Agricultural Issues Center
University of California

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Commodity Profile: Almonds

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Overview

The earliest varieties of almonds are native to western Asia. Brought to California by Spanish explorers, it was not until the 1900s that commercial almond production began to flourish in California's Central Valley. By 1977, California had surpassed Spanish production and by 2000, California became the only commercial U.S. producer of almonds, the leading supplier of almonds world wide, and the leading global exporter.

In 2004 the value of U.S. production of almonds exceeded $2 billion, making almonds the second largest fruit and nut crop in the United States, behind grapes (National Agricultural Statistical Service (NASS)). Almonds are produced commercially only in California and remain the leading California agricultural export by value and the leading U.S. horticultural export according to United States Department of Agriculture (USDA) 2004 statistics.

Industry Characteristics

Currently, over thirty varieties of almond trees are grown in California, though only a handful of these are common throughout the state. Typically producers plant multiple varieties of almond trees to capitalize on the beneficial effects from cross pollination and producers rely on bees to fertilize almond blossoms. Nonpareil is the single largest variety planted, representing 38 percent of the total acreage, followed by Carmel (17%) and Butte (11%) (Economic Research Service (ERS)).

The almond tree has an average life span of 20-25 years, and does not bear fruit during the first 3-4 years after planting. Additionally, almond trees are alternate bearing so that a large crop one year is often followed by a lighter crop the following year. Encased in a tough, leathery hull and an inner, protective hard shell, almonds are mechanically shaken from the tree during the fall harvest and sent to handlers to be processed and marketed as a final product. Almonds are either sold as in-shell or as processed, which can include shelling, dry roasting, blanching, slicing, chopping, and conversion into flour, paste or flavorings (ERS). The majority of almonds are shelled

during processing and the excess casings (the hull and shell) are used in the livestock industry for both feed and bedding material.

According to the NASS' 2002 census data, almond production is becoming more concentrated, with a decrease in the number of growers and farms of less than 50 acres and an increase in farms with 100 acres or more. In addition, the number of farms with 750-1,000 acres was the fastest growing of any almond acreage category between 1997 and 2002.

Although the processing industry may be considered concentrated, the number of almond handlers has increased since 1997, likely a result of strong market prices and increased production (ERS). According to the Almond Board of California, 20 percent of the handlers were responsible for 78 percent of the exported crop in 2003. The world's largest almond handler is the Blue Diamond Growers cooperative which is located in Sacramento, California and was established in 1910. Blue Diamond is only one of the 113 handlers in the state in 2005, but is owned by over two-thirds of California growers and markets one-third of California's crop (Blue Diamond and ERS).

As is the case with many U.S. agricultural commodities, the USDA provides federal oversight for the handling of almonds. In 1950, the almond marketing order established the Almond Board of California, which administers the provisions of the order under the supervision of the USDA. Funded by a 2.5 cent "check-off" for each pound of almonds entering the marketplace, the Almond Board uses these funds to expand markets, fund production research, and increase marketing promotion. The almond marketing order also provides regulatory authority on quality control and volume control to help stabilize market conditions. The existence of the order is subject to the will of the growers, who can eliminate the order or amend the provisions by a two-thirds vote.

Demand

The United States is the largest single market for California almonds. However, nearly two-thirds of California production is exported to over 90 countries, making world demand for almonds an essential element of market success. The total U.S. almond export value reached nearly $1.3 billon in 2004. The four largest export destinations for almonds in 2004 were Spain, Germany, Japan and India, as seen in Figure 1, with shipments valued at $211 million, $143 million, $100 million and $92 million respectively. Most almonds are exported as shelled and much of the demand for almonds from Spain and Germany is due to their use of almonds in confectionary industries. The majority of exports to India however, are in-shell, mostly due to India's ability to shell imported almonds with cheaper labor and in turn market a high quality processed product (ERS and FAS). As a result, India has emerged as one of the fastest growing export markets for California in-shell almonds, however the implementation of strict phytosanitary requirements in 2004 restricted U.S. imports into India and prompted negotiations to lessen the impact on the United States industry (FAS).

Demand for almonds is dependent on a number of factors including consumer perceptions and preferences, availability, and relative prices and popularity of competing

nuts. Globally, as per capita income rises in developing countries, market conditions for almonds become more favorable since countries enjoying greater economic prosperity are able to introduce almonds into confectionary and snack variety products.

U.S. per capita consumption of almonds has varied around a generally increasing trend which reached a record of 1.12 pounds in 2004 as seen in Figure 2. In the United States, the majority of almonds are consumed as ingredients in manufactured goods including cereal and granola bars, while remaining consumption takes place in the form of snacks, in home baking, and food service outlets (ERS). The expanding consumer pallet for foreign dishes and a growing Middle Eastern population may also help increase demand for almonds due to the use of almonds in many international cuisines (ERS).

In an effort to increase demand, the Almond Board has become more involved in the research and promotion of the nutritional benefits of almonds. In addition to being a good source of protein, almonds have also been marketed as a good source of vitamin E, dietary fiber and monounsaturated fat—the latter of which has been associated with decreased risk of heart disease (Almond Board of California).

The increased promotion of almonds as a nutritional product and as an ingredient in a variety of food segment areas such as snacks, cereals, confections and desserts has helped to expand marketing opportunities. In more recent years, government procurement programs have become a viable market for almonds (Almond Board of California).

Almonds have remained competitive with other available nuts including peanuts, cashews, pecans, walnuts, hazelnuts and pistachios. According to ERS statistics, in 2003, almonds were the leading tree nut consumed, accounting for 36 percent of total American tree nut consumption. However, many tree nuts provide similar nutritional benefits compared to almonds, making them strong substitutes. High almond prices promote substitution towards alternative nuts, whereas high prices of competing nuts lead to an increased demand for almonds.

Supply

California is responsible for 100 percent of U.S. commercial production of almonds and U.S. imports remain negligible. The trend in production has continued to increase over time. Total value of almond production increased by over $800 million between 2002 and 2004, reaching just over $2 billion in 2004 (Figure 3). Acreage of almonds has continued to increase from 327 thousand acres in 1980 to 411 thousand in 1990. By 2004 the almond crop was produced by over 6,000 growers cultivating 550 thousand acres. The United States remains the world's largest producer, accounting for 48 percent of total world production in 2003, followed by the Syrian Arab Republic with 8.5 percent, Italy with nearly 6 percent, and Spain and Iran with roughly 5.5 percent each (Food and Agricultural Organization of the United Nations (FAO)). The majority of California production is concentrated in the San Joaquin and Sacramento valleys.

Almond supply is affected by a variety of factors including weather, changes in efficiency and technology, and policy action. Poor weather can significantly affect

almond production. In 2003 and 2004, a bad frost resulted in a diminished Spanish crop, causing world supply to tighten and effectively pushed world almond prices upward, allowing U.S. producers to capture a larger share of the global market.

In an effort to control over-supply and stabilize prices in a saturated market, the almond marketing order established the almond reserve. In years where large almond crops are expected to significantly depress prices, the almond reserve can require a percentage of almonds be withheld from handling and diverted to low paying secondary outlets. The Almond Board of California annually makes recommendations to the Secretary of the USDA on the percentage of saleable almonds, if any, to be removed from the market and placed into reserve (Agricultural Marketing Service(AMS)). The reserve has not been used since 1994.

Improvements in efficiency and technology have had a dramatic effect on increasing yields per acre of almonds. Overall yields of California orchards have increased, however, year-to-year yields vary given the alternate bearing nature of the trees. Figure 4 shows this variability, though also it shows increases in yields over time rising from a low of 601 pounds per acre in 1986 to a high of 2000 pounds per acre in 2002. Advances in tree varieties, planting patterns, mechanization and orchard agronomy have been responsible for some of the increased yields per acre and new orchards are estimated to produce 2,000-3,000 pounds per acre

As is inherent in the nature of almond production, almond supply is inelastic. An inelastic supply means that supply does not adjust quickly to price and results in variability in prices. Historically, the almond industry has been characterized by periods of slow growth followed by rapid expansion, which results in long periods of lower farm prices followed by higher prices for a short period of time, as seen in Figure 5.

Current Issues

Although strong demand and shorter supply have kept prices high for almond growers in recent years, much attention will be on future changes to supply and demand and the effect of the recent period of high prices which has promoted industry expansion. Additional concerns include the honeybee supply which is being decimated by mites and caused the price of rented hives to double in 2005, pesticide use as it affects water quality, and environmental concerns regarding production of airborne dust during harvest.

Sources

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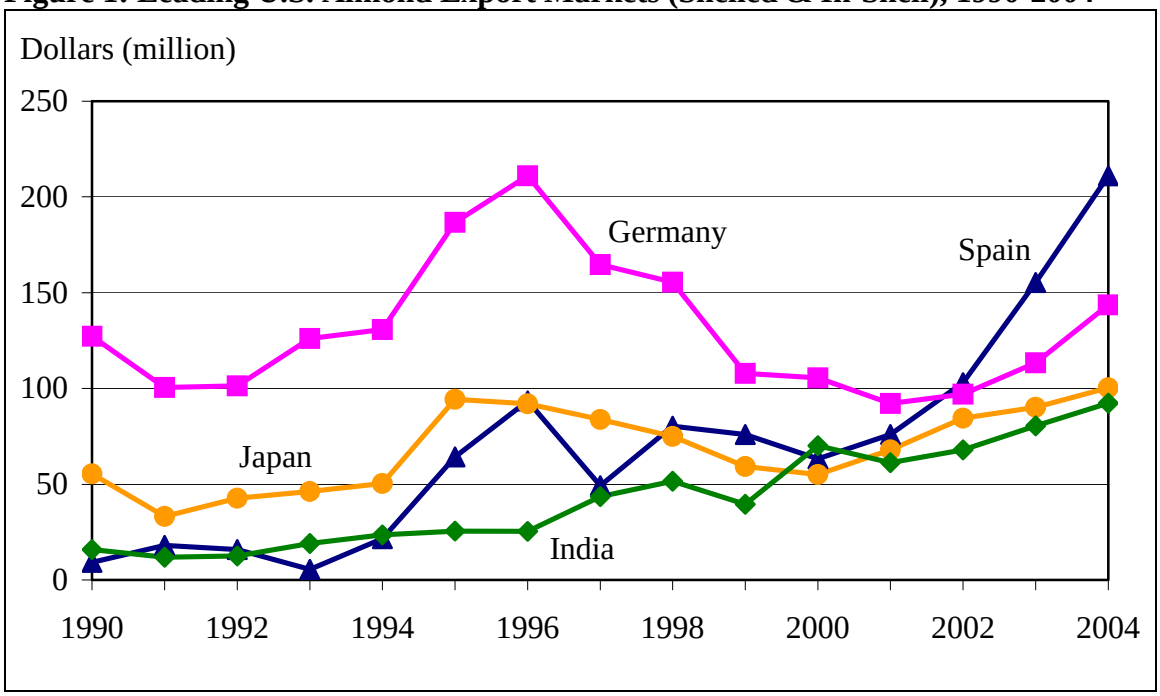
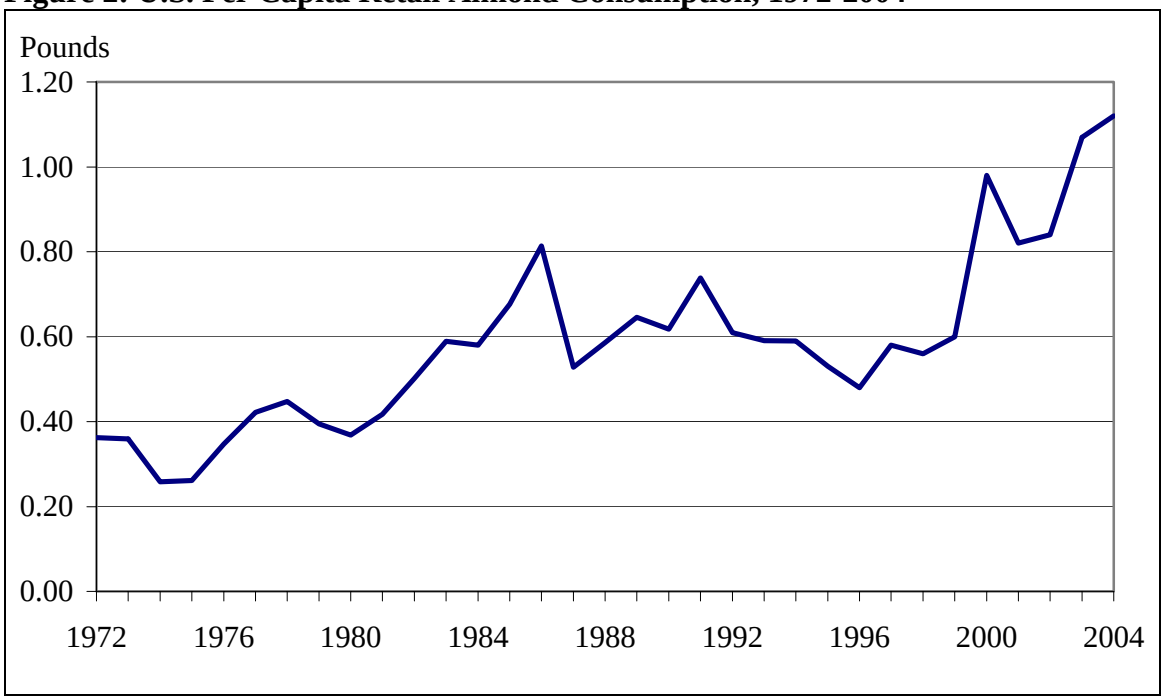
FIGURES

Figure 1: Leading U.S. Almond Export Markets (Shelled & In-Shell), 1990-2004



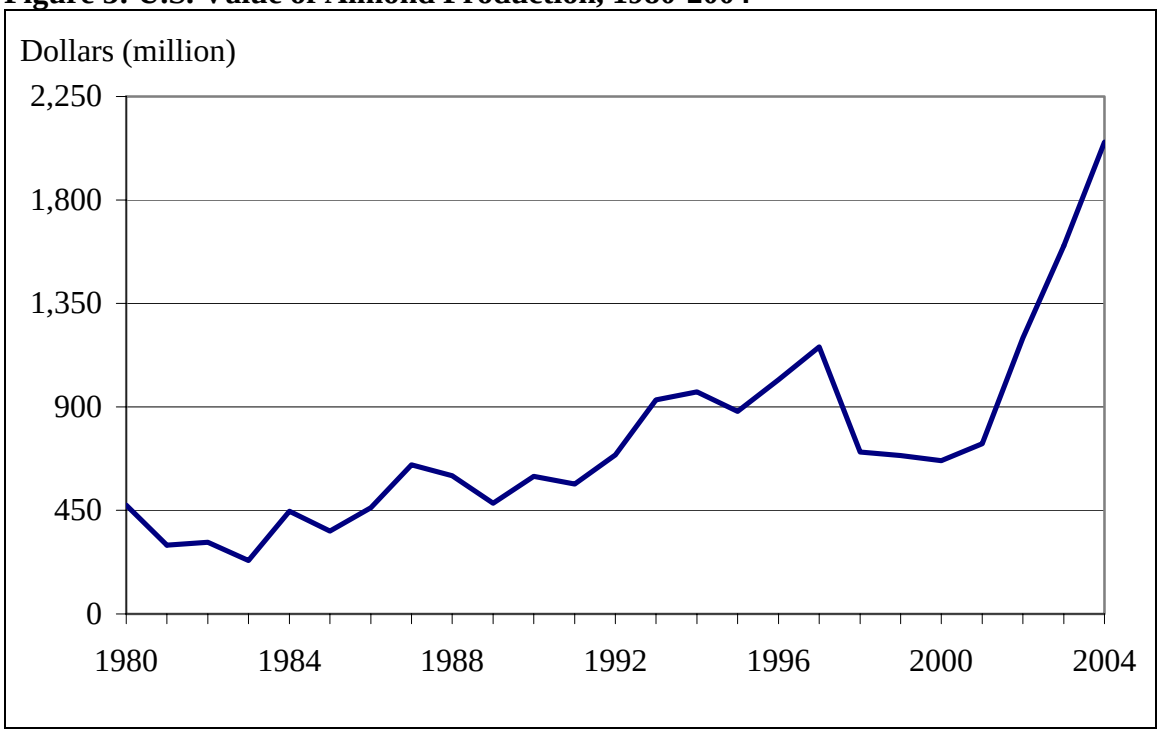
Source: USDA Foreign Agricultural Service

Figure 2: U.S. Per Capita Retail Almond Consumption, 1972-2004



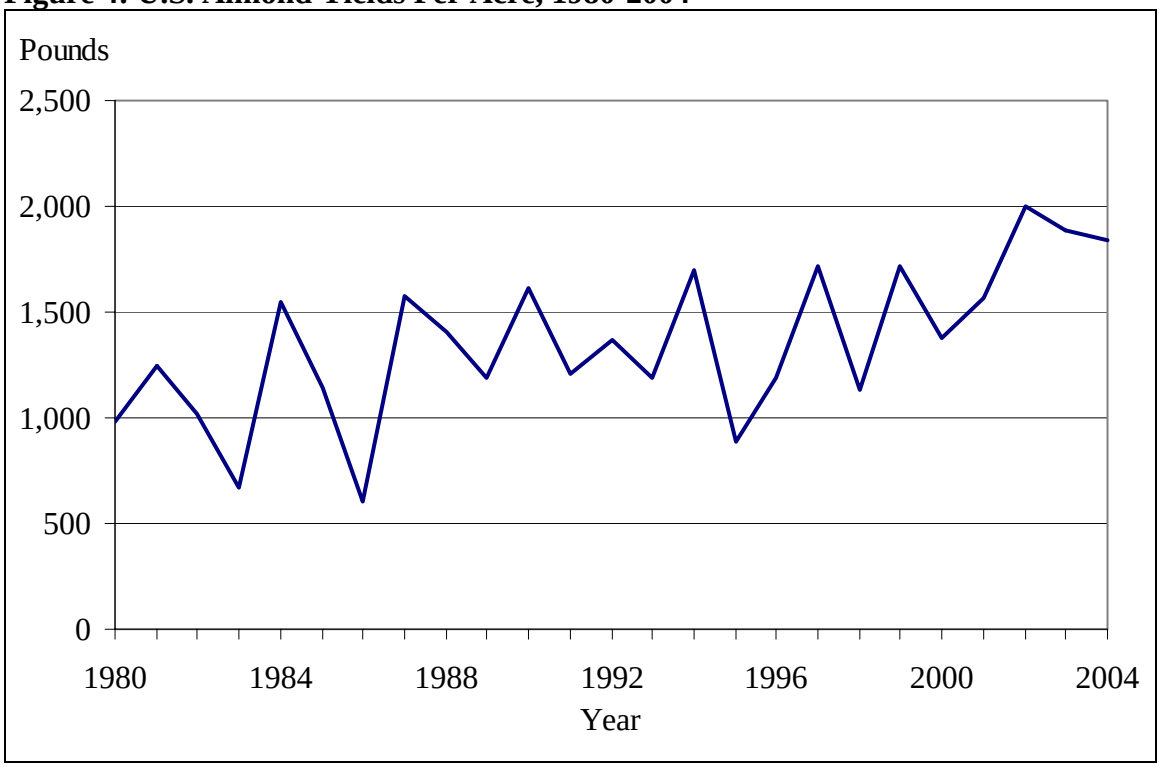
Source: USDA Economic Research Service, Fruits and Tree Nuts Yearbook

Figure 3: U.S. Value of Almond Production, 1980-2004



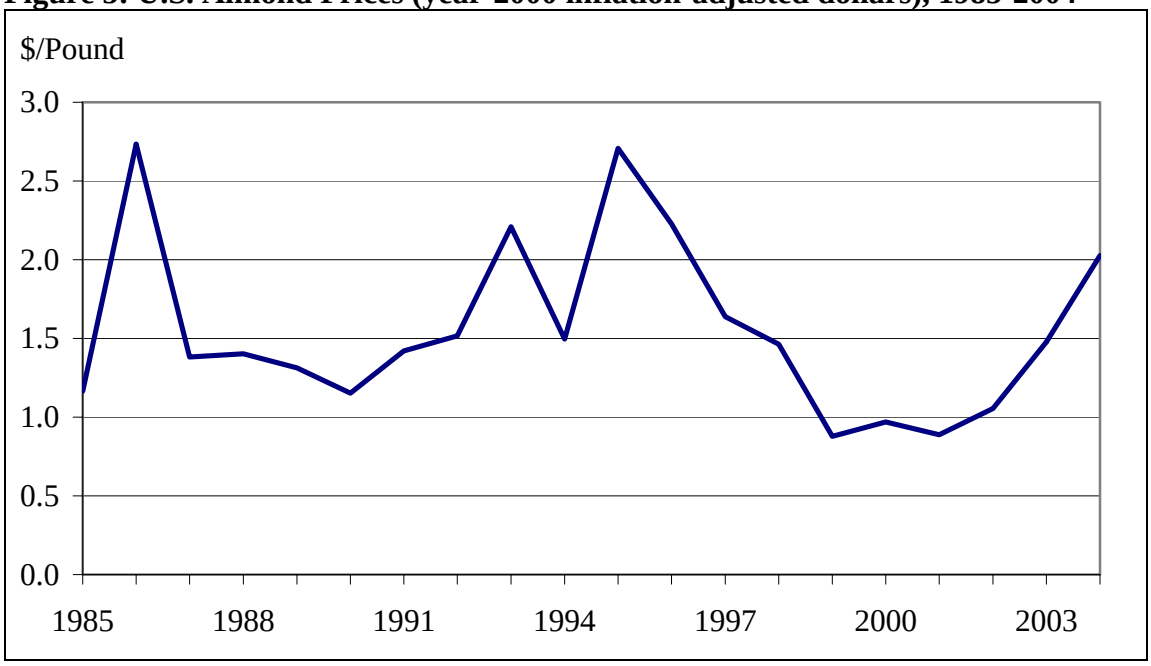
Source: USDA Economic Research Service, Fruit and Tree Nuts Yearbook

Figure 4: U.S. Almond Yields Per Acre, 1980-2004



Source: USDA Economic Research Service, Fruit and Tree Nuts Yearbook

Figure 5: U.S. Almond Prices (year-2000 inflation-adjusted dollars), 1985-2004



Source: USDA National Agricultural Statistics Service