

Proper Storage and Planting of Bareroot Seedlings

Always pick up your seedlings the day they are dropped off. The interval from seedling drop-off to planting should be minimal, ideally two to four days. If possible, transport seedlings in an enclosed vehicle. If you must use the back of a pickup truck or an exposed trailer, cover the seedlings with a tarp to keep them out of direct sun and wind. The optimal short-term storage temperatures are 32 to 45 degrees.

Store seedlings in a cool, humid location in their unopened bundles until they are planted. Root cellars, crawl spaces, basements, and unheated barns work well for short time periods. Never allow seedlings to freeze or expose seedlings to temperatures above 60 degrees. During storage, check bare-root seedlings every two to four days to insure the roots and sphagnum moss packing material remain moist.

Prepare site for planting. Favorable seedling sites have high soil moisture levels; little competing vegetation; and soil with high organic matter, proper Ph, good aeration or texture, and good moisture retention. On most planting sites, water is the greatest limiting factor to survival.

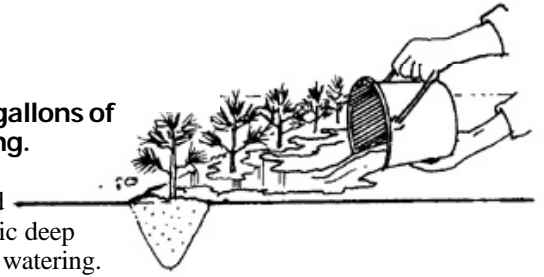
Do not expose seedlings to direct sun and air during handling and preparation for planting. Only take the seedlings that can be planted in one day to the site. Use a hydrosopic root dip on seedlings – do not let seedling sit in dip, and do not shake the dip off roots. Then wrap roots in wet burlap. This will help protect roots from heat and drying.

Plant in early spring for high soil moisture levels and cool temperatures. The ideal temperature range to plant is 33 to 50 degrees. If it is warmer than 60 degrees or becomes windy, it is best to stop planting and wait for conditions to improve. A planting bar works well for digging narrow, deep holes. Each planting hole must be large enough to accommodate the root system in a natural form. Place the seedling in the hole spreading the roots downward and horizontally. Do not bunch roots at the bottom of the hole or fold them so that the roots ends are directed toward the surface (see proper planting diagram.) Incorrect planting depth is another cause of poor seedling survival. The root collar (soil surface line when the seedling was in the nursery beds) must be located at the soil surface when finished. After backfilling the hole with planting bar, check for correct root collar depth.

Fertilizer use on first-year seedlings is generally not recommended. After the first year, small applications of slow release fertilizers with equal parts nitrogen, potassium, and phosphorus will aid plant growth. Follow recommended rates carefully.

Give each seedling one to two gallons of water immediately after planting.

Regular irrigation for the first two to three years can increase survival and greatly increase growth rates. Periodic deep watering is better than frequent light watering. Irrigate each plant with one to two gallons of water every one to two weeks during the summer. Gradually reduce irrigation in late summer to allow the seedlings to harden off for winter. Do not water if the ground is frozen.



Woven weed fabric is the best mulch for seedlings. It controls all weeds, reduces evaporation from the soil around the roots, and allows water and air to pass through. Other good mulch materials are wood chips; bark chips, straw, and composted sawdust. Mulch should be no deeper than three inches. Grass clippings seem to attract rodents and are not recommended.

Restrict access to seedlings or apply repellents to control deer browse. Rigid net-like tubes are available from many reforestation suppliers. These are effective at discouraging browse of the terminal bud, but require annual maintenance. Repellants have given variable and on consistent results but there are several that appear to be effective with several applications per year. Rodent damage to stems will increase if weeds are not controlled around the base of seedlings. Shallow, clean cultivation around the seedlings will discourage rodents.

Other general planting tips:

- Select good microsites for the seedlings.
- Plant on the north and east side of downed logs or stumps to shade the seedling, especially on south-facing slopes.
- Avoid areas of dense sod.
- Dig holes the same day you plant so the holes do not dry out.
- Don't put water in the planting holes immediately prior to planting to avoid excessive compaction.
- Remove all weeds and grass from an 18-inch area around each planting hole.
- If using a mechanical tree planter, have someone follow behind to adjust root-collar depth and tamp out air pockets.
- Woven weed fabric is recommended to conserving water around the plant roots and controlling weeds. Studies have shown that weed fabric greatly increases survival and growth rates even over supplemental irrigation.

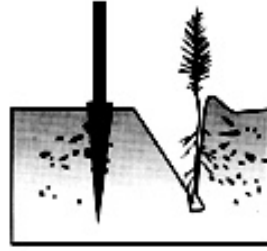
Seedling properly planted with planting bar



1. Insert bar at angle shown and push forward to upright position



2. Remove bar and place seedling at correct depth



3. Insert bar two inches toward yourself from seedling



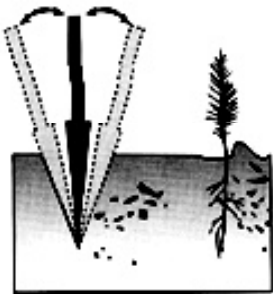
4. Pull handle of bar toward yourself to firm soil at bottom of roots



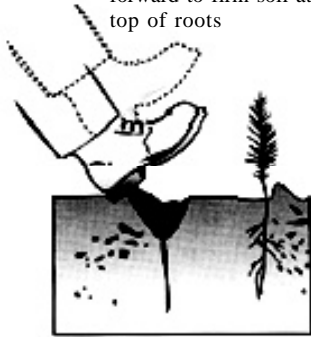
5. Push handle of bar forward to firm soil at top of roots



6. Insert bar two inches from last hole



7. Push forward then pull backward to fill hole



8. Fill in last hole by stamping with heel



9. Firm soil around seedling with foot

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Bareroot Seedling Planting and Care

Make your conservation plantings a success by properly preparing the site, and using healthy seedlings. Transplanting is a shock to live plants and care must be taken to protect seedlings for planting. Seedlings planted incorrectly have little chance of survival. The following information will help you plant and care for seedlings and achieve higher survival rates.



Common causes of seedling mortality during handling and planting:

- Seedlings not picked up promptly.
- Improper storage of seedlings, especially exposure to high temperatures or drying.
- Planting when weather conditions are too hot or windy.
- Roots drying during planting.
- Roots j-rooted in the planting hole.
- Seedlings planted to the wrong depth.
- Air pockets left in planting hole or soil over-compacted.
- Planting too late in the spring.



New Jersey Tree Nursery
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 Division of Parks and Forestry
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