.5# N Osmocote 17-7-12 had potting mix levels that were acceptable for nitrogen, phosphorous, potassium; slightly low calcium and low magnesium. The leaf tissue was acceptable for nitrogen, calcium, magnesium, copper, iron, manganese and zinc; slightly low for boron; and low for phosphorous and potassium.

The higher N rates depressed the potting mix pH. The Multicote 17-5-11 at the 2.5# N rate appears to have run out of nutrients or is releasing little at this time. The tissue levels are mostly acceptable except for the phosphorous and potassium which were low for all treatments. The Osmocote 17-7-12 appears to have a greater reserve of nutrients in the media but not much difference in the plant tissue. The Osmocote 17-7-12 at both rates appears to still be releasing nutrients.

The 9 month product evaluation on the Holly crop with the Multicote 18-6-12 (both rates) had low levels of nearly all nutrients in the potting mix. The tissue had acceptable levels of nitrogen, calcium, magnesium and most of the minor elements. The Osmocote 18-6-12 (both rates) potting mix results were all acceptable except for the potassium at the 1.75# N rate, which was slightly low. The tissue analysis showed acceptable levels of nitrogen, calcium, magnesium levels and most of the minor elements.

The higher rates depressed the potting mix pH with stronger depression from the Osmocote 18-6-12. The Multicote 18-6-12 appears to have run out of nutrients or are releasing very slowly. The leaf tissue of all treatments had acceptable levels of nitrogen and low levels of phosphorous and potassium.

The Azalea crop had all low potting mix nutrients for the 12 month Multicote 17-5-11. The leaf tissue was also low for nitrogen, phosphorous, potassium and copper. All other nutrients were acceptable. The Osmocote 17-7-12 potting mix was acceptable to high for the nitrogen, phosphorous and potassium levels. The leaf tissue however was low for nitrogen, phosphorous, potassium and copper.

The Osmocote appears to be releasing higher levels of nitrogen, phosphorous and potassium late in the season. The pH was strongly depressed with the increased rates of fertilizer.

The 9 month Azalea treatments had all low potting mix nutrients for the Multicote 18-6-12 product. The leaf tissue had acceptable levels of nitrogen, calcium, magnesium and all minor elements except copper. The phosphorous and potassium levels were low for both rates. The Osmocote 18-6-12 potting mix had all acceptable nutrient levels except for the low calcium and magnesium levels. The leaf tissue for Osmocote 18-6-12 had acceptable nitrogen and low phosphorous, potassium and copper. The leaf tissue calcium and magnesium levels were acceptable as were most of the minor elements, except for the noted low copper levels .

The quality ratings range from the high score of 50 for all excellent plants, a medium score of 30 for all average plants and a low score of 10 for all poor plants. The results of evaluating 10 plants from each treatment in October 2000 are presented in Table 1. Of the 12 month products, the Osmocote 17-7-12 was slightly better than the Multicote 17-5-11 at the 2.5# N rate for both the Holly and Azalea crop. The Multicote 17-5-11 was better than the Osmocote 17-7-12 at the 3.5# N rate for the Holly crop but not the Azaleas. All plants were rated above average. The Hollies at the 3.5# N rate were judged to be very good.

With the 9 month treatments the Multicote 18-6-12 was slightly better than the Osmocote 18-6-12 for the 1.75# N rate for both the Hollies and Azaleas. The reverse was true for the 2.5# N rate, where the Osmocote 18-6-12 was slightly better than the Multicote 18-6-12. All plants were judged about average.

Visually the Multicote 17-5-11 and Multicote 18-6-12 treatments for both crops appeared better branched thus a little more dense. However, these Hollies were lighter green in color than the Osmocote 17-7-12 and 18-6-12 treatments. The darker green Osmocote plants were more open with fewer lateral branches.

<b>Table 1. Holly &amp; Azalea Quality Ratings*</b>				
<b>Treatment 12 Months</b>	<b>Multicote 17-5-11 2.5# N</b>	<b>Osmocote 17-7-12 2.5# N</b>	<b>Multicote 17-5-11 3.5# N</b>	<b>Osmocote 17-7-12 3.5# N</b>
Holly	36.3	38.7	43.3	41.3
Azalea	31.0	37.7	32.7	36.3
<b>Treatment 9 Months</b>	<b>Multicote 18-6-12 1.75# N</b>	<b>Osmocote 18-6-12 1.75# N</b>	<b>Multicote 18-6-12 2.5# N</b>	<b>Osmocote 18-6-12 2.5# N</b>
Holly	32.3	30.7	30.7	33.0
Azalea	32.3	31.0	30.0	31.7
*Excellent = 50, Good = 40, Average = 30, Questionable = 20 and Poor = 10				

The plant dry weights (grams) were recorded at the end of the production season in late October. The 12 month Holly dry weights were not different between the Multicote 17-5-11 and the Osmocote 17-7-12. There were differences between the two rates. The 3.5# N rate produced more dry weight (growth) than the 2.5# N rate. The 9 month dry weights in Holly had differences between the Multicote 18-6-12 and the Osmocote 18-6-12 with the Osmocote producing slightly more dry weight (Tables 2 & 3). There were no differences between the two rates used.

The 12 month dry weights in Azalea had no differences between the Multicote 17-5-11 and the Osmocote 17-7-12. There also were no differences between the two rates. The 9 month Azalea dry weights had no differences between the Multicote 18-6-12 and the Osmocote 18-6-12. Also, there was no difference between the two fertilizer rates.

The plant growth represented by the dry weight produced no significant differences in the comparisons of Multicote and Osmocote in three of the four tests. These two products performed almost equally in producing growth during the 2000 season on Green Luster Japanese Holly and Delaware Valley White Azalea.

<b>Table 2. Holly Dry Weight 12 Month Fertilizer Rates Statistical Analysis</b>		
<b>Treatment 12 Months</b>	<b>Mean Weight (g)</b>	<b>Non-Significant Range*</b>
2.5# Nitrogen Rate	27.6	a
3.5# Nitrogen Rate	34.1	b
*Treatments means sharing the same letter are not significantly different using the Student-Newman-Keuls test.		

<b>Table 3. Holly Dry Weight 9 Month Fertilizer Treatments Statistical Analysis</b>		
<b>Treatment 12 Months</b>	<b>Mean Weight (g)</b>	<b>Non-Significant Range*</b>
Multicote 18-6-12	19.5	a
Osmocote 18-6-12	21.8	b
*Treatments means sharing the same letter are not significantly different using the Student-Newman-Keuls test.		

**Summary:**

The 12 month Multicote 17-5-12 on Holly had low nutrients in the potting mix. The leaf tissues were mostly adequate. The Osmocote 17-7-12 had acceptable nutrient levels in the potting mix while the tissue levels were mostly adequate. The phosphorous and potassium tissue levels were mostly low for all treatments.

The same pattern on the Hollies was generally followed for the 9 month Multicote 18-6-12 and Osmocote 18-6-12. The Azalea 12 and 9 month potting mix and leaf tissue results follow this same

pattern.

The Osmocote 17-7-12 and 18-6-12 appear to be releasing nutrients in the potting mix in late October. The Multicote 17-5-11 and 18-6-12 do not appear to be releasing nutrients and may have exhausted their nutrient reserves.

The quality ratings were very close. The 12 month products ranked the Osmocote 17-7-12 slightly better in three of the four rate treatments among both crops. Within the 9 month treatments the Multicote 18-6-12 was ranked better two of the four rate treatments among both crops. The differences were slight and all plants were ranked average to good.

The plant growth measured by the seasons top growth dry weight produced few differences. There was no difference between treatments for the Azalea fertilizer treatments and the 12 month Holly fertilizer treatments. The 9 month Holly dry weights were greatest for the Osmocote 18-6-1. There was less difference between the rates than expected. Only the 12 month products produced more growth on Holly with the higher fertilizer rate. There was no rate differences within the Azalea crop for either the 9 or 12 month products.

Overall, both products performed very similarly over the period evaluated. However, the Multicote appears to be short on nutrients being released in late October. This may affect the crop holding capacity of the products. These fertilizers should hold the crops until February, which corresponds to the end of the 9 month and 12 month period for these products. A quality rating will be done in February 2001 to complete the evaluation.