GrowerExpo ‘98

Advanced Root Media

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Question

What's the difference b/t beginning & advanced?
In the beginning...

- Mix media
- Fill pot/flats
- Water plants
- Fertilize
Advanced

Create & manage
the root
environment
Beginning vs Advanced

*Biggest Difference??*

- Technical knowledge?
- Special expertise?

**ATTITUDE!**
Seminars

Lots of information!

- Information is NOT power
- Knowledge IS power!!!
- Knowledge is information in a useful framework
Seminars

Today

Technical information in a useful framework

• Frame of reference
• Way of thinking
In the beginning...

Creating the root environment

Picking the best mix?
What is the **best** mix?

Plants have the amazing ability to **adapt** to almost any situation!
The Perfect Mix

- 3 parts Absolute Vodka
- Splash of extra-dry vermouth
- 2 olives - chilled glass

NO PERFECT MIX
Light

Temp

CO$_2$

Root Environment
Creating the root environment is a Process!
The Creation

Mix Substrate → Fill Flats or Pots

Water Plants In

Root Environment
Root Environment

- Substrate Handling
- Watering Practices
- Container
- Substrate
What makes a good mix?

What do plants want in a mix?

They don’t “care” what’s in it!

They “care” what it PROVIDES!
Mix Properties
Mix Properties

Chemistry & Structure

Chemistry is developed directly.
Comes in the bag
Structure affected by:
components, blending,
container size, and filling
Developed at point of use
Air & Water

NOT IN THE BAG!!
Pore Space / Solids

- Mineral Soil
- 1 Soil: 1 Peat: 1 Sand
- 3 Bark: 1 Peat: 1 Sand
- 9 Bark: 1 Peat
- Peatlite Mixes

10 20 30 40 50 60 70 80 90
Total Pore Space

1. Growers buying PORES - not solids
2. Must manage the SPACES
Substrate Components

- Not as important as how processed (milling, composting, particle size...)
- Largest component (by volume) is: SPACE
Containers
Container Considerations

- Container height affects drainage
- The smaller the container, the greater the effects...
## Container Size

### Peatlite Mixes

<table>
<thead>
<tr>
<th></th>
<th>6 in.</th>
<th>4 in.</th>
<th>48</th>
<th>288</th>
<th>648</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Air</strong></td>
<td>20</td>
<td>13</td>
<td>8</td>
<td>3</td>
<td>0.5</td>
</tr>
<tr>
<td><strong>Water</strong></td>
<td>67</td>
<td>74</td>
<td>79</td>
<td>84</td>
<td>86.5</td>
</tr>
<tr>
<td><strong>Solid</strong></td>
<td>13</td>
<td>13</td>
<td>13</td>
<td>13</td>
<td>13</td>
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</table>
Substrate Handling
# Effects of Compaction

*Peat : Vermiculite  48 Cell Pack*

<table>
<thead>
<tr>
<th>Compaction</th>
<th>Air Space</th>
</tr>
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<tbody>
<tr>
<td>Light</td>
<td>9</td>
</tr>
<tr>
<td>Medium</td>
<td>4</td>
</tr>
<tr>
<td>Heavy</td>
<td>2</td>
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</table>
Flat/Tray/Pot Filling

- Lightly fill and brush
- Do not pack into containers
- Do not stack filled flats/pots
Moisture Content

- Wet to achieve a 1:1 water: dry substrate for flats and pots (50% moisture)
- Wet to achieve a 2:1 water: dry substrate for plugs (67% moisture)
- No re-drying prior to use
# Water Content per Cu. Yd.

**Peatlite Mixes**

<table>
<thead>
<tr>
<th>% Moisture</th>
<th>Gal / cu yd</th>
</tr>
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<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>10</td>
<td>2</td>
</tr>
<tr>
<td>20</td>
<td>5</td>
</tr>
<tr>
<td>33</td>
<td>10</td>
</tr>
<tr>
<td>50</td>
<td>20</td>
</tr>
<tr>
<td>60</td>
<td>30</td>
</tr>
<tr>
<td>67</td>
<td>40</td>
</tr>
<tr>
<td>72</td>
<td>50</td>
</tr>
<tr>
<td>75</td>
<td>60</td>
</tr>
</tbody>
</table>

- **Pots**: 50 and 67
- **Cells**: 67 and 60
Handling Substrates

- Avoid compaction of substrates, both in storage and in containers.
- Adjust substrate moisture content to proper levels prior to filling containers.
Good Watering = Good Roots
Watering
Watering Practices

“The person at the end of the hose controls your profits.”

- Watering = Frequency X Volume
- Both are important
- Both must be adjusted, based on production system
Watering Practices

Leaching

- Recommended: 10 to 20%
- In practice: 40 to 80%
- Small pots leach more than large pots!
  • Sometimes 200 to 400%

“The person at the end of the hose controls your profits.”
Watering

- Water channels
- Leaching starts
- Bottom saturates
- Water moves UP
- Leaching continues
Watering

Wetting Agents

- Initial wet-out
- Reduce channeling
- Improve lateral movement

Beware of old mix!
Watering

Wetting Problems

- Use oldest mix first
- If old mix is hard to wet
  - Use liquid wetting agent drench
Grower Effects

- Substrate Handling
- Watering Practices
- Container
- Substrate
Bottom Line?
Substrate Selection

*Pick a Company - Not a Mix*

Service
QC/QA Program
Technical Support
Don’t Mix, Water, & Fertilize...

Create & Manage the Root Environment

Attitude
Management

We manage what we measure!