

Growing English Walnuts, Pecans, and Chestnuts

By R. A. Jaynes, G. C. Martin, L. Shreve, and G. S. Sibbett

What could be simpler than to buy a nut tree seedling, plant it in a sunny location, and wait for a bountiful harvest? Unfortunately, that is not the way it goes.

Local climate and site have to be right for the species grown. Grafted trees of proven selections, as opposed to seedlings, are usually essential. The common crop-growing problems of weeds, fertilizer, and water must be dealt with. Plus pruning, pollination, insect, disease, rodent and bird problems. And finally, you need knowhow in harvesting, storing, and marketing.

Attention to establishment and care of nut trees is even more important than for shorter-lived crops, because of the 5 to 10 year wait from planting to bearing. A mistake in the vegetable garden can be recouped the same or the next year, but with nut trees eight years may be needed just to learn of a mistake, such as planting the wrong variety. Yet, this challenge in growing nut trees captivates many people.

Nut trees are a highly nutritious food source and traditionally grown for their nut meats. They are also valuable as shade trees and as a source of food for wildlife.

The small landowner should consider growing seedlings or grafted trees for sale. Most nut-tree selections, especially away from geographic areas of commercial production, are difficult to obtain. Grafting and budding trees is a skilled technique, but can be learned by the interested layman.

Marketing nuts is another area where imagination can greatly enhance return. Wholesaling at the local farm market or co-op may be practical but will give a relatively low return.

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Consider direct retailing, pick your own, and mail order sales.

Attractive packaging boosts sales and increases the dollar return. Even unfilled nuts have value when made into novelty items for sales at craft shops and church fairs.

Only three nut-tree species are discussed in this chapter; pecan, English walnut, and chestnut. There are numerous other possibilities including filbert, black walnut, butternut, hickory, pistachio, and macadamia.

Pecan Orchards

The pecan tree is native to North America and commonly found in the valleys of the Mississippi River and its tributaries. Pecans also are grown in the southeastern states north to Virginia and in western Texas, New Mexico, Arizona, and California.

Even though outside the natural range, more pecans are commercially produced in planted groves in Georgia than in any other state. Still, over 50% of all marketed pecan nuts are produced from native groves managed intensively for nut production. The trend, however, is away from native stands and toward planted grafted trees of proven performance.

The first commercial varieties were selections from native stands, whereas most new selections are from breeding programs. The U.S. Department of Agriculture's Pecan Research Center at Brownwood, Texas, has been a leader in releasing new varieties, all distinguished by their Indian names.

Optimum conditions for growing pecans include deep, well-drained soils and a warm growing season. Different varieties are adapted for frost-free growing seasons of 150 to 210 days. Although the season is long enough in parts of the Northeast and Northwest to grow "northern" varieties, it is not hot enough for the kernels to develop.

The following examples illustrate how pecan growing can be profitable on small acreage with good management.

Annual production and gross return from a 10-acre (30 trees per acre) pecan orchard planted in 1970

Year	Lbs. per tree	Total yield lbs	Price per lb	Total received
1974	15.5	4,650	\$1.25	\$5,812.50
1975	17.9	5,386	1.25	6,732.46
1976	21.6	6,487	1.50	9,730.90
1977	15*	4,129	1.50	6,193.00

* Low yield attributed to tree damage to Wichita variety in a shaker demonstration.

Annual production and gross return from a 10-acre (35 trees per acre) pecan orchard planted in 1972

Year	Lbs produced ¹	Price per lb	Gross return
1975	300	\$1.25	\$ 375.00
1976	400	1.50	600.00
1977	3,643	1.50	5,464.50

¹ Severe hail damage to the young trees depressed yields in 1975 and 1976.

Bill Perry, a former barber, and his wife, Virginia, planted a pecan orchard in 1970 on ten acres at Quemado, Texas. Through the State Extension Service they obtained assistance on spacing, irrigation, fertilization, pruning, and insect, disease, and weed control. In 1972, another 10 acres was planted with hybrid pecan varieties.

The pecans are sold directly to consumers. The only advertisement is a sign near the mailbox, "Perry's Pecan Orchard, Pecans for Sale." Customers who appreciate their high quality pecans have been their best advertisement.

Annual production and gross returns from the two plantings are given in the tables.

Costs that prospective pecan growers need to consider include:

- Land purchase
- Tractor, disk, and sprayer
- Irrigation, including water, leveling, and water lines
- Planting stock
- Operating costs including labor (tillage, chemicals, fertilizer, and harvesting)

Bill and Virginia Perry sell their pecans directly to consumers, depending on word-of-mouth advertisement.

Barry W. Jones



The Perrys' advice to prospective pecan growers is to find a good banker, have an understanding family, and don't be afraid to work.

Another couple, Horace and Lorine Brown, Ricksprings, Texas, purchased land containing 14 acres of native pecan trees. The undergrowth was removed by shredding in 1973. In addition, they planted 1.75 acres to selected varieties of pecan.

The native stand required thinning, spraying, and fertilization. With advice from a local grower and the Extension Service, they have begun to graft small native trees to paper-shell varieties.

The Browns work in their pecan orchard on weekends and holidays—spraying, fertilizing, weeding, grafting, and thinning. Production from 1972 through 1977 has gone from less than 500 lbs a year to 7,000 lbs. Loss of nuts to squirrels is a problem, especially in years when the hundreds of acres of surrounding, unmanaged native groves have no crop.

Native pecan nuts usually sell for about half the price of paper shells. However, because of the high quality of nuts from the managed grove, the Browns should receive 67 cents per pound instead of the usual 40 to 45.

The Perrys and Browns have demonstrated that pecan growing does not require vast acreages to be profitable as a vocation or hobby.

English Walnuts

English walnuts received their name because they were brought to this country on English ships. They probably originated in Persia, hence their alternate name, Persian walnuts. California accounts for more than 97% of the domestic commercial acreage, and for more than 55% of all English walnuts grown in the world.

English walnut trees may grow very large under ideal conditions, reaching heights of 90 feet with a 60-foot spread. But in orchards they commonly achieve heights of 40 feet and spreads of 30. In home plantings, walnuts provide shade and, under proper climatic conditions, an edible crop.

Because of land value and cost of production and management, walnuts are grown intensively, under sophisticated cultural management. However, productive trees and small plantings occur throughout much of the Midwest and eastern U.S., in addition to the west coast states.

Walnut trees require good-textured, deep, well-drained soils for optimal growth and production. Extensive root development can occur to 15 feet in deep soils.

The best sites have good air drainage and moderate temperatures. During winter, about 1,000 hours of temperature below 45° F (7.2° C) are needed to complete the winter chilling requirement.

At the same time, bear in mind that walnut trees can be damaged by winter temperatures as low as 14° F (-10° C), especially when followed by a warm period. However, some of the hardier Carpathian strains of English walnut regularly withstand temperatures of -20° F (-29° C).

In the present commercial orchard areas, the growing season should have 200 or more frost-free days, but the trees will thrive and produce where the frost-free season is as short as 150 days.

Grafted varieties of proven performance are recommended instead of seedlings. Rootstocks used in California are *J. hindsii* and Paradox (a cross of *J. hindsii* and *J. regia*) and in the East, eastern black walnut, *J. nigra*. Nurserymen or local nut growers should be consulted for the best variety for a given location.

Franquette is the standard old variety. It is a late leafing and harvesting variety, with small nuts of high quality. Yields are moderate and requirements for cultural care minimal. Hartley is the preferred variety for the inshell trade, and important for export.

Market Preferences. The domestic American market prefers packaged walnut kernels to inshell walnuts. For this market, new varieties have been developed which have high kernel yields of good quality, such as Payne, Ashley, Serr, Vina, and Chico. These varieties bear early in the orchard's life and yield heavy crops, but in general need more cultural care than Franquette.

Hanson is a productive, well filled, small nut selection favored in the East.

Preparations before planting might include leveling the ground for irrigation, ripping the soil to eliminate restrictions in the soil profile, and fumigating to eliminate weeds, pathogens, and nematodes. Poor site preparation will result in less than optimal production at increased expense throughout the orchard's life.

Specific information on suggested methods of planting, irrigation, pruning, and nutrition can be obtained from your state Extension Service.

Walnuts are mature and ready for harvest as soon as the tissue between the kernel and the inner lining of the shell turns brown. Shortly after that time, nuts can easily be shaken from the tree. Any harvest delay will result in a darker colored

kernel, and also allow time for mold and entrance of the navel orange worm.

The homeowner can easily harvest walnuts as they fall from the tree. However, economic farming enterprises must, in our present labor market, harvest mechanically. Special equipment required for harvest includes a tree shaker, a windrower or sweeping device to pile the nuts into a neat, long row, and a pickup machine.

Once harvested, nuts are taken to the huller, where the remaining hulls are mechanically removed and the shells brushed clean. From there, the nuts go into a drying facility and are treated with forced air at 109° F (43° C) for 24 to 36 hours.

Even with mechanization, harvest costs comprise nearly a third of total cash costs for producing a walnut crop. The dried nuts will store for at least a year under fairly variable conditions, up to two years if the storage temperature is kept below 40° F (4.8° C).

Insects infesting fruit and wood of walnuts reduce quality and yield of nuts. Those which directly affect the current season's crop include codling moth, walnut aphid, dusky-veined aphid, spider mite, walnut husk fly, and navel orange worm. They either cause infested nuts to drop prematurely (primarily codling moth), or affect the nuts' quality by reducing kernel color or directly infesting the kernels, making them worthless.

Spider mites, aphids, and scale pests cause production cuts the next year. By infesting wood and leaves, they stress the tree, resulting in less fruit wood or fruit buds being produced for the next crop. These insects can be controlled by complex programs integrating either chemicals (codling moth and scale), biological control (walnut aphid), or adequate cultural practices (navel orange worm). Consult a trained pest control advisor on these matters.

Insect and disease control, perhaps more than anything else, limits the success of small plantings of walnut and other nut trees. The knowledge and equipment required for pest control, as well as other operations, often exceed the small landowner's capabilities. These limitations should be recognized before the crop is planted.

The small landowner often needs as much knowhow to grow 3 acres as the grower with 3,000 acres, and expensive equipment used by the big commercial grower often is not justified with the potential return from small plantings. However, in at least some instances, ingenuity, hard work, and elimination of middlemen can give the grower with small acreage a competitive edge.

Chinese Chestnut

Of the several species of chestnut, the Chinese chestnut is the best one for nut production in the U. S. It does well in areas where peaches can be grown. The American chestnut was an important timber species in the eastern U. S. but the chestnut blight fungus destroyed it.

Although numerous selections of chestnut have been named—including Crane, Eaton, Nanking, and Orrin—they are not normally available from nurseries. Thus the purchaser of trees usually has to settle for seedlings offered by mail-order nurseries. These are generally satisfactory for the homeowner, but lack the uniformity and performance that could be expected from proven varieties.

Chestnuts prefer a well-drained, acid (pH 5.5-6.0) soil. Fertilization, cultivation, use of herbicides, and mulching are essentially the same as for other temperate climate crops. Pruning, in the early years, should only be enough to develop a single trunk and basic scaffold. Excessive pruning of young trees delays the onset of bearing.

Chinese chestnut bears at a younger age than most other nut trees, usually 3 to 4 years after transplanting. Mature trees may have to be spaced 40 feet apart — but to increase unit area yields, a 20 x 20 foot spacing initially is more practical. Just be prepared to remove trees when they begin to shade each other.

Chestnuts are fairly regular bearers compared to many of the other nut trees, which are prone to a biennial cycle. Common yields are 1 to 2 tons per acre.

The most common and ubiquitous pests are the chestnut weevils. Adult weevils lay eggs in the nuts as the kernel fills. The larvae are well developed about harvest time. Some insecticides are capable of controlling the weevil, but none are presently registered for use. Another pest is the chestnut blight fungus; it is not generally a problem on well grown Chinese chestnut trees.

The gall wasp was recently introduced into the U. S. and is a threat to chestnut. It destroys new shoot growth. So far the wasp has been found only in Georgia.

Chestnut trees have a place in the home planting, as seen by the thousands of trees people have in their yards. Small plantings may be profitable where there is a local market for the nuts, and if problems such as squirrels and weevils can be handled.