Almond

For other uses, see Almond (disambiguation).

"Badam" redirects here. For some villages in Iran, see Badam, Iran.

Almond
Almond tree with ripening fruit. Majorca, Spain.

Scientific classification	
Kingdom:	Plantae
(unranked):	Angiosperms
(unranked):	Eudicots
(unranked):	Rosids
Order:	Rosales
Family:	Rosaceae
Genus:	*Prunus*
Subgenus:	*Amygdalus*

Species:	*P. dulcis*
Binomial name	
Prunus dulcis (Mill.) D.A.Webb	
Synonyms	
Prunus amygdalus Batsch	

The **almond** (/ɑːmənd/) (*Prunus dulcis*, syn. *Prunus amygdalus*, *Amygdalus communis*, *Amygdalus dulcis*) (or **badam** in Indian English, from Persian: بادام) is a species of tree native to the Middle East and South Asia. "Almond" is also the name of the edible and widely cultivated seed of this tree. Within the genus *Prunus*, it is classified with the peach in the subgenus *Amygdalus*, distinguished from the other subgenera by the corrugated shell (endocarp) surrounding the seed.

The fruit of the almond is a drupe, consisting of an outer hull and a hard shell with the seed (which is not a true nut) inside. Shelling almonds refers to removing the shell to reveal the seed. Almonds are sold **shelled** (i.e., after the shells are removed), or **unshelled** (i.e., with the shells still attached). **Blanched** almonds are shelled almonds that have been treated with hot water to soften the seedcoat, which is then removed to reveal the white embryo.

Description

Tree

The almond is a deciduous tree, growing 4–10 m (13–33 ft) in height, with a trunk of up to 30 cm (12 in) in diameter. The young twigs are green at first, becoming purplish where exposed to sunlight, then grey in their second year. The leaves are 3–5 inches long,[1] with a serrated margin and a 2.5 cm (1 in) petiole. The flowers are white to pale pink, 3–5 cm (1–2 in) diameter with five petals, produced singly or in pairs and appearing before the leaves in early spring.

Almonds begin bearing an economic crop in the third year after planting. Trees reach full bearing five to six years after planting. The fruit matures in the autumn, 7–8 months after flowering.
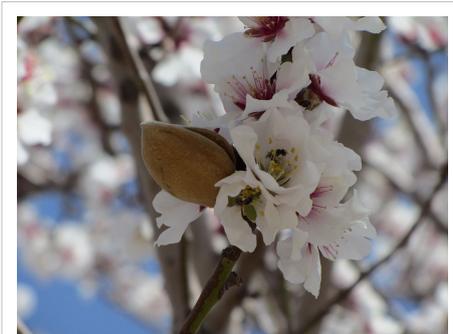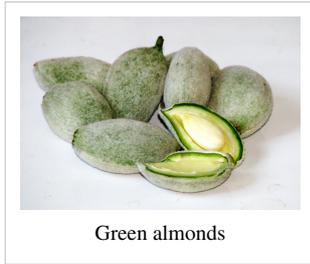

Almond blossoms with its fruit in Tudeshg, Isfahan, Iran

Drupe

'Fitas' almonds from Ibiza

Green almonds

Unshelled (left) and shelled (right) almonds


Blanched almonds

The almond fruit measures 3.5–6 cm (1–2 in) long. In botanical terms, it is not a nut, but a drupe. The outer covering or exocarp, fleshy in other members of *Prunus* such as the plum and cherry, is instead a thick, leathery, grey-green coat (with a downy exterior), called the hull. Inside the hull is a reticulated, hard, woody shell (like the outside of a peach pit) called the endocarp. Inside the shell is the edible seed, commonly called a nut. Generally, one seed is present, but occasionally two occur.

Origin and history

The almond is native to the Mediterranean climate region of the Middle East, eastward as far as the Indus.[2] In India, it is known as badam. It was spread by humans in ancient times along the shores of the Mediterranean into northern Africa and southern Europe and more recently transported to other parts of the world, notably California, United States.
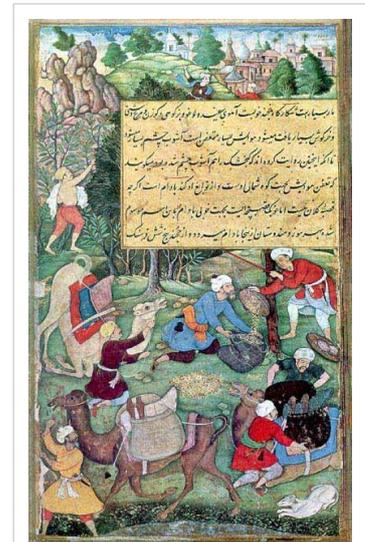
Harvesting of the almond crop at Qand-i Badam, Fergana Valley (16th century)
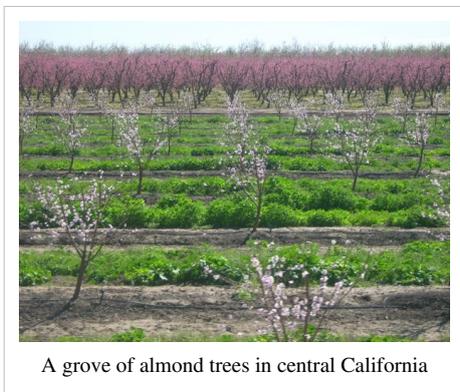
A grove of almond trees in central California

The wild form of domesticated almond grows in parts of the Levant; almonds must first have been taken into cultivation in this region. The fruit of the wild forms contains the glycoside amygdalin, "which becomes transformed into deadly prussic acid (hydrogen cyanide) after crushing, chewing, or any other injury to the seed."

Wild almonds are bitter, the kernel produces deadly cyanide upon mechanical handling, and eating even a few dozen in one sitting can be fatal. Selection of the sweet type, from the many bitter types in wild, marked the beginning of almond domestication. How humans selected the sweet type remains a mystery. It is unclear as to which wild ancestor of the almond created the domesticated species. Ladizinsky suggests the taxon *Amygdalus fenzliana* (Fritsch) Lipsky is the most likely wild ancestor of the almond in part because it is native of Armenia and western Azerbaijan where it was apparently domesticated.

While wild almond species are toxic, domesticated almonds are not; Jared Diamond argues that a common genetic mutation causes an absence of amygdalin, and this mutant was grown by early farmers, "at first unintentionally in the garbage heaps, and later intentionally in their orchards". Zohary and Hopf believe that almonds were one of the earliest domesticated fruit trees due to "the ability of the grower to raise attractive almonds from seed. Thus, in spite of the fact that this plant does not lend itself to propagation from suckers or from cuttings, it could have been domesticated even before the introduction of grafting". Domesticated almonds appear in the Early Bronze Age (3000–2000 BC) such as the archaeological sites of Numeria (Jordan), or possibly a little earlier. Another well-known archaeological example of the almond is the fruit found in Tutankhamun's tomb in Egypt (c. 1325 BC), probably imported from the Levant. Of the European countries that the Royal Botanic Garden Edinburgh reported as cultivating almonds, Germany is the northernmost, though the domesticated form can be found as far north as Iceland.

Etymology and names

The word "almond" comes from Old French *almande* or *alemande*, Late Latin **amandula*, derived through a form *amygdala* from the Greek ἀμυγδαλή (*amygdalē*) (cf. amygdala), an almond. The *al-* in English, for the *a-* used in other languages may be due a confusion with the Arabic article *al*, the word having first dropped the *a-* as in the Italian form *mandorla*; the British pronunciation *ah-mond* and the modern Catalan *ametlla* and modern French *amande* show a form of the word closer to the original. Other related names of almond include *Mandel* or *Knackmandel* (German), *mandorlo* (Italian), *amêndoa* (Portuguese), and *almendra* (Spanish).

The adjective "amygdaloid" (literally "like an almond") is used to describe objects which are roughly almond-shaped, particularly a shape which is part way between a triangle and an ellipse. See, for example, the brain structure amygdala, which uses a direct borrowing of the Greek term *amygdalē*.

Production

The world produced 2.00 million tonnes of almonds in 2011 according to Food and Agriculture Organization, with United States the largest producer at 0.73 million tonnes. The apparent 50% decrease in production by the United States led to a calculated percentage of world production decrease from 56% to 36%; however, a 2013 news article indicated the United States produced at least 80% of the world's supply.

An almond shaker before and during a harvest of a tree

Top ten almond with shell producers in 2010, with 2011 data		
Country	Production 2010, 2011 (million tonnes)	Yields 2010, 2011 (ton/hectare)
🇺🇸 USA	1.41 ▼ 0.73	4.85 ▼ 4.50
🇪🇸 Spain	0.22 — 0.21	0.40 — 0.40
🇮🇷 Iran	0.16 — 0.17	2.97 ▼ 1.91
🇮🇹 Italy	0.11 — 0.10	1.26 ▲ 1.39
🇲🇦 Morocco	0.10 ▲ 0.13	0.98 ▲ 1.52
🇸🇾 Syria	0.073 ▲ 0.13	1.49 ▲ 2.52
🇦🇫 Afghanistan	0.056 ▲ 0.061	5.00 ▼ 4.50
🇹🇷 Turkey	0.055 ▲ 0.070	3.23 ▲ 3.41
🇹🇳 Tunisia	0.052 ▲ 0.061	0.32 — 0.32
🇩🇿 Algeria	0.039 — 0.050	1.16 ▲ 1.80
World Total	**2.51 ▼ 2.00**	**1.62 ▼ 1.27**

Spain has one of the most diverse commercial cultivars of almonds. It is grown in Spain's Catalonia, Valencia, Murcia, Andalusia, and Aragón regions and the Balearic Islands. In Greece, most of the production comes from the region of Magnesia at the area of Almyros. The most cultivated types of almonds in Greece are ferragnes and Texas (mission), which are known for their sweet taste and premium quality. Because of its quality, it is used as a luxury nut. In Turkey, most of the production comes from the Aegean, Marmara, and Mediterranean regions.

In the United States, production is concentrated in California, with almonds being California's third-leading agricultural product, its top agricultural export in 2008, and 100% of the U.S. commercial supply. The United States is the dominant supplier of almonds. In 2011, the country exported about 637,000 metric tons, valued at US$2.8 billion. Almonds were mostly exported as shelled almonds (70%), with the remainder being either unshelled or processed.

Australia is the largest almond production region in the Southern Hemisphere. In 2013, Australia contributed to 5.9% of the world almond supply. Most of the almond orchards are located in New South Wales, Victoria, and South Australia. [3]

In 2013 and 2014, environmental problems in California affected the almond supply, contributing to higher almond prices worldwide.[4]

Pollination

Young almond fruit

Mature almond fruit

The pollination of California's almonds is the largest annual managed pollination event in the world, with close to one million hives (nearly half of all beehives in the USA) being trucked in February to the almond groves. Much of the pollination is managed by pollination brokers, who contract with migratory beekeepers from at least 49 states for the event. This business has been heavily affected by colony collapse disorder, causing nationwide shortages of honey bees and increasing the price of insect pollination. To alleviate almond growers from the rising cost of insect pollination, researchers at the Agricultural Research Service (ARS) have developed a new line of self-pollinating almond trees.[5] Self-pollinating almond trees, such as the 'Tuono', have been around for a while, but their harvest is not as desirable as the insect-pollinated California 'Nonpareil' almond tree. The 'Nonpareil' tree produces large, smooth almonds and offers 60–65% edible kernel per nut. The 'Tuono', however, has thicker, hairier shells and offers only 32% of edible kernel per nut, but having a thick shell has advantages. The 'Tuono's' shell protects the nut from threatening pests such as the navel orangeworm. ARS researchers have managed to crossbreed the pest-resistant 'Tuono' tree with the 'Nonpareil', resulting in hybridized varieties of almond trees that are self-pollinated and maintain a high nut quality. The new, self-pollinating hybrids possess quality skin color, flavor, and oil content, and reduce almond growers' dependency on insect pollination.

Diseases

Main article: List of almond diseases

Almond trees can be attacked by an array of damaging organisms, including insects, fungal pathogens, plant viruses, and bacteria. Symptoms can vary depending on the organism attacking the plant.

Sweet and bitter almonds

The seeds of *Prunus dulcis* var. *dulcis* are predominantly sweet, but some individual trees produce seeds that are somewhat more bitter. The genetic basis for bitterness involves a single gene, the bitter flavour furthermore being recessive, both aspects making this trait easier to domesticate. The fruits from *Prunus dulcis* var. *amara* are always bitter, as are the kernels from other *Prunus* species, such as apricot, peach, and cherry (to a lesser extent).

Flowering (sweet) almond tree

The bitter almond is slightly broader and shorter than the sweet almond, and contains about 50% of the fixed oil that occurs in sweet almonds. It also contains the enzyme emulsin which, in the presence of water, acts on soluble glucosides, amygdalin, and prunasin, yielding glucose, cyanide and the essential oil of bitter almonds, which is nearly pure benzaldehyde. Bitter almonds may yield from 4–9 mg of hydrogen cyanide per almond. Extract of bitter almond was once used medicinally, but even in small doses, effects are severe, and larger doses can be deadly; the cyanide must be removed before consumption.

All commercially grown almonds sold as food in the United States are of the "sweet" variety. However, The US Food and Drug Administration reported in 2010 that some fractions of imported sweet almonds were contaminated with bitter almonds. Eating such almonds could result in vertigo and other typical bitter almond (cyanide) poisoning effects.
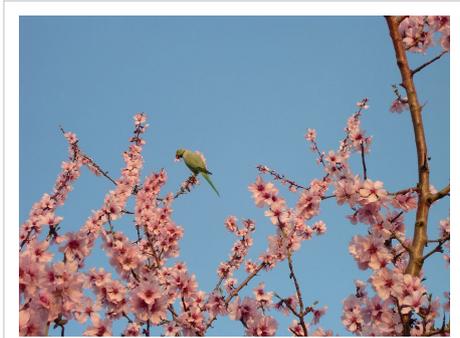
Blossom on bitter almond tree

Certain health food stores sell "bitter almonds" or "apricot kernels" labeled as such.

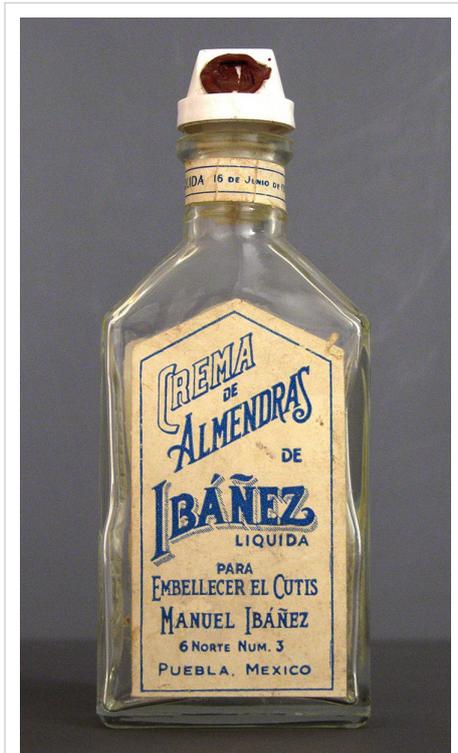## Culinary uses

Smoked and salted almonds

While the almond is often eaten on its own, raw or toasted, it is also a component of various dishes. Almonds are available in many forms, such as whole, sliced (flaked, slivered), and as flour. Almonds yield almond oil and can also be made into almond butter or almond milk. These products can be used in both sweet and savoury dishes.

Along with other nuts, almonds can be sprinkled over breakfasts and desserts, particularly *muesli* or ice cream-based dishes. Almonds are used in marzipan, nougat, many pastries (including *jesuites*), cookies (including French *macarons*, macaroons), and cakes (including financiers), *noghl*, and other sweets and desserts. They are also used to make almond butter, a spread similar to peanut butter, popular with peanut allergy sufferers and for its naturally sweeter taste. The young, developing fruit of the almond tree can be eaten whole ("green almonds") when they are still green and fleshy on the outside and the inner shell has not yet hardened. The fruit is somewhat sour, but is a popular snack in parts of the Middle East, eaten dipped in salt to balance the sour taste. Also in the Middle East they are often eaten with dates. They are available only from mid-April to mid-June in the Northern Hemisphere; pickling or brining extends the fruit's shelf life.

Almond cookies, Chinese almond biscuits, and Italian *ricciarelli* are made with almonds.

- In Greece, ground blanched almonds are used as the base material in a great variety of desserts, usually called *amygdalota* (αμυγδαλωτά). Because of their white colour, most are traditionally considered "wedding sweets" and are served at wedding banquets. In addition, a soft drink known as *soumada* is made from almonds in various regions.

- In Iran, green almonds are dipped in sea salt and eaten as snacks on street markets; they are called *chaqale bâdam*. Also sweet almonds are used to prepare a special food for babies, named *harire badam*. Almonds are added to some foods, cookies, and desserts, or are used to decorate foods. People in Iran consume roasted nuts for special events, for example, during New Year parties.

- In Italy, the bitter almonds from apricots are the base for *amaretti* (almond macaroons), a common dessert. Traditionally, a low percentage of bitter almonds (10-20%) is added to the ingredients, which gives the cookies their bitter taste (commercially, apricot kernels are used as a substitute for bitter almonds). Almonds are also a common choice as the nuts to include in *torrone*. In Puglia and Sicily, *pasta di mandorle* (almond paste) is used to make small soft cakes, often decorated with jam, pistachio, or chocolate. In Sicily, almond milk is a popular refreshing beverage in summer.

- In Morocco, almonds in the form of sweet almond paste are the main ingredient in pastry fillings, and several other desserts. Fried blanched whole almonds are also used to decorate sweet *tajines* such as lamb with prunes. A drink made from almonds mixed with milk is served in important ceremonies such as weddings and can also be ordered in some cafes. Southwestern Berber regions of Essaouira and Souss are also known for *amlou*, a spread made of almond paste, argan oil, and honey. Almond paste is also mixed with toasted flour and among others, honey, olive oil or butter, anise, fennel, sesame seeds, and cinnamon to make *sellou* (also called *zamita* in Meknes or *slilou* in Marrakech), a sweet snack known for its long shelf life and high nutritive value.

- In South Asian cuisine, almonds are the base ingredients of *pasanda*-style and Mughlai curries. *Badam halva* is a sweet made from almonds with added coloring. Almond flakes are added to many sweets (such as *sohan barfi*), and are usually visible sticking to the outer surface. Almonds form the base of various drinks which are supposed to have cooling properties. Almond sherbet or *sherbet-e-badaam*, is a popular summer drink. Almonds are also sold as a snack with added salt.

Bottle for a cream of almond liquor from Mexico (beginning of 20th century) from the permanent collection of the Museo del Objeto del Objeto

Marzipan is a popular almond meal-based confection. It is artistically shaped into festive motifs, figures, and fruit shapes such as those shown above in a Paris shop.

Almonds can be processed into a milk substitute called almond milk; the nut's soft texture, mild flavour, and light colouring (when skinned) make for an efficient analog to dairy, and a soy-free choice for lactose intolerant people and vegans. Raw, blanched, and lightly toasted almonds work well for different production techniques, some of which are similar to that of soymilk and some of which use no heat, resulting in "raw milk" (see raw foodism).

The 'Marcona' almond cultivar is recognizably different from other almonds, and is marketed by name. The kernel is short, round, relatively sweet, and delicate in texture. It has been grown in Spain for a long time and its origin is unknown; the tree is very productive, and the shell of the nut is very hard. 'Marcona' almonds are traditionally served after being lightly fried in oil, and are used by Spanish chefs to prepare a dessert called *turrón*.

Almond flour and skins

Almond flour is often used as a gluten-free alternative to wheat flour in cooking and baking.

Almonds contain polyphenols in their skins consisting of flavonols, flavan-3-ols, hydroxybenzoic acids and flavanones analogous to those of certain fruits and vegetables. These phenolic compounds and almond skin prebiotic dietary fiber have commercial interest as food additives or dietary supplements.

Almond syrup

Historically, almond syrup was an emulsion of sweet and bitter almonds, usually made with barley syrup (orgeat syrup) or in a syrup of orange flower water and sugar.

The Grocer's Encyclopedia (1911) noted, "Ten parts of sweet almonds are generally employed to three parts of bitter almonds"; however, due to the cyanide found in bitter almonds, modern syrups generally consist of only sweet almonds.

Nutrition

Almonds

Nutritional value per 100 g (3.5 oz)	
Energy	2,408 kJ (576 kcal)
Carbohydrates	21.69 g
Starch	0.74 g
Sugars	3.89 g
lactose	0.00 g
Dietary fiber	12.2 g
Fat	49.42 g
Saturated	3.731 g
Monounsaturated	30.889 g
Polyunsaturated	12.070 g
Protein	21.22 g
Tryptophan	0.214 g

Threonine	0.598 g
Isoleucine	0.702 g
Leucine	1.488 g
Lysine	0.580 g
Methionine	0.151 g
Cystine	0.189 g
Phenylalanine	1.120 g
Tyrosine	0.452 g
Valine	0.817 g
Arginine	2.446 g
Histidine	0.557 g
Alanine	1.027 g
Aspartic acid	2.911 g
Glutamic acid	6.810 g
Glycine	1.469 g
Proline	1.032 g
Serine	0.948 g

Vitamins	
Vitamin A equiv. beta-carotene lutein zeaxanthin	(0%) 1 μg 1 μg
Vitamin A	1 IU
Thiamine (B1)	(18%) 0.211 mg
Riboflavin (B2)	(85%) 1.014 mg
Niacin (B3)	(23%) 3.385 mg
Pantothenic acid (B5)	(9%) 0.469 mg
Vitamin B6	(11%) 0.143 mg
Folate (B9)	(13%) 50 μg
Choline	(11%) 52.1 mg
Vitamin E	(175%) 26.2 mg
Vitamin K	(0%) 0.0 μg

Trace metals	
Calcium	(26%) 264 mg
Iron	(29%) 3.72 mg
Magnesium	(75%) 268 mg
Manganese	(109%) 2.285 mg
Phosphorus	(69%) 484 mg
Potassium	(15%) 705 mg
Sodium	(0%) 1 mg
Zinc	(32%) 3.08 mg
Other constituents	
Water	4.70 g

Link to USDA Database entry [6]

- Units
- μg = micrograms • mg = milligrams
- IU = International units

Percentages are roughly approximated using US recommendations for adults.
Source: USDA Nutrient Database [7]

The almond is a nutritionally dense food and is a rich source of vitamin E, containing 26 mg per 100 g. They are also rich in dietary fiber, B vitamins, essential minerals such as magnesium, copper, manganese, calcium, and potassium as well as monounsaturated fats and polyunsaturated fats (see nutrient table), fats which potentially may lower LDL cholesterol. Typical of nuts and seeds, almonds also contain phytosterols such as Beta-sitosterol, stigmasterol, campesterol, sitostanol, and campestanol, which have been associated with cholesterol-lowering properties.

Preliminary research associates consumption of almonds with elevated blood levels of high density lipoproteins and lower low density lipoproteins.

Almonds may cause allergy or intolerance. Cross-reactivity is common with peach allergens (lipid transfer proteins) and tree nut allergens. Symptoms range from local symptoms (e.g., oral allergy syndrome, contact urticaria) to systemic symptoms including anaphylaxis (e.g., urticaria, angioedema, gastrointestinal and respiratory symptoms).

During the digestion process in humans, almond flour may be fermented into short-chain fatty acids, most notably butyrate which is a substrate for cells lining the large intestine.

Oils

Almond oil in a clear glass vial

Almonds are a rich source of oil, with values ranging between 36 to 60% of kernel dry mass.[8] A study by Venkatchalam and Sathe suggests almonds contain approximately 44% oils, of which 62% is monounsaturated oleic acid (an omega-9 fatty acid), 29% is linoleic acid (a polyunsaturated omega-6 essential fatty acid), and 9% is saturated fatty acid.

"*Oleum amygdalae*", the fixed oil, is prepared from either sweet or bitter almonds and is a glyceryl oleate, with a slight odour and a nutty taste. It is almost insoluble in alcohol but readily soluble in chloroform or ether. Sweet almond oil is obtained from the dried kernel of sweet almonds.

The oil is good for application to the skin as an emollient, and has been traditionally used by massage therapists to lubricate the skin during a massage session.

Almond oil can also be used as a wood conditioner of certain woodwind instruments, such as the oboe and clarinet.

Aflatoxins

Almonds, like other tree nuts, are susceptible to aflatoxin-producing molds. Aflatoxins are potent carcinogenic chemicals produced by molds such as *Aspergillus flavus* and *Aspergillus parasiticus*. The mold contamination may occur from soil, previously infested almonds, and almond pests such as navel orangeworm. High levels of mold growth typically appear as gray to black filament like growth. It is unsafe to eat mold infected tree nuts.

Some countries have strict limits on allowable limits for aflatoxin contamination on almonds, and require adequate testing before the nuts can be marketed to their citizens. The European Union, for example, introduced a mandatory requirement since 2007 that all almond shipments to EU must be tested for aflatoxin. If aflatoxin does not meet the strict safety regulations, the entire consignment may be reprocessed to eliminate the aflatoxin or it must be destroyed.

The almond industry not only tests and processes almonds to ensure infected almonds do not reach the market, the industry also takes steps to prevent sources that cause contamination. These steps include proper orchard management, winter sanitation, early harvest, proper storage among others.Wikipedia:Citation needed

Mandatory pasteurization in California

The USDA approved a proposal by the Almond Board of California to pasteurize almonds sold to the public, after tracing cases of salmonellosis to almonds. The almond pasteurization program became mandatory for California companies in 2007. Raw, untreated California almonds have not been available in the U.S. since then.

California almonds labeled "raw" must be steam-pasteurized or chemically treated with propylene oxide. This does not apply to imported almonds[9] or almonds sold from the grower directly to the consumer in small quantities. The treatment also isn't required for raw almonds sold for export outside of North America.

The Almond Board of California claims "PPO residue dissipates after treatment"; however, the EPA reports "Propylene oxide has been detected in fumigated food products; consumption of contaminated food is another possible route of exposure." PPO is classified by the EPA as a "Group B2, probable human carcinogen."

The USDA-approved marketing order was challenged in court by organic farmers organized by the Cornucopia Institute, a Wisconsin-based farm policy research group. According to the Cornucopia Institute, this almond marketing order has imposed significant financial burdens on small-scale and organic growers and damaged domestic almond markets. A federal judge dismissed the lawsuit in the spring of 2009 on procedural grounds. In August 2009 farmers were appealing.

Cultural aspects

The almond is highly revered in some cultures. The tree originated in the Middle East, and is mentioned numerous times in the Bible.

In the Hebrew Bible, the almond was a symbol of watchfulness and promise due to its early flowering. In the Bible the almond is mentioned ten times, beginning with Book of Genesis 43:11, where it is described as "among the best of fruits". In Numbers 17 Levi is chosen from the other tribes of Israel by Aaron's rod, which brought forth almond flowers. According to tradition, the rod of Aaron bore sweet almonds on one side and bitter on the other; if the Israelites followed the Lord, the sweet almonds would be ripe and edible, but if they were to forsake the path of the Lord, the bitter almonds would predominate. The almond blossom supplied a model for the menorah which stood in the Holy Temple, "Three cups, shaped like almond blossoms, were on one branch, with a knob and a flower; and three cups, shaped like almond blossoms, were on the other...on the candlestick itself were four cups, shaped like almond blossoms, with its knobs and flowers" (Exodus 25:33–34; 37:19–20). Similarly, Christian symbolism often uses almond branches as a symbol of the Virgin Birth of Jesus; paintings often include almonds encircling the baby Jesus and as a symbol of Mary. The word "Luz", which appears in Genesis 30:37, is sometimes translated as "hazel", may actually be derived from the Aramaic name for almond (Luz), and is translated as such in some Bible versions such as the NIV.[10] The Arabic name for almond is "laoz". In some parts of the Levant it is pronounced "loz", which is very close to its Aramaic origin.

References

Footnotes

[1]   Bailey, L.H.; Bailey, E.Z.; the staff of the Liberty Hyde Bailey Hortorium. 1976. *Hortus third: A concise dictionary of plants cultivated in the United States and Canada*. Macmillan, New York.

[2]   Introduction to Fruit Crops (http://books.google.co.uk/books?id=vUXKIkjDtAQC&pg=RA1-PA38), p. 38, Mark Rieger, 2006

[3]   Drought in California likely to benefit local almond producers, Chris Gibson, Sydney Morning Herald, 5 February 2014, p27

[4]   http://www.modbee.com/2014/01/11/3129738/water-battles-loom-as-almond-orchards.html

[5]   Alfredo Flores. " ARS Scientists Develop Self-pollinating Almond Trees (http://www.ars.usda.gov/is/pr/2010/100406.htm)". USDA Agricultural Research Service, April 6, 2010.

[6]   http://ndb.nal.usda.gov/ndb/search/list?qlookup=12061&format=Full

[7]   http://ndb.nal.usda.gov/ndb/search/list

[8]   Search the USDA National Nutrient Database for Standard Reference (http://www.nal.usda.gov/fnic/foodcomp/search/) under "Nuts, almonds". Agricultural Research Service, United States Department of Agriculture.

[9]   Agricultural Marketing Service (2006-11-08) "Almonds Grown in California: Changes to Incoming Quality Control Requirements" (, , and)

[10]   *meaning of trees: botany, history, healing, lore* (http://books.google.com/books?id=g8YSB2K9d1oC&pg=PA37&lpg=PA37& dq=Aramaic+almond&source=web&ots=bUh0oxqLD2&sig=5WxT7GZydOwBr0xzulBblDuZDcE&hl=en&sa=X&oi=book_result& resnum=1&ct=resultThe) by Fred Hageneder, p. 37.

Notations

- ⓔ This article incorporates text from a publication now in the public domain: Ward, Artemas (1911). *The Grocer's Encyclopedia*.

External links

	Wikimedia Commons has media related to ***Almonds (Prunus dulcis)***.
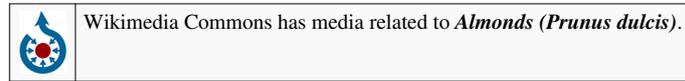
- INC, International Nut and Dried Fruit Council Foundation (http://www.nutfruit.org/)
- Top Almond Producing Countries (http://www.whichcountry.co/top-10-almond-producing-countries)
- Almond Board of California (http://www.almondboard.com/) Resources for almond production and research reports for California
- University of California Fruit and Nut Research and Information Center (http://fruitsandnuts.ucdavis.edu/datastore/?ds=391&reportnumber=612&catcol=2806&categorysearch=Almond)
- The Almond Doctor (http://www.thealmonddoctor.com/) University of California Cooperative Extension Website on Almond Production
- Almond Production Manual (http://books.google.com/books/p/anr_publications?id=3dN5Yw_y8UEC&printsec=frontcover&source=gbs_ge_summary_r&cad=0#v=onepage&q&f=false) Published by University of California Agriculture and Natural Resources, this handbook includes amongst other chapters a history of almonds, trends in orchard management, and almond farm economics.
- CSIC, Spain (http://www.csic.es/web/guest/home) A Government of Spain website for European publications on tree nuts including almonds

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