

## E-newsletter 3: Growing Media



### ***Why is Plant Growing Media Important?***

Plant growing media has a major impact on plant health, plant quality, production cycles (including rate of plant turn over), maximisation of nursery space, and transport costs. The management of each of these factors affects profitability.

*Within the nursery accreditation system, the safe and hygienic storage of growing media will be assessed*



*Sealed pavements and covered areas are ideal for storing growing media for nursery plants as they are protected from excessive moisture build up and reduce the risk of the infection of soil borne pests & diseases*

### **Components of Growing Media**

Opinions vary on growing media components and proportions. Factors which seem to influence decisions in these matters include:

- Availability of component
- Consistency of quality
- Price
- Risk of toxicity from salts or plant excretions (eg harmful resins)
- Biological activity within the growing media (good / bad bugs, weeds)
- Pest and disease reduction
- Risk of nutrient draw down (ie competition for nutrients with plants)
- Ability to promote air circulation around the plant roots (especially to provide oxygen)
- Water holding capacity
- Drainage capacity
- Nutrient holding capacity
- pH and nutrient buffering
- Phytosanitary requirements
- Weight (effects handling / plant transportation costs)
- How long the plant is expected to grow in a container
- End use of the plant eg:
  - Display
  - Landscape
  - Propagation stock
- Container size
- Desired rate of plant turnover
- Desired productivity levels
- Ability to provide plant support
- Colour (consumer preferences)
- Shape (consumer preferences – eg fired clay)

In Singapore, the main nursery plant growing media components are:

1. **Soil.** Range in texture from clays to sandy clay loams
  - a. Strengths
    - i. Relatively inexpensive
    - ii. Easy to source
    - iii. Good nutrient holding capacity
    - iv. Good water holding capacity
  - b. Challenges
    - i. Inconsistent quality
    - ii. Poor water infiltration rates
    - iii. Poor air infiltration rates
    - iv. Does not lend itself to semi-automated production systems
    - v. Heavy and bulky – higher handling and transport investments



2. **Sand.** Various grades from small pebbles to fine. Common in propagation mixes

- a. Strengths
  - i. Good water infiltration and drainage capacity
  - ii. Improves media aeration
  - iii. Better quality sands (granitic or silica) do not affect pH levels
  - iv. Can be very consistent in quality
- b. Challenges
  - i. Poorer quality sands may be too alkaline (eg calcareous sands, salt water beach sands) or contaminated – require washing
  - ii. Heavy – higher handling and transport investments
  - iii. When mixed with some clays can create a concrete like growing media



3. **Coco.** Various grades from husks to peat

- a. Strengths
  - i. Good re-wetability
  - ii. Higher in P & K
  - iii. Good water holding capacity
  - iv. Light weight
  - v. Some nutrient holding capacity
  - vi. Often used in substitution to more expensive Peats
- b. Challenges
  - i. Can lose its qualities after a number of months
  - ii. Can have high total soluble salt levels which damage plant roots



4. **Peat.** Variable qualities and grades

- a. Strengths
  - i. Light weight
  - ii. Good water holding and drainage capacity
  - iii. Good nutrient holding capacity
  - iv. Good aeration properties
- b. Challenges
  - i. Expensive
  - ii. Variable in quality
  - iii. Can be low in pH and high in salts
  - iv. Can be difficult to re-wet



5. **Vermiculite.** Often used as a component of seed raising mixes. Coarser grades are used in potting mixes

- a. Strengths
  - i. Light weight
  - ii. Sterile
  - iii. Good air, water and nutrient holding capacity
  - iv. Consistent quality
- b. Challenges
  - i. Expensive
  - ii. Compacting when wet destroys its porous structure



6. **Pumice.** Screened to different grades. Often mixed with peat. Used interchangeably with Perlite
- a. Strengths
    - i. Light weight
    - ii. Contains iron, calcium, magnesium and sodium in oxide form
    - iii. Good aeration and drainage properties
  - b. Challenges
    - i. Attracts algal growth
    - ii. Relatively expensive



7. **Perlite.**
- a. Strengths
    - i. Light weight
    - ii. pH neutral
    - iii. Sterile
    - iv. Chemically inert
  - b. Challenges
    - i. Some perlite contains fine material
    - ii. Attracts algal growth
    - iii. Relatively expensive
    - iv. Inert with no buffering or cation exchange capacity



8. **Expanded Clay.** Often used in display planting containers
- a. Strengths
    - i. Attractive
    - ii. Good aeration and drainage properties
    - iii. Some cation exchange capacity
  - b. Challenges
    - i. Quite heavy
    - ii. Can attract algal growth
    - iii. Expensive



9. **Rice Hulls.** Composted and not composted – better qualities when composted
- a. Strengths
    - i. Light weight
    - ii. pH neutral
    - iii. Good aeration and drainage properties
    - iv. Cheap
  - b. Challenges
    - i. Can require Nitrogen supplementation if not composted
    - ii. Rice weed infestation



10. **Compost.** Variable quality and grades
- a. Strengths
    - i. Good aeration and drainage properties
    - ii. Good water holding capacity
    - iii. Supplies nutrients
    - iv. Good buffering capacity
    - v. Increases advantageous microbial activity
  - b. Challenges
    - i. Not standards applied to most composting processes – hence high variability in quality
    - ii. Poor quality composts can harbour pests, diseases and inert debris



### ***Tips to determine nursery growing media***

- Consider the containerised growth cycles of your plants eg:
  - Hardening off and reshaping
  - Maximising turnover
  - Display
  - Cut flowers
  - Propagation
  - Landscaped areas
- Consider consistency of supply & quality:
  - Availability
  - Variability
  - Reliability
- Determine the physical, chemical and biological make up of the desired growing media
  - pH
  - Salt content
  - Longevity
  - Soil vs soilless growing media
  - CEC (cation exchange capacity)
  - Porosity
  - Water holding capacity
  - Microbial and other biological activity
  - Desired turnover rates
  - Costs
- Consider semi automated and ergonomic potting systems for higher productivity
  - Best suited to soilless growing media
  - Mixing and potting machinery aids can increase production rates 5 to 50 fold.
- Test growing media prior to full implementation