



Growing Media: Management Considerations

Growing media management

Growth media management involves 1) drainage and aeration, 2) fertility and soluble salts, 3) soil pests and 4) economics.



1. Drainage and aeration

Issue: Water often accumulates at the base of a container because water cannot cross the soil/air interface at the bottom of the container until the weight of the water exceeds atmospheric air pressure at the interface. Such waterlogging can reduce root and plant growth.

Solution: Reduce waterlogging problems (1) by increasing the depth of the soil in the container or (2) by adding media to increase the number of large pores and so reduce total water retention.

2. Fertility and soluble salts

Issue: Too much fertilizer in a media can cause problems of excess soluble salts and plant growth. Thus, develop a plant nutrition program to regularly apply fertilizer. The exception is to add and thoroughly mix immobile elements (such as phosphorus, magnesium, calcium, sulfur, trace elements) with the media prior to planting.

Solution: Soluble salt problems can be corrected 1) by using fertilizers low in salts, 2) by leaching pots with excess water (e.g., 10%), or 3) by ensuring adequate drainage for containers.

3a. Soil pests

Issue: Pathogens, nematodes, weed seeds, insects and other animal pests affect plant growth in media.

Solution: Soil treatment with heat (pasteurization) or chemicals are the commonly used to eliminate soil pests.

Heat treatment (also known as pasteurization) Steam is much more effective than hot water treatment as steam retains almost 10 times the heat of hot water at the same temperature.

Chemical treatment. Soil Fumigation can be more costly and more dangerous than steam treatment as fumigation involves volatile toxic chemicals. Control is often not uniform throughout the soil. Check with an application specialist for chemicals and safe application. Chemicals used include formaldehyde, chloropicrin, and methyl bromide, plus combinations of chloropicrin and methyl bromide, mylone, vapam.

3b. Soil pests - selecting media to be stable after heat or chemical treatment

1. **Issue: Ammonia accumulation:** Heat treatment kills the bacteria that convert ammonia to nitrates.

Solution: Choose organic matter that is low in organic nitrogen. Apply organic forms of nitrogen after steam treatment.

2. **Issue: Recontamination:** Pasteurization kills most soil microbial, so if a pathogen is reintroduced it meets little competition and is able to colonize the soil rapidly.

Solution: Sanitation is essential with emphasis on eliminating pathogens from tools and equipment.

Aerated steam (maximum temperature of 160°F) allows more soil microorganisms to survive than with free flowing steam. As a result, pathogens introduced into the mixture have more competition.

Soil fungicides are useful against recontamination.

3. **Issue: Manganese toxicity** Manganese toxicity occurs when high Manganese soils are heated at high temperatures or when heat treatment is extended beyond the recommended time. Acid conditions accentuate the problem.

Solution: Lime soil to pH levels 6.5- 6.8. Use aerated steam to reduce treatment temperatures.

4. **Issue:** Total soluble salts.

Solution: Use growing media are prepared from ingredients that are low in salts.

4. Economics

Substrates account for 1 to 2 percent of the total cost of production for flowering potted plants and bedding plants where the substrate is sold with the plant and must be replaced with each new crop. Evaluate growing media costs in relation to suitability for plant growth, labor requirements for media preparation, crop and media management requirements, and any problems that may be prevented or introduced by saving on the cost of ingredients.

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