

10-28-2008

101 Ways to Try to Grow Arabidopsis: Can a Soilless Mix Be Augmented to Improve Growth?

Robert Eddy

Purdue University, robeddy@purdue.edu

Daniel T. Hahn

Purdue University, dhahn@purdue.edu

Follow this and additional works at: <http://docs.lib.purdue.edu/pmag>

Suggested Citation

Eddy, Robert and Hahn, Daniel T., "101 Ways to Try to Grow Arabidopsis: Can a Soilless Mix Be Augmented to Improve Growth?" (2008). *Purdue Methods for Arabidopsis Growth*. Paper 3.
<http://docs.lib.purdue.edu/pmag/3>

This document has been made available through Purdue e-Pubs, a service of the Purdue University Libraries. Please contact epubs@purdue.edu for additional information.

Purdue Methods:



Can a soilless mix be augmented to improve growth?

Short answer:

Yes

Results:

In our study, augmenting a commercial soilless media with calcined clay granules (also called porous ceramic) ranging in diameter from 0.2-0.5 cm improved plants growing in constant sub-irrigation, across all brands of soilless mix. Addition of these granules also improved health of plants growing in a soilless media that was hydrophobic due to being stored too long, and in plants from soilless media that initially tested low in iron.

Addition of the granules to the two soil mixes we found most suitable for Arabidopsis growth, Pro-Mix PGX or MetroMix Redi-earth, did not improve growth of plants, as long as the fertilizer was strong enough and the trays were drained following irrigation. But it did improve growth if either of those stresses existed.

Discussion:

We conclude from these observations that this simple augmentation (25% by volume) of calcined clay granules might make any commercial soilless mix more "foolproof" from manufacturing or storage problems. Augmentation of 50% by volume is recommended if the researcher must leave water in the tray for any period of time, such as over weekends or holidays.

It is very important to remember that these percentages and the size of calcined clay granules are based on 3" pots; experimentation will need to be done for different size containers. For example, the smaller granule product (<0.1 cm diameter) made by the same manufacturer resulted in poor plant growth when used to augment soilless mixes in this experiment, even though similar rates of augmentation with these granules improved growth of corn in large 8" diameter pots or 1-gallon nursery containers at our facility (data not shown). We did not examine the benefits of using rockwool media that is used to great success by several researchers, including the Grant Cramer lab at University of Nevada which has trialed many systems for Arabidopsis production (6).



Figure 1. Turface MVP and Profile Greens calcined clay granules. These products are manufactured for athletic fields and golf course industry to improve drainage.



Figure 2. Representative pots from six soilless mixes without augmentation. From left to right, top row: Sunshine Mix, Redi-earth, Metro Mix 360. From left to right, bottom row: Pro-Mix PGX, Pro-Mix BX, Pro-Mix HP.



Figure 3. Representative pots from six soilless mixes with augmentation with Turface MVP at 1:1 ratio by volume. From left to right, top row: Sunshine Mix, Redi-earth, Metro Mix 360. From left to right, bottom row: Pro-Mix PGX, Pro-Mix BX, Pro-Mix HP.



Figure 4. Example of improved early growth of seedlings in a soilless mix augmented with Turface MVP.



Figure 5. Example of a soilless mix that had tested low for iron being improved with augmentation with Profile Greens or Turface MVP.



Figure 5. Example of a plants kept sitting constantly in water being improved with augmentation with Turface MVP at 1:1 ratio by volume.