The greatest difference in fruit set was under the highest nitrogen level in the fertilizer applications. The 6% nitrogen also showed the best tree condition. The 2% nitrogen range was obviously too low for either tree growth or adequate fruit set. The addition of extra potash in the 4% nitrogen level tended to depress fruit set and gave a poorer tree condition than where potash was omitted entirely. It is to be borne in mind that the trees must have had some potash reserve from previous fertilizer practices in which the potash was kept at a 5% level. This difference in tree condition where potash has been withheld is not borne out by results found on avocados (7). On avocados, it was found that increases of potash at a particular nitrogen level resulted in slightly better leaf color.

The results of the study on bloom sprays are summarized in Table II. It should be noted in interpreting these results that the trees which received the 125 ppm of boron have previously shown somewhat more vigorous growth than have those in the other plots. Due to the wide variation in the number of fruit per tree in the same plot, no definite conclusions can be reached regarding the effect of the sprays.

The most promising indication from this preliminary study is that tangelos on the oolite soils require a heavier nitrogen fertilization than has been previously practiced in order to insure some yields. Boron, itself, is also not the “touchstone” to good consistent yields of Minneola tangelos in Dade County. It may well be that the unfruitfulness of the tangelo is due to some in-perfection of the floral anatomy, pollination, and pollen viability, which is receiving further attention at this research station.

Appreciation is extended to F. H. McDonald of Coral Gables whose financial aid and personal interest have made much of this work possible.

**TABLE II. Effect of Sprays Applied During Bloom Period on the Set of Hinneola Tangelos.**

<table>
<thead>
<tr>
<th>Spray Treatments</th>
<th>Trees per Treatment</th>
<th>No. of Fruit per Tree</th>
<th>Average</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>125 ppm. Boron</td>
<td>6</td>
<td>22.3</td>
<td>6-42</td>
<td></td>
</tr>
<tr>
<td>15% Sugar</td>
<td>6</td>
<td>11.7</td>
<td>0-25</td>
<td></td>
</tr>
<tr>
<td>125 ppm. Boron plus 15% Sugar</td>
<td>6</td>
<td>5.3</td>
<td>0-14</td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>6</td>
<td>5.3</td>
<td>2-13</td>
<td></td>
</tr>
</tbody>
</table>

**LITERATURE CITED**


A NOTE ON THE PROPAGATION OF PHYLLANTHUS EMBLICA L.

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The emblic (Phyllanthus emblica L.) which was so ably described in another paper by our colleague, Julia Morton, has aroused some interest in Florida and has created a demand for plants of this species. Several
large trees are growing in south Florida but no seedlings could be found under the four bearing trees examined. The intimation was that they did not come readily from seed, but could be grown from root sprouts. Reports from India, its native habitat, indicated that seeds were an ordinary method of propagation (1), and that budding was practiced to some extent to perpetuate the high ascorbic acid-rated clones. Even topworking of older trees was done by shield-budding sprouts (3).

Average ascorbic acid content of mature fruit from a large tree in Coconut Grove had been reported by Mustard (2) as 1561 mg/100 gms pulp. Prof. Milton Kaplow of the Tropical Food Research Laboratories, University of Miami, in the spring and summer of 1955, determined the ascorbic acid content of fruit for the following trees: Albert Caves, Homestead, Florida – East tree, 1130 mg/100 gms pulp; West tree, 1325 mg/100 gms pulp; and, tree in Avon Park Parkway, 467 mg/100 gms pulp.

Mature fruit was obtained in the spring and summer of 1955 from all four of the above mentioned trees. When the pulp was removed, the seed capsule allowed to dry, and the plump seeds, averaging about two per fruit, were planted, they germinated 100% in 3 to 4 weeks. They all produced vigorous seedlings (Fig. 1, right).

To determine success with cuttings, the following cutting material was used from both the Caves trees: small woody (up to ¾ inch diameter, 6 to 8 inches long), large woody (up to ⅜ inch diameter, 6 to 8 inches long), root (6 to 8 inches long), and root sprouts. These were placed in cutting sand under fog. The only material which established a root system and grew were the sprouted root cuttings. (Fig. 1, left) Woody cuttings taken from the Coconut Grove tree also failed to develop roots under fog. In all cases the unrooted cuttings finally decayed.

Air layers placed on small branches (¾ inch diameter) and large branches (⅜ inch diameter) of both trees failed to develop roots, although some callus formed. The air layers repeated again in late summer failed to develop roots although callus and cell proliferation was more pronounced.

The ready and vigorous growth of seedlings and the apparent ease of shield budding the nursery stock would indicate that ample trees of a particular clone of emblic can be produced at the will of the nurseryman. The great variation of ascorbic acid content between different trees as tested so far in Florida makes it imperative that vegetative propagation of the emblic be followed if successful commercial plantings are to result.

LITERATURE CITED