

Growing Chestnut Trees from Seed [and Transplanting]

by

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Growing chestnut from seed is easy. If you can germinate one avocado in twenty tries, you will be able to germinate at least fifteen chestnuts. The nuts are relatively big, and seedlings grow fast, so most survive the rigors of their first winter. The six essentials are proper storage before planting, an appropriate potting mix for planting, adequate protection from rodents and deer, no weeds, good fertilization, and watering.

Storing Nuts. Chestnuts may be planted in the fall, as soon as they drop, or stored overwinter in a refrigerator. Immediately on harvest, nuts should be placed in moist, but not wet, peat moss in plastic bags or buckets. Moisten dried, milled peat moss with 2 cups of water to 1 gallon of moss. Numerous holes should be placed in the plastic bag with a toothpick so the nuts can breathe. Each nut should be completely surrounded by peat moss, not touching other nuts or the sides of the bag. The moss keeps the nuts moist and retards spoilage. The bagged nuts can be stored at 32-34 F (near the top of the refrigerator) for 2-3 years. They require 2-3 months of cold before they will germinate.

Planting Nuts Indoors. Planting chestnuts indoors in a warm (70-80 F), sunny window or greenhouse ensures the highest rate of seedling establishment. Do not let the nighttime temperature drop below 60-65 F. Nuts should be planted in the potting mix described in Table 1. Commercial potting mixes generally do not provide enough aeration, so nuts and seedling frequently rot in them, especially with too much watering.

The best pots for planting are 1- or 2-quart cardboard milk cartons with the bottoms removed. This ensures air-pruning of deep roots and adequate root aeration. The cartons can be placed on window screening on top of hardware cloth (rat wire) in milk crates to prevent the potting mix from falling out the bottom. Moistening the mix before putting it in the cartons also helps prevent it from falling out the bottom.

Nuts should be planted on their sides 1/2 to 1 inch deep in the mix. The easiest method of fertilization is daily watering with MirAcid or a similar soluble azalea-rhododendron food that contains micronutrients. Follow the package instructions for amounts to use.

Nuts can be sown in late March for transplanting in mid-May. Earlier sowing can lead to overcrowding of seedlings in milk crates, requiring more space than one window can provide. Seedlings should be hardened off by placing them outdoors in shade (under a tree for instance) for several days before transplanting. To avoid sunscald, place a light or moderate cover of hay over the leaves for two weeks after transplanting and remove the hay gradually over the next two weeks. Do not transplant before the last frost-free date for your area. This is mid-May here in southwestern Virginia. Additional information follows below.

Planting Nuts Outdoors. Like potted seed, nuts should be planted outdoors 1/2 to 1 inch deep, on their sides.

Seedbeds. As mentioned above, nuts may be planted outdoors in the fall, right after harvest. The main danger of this method is freeze-killing of nuts during cold winter weather. Chestnuts die at temperatures much below freezing. Fall seedbeds should be covered with 6-18 inches of mulch to keep them warm. The covering mulch should be removed in April.

Moist peat moss (see "Storing Nuts" above) or compost are good seedbed soils. You can economize on their use by planting chestnuts in rows spaced 3-6 feet apart. Line the bottoms of trenches with an inch or two of moss or compost, lay the nuts 6-12 inches apart and cover with a half-inch of moss or compost. Cover the moss or compost with soil and pack it down to prevent it from being blown away by wind or heaved by frost. You want the top of the trench to be level with the surrounding soil. It is necessary to ensure proper aeration by placing the seedbed in well drained soil or by raising it. Raised seedbeds can be vulnerable to freezing, especially along the edges.

Seedbeds can be protected from rodents by fencing them with 1/4-inch mesh hardware cloth, sunk 6-12 inches into the soil. Hardware cloth also can be laid on top of the beds, but it must be removed before germlings become immeshed in it. Enterprising rodents may still tunnel underneath. If birds raid a seedbed, it must be covered with hardware cloth or netting.

Seedlings are generally transplanted from seedbeds after one or two years.

Direct Seeding. At the farm, we sow most nuts directly at orchard spacing. We will plant more than 2000 nuts next year, and other methods are not feasible with our limited resources, especially if we have to water transplants during pollinating season.

In order to avoid deep winter freezes, we start planting in mid February. In our climate, there can be significant root development beginning in the latter half of March. Because of those deep roots, seedlings of February-planted nuts that emerge in mid-May can tolerate drought well. We try to plant before March, before nuts germinate, as ungerminated nuts seem to develop better seedlings. But nuts can be planted successfully until mid June.

We plow, disk and fertilize orchards before planting. More details follow in the next paragraph.

Rodent and Weed Control. We protect directly sown nuts from rodents by placing a 3-inch diameter cylinder of 10-inch aluminum flashing around the nuts. We make the top of the cylinder slightly smaller than the bottom (about 1/2 inch) to reduce internal reflection of sunlight onto the leaves; they are slightly cone shaped. The cylinder is sunk in the ground 1-2 inches. We mound soil around the cylinder to keep it from blowing away in heavy winds. The cylinder is covered

with a paper or styrofoam cup until May to exclude rain and to keep the nuts at soil temperature. Holes are placed in the cup for aeration. Try to remove the cups on a cloudy day or in the evening so the leaves are not suddenly exposed to full sunlight. It can be helpful to rip the bottom out of the cup and replace it on the cylinder, to shade the seedling. Before planting, a plug of soil is removed with a handled bulb planter and the hole filled with moist peat moss (see "Storing Nuts" above). This keeps the nuts moist and free of mold and prevents weed growth inside the cylinder.

Transplants can be protected from rodents with a cylinder of 1/4-inch hardware cloth. The cylinders should be sunk 2-4 inches into the ground and extend 18 inches above ground. For nuts, we use aluminum flashing instead of hardware cloth to keep our winter-planted nuts warm, and to protect them from wind. It is also more inexpensive.

In areas where deer are a problem, 4 or 5-foot tree shelters, such as those sold by Tubex (75 Bidwell St., Suite 105, St. Paul, MN 55107), should be used for transplants and directly sown nuts. Alternatively, trees can be protected with 4 or 5-foot-tall cylinders of hardware cloth. Either tree shelters or hardware cloth must be tied securely to strong stakes to prevent deer from tearing them out to reach the nuts and seedlings. Nuts sown directly in tree shelters or hardware cloth cylinders should be planted in peat-moss-filled holes larger than the shelter, to prevent weed growth inside it. It may be best to wait until mid April to sow nuts in tree shelters, as the warm shelter can lead to early germination, with consequent risk of frost damage.

Weeds and grass must be kept at least 2 feet away from seedlings, and clear out to the ends of branches in larger trees. This can be done manually, with mulches or with herbicides such as Round-Up plus Princep. Be sure to protect the trunk with an open stove pipe or similar device when applying herbicides; plants in tree shelters are already protected. Mulching not only controls weeds, but also helps retain soil moisture. Either plastic or organic mulches can be used. We use plastic mulches at the farm because of our large number of plants. However, plastic mulch does impede fertilization of trees and can harbor rodents, so there are drawbacks to its use. Mulches should be cleared about 6-12 inches from the base of trees in fall and winter to reduce rodent damage.

Fertilization. Chestnut prefers well drained, acid soils. It has the same soil preferences as blueberries and azaleas. At soil pHs above 6.5, nitrogen frequently is limiting. Most transplants should not be fertilized their first year, but if any leaves start turning yellow before early August, immediately apply 1/4 lb of 10% nitrogen. A foliar spray of soluble fertilizer such as MirAcid or fish emulsion will restore leaf color quickly while the ground-applied fertilizer is being absorbed. Seedlings from nuts planted outdoors can be fertilized heavily the first year. Fertilize transplants that have been in the ground for a year and seedlings with a 10-10-10 or 20-20-20 N-P-K ratio at lower soil pHs. At higher soil pHs, a 20-6-6 or 30-10-10 ratio is frequently satisfactory. This often can be found premixed with instructions as azalea & rhododendron food; either granular or liquid formulations (such as MirAcid) can be used. Organic gardeners can use fish

emulsion as a nitrogen source. As a general rule, apply 1 lb of granular fertilizer per inch of trunk diameter per year, half in the spring and half at the beginning of summer. Apply the fertilizer uniformly over the root zone, 6 inches from the base of the trunk to the ends of the branches. Follow the package instructions for fish emulsion and liquid fertilizers. These frequently are applied every 2 weeks until early August.

Watering and Transplanting. Water transplants immediately after setting them. During dry periods, soak the soil around the tree once a week. It is best to keep watering for four years after transplanting. Watering needs vary, of course, with the weather. Soil conditions also influence watering needs. It is best to dig a hole at least twice as wide as the root system of the transplant, and to mix 1 part of compost or peat moss with 3 to 4 parts of soil. This promotes healthy roots and reduces watering needs.

A 10 by 15 foot spacing of transplants is suitable if space is tight. Wider spacing, such as 10 by 20 or 20 by 20 feet can facilitate artificial pollination when trees mature. Old orchards of Chinese chestnut probably should be spaced at 40 by 40 feet. Frequently, growers will start such orchards at 20 by 20 foot spacing, then thin later to 40 by 40 feet. Doing so increases yields during the early years.

That's it. We hope this information is useful to people who want to grow chestnut trees.

Table 1

Chestnut Potting Mix

Ingredients: peat moss, vermiculite and perlite. Lime to pH 6.

12 quarts	perlite
12 quarts	vermiculite
12 quarts	ground peat moss
2 ounces (1/4 cup)	lime

Mix well in a wheelbarrow with a shovel. Sprinkle the lime over the mix to insure even distribution, and mix well. Moisten with water if dust is a problem during mixing. It is important that pots have good drainage.