

ALMONDS



Presented by



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ALMONDS



This production summary provides an overview of almond growing, harvesting, and post harvesting practices. There are some common practices that many large commercial growers use when producing almonds and though there are variations in these practices, having an understanding of the most common methods used will be helpful when carrying out regulatory activities.

By the end of this summary, you will be able to:

1. List the three major classifications of almonds.
2. List the world's top almond producing regions.
3. Identify the most common farming practices used in almond production.

INTRODUCTION

There are many cultivars or varieties of almonds that are commercially grown. These generally fall into one of three major classifications: Nonpareil, Butte, and Mission, depending on the size, shape, and 'blanchability' of the nut. The United States is the largest producer of almonds in the world.

Domestically, California is the number one almond producer – nearly all of the almonds sold inside the U.S. come from California (Fig 1). Most California almonds are produced in the San Joaquin and Sacramento Valley regions. There are over 6,000 almond growers in California, who produce nearly one billion pounds of almonds each year!

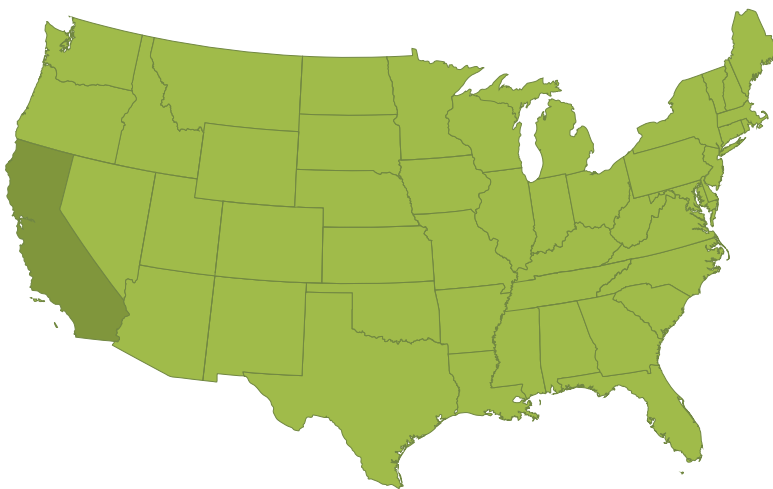


Fig 1 - Top Almond Producing State in the US



GROWING

Almonds thrive in a climate that has mild, wet winters and hot, dry summers. Almonds grow best on deep loam soils consisting of clay, sand, humus or other organic material. This soil type allows for optimal permeability, water retention, and root zone aeration. When preparing to plant a new orchard, growers cultivate the soil to loosen clods and grade the orchard. It is common practice to use a chisel attachment to dig deep down and break up any hardpan below the soil surface to help newly planted trees establish a deep root system.

Specialized equipment is used to form raised beds or individual mounds on which trees will be planted. Irrigation lines are installed. Almond trees start as transplants that have been grafted onto specific rootstocks that are chosen for a particular orchard site with specific local conditions. Factors that are considered when selecting specific rootstocks include anchorage, disease or nematode resistance, yield, nutrient uptake, or tolerance for adverse soil conditions.



Once planted, it takes three to four years for an almond tree to begin producing nuts. The almond tree has an average life span of 20 to 25 years. Once established, trees typically begin blooming mid-February through March. Almond trees are alternate bearing, meaning that a large crop will be followed by a lighter crop the following year.

Almond trees are not self-pollinating and require bees for pollination. The nuts will grow and develop for approximately four months through the summer. Older orchards in California may be irrigated using flood irrigation. Most of the new orchards, however, use drip or sprinkler irrigation systems. These systems allow for greater conservation of water and better control of run-off.

The frequency of water application during the growing season depends on the age of the orchard, the levels of precipitation in the region, and other weather conditions. Drought conditions have very little negative impact on almond trees. In fact, most almond trees benefit from some drought stress. Under dry conditions, the hulls split more uniformly and are less likely to rot. A dry growing season will often result in an early harvest.

Ideally, an almond orchard will be harvested before the start of fall and winter rainy weather, which can lead to pest exposure and potential fungal growth and aflatoxin contamination. Growers gauge the need for various fertilizers through soil and leaf analysis throughout the year. The age of the orchard may also help determine what fertilizers are needed for the growing trees. Fertilizers are typically applied to the root zone when the tree is able to use it efficiently. The first application happens in springtime, with lesser amounts applied during the course of the growing season. Additional treatments may also be applied during the dormant season, depending on the soil conditions.

Common elements for almond orchards include nitrogen, potassium, boron, phosphorous, and zinc. These will be applied in varying proportions, depending on element availability in the soil.

Growers employ many techniques to protect their orchards from weeds, disease, and pests. A common example of weed control used by most commercial almond growers is the application of herbicides. These may be directly applied to weeds or added to the irrigation water. Almonds are susceptible to a variety of different infections, caused by fungus, bacteria, mites, insects, and nematodes. Growers routinely apply fungicides, bactericides, or pesticides at different times in the life cycle of the orchard to protect the trees and developing nuts. Also, growers select specific root stocks that are resistant to certain types of pests. This can reduce the need for certain pesticide applications.



Almonds are harvested between mid-August and October, about two weeks after the last irrigation. Before harvesting almonds, growers clear weeds and other debris from the orchard floor. Almond

trees are shaken with specialized harvesting machinery so that the almonds drop to the ground. Almond growers will either hire an outside harvesting contractor or use their own equipment and crews to shake the nuts to the ground.

It is a dusty job, but dry conditions are paramount to reducing mold and bacterial contamination of the almonds. When the nuts are ready, pick-up machines, as you might expect, “pick up” the nuts from the ground and convey them into carts or trailers that are used to transport the almonds to the huller/sheller.



HOLDING

Almonds usually arrive from the grower in a gondola type trailer. The almonds are offloaded through chutes and passed through a grate which helps remove any large debris. 'Huller' operations produce in-shell almonds as the final product. Almonds are precleaned and the hull is removed by passing the almonds through a series of metal rollers that crack the dried hulls. Hulled in-shell almonds are separated from other debris.

Depending on the capacity of the post-harvest processing operation and the duration of the harvest, it might be necessary to stockpile and hold the almonds prior to hulling and shelling. In that case, the nuts are tarped and fumigated for insect control as they are held in storage.

'Huller/sheller' operations produce shelled almond kernels as the final product. Almonds are precleaned, hulled, and the shell cracked and removed. Almond kernels are separated from broken shells as they are passed along vibrating conveyor screens.

Both in-shell almonds and almond kernels are separated and graded before being packaged and sent to market or on for further processing. Bulk almonds are transported to a warehouse where the almond kernels are stored prior to processing. Almonds are typically stored in bins at about 75°F in a temperature insulated warehouse.



CONCLUSION

Having a basic understanding of the way almonds are grown, harvested, and handled post-harvest will provide the basic background information that will be helpful to regulators when completing inspections or investigations in the field.

The agricultural practices described in this production summary are common on most large commercial farms like those found in major almond producing regions in the United States. There are undoubtedly variations in these practices depending on the region, operation size, and individual grower preferences. This is especially true of farms outside of the U.S.

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