

Seedling Care Tips

Use Quality Seedlings

1. Once you receive your seedlings, make sure they are suitable for planting.
2. Seedling quality is determined by two properties:
 - a. physical features and
 - b. conditions.

Evaluating both properties is critical to successful planting and seedling establishment.

Assess Seedling Quality

The table below lists the minimum requirements for acceptable pine seedlings. You should evaluate your seedlings before planting to ensure that most of your seedlings meet these requirements. Be sure to remove inferior seedlings before or during the actual planting. If the majority of your seedlings do not meet these minimums, immediately notify the nursery. Do not plant the trees.

Minimum Quality Measures For Pine Seedlings

Quality Measures	Loblolly, Slash and Sand	Longleaf
Stem Length	6"	8" (needle length)
Root Collar Diameter	1/8"	3/8"
Lateral Roots	Abundant	Abundant
Winter Buds	-----	Present

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Many physical features such as stem length, root length, root collar diameter, and lateral root abundance are used to assess seedling quality. These physical features remain the same from the time a seedling is lifted at the nursery until it is planted unless altered during the handling and/or planting process. Nearly all survival studies show that balanced, medium-sized seedlings (7-13 inch stem height) with sturdy stems and well-developed, fibrous root systems have a higher survival rate and make better initial growth than smaller seedlings.

One of the most important physical features that is vital to seedling survival is the relationship between the size of the root mass and the size of the foliage. The foliage of top-heavy seedlings can transpire water out of the seedling faster than the roots can absorb water. As a result, seedlings can dry out and die. For pine seedlings, the best quality stock is that which has a relatively small top and a large, fibrous root system.

Condition of Your Seedlings Before Planting

Equally important is the condition of your seedlings before planting. Unlike physical features, the condition of seedlings can change rapidly when seedlings are improperly stored or transported. For this reason, seedlings should be monitored and inspected continuously -- from lifting until they are successfully planted.

Indicators of seedling deterioration and unacceptable condition include:

1. Sour smell due to heat buildup and fermentation
2. Yellow needles
3. Seedlings are warm to the touch
4. Bark slips off easily, especially on the roots
5. Cambium layer is yellow to brown
6. Seedlings are molded.

The color of the cambium layer is a very good indicator of seedling condition and can give clues to potential problems that have not begun to show up in the foliage. The cambium layer is the soft tissue that lies between the bark and the woody portion of the seedling. This layer can be inspected by peeling back the bark with your fingernail or a knife blade. If the seedling is in good condition, the cambium layer should be light green. If the color of the cambium is yellowish or brownish, do not plant the seedling.

Seedling Care and Handling Before Planting

Proper transportation and storage of seedlings between the nursery and the planting site helps to ensure good seedling survival. Just like meats, fruits and milk, **SEEDLINGS ARE PERISHABLE!**

1. Store seedlings at a temperature between 33-38F with 85-95 percent relative humidity. If they are mishandled during transportation and storage, **THEY WILL SPOIL AND DIE!**
2. Seedlings should arrive at the planting site with as little unrefrigerated exposure time as possible.
3. Order your seedlings from a nursery located within 1-2 hours of the planting site or from a nursery that can provide refrigerated delivery to a point within 1-2 hours of the planting site.
4. If you must arrange for your seedlings to be transported, consider arranging for refrigerated transportation.

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5. Arrange for your seedlings to be delivered as close as possible to the date that planting will actually begin.
6. If possible use a consultant/vendor who has refrigerated transportation and storage capability.

If you are forced to deal with unrefrigerated transportation and storage, remember these important points:

1. If seedlings must be hauled in open truck beds, use a tarpaulin to cover the seedlings. Leave sufficient air space between the top of the seedlings and the tarpaulin so air can circulate and reduce heat buildup.
2. Keep seedlings in the shade at all times to reduce the chance of heat buildup.
3. Unload and properly store seedlings as soon as you reach your destination.
4. Store seedlings in a protected area such as a shed to avoid freezing, wind, and heat buildup, provided that the area is not prone to overheating or direct sunlight.
5. Do not stack seedlings more than 2 bundles high and use spacers to provide sufficient air space between stacks of bundles to reduce heat buildup.
6. Plant your seedlings as soon as possible. Only order delivery or pick up of the quantity of seedlings to be planted during 1 week.

Seedling Care and Handling During Planting

Proper care and handling during planting is critical as seedlings may be exposed to the harshest conditions during this time.

Weather conditions can influence seedling survival:

1. High temperatures, low humidity, strong winds, and dry soil conditions all contribute to the dehydration of seedlings, reducing likelihood of success.
2. Cool, moist conditions help minimize seedling exposure to dehydrating conditions.

Take the following precautions to minimize the adverse effects of on-site storage:

1. Don't carry more seedlings to the site than can be planted in one day.
2. Keep seedlings shaded to reduce exposure to the sun.
3. Cover seedling roots in open bundles and keep them moist.
4. Do not immerse seedlings in water – this will wash off the moisture retentive root coating applied at the nursery.
5. Plant seedlings as soon as possible.

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Day Classes For Tree Planting Based On Weather Conditions

Day Class	Weather Conditions
Normal	Temperature: 33-75F Relative Humidity: >50% Wind Speed: <10 mph Soil Moisture: abundant
Marginal	Temperature: 76-85F Relative Humidity: 30-50% Wind Speed: 10-15 mph Soil Moisture: marginal
Critical	Temperature: <32F or >85F Relative Humidity: <30% Wind Speed: >15 mph Soil Moisture: low to absent

Whenever possible, avoid planting when weather conditions are critical. Take special care when conditions are marginal. If one or more of the weather conditions in the Table below fall within the critical class, take precautions to protect seedlings from potential damage.

Root Protection During Planting

From the moment a seedling bundle is opened until each seedling is in the ground, **PROTECT THE ROOTS**. Many failures can be attributed to root damage or pruning, especially to lateral roots.

Follow these simple root protection guidelines and require those you hire to do the same.

1. When separating seedlings, do not beat seedlings against objects to loosen the roots.
2. Don't shake off or remove moisture retentive root coatings.
3. Don't root prune seedlings to make them easier to plant.
4. Protect and keep lateral roots intact -- they are the primary source of water and nutrient uptake.
5. For hand planting, carry seedlings in planting bags or buckets during planting and keep roots moist. Do not immerse seedlings in water because that will wash off the moisture retentive root coating.

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