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# FIRED MONTMORILLONITE CLAY AS A PROPAGATION AND HYDROPONIC GROWING MEDIUM[1]

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*Abstract.* **Propagation of** Aglaonema **and** Dieffenbachia **was better in Peat:Perlite mixture than in solite or Gro-Sorb while** Maranta **produced higher quality root systems in Gro-Sorb. Propagation media had no effect on rooting of** Epipremnum **and** Syngonium. **Plants were generally better after transplanting into a soilless medium or hydroponics containers with Gro-Sorb or solite when propagated in Peat:Perlite or Gro-Sorb. Propagation was delayed in solite and resulted in poor quality plants when transplanted into hydroponics containers with solite.**

Numerous efforts to simplify the care of foliage plants in interior decors have been made. Renewed interest exists for hydroponic pots for foliage plants to eliminate the need for rather constant care required when they are grown in soil or artificial media. Most hydroponic pots have an inner pot containing a porous rock medium having particle sizes ranging between one and two centimeters. The outer pot contains a nutrient solution and most containers have a visible water level indicator. Irrigation and, therefore, fertilization requires only the nutrient solution be maintained at indicated levels. Roots of plants grown in such containers must adapt to a greatly different environment than that in which they were initiated during propagation unless the two media were the same.

Previous research has indicated type and quality of roots formed during propagation are largely the result of propagation medium, especially due to aeration or oxygenation (2). Generally, the less aerated the propagation medium the shorter and finer the roots formed and the fewer the number of root hairs. Increased aeration produces longer, fleshier root systems with a larger number of root hairs per area of root (1). Tight, poorly aerated media will completely prevent or seriously retard rooting and media that are too aerated will produce fleshly roots with few to no root hairs. Roots formed under one set of environmental conditions often will not adjust to another when transplanted (2).

This experiment was established to evaluate three propagating media that would permit plants to be successfully transplanted into either a soil culture or a hydroponics system.

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## Methods and Materials

Sixty cuttings of five foliage plant species—*Aglaonema commutatum, Dieffenbachia maculata, Syngonium podophyllum, Maranta Leuconeura kerchoviana* and *Epipremnum aureum* (pothos)—were stuck in Gro-Sorb (a fired montmorillonite clay with particle sizes ranging from 2 mm to 8 mm) or solite (particle sizes from 1 to 2 cm), or a mixture of 1 peat:1 perlite (v/v) and placed in a clear glass greenhouse under intermittent mist with bottom heat March 7, 1979.

Rooted cuttings were removed from the propagating media after 6 weeks and a root quality given. Visual rating was based on a scale of 1 through 5 with 1 being poor and 5 being excellent. Root dry weights were determined on half of the cuttings at this time.

One-third of the remaining rooted cuttings from each propagating medium were transplanted into Vergro Klay mix[1] in a 15 cm (4 inch) plastic container and surface watered and fertilized, and one-third each into hydroponic pots containing Gro-Sorb or solite. The production phase, therefore, was a 3 x 3 factorial placed in randomized block design with one container and plant constituting the experimental unit. Hydroponically grown plants were grown in a non aerated solution containing 50 ppm N 5 ppm P, 50 ppm K and 5 ppm mg, and the plants grown in Vergro Klay mix received 200 ppm N from a 20-20-20 soluble source with each watering. Plants were harvested June 2, 1980 after a 10 week growing period.

At harvest plant height was measured (except for *Maranta*). Root systems were graded visually (1 = poor, 5 = excellent) and dry weights of tops and root systems were determined. Top and root dry weights and visual root ratings are presented for *Aglaonema, Maranta* and *Dieffenbachia* since neither media affected propagation or growth of *Epipremnum* and *Syngonium*.

## Results and Discussion

Visual ratings of *Aglaonemas* and *Dieffenbachia* roots were highest when propagated in peat:perlite, the next best for *Dieffenbachia* was in Gro-Sorb and least when produced in solite (Table 1). *Aglaonema* propagated equally well in Gro-Sorb and solite. *Maranta* roots were of higher visual grade in Gro-Sorb than the other media. Dry weights of roots for all three species were highest and equal when propagated in peat:perlite and Gro-Sorb and both media produced more root dry weights than solite.

Top weights of *Aglaonemas* were higher from the peat: perlite/Vergro Klay mix combination compared to other

[1]An artificial soilless medium produced by Verlite Corporation, Tampa, FL.

Table 1. Influence of propagation media on root visual grade and dry weights of 3 foliage plants.

| | *Aglaonema* | | *Dieffenbachia* | | *Maranta* | |
|---|---|---|---|---|---|---|
| | Visual Grade[z] | Dry Weight (g) | Visual Grade | Dry Weight (g) | Visual Grade | Dry Weight (g) |
| Gro-Sorb | 2.3b[y] | 0.11a | 3.4b | 0.52a | 4.8a | 0.26a |
| Peat:Perlite | 2.8a | 0.10a | 4.4a | 0.51a | 3.3b | 0.31a |
| Solite | 1.9b | 0.04b | 2.1c | 0.18b | 2.3b | 0.08b |

[z]Visual rating from 1-5, 1 = no rooting, 5 = well developed, branched root system.
[y]Mean separation within columns by Duncan's new multiple range test, 5% level.

Table 2. Influence of propagation and growing media on top and root dry weights (g) of 3 foliage plants.

| Propagation Medium | Growing Medium[z] | *Aglaonema* Top | *Aglaonema* Roots | *Dieffenbachia* Top | *Dieffenbachia* Roots | *Maranta* Top | *Maranta* Roots |
|---|---|---|---|---|---|---|---|
| Peat:Perlite | Vergro Klay Mix | 5.8a[y] | 4.2a | 5.6a | 2.3abc | 3.9ab | 1.1a |
| Peat:Perlite | Gro-Sorb | 3.8bcde | 3.3abcd | 4.5abc | 2.9abc | 3.0abcd | 1.0a |
| Peat:Perlite | Solite | 4.9abc | 3.4ab | 4.0abc | 3.4ab | 4.2a | 0.9a |
| Gro-Sorb | Vergro Klay Mix | 4.1bcd | 2.6abcde | 5.6ab | 2.3bc | 3.5abc | 1.0a |
| Gro-Sorb | Gro-Sorb | 3.4 defg | 2.8abcde | 3.3abc | 2.5abc | 1.8cd | 1.2a |
| Gro-Sorb | Solite | 5.1ab | 3.3abc | 4.0abc | 3.8a | 2.3abcd | 0.6a |
| Solite | Vergro Klay Mix | 3.4defgh | 1.9bcde | 4.9abc | 2.3abc | 2.9abcd | 0.6a |
| Solite | Gro-Sorb | 3.5def | 2.0bcde | 2.7c | 1.8c | 2.2bcd | 0.5a |
| Solite | Solite | 2.0i | 1.3e | 4.3abcl | 2.2bc | 1.5d | 0.3a |

[z]Plants in Gro-Sorb and solite were grown in hydroponic containers.
[y]Mean separation within columns by Duncan's new multiple range test, 5% level.

treatments, except peat:perlite/solite and Gro-Sorb/solite combinations (Table 2). The solite/solite combination produced the least top dry weight. Root dry weights were generally less affectel by growing media when propagated in peat:perlite or Gro-Sorb. *Aglaonema* generally produced vigorous, well branched root systems that recovered during the growing phase to any reduction in rooting due to propagation media, except when propagated in solite and grown in solite.

*Maranta* root development was not as extensive as *Aglaonema* or *Dieffenbachia* regardless of propagation media and did not improve in any growing media. Top dry weight varied depending on propagation/growing media combination (Table 2).

*Dieffenbachia* root dry weights were greater from the Gro-Sorb/solite combination than from the solite/Gro-Sorb or solite/solite ones. The other combinations produced root dry weights similar to Gro-Sorb/solite. Solite/Gro-Sorb plants had less top dry weight than plants propagated in either peat:perlite or Gro-Sorb and grown in Vergro Klay mix. However, propagating media did not affect plant top weights of *Dieffenbachia* regardless of the growing medium or growth system.

These results indicate, therefore, that the propagating medium has little effect on size and quality of the final product. Poor results obtained from solite suggest that root initiation and development is reduced in a highly aerated medium and that plant production time in hydroponic systems might be shortened and higher quality plants produced when propagated and grown in media containing more desirable air:water ratio.

### Literature Cited

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# EFFECT OF GROWTH REGULATORS ON PIXIE POINSETTIAS GROWN WITH TWO IRRIGATION SYSTEMS[1]

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*Additional index words.* ancymidol, chlormequat, *Euphorbia pulcherrima*, capillary mat, inflorescence, water.

*Abstract.* **Multi-branched poinsettia 'Annette Hegg Diva' plants grown in 10 cm pots with hand or capillary mat irrigation were evaluated following treatment with granular ancymidol incorporated in the medium or ancymidol or chlormequat applied as a soil drench or foliar spray. Plants were generally taller on the capillary mat in 1977 but height differences due to irrigation method were not evident in 1978. In both years the granular ancymidol at concentrations ≧0.5 mg ai/pot produced plants excessively short (<15 cm). A concentration of this material as low as 0.0625 mg ai/pot produced well-proportioned plants (15-20 cm) and was equivalent to the effect of ancymidol applied as a soil drench. Foliar application of ancymidol did not retard plant height to a desirable level. Plants treated with chlormequat as a 2000 ppm foliar spray or a 3000 ppm soil drench were slightly tall (22 cm) in 1977 but of an acceptable height (18 cm) in 1978. Granular ancymidol ≧0.25 mg ai/pot and ancymidol drench ≧0.125 mg ai/pot reduced plant and inflorescence diameter.**

Potted poinsettias (*Euphorbia pulcherrima* Willd.) have increased in national sales to 22,550,000 pots in 1979, with a value of $57,139,000 (9). The majority of these sales are of plants in 15 cm diameter or larger containers for specialty purchases. Poinsettias also are adaptable to small pot culture, grown either as single stem or multi-branched plants, and have shown good consumer acceptance (3, 4, 7, 12). A growth retardant generally is used on poinsettias to obtain a well-proportioned plant, especially when grown in warm temperature areas. Two chemicals, chlormequat (1, 2, 8) and ancymidol (1, 8, 11), are useful as foliar sprays but are more effective as soil drenches in height retardation of poinsettias. Both application methods require an additional operation

[1]Florida Agricultural Experiment Stations Journal Series No. 2665. Trade names are included for the benefit of the reader and do not infer any endorsement or recommendation by the author.