

# NURSERY PAPERS

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## Growing media storage

With soilless growing media being integral to the success of greenlife and contributing to the sustainability of a business, regular monitoring and appropriate storage of media should be considered a critical component to your nursery's operation. In this month's Nursery Paper NGIV Industry Development Officer (IDO), David Reid outlines best practice storage requirements for both bulk and packaged soilless potting media.

## Growing media storage

Preventing soilless growing media's contact with potentially pathogen-infested materials such as discarded media, drainage/untreated surface water, plants, contaminated surfaces, used tools, soil and dust should be considered essential. Not only do contaminants need to be excluded from media, but any additives to growing media require monitoring if storing media for extended periods.

Soilless growing media can change over time, with draw-down of certain nutrients or the decreased effectiveness of a wetting agent due to a degradation through microorganisms in the growing media consuming them. Furthermore, microbes in the growing media can also utilise the fertiliser charge, especially iron and nitrogen. Some studies have also found that crops planted in aged growing media get off to a slower start or are liable to suffer a reduced overall vigour. Extended storage periods may also contribute to a mix that lacks sufficient moisture, thus increasing the difficulty of wetting. Extended storage can also cause chemical changes, such as an increase in pH and/or a decrease in soluble salts and nitrogen levels.

***These changes will occur at a higher rate during periods of higher temperatures than low.***

While the soilless growing media a nursery uses may be of the highest quality, failure to adhere to some basic storage requirements, will see it transform into a vehicle that

may spread contaminants through your nursery, carrying weed seeds, chemicals, insects or pathogens or will contribute to the degradation of its components and additives.

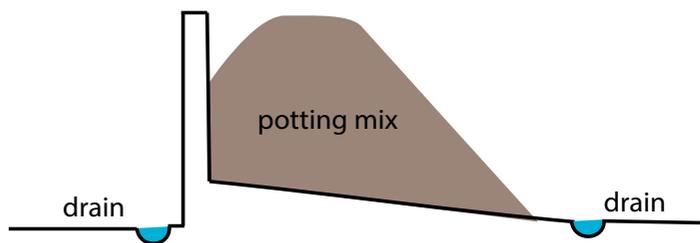
The following are a few guidelines for the proper storage of soilless growing media; bulk and packaged:

- Soilless growing media should preferably be stored in a dry, cool, low-light

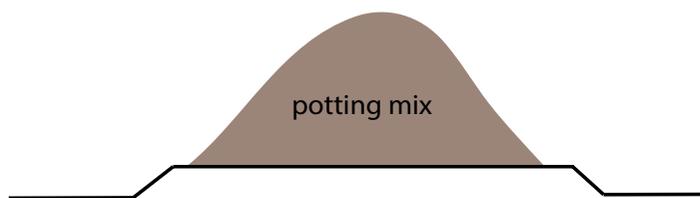
environment. In an ideal situation, growing media would be stored undercover (not a poly or greenhouse), in a concrete bay or on some other clean, sealed surface (See Fig.1). Alternative storage methods that are easy to clean and disinfest can include metal or plastic bins, trailers, trolleys or in bags on a sealed surface or racks under cover.



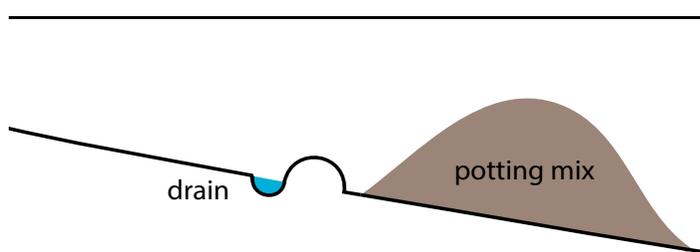
**Fig #1 – A concrete storage area is ideal, with a large concrete apron leading up to the bay(s). This nursery also employs the use of a dedicated bucket/shovel just for media, otherwise, they should be regularly disinfested. Clyde Plant Nursery**



**Fig #2 – Potting media storage area designed to prevent water flowing onto or remaining on the pad.**



**Fig #3 – Potting media storage on a raised pad**



**Fig #4 - Diversion banks are another method to prevent water entering potting media storage**

worthwhile thinking in terms of ‘dirty’ or ‘clean’ areas when choosing its location and other sites where inputs (plant material, containers, etc.) are received. With regards to media, it should be located close to the nursery entrance to reduce external vehicular movement through or onto the ‘clean’ areas of your site. The area leading up the media storage bay should be covered or sealed with gravel to minimise the movement of dust and soil particles. The location of throw-out, green-waste and contaminated media storage areas should also be carefully thought out and clearly separated from your clean media area to prevent cross contamination.

*Treated propagation media storage area/systems need to be separated from untreated media storage area/systems to avoid cross contamination. Fortunately, studies have confirmed that the most common growing media materials such as peatmoss, perlite, vermiculite and properly composted pine barks prepared on clean surfaces, are often free of the most common pathogens occurring in propagating facilities, (Pythium spp., Rhizoctonia solani, Fusarium spp., Cylindrocladium scoparium, Phytophthora spp. and Botrytis cinerea). To keep them pathogen free best practice for storage should be followed. Source: NIASA*

- Concrete meets the storage surface requirement of easy cleaning and is most suited to disinfestation between media deliveries. Wooden sleepers are difficult to decontaminate, however scrubbing the surface thoroughly with an appropriate disinfestant (see references below) will reduce the risk. Concrete too has tiny pores that may hold contaminated media; however sealing the storage area with a suitable sealing paint again will reduce the risk even more so.

- Bulk media bays should be graded to remove water and should be constructed to prevent water from flowing into it and any water that enters the storage area should drain away freely (See Fig.2). Storing media on a raised area of land (height 10-12cm) will

also prevent run-off water from entering the area (See Fig.3). Another option is to surround the media storage area with surface drains or diversion banks. If this cannot be easily achieved it may be necessary to surround the area with surface drains or diversion banks (See Fig.4).

- Exposure to heat and sunlight can accelerate degradation of nutrients and wetting agents in mixes. As most businesses do not have the capacity to store media indoors, bulk media stored outdoors for extended periods should be covered to prevent contamination and to protect it from sunlight and other contaminants (See Fig.5).
- When considering a potential media storage area at your facility it may be

- When receiving media at your nursery designated employees should verify delivery specifications are met and ensure that potentially contaminated delivery vehicles do not enter the production ‘clean’ area. (Best practice procedures for receiving goods can be found in BioSecure documentation or from your state IDO)
- Packaged growing media should be kept shrink-wrapped, raised on pallets and covered appropriately until it is used. The elimination of direct sunlight, the provision of suitable circulation to prevent moisture build-up and the prevention of heat build-up should be the aim when storing media in this form.
- Media should not be stored under or near chemicals such as insecticides, herbicides, disinfectants or even fertilisers. This is the case for packaged product too, as dry or liquid chemicals



**Fig #5 – If storing media for extended periods or if vegetation is overhead or close by, cover it. Dream-Time Wholesale Nursery**

may permeate packaging and affect contents. The handling and use of chemicals, both within your business and external to it, should also be done clear of media storage areas to prevent contamination. See your state IDO for details on chemical storage best practice

- Growing media and allied products should also be stored away from seed and seed products such as livestock feed or forage and pasture seeds, again to prevent contamination.
- Rodent populations should be controlled to prevent contaminants (i.e. weed seeds and droppings).

- Vegetation should be cleared from around storage areas to prevent leaf litter and seed contamination. Weeds around storage areas should be removed as part of a regular weed-monitoring program
- The storage area should be regularly cleaned between deliveries. Quaternary ammonium compounds (4,000ppm for 1 hour) such as Phytoclean or sodium hypochlorite solutions (4,000ppm for 1hour) are both effective treatments for disinfection, along with high-pressure steam. See references below for further, detailed, disinfestation methods.

- When transferring media, the equipment used such as front-end loader buckets, barrows, mobile bins, trolleys or plastic containers need to be regularly cleaned and disinfested between use and/or should be dedicated to a specific task. Cleaning such tools should be done according to the previously mentioned specifications; scrubbing first or pressure cleaning and then using a suitable disinfectant (see references below). Such cleaning should be carried out on a sealed area with appropriate drainage into a sump or a drain, located so as to minimise risk of contamination of growing areas.



**Fig #6 – If storing multiple loads, ensure that staff practice inventory rotation. Purtils Nursery**

- If you receive multiple loads or packaged product, ensure that inventory rotation is practiced. Different batches of media should be stored separately to avoid possible cross-contamination and to permit easy trace-back of any potential future growth issues (See Fig.6)
- Plug and propagation mixes should be used within the first six months of being manufactured. Peat-based media should be used within nine months of manufacturing date. Depending on the manufacturer and the specifics of the mix, bark based media should be used within 2-6 months. If the media does not contain controlled release fertilisers (CRF) it can be stored in large volumes and with heaps at heights of up to 2.5m in height, however it is important to keep the moisture levels at above 50% and to ensure the media is turned regularly to stop the product becoming anaerobic.
- Media stored for six months or longer should be tested to determine whether any chemical changes have occurred and to compensate for any changes as necessary. As mentioned earlier, wetting agents incorporated into the media may degrade over time, along with chemically altering the mix, such as a pH increase along with a decrease in soluble salt and nitrogen levels. It is advisable to test any product that has been stored for 6 months or longer to determine what changes have occurred and compensate for any change (see references below). Contact your supplier to gain an understanding of your media's 'best before' dates.
- The introduction of CRF, fungicides or other special additives brings with it extra elements to be aware of. Ideally bulk media should be turned over within

5 days if the product contains CRF and if the product is held for longer, by keeping it under approx. 60cm in height it will go some way to prevent the product heating up and causing the CRF to dump. Media containing a controlled-release fertiliser can typically be safely stored for one to two weeks prior to use, however soluble salt levels should be checked during extended storage periods. CRFs are not characteristically uniform and their manufacturers have particular media storage guidelines when added. The CRF product label or the manufacturer's recommendations should be referred to for specific instructions on longevity and usage of CRF incorporated into potting mixes.

- Packaged media has a general limit of 6 months storage, however if it contains CRF in it should not be stored outside during the warmer months, as it will increase the release rate.
- It is not advised that growing media is reused, but if it is it should be disinfested in an appropriate manner and prior to disinfestation, media to be reused must be stored on a site well separated from storage sites of new or treated media ingredients (see NIASA documentation or the IDO in your state).

Whilst you may receive a specification sheet upon delivery of your media, it is advised that you keep detailed records of shipments for future reference and that you perform some perfunctory pH or electrical conductivity testing on your media testing upon receipt using the Australian Standard methods. NIASA accredited and growing-media manufacturers keep samples and records from each batch shipped to help identify or rule out any potential media related issues if they were ever to arise.

NIASA Accredited growing media manufacturers endeavour to supply a superior, closely monitored product, so if you have any questions about its quality, contact the manufacturer for assistance. Appropriate storage will maximise both the shelf life of the growing media and minimise the potential for crop difficulties associated with product aging and contaminants. In order to ensure satisfaction, consider these suggestions and implement similar precautionary measures to help maintain the quality of the products you receive.

### Growing media manufacturers and component suppliers are required to:

- **Adopt NIASA guidelines and adopt an internal audit system as described.**
- **Implement Australian Standard AS 3743 – 1996 and amendment 1 – 1998, 'Potting Mixes' as required.**
- **Implement Australian Standard AS 4454 – 1999, 'Composts, soil conditioners and mulches' for bark composting systems.**
- **Consent to independent site evaluations as described (external audits).**
- **Provide a manufacturer procedure statement.**
- **Provide a producer's product specification.**
- **Implement a satisfactory complaints resolution procedure.**

### Growing media storage basic rules:

- **Dry**
- **Cool**
- **Clean**
- **Sealed surfaces**
- **Low-light environment (if holding for extended periods)**

## References

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