Tree Nuts

Almonds, Brazil nuts, hazelnuts, macadamia nuts, pecans, pistachios, and walnuts are all tree nuts. Though many consumers lump all nuts into one category, peanuts are not considered tree nuts, as they are a legume.

Produced on less than two percent of the nation’s agricultural cropland, the United States still harvests a vast amount of tree nuts each year. Georgia, New Mexico, and Texas dominate in pecan production while California continues to produce the lion’s share of almonds, pistachios, and walnuts. Tree nuts are also among California’s top exports.

While the chestnut is considered a tree nut, this commodity is covered in a separate Know Your Commodity profile.

References: Agricultural Marketing Resource Center, USDA.

TYPES, VARIETIES & CUTS

Almonds
California is the only U.S. state that grows almonds commercially, and most production is exported across the globe. There are several varieties of almonds including Mission, Nonpareil, Price, Butte, and Padre.

As the nut forms on the tree, it is enclosed in a sturdy hull and an inner hard shell. Although almonds are sometimes sold in-shell, they are more often shelled during processing. The product may be further processed through blanching, dry roasting, chopping, or converted into a paste called marzipan—a confection made from honey, sugar, and almond meal.

Brazil nuts
Brazil nuts grow on the *Bertholletia excelsa* tree native to the South American Amazon forest. Growing up to 160 feet high with a trunk diameter of three to six feet wide, the Brazil nut is the largest tree in the Amazon forest. The majority of Brazil nuts are produced in Bolivia, followed by Peru and Brazil.

Generally eaten raw, Brazil nuts are a good source of protein, magnesium, and Vitamin E, and are extremely rich in selenium, a powerful antioxidant. However, people who regularly eat too many Brazil nuts can suffer from selenium poisoning. For this reason, it is recommended consumers eat no more than two or three Brazil nuts per day.
Direct Importer of
Nuts • Dried Fruits • Rice • Beans

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TYPES, VARIETIES & CUT—CONTINUED

Hazelnuts
Also called filberts, hazelnuts originated from the Black Sea and Mediterranean regions in Turkey, Italy, and Spain. This area is still the center of production, with Turkey producing more than half of all hazelnuts in the world. The United States ranks third in production after Turkey and Italy.

Although a small portion of hazelnuts are grown in Washington State, Oregon is responsible for nearly all U.S. production. The only tree nut produced commercially in Oregon, hazelnuts are an important crop and frequently featured in confections such as chocolate truffles, cookies, pralines, and chocolate-hazelnut spreads. A popular commodity for the snack food industry, hazelnuts are sold whole, diced, ground, unshelled, or as a paste or oil.

Macadamia nuts
Macadamia nuts originated in Australia in the mid-1800s and were later introduced to Hawaii in 1881. Though found in tropical and subtropical countries across the world, the round nuts are only commercially produced in Australia and Hawaii.

Two primary species, *Macadamia integrifolia* and *Macadamia tetraphylla*, are both native to Australia. Also known as the “smooth shell” species, the integrifolia is grown in Hawaii and produces a round, small nut with high oil content—a characteristic that makes it better for roasting and salting. Tetraphylla, the “rough shelled” species, is less tolerant of extreme temperatures but produces a sweeter tasting nut. Considered a gourmet nut, whole macadamias are sold salted in glass jars or used in cookies and candies.

Pecans
Native to North America, the pecan tree belongs to the same family as English and black walnuts and hickory nuts. The pecan tree, which originated in the Mississippi flood plain, was a prominent food source for Native Americans for thousands of years before European settlers arrived.

Georgia, New Mexico, and Texas are the top three pecan-producing states, with Georgia responsible for the vast majority of production. Arizona also grows a small amount. In the United States, pecans rank third in tree nut consumption behind almonds and English walnuts, and are an important export commodity. Pecans are sold in-shell or shelled, and grade standards are tied to this designation. Nuts in the shell are graded by size or kernel color, while shelled nut grades are determined by size in halves or pieces.

Pistachios
It is believed that pistachios originated in the Middle East, where the trees have grown for thousands of years. The green nuts eventually reached Greece, Italy, and Spain, then the United States in the 1880s where they grew in popularity.

California is responsible for the bulk of U.S. production, though Arizona, New Mexico, Texas, and Utah also grow pistachios in lesser quantities. Most pistachios are sold in the shell, primarily roasted, salted, and sold as a snack food. Some are also used in ice cream, confections, baked goods, and dressings. A single ounce serving includes 6 grams of protein, 3 grams of fiber, and 286 milligrams of potassium.

Walnuts
The oldest known tree food, walnuts date back to 7000 B.C. and are believed to have originated in ancient Persia. Although walnut trees were first cultivated in California in the 1700s, commercial production did not begin until 1867 and went on to become the nation’s top walnut-producing state.

There are two major varieties of walnuts grown in the United States: the English walnut and the black walnut. Often called the American walnut, the black walnut tree is native to North America and grows wild across the central and eastern parts of the country. California black walnuts have a rich, bold flavor and thick, hard-to-crack shells. Because English walnuts feature a milder taste and thinner shells, the latter variety has much broader appeal.

In August of 2017 the USDA revised its standards for walnuts to allow grade certification for the Livermore walnut. This unique red walnut variety was first introduced by the University of California, Davis in 1999. Since hitting the commercial market in 2012, consumer demand has skyrocketed for this mellow, creamy-tasting walnut.

References: Agricultural Resource Marketing Center, American Pistachio Growers, California Walnut Board, National Health Institute, National Pecan Growers Council, University of Florida/IFAS Extension, USDA, Western Farm Press.
**SEASONAL AVAILABILITY**

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*California availability is for almonds, pistachios, and walnuts.

References: Agricultural Marketing Resource Center, USDA, Western Farm Press.

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**PESTS & DISEASE**

**Common Diseases:**
Depending on the variety and location, tree nuts can be vulnerable to a number of diseases; following are a few of the more common culprits. *Eastern filbert blight* can be lethal to hazelnut plants. Branches should be pruned far below the infected edge, and the limbs should be burned or chipped to prevent spreading. *Botrytis blossom and shoot blight* can cause tender shoots in pistachios to wither and die. Proper pruning and fungicide application may help manage this disease.

*Bacterial spot*, also called *bacterial leaf spot* or *shot hole*, occurs on almond leaves, twigs, fruit, and flowers. Serious infection among young almonds may cause early fruit drop, distortion, and gumminess. The disease may be managed by applying bactericide at least once per season.

**Common Pests:**
*Navel orangeworm* is a major insect pest of California almonds, walnuts, and pistachios. The worm bores into the nut and feeds on the nutmeat, which causes serious food safety issues. *Black pecan aphids* attack pecan foliage, causing premature leaf drop, poor nut quality, and reduced bloom in subsequent seasons.

*Codling moths* attack and feed on walnuts, damaging the kernel. *Leaffooted bug* can cause severe damage to an almond orchard, leading to aborted nuts, internal gumming, and stained shells.

References: Almond Board of California, Cornell University, University of California Integrated Pest Management, University of California Cooperative Extension.
CULTIVATION, STORAGE & PACKAGING

Preharvest:
Tree nut cultivation and harvesting greatly depends on the variety and growing region.

Almond trees require mild winters followed by a long, warm growing season. Trees should be planted in moist soil 15 to 20 feet apart, and the orchard floor should be smooth, bare, and firm. Between late February and early March, buds burst into light pink and white blooms. Because most almond trees are not self-pollinating, growers must bring in bees to complete the process. In March and June, the almond shell hardens and the kernel begins to form. By July, the hulls start to split, which allows the shell to dry. When the hulls open completely, it is time to harvest.

Pecan trees grow best on hilltops. These large trees thrive in warmer climates and often grow more than 70 feet tall with a trunk diameter of up to 6 feet. Unlike almond trees, pecan trees are wind pollinated. For the first two years, pecan trees may require double-digit gallons of water a day depending on the season and conditions. Once mature, a pecan tree will not be damaged by lack of irrigation, although drought can negatively impact yield and nut quality.

Pistachio trees grow best in an arid semi-desert climate with long, dry, hot summers and cool winters. These trees, which begin bearing fruit between five and seven years, are biennial—offering a heavy crop one year and a lighter crop the next. When it comes to viability, there does not seem to be a maximum lifespan for pistachio trees as they can live for more than a century. In the western United States, pistachios are generally harvested in September or October once the shells have split.

Walnut trees do not produce nuts until they are about 10 years old, with most production after the tree reaches the age of 30. Typically, heavy nut crops only occur every two out of five years. Walnut trees should be planted with 200 to 300 square feet of growing space around the base of the tree. Trees grown in the open with large canopies generally produce more nuts than those growing in the forest.

Hazelnut shrubs flourish in areas with cool summers and mild winters. These relatively fast-growing plants expand at a rate of 13 to 24 inches a year and reach a maximum height of 18 feet at maturity. Hazelnut shrubs do best with ample sunlight: a minimum of four hours of direct, unfiltered sunlight every day. Hazelnuts are typically ready for harvesting in September or October.

Macadamias, as subtropical plants, grow best in coastal areas where temperatures range between 50 and 80°F. Mature trees are more resistant to extreme temperatures of up to 100°F. Trees typically begin bearing fruit between six to seven years of age. In Hawaii, macadamias typically drop eight to nine months out of the year, generally from July to March.

Brazil nuts grow in lowland subtropical humid regions up to altitudes of 500 meters. These massive trees can live up to 1,000 years. Brazil nut pods are round, hard, coconut-like shells, and each fruit contains 10 to 25 seeds. Between December and March, the pods start to fall from the trees.

Postharvest:
Tree nuts are harvested one of two ways: either the pods are allowed to fall naturally from trees and then collected, or the nuts are mechanically shaken from the trees.

Typically, macadamias and Brazil nuts are harvested after the fruits have fallen from the tree. When Brazil nuts fall from the trees, Amazon nut gatherers called castañeros roam the jungle collecting them. They crack open the pods with a machete, place the seeds in sacks, and take them to processing plants in nearby cities where the nuts are peeled and dried. In large-scale macadamia nut operations, mechanical sweepers and pickup devices are used to collect the fallen nuts. The macadamias are husked immediately and allowed to air dry or taken to a processor the next day.

Pecans are typically harvested in a two-step process. In the fall, a mechanical tree shaker is used to knock about half of the nuts from the tree. Then, after the first hard freeze of winter, when most of the foliage has fallen from the tree, the mechanical shaker is used again to remove the remainder of pecans.

Pistachios are harvested differently. Because these nuts split before harvesting, they should never touch the ground to avoid contamination. Instead, a harvester shakes the nuts out of the tree into a catch-frame that conveys them to a receiving bin. Nuts are then sent to processing mills to be hulled and dried.
CULTIVATION, STORAGE & PACKAGING — CONTINUED

Typically, lower temperatures will result in longer storage: in-shell pecans stored at 70°F may keep for up to four months, but can last up to 18 months at 32 to 36°F; when stored at 0°F, storage can extend to five or more years. Shelled nuts do not last as long in storage as in-shell nuts; because most shelled nuts will absorb moisture, they should be stored in clean, tight, moisture-free packaging.


References: Almond Board of California, American Pistachio Growers, New Mexico State University, University of California Division of Agriculture & Natural Resources, University of Florida/IFAS Extension, University of Hawaii, University of Minnesota Extension, USDA.

GOOD ARRIVAL GUIDELINES/TOLERANCES

There are no good arrival guidelines specific to tree nuts (individually or collectively).