

Suggestions on How to Handle Bareroot & Potted Liners upon Arrival

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I recently compared the instructions for handling bareroot liners upon arrival from local nurseries and large liner nurseries in the northwest. The instructions were part of the catalog for some or a separate loose sheet packed with the liners for others. I would suggest doing both. Suggestions in the box will be seen by whoever opens the box. The catalog will be in the office or at home.

These suggestions may be helpful if you are receiving or selling liners. We ship liners to people brand new in the industry; that do not have a clue how to properly handle this perishable commodity; that they may have borrowed money to buy; that they may want you to refund their money if the liners die; even though you did everything correct.

You may desire to write a set of instructions on how you think your liners should be handled by these first timers. Could be time well spent. Include what should be done immediately when the liners arrive, later that day, the next day and next week until planted. Planting could be the end of your concern, but I noticed one nursery discussed certain points while planting and during the first growing season.

I had wanted to write a neat, clean, concise, generic set of suggestions that would cover small bareroot, tall bareroot trees, evergreen, deciduous, and coniferous liners, but the subject is too complicated. These seemed to be the important points I found in various catalogs.

- ▶ Count the liners and verify correct varieties. Moisten the roots.

- ▶ Check the condition of the liners immediately. Open boxes and check for moisture, heat, ice, etc. See if broadleaf deciduous plants have broken dormancy while in transit. Use a digital camera to document a problem and send the images immediately to the supplier. Discuss the situation by phone ASAP. The sooner you notify them the more likely they may think the problem was not caused by you.

- ▶ It is best to plant immediately, but if not.....

- ▶ Keep the plants from drying out, freezing or heating. Roots must not dry out. They should be kept evenly moist, but not soaked. Keep them out of the sun or drying winds when harvesting, loading or unloading, hauling and when planting.
- ▶ Tree liners can be stored outside in mild climates, as long as the roots are completely covered (6 to 8 inches) in moist sawdust; and the tops protected from strong winds by a wind break, a tree line, building, etc.
- ▶ Tree Liners can be Stored Outside in Trenches
Bareroot shade tree liners can be stored outside in trenches. The trenches can be dug with a back-hoe and sawdust can be used to cover the roots. Select a sunny slope and dig the trenches approximately 24 inches deep. Try to maintain a constant depth. The goal will be that water will not be trapped, not stand and that the slope will allow excess water to move to the lower end. Don't use the lower end.

Sawdust is easier than soil to use. Soil can get too wet and gunky to handle when new liners need to be added to the trenches. It would be chunky and leave air spaces around the roots, allowing the roots to possibly dry out. Sawdust would shovel and fill the spaces between the roots, regardless of how wet it might be. The liners would pull out of the sawdust easier than from soil. A wet soil might hold too much moisture during a wet winter and set up a root rot.

- ▶ Have ground worked and ready; pots and media waiting before the liners arrive.
- ▶ Surprisingly, one nursery recommended removing the liners from their boxes and keep roots moist and the tops dry. Another nursery suggested storing them in their boxes after the initial inspection to assure all was well. Place them in a cool, humid basement or cellar.
- ▶ If Broadleaf Deciduous Liners have broken dormancy in shipment; the plants should not be stored for more than 1 or 2 days prior to planting.
- ▶ If Deciduous Plants are still dormant and in good condition, they can be kept in carefully controlled cold storage until approximately May 1st as long as storage temperatures are maintained between 34 to 38 degrees F, relative humidity is kept above 85 percent, with good air circulation and stock is kept well hydrated without excessive surface moisture.
- ▶ Keep in mind that the longer liners are held in cold storage; the longer it may take them to show signs of life after they have been exposed to spring temperatures. It is very difficult to maintain the proper conditions.

- ▶ Broadleaf Evergreen Nursery Stock: Process and plant these immediately. Do not attempt to store them for more than 36 hours. Keep plants cool, moist and shaded until ready to plant.
- ▶ Conifer Nursery Stock: Conifers can be held for short periods if stored immediately upon arrival in an area kept 34 to 38 degrees F. Their tops and roots should be kept moist and shaded and planted within 24 to 48 hours.

Preparation to Plant: Grade the plants. Toss culls. Group by size and plant by size. Do little root pruning. Prune broken or ripped roots back to healthy tissue. Do not prune too severely, after all, the harvesting procedure pruned roots. Do not prune to make the root system fit the transplanter. Borrow or buy the correct size transplanter.

The pruning of broken branches can be done now or after the transplant, but planting is more critical. Besides, additional breakage can occur.

Planting Bareroot Stock: Roots should be soaked before planting a minimum of 4 to 6 hours to ensure proper hydration. If possible, continue to soak roots while transplanting. Plants should be transplanted within 24 to 48 hours of arrival.

- ▶ The first two weeks after planting will be the most crucial to survival. So keep your plant material properly irrigated. Drying winds can dehydrate liners.
- ▶ Problems transplanting broadleaf evergreens and some conifers usually stem from desiccation (drying out) of the stock after transplanting. Strong drying winds during the first few days after transplanting can contribute greatly to this problem. Remove or clip off most leaves prior to transplanting to reduce transpiration. As stock begins new root growth, new leaf buds will push and grow.
- ▶ I liked this nice friendly touch at the end of the instructions. "We appreciate the opportunity to serve you. Please let us know if anything is less than completely satisfactory or if you have any suggestions as to how we could better serve you. Thank you for your business." They closed with a signature.

Many nurseries in Middle Tennessee have bareroot barns to grade and store liners in. A dirt floor is preferred. Concrete will pull moisture away from the plants and is not recommended.

Rake and remove the debris from the floor daily. Use a solution of household bleach to disinfect the floor, masonry walls, tables, benches, partitions, etc., occasionally. Mix 1 part of bleach to 9 parts of water to achieve a 10% solution. Use it freely as a very coarse spray or even heavier, as if swabbing the deck on the tables.

Household bleach is a good disinfectant; economical, readily available, easy and safe to use. Avoid contact with the eyes and colored clothing. Household bleach will kill bacteria and fungi; but is volatile and will dissipate rather quickly. It will only kill the disease organisms that are present when it is applied. There is no residual control after drying occurs.

The process can be repeated safely as often as management chooses. Grading tables should be swabbed down at the end of each day. Bins can be sprayed down each time they are emptied. High traffic areas perhaps need to be treated more often.

A small suspended fan will create air movement without excessively drying the plants. Try to keep the moisture high enough to begin to form moisture on the ceiling. When the dripping becomes excessive, open the door until it slows down. Try to spray water on the dirt floor more often than you spray the roots. But spray the roots often enough to prevent them from drying. The moisture will rise from the floor.

Once the bareroot plants are brought into the shed, they may be sprayed with a **coarse spray of 3.75 teaspoons of Cleary's 3336F per 3 gallons of water or 1 1/4 teaspoons per gallon of water**. Fungicides sprayed on the dirt floor, masonry, or wood are likely wasted.

Do a good job of spraying the roots, but it's safe for the tops as well. Observe the roots daily for any sign of fungal growth. Re-spray as often as necessary. But remember, all fungi are not harmful. A packing shed offers the perfect environment for fungi -- high moisture, warm air and little air movement.

Factors such as temperature, humidity, moisture, and air circulation dictate if or when fungal growth might occur. Spray as often as necessary.

The Care of Potted Liners upon Arrival

- Potted liners may be in cones, 4" pots, trade gallons or in 1, 2 or 3 gallon containers.
- Potted liners should be watered as soon as they are received and unloaded. It helps settle the media back from the bouncing around.
- Look at the roots of several containers. Determine if the roots are alive and the level of root growth. If roots are not alive, contact the source ASAP.
- Where they are unloaded depends on the weather forecast, how soon they will be planted, and facilities available. Set them in the shade during warm fall days. Set them in a poly house or overwintering house if available, during the winter.
- Container roots are less cold hardy than the tops. If lower than expected temperatures are forecast and a poly house is not available; containers can be moved into any unheated building for a day or two or set pot tight outside with straw bales around the edges. White poly can be thrown over a group of containers, supported by anything that will not puncture the poly and sealed to the earth with anything to trap the heat and prevent the wind from getting under (crossties, concrete blocks, soil or sand).
- Check the moisture of the media every other day and be prepared to water until they are transplanted.

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