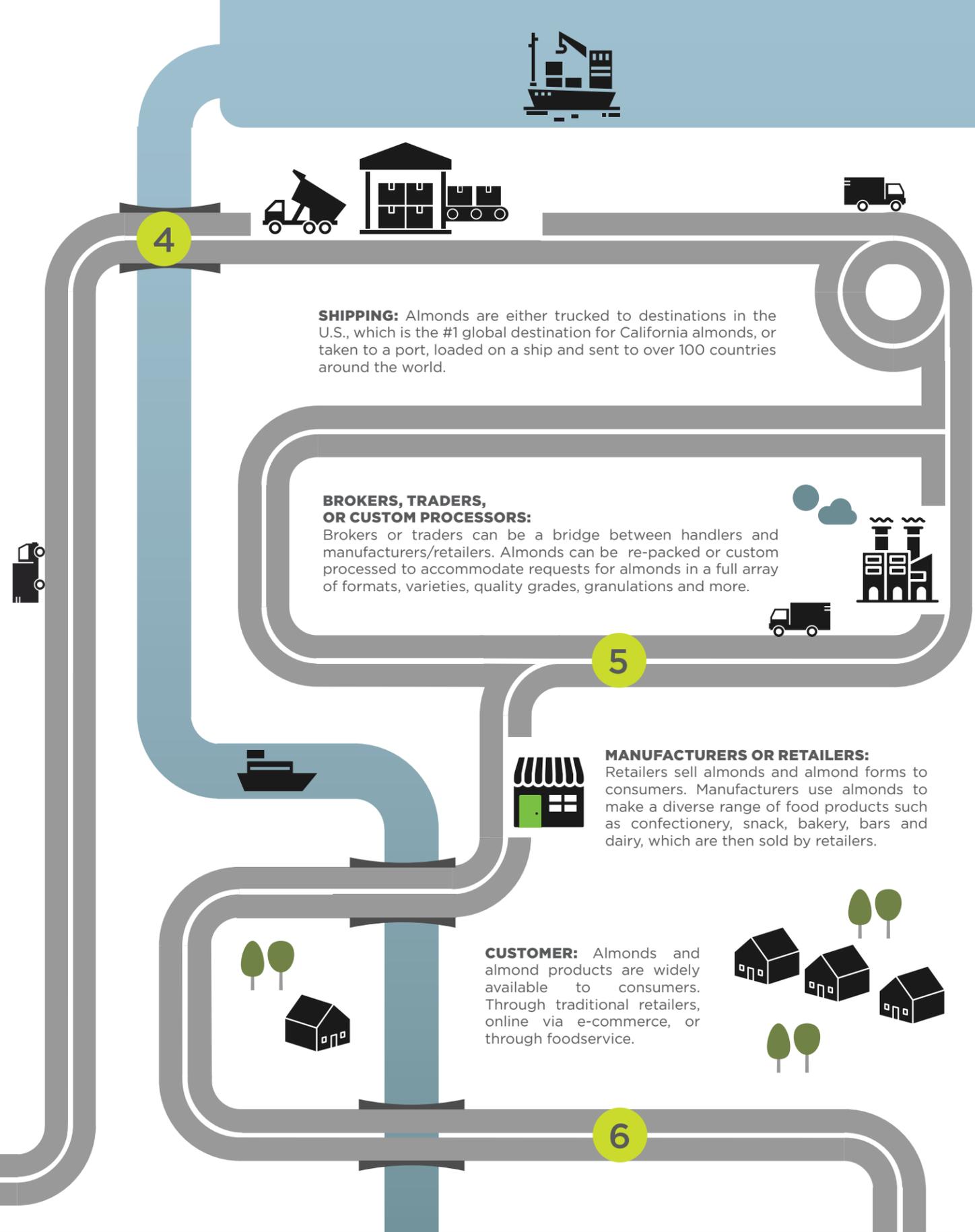
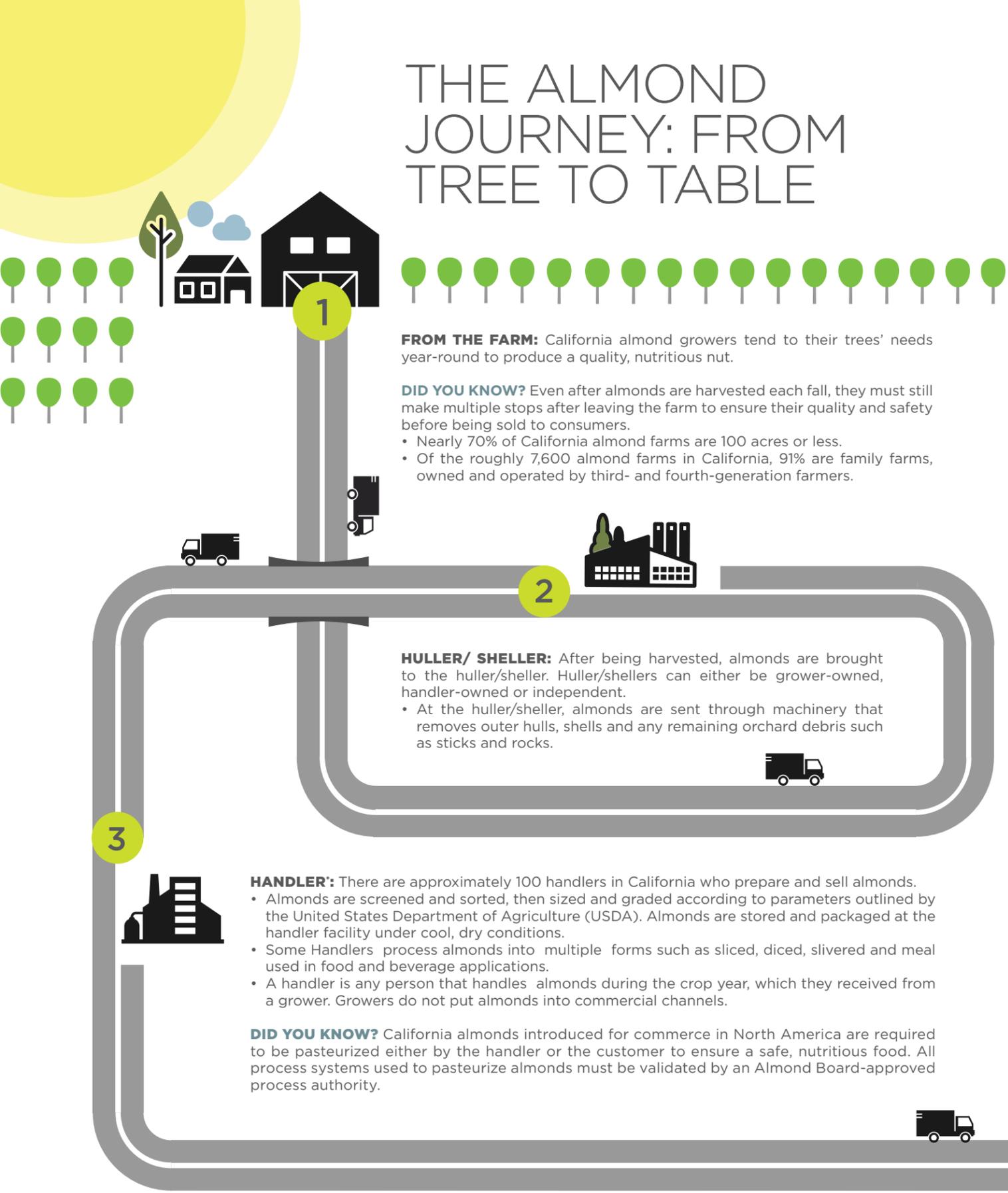


THE ALMOND JOURNEY: FROM TREE TO TABLE



THE ALMOND LIFECYCLE

Almond farmers take a zero-waste approach, ensuring the coproducts—hulls, shells and woody tree material—are put to good use. The trees store carbon and have traditionally been sent to cogeneration facilities to convert wood into electricity at the end of their lives. The shells become livestock bedding, and the hulls are used as dairy feed. With changing markets for these coproducts, the California almond community is spurring innovation for higher value and more sustainable uses. Current research is exploring using almond hull and shell components as a growing medium for mushroom cultivation, produce feed sources for poultry and aquaculture, soil amendments, strengthening post-consumer recycled plastics and creating fuel.

ALMOND TREES GENERALLY PRODUCE FOR 25 YEARS, yielding their first crop three years after planting. Over this lifespan, almond trees annually cycle through multiple stages—all crucial to the development of this valued nut.

1 DORMANCY: NOVEMBER-JANUARY

Almond trees lose their leaves and “rest” during California’s cool, wet winters. Trees store nutrients and energy for next year’s crop. During this time, growers shake and knock any remaining unharvested nuts from the trees to minimize orchard pests.

2 BLOOM AND POLLINATION: FEBRUARY-MARCH

Almond tree buds burst into beautiful white and light-pink blooms. Most almond tree varieties are not self-pollinating, so orchards are planted with multiple almond varieties, and beekeepers bring hives of honeybees to orchards to pollinate the blossoms. Every almond you eat is a result of pollination, and every honeybee that visits an almond orchard gets its first natural food source of the year there, supporting it with a healthy start² as it moves on to pollinate other crops across the nation.

3 GROWING: MARCH-JUNE

Almond kernels mature and grow to full size, with the shell hardening around them—and further protected by a fuzzy outer hull. Once the spring rains stop and the weather heats up, farmers begin irrigating their orchards to support the growing crop, taking great care to ensure each drop of water is used responsibly and efficiently. During this time, green almonds can be harvested for various culinary uses.

4 HULL SPLIT: JULY

Almond hulls split open, exposing

the almond shell and allowing it and the kernel inside to dry. Shortly before harvest, the hulls turn a straw-yellow color and open completely.

5 HARVEST: AUGUST-OCTOBER

Mechanical “shakers” harvest the crop by vigorously shaking the tree, so almonds fall to the ground. Protected by their outer hulls and shells, the almonds then finish drying in the warm California sun for 7-10 days before being swept into rows by a “sweeper” machine. After that, a harvester or “pickup” machine drives over the rows, vacuuming the nuts up into a cart that transports them to the next stop on their journey.

6 HULLER/SHELLER: Almonds arriving from the orchard are typically stockpiled and carefully monitored and/or fumigated to avoid insect damage while the almonds await processing. Almonds are sent through machinery at a huller and sheller to remove outer hulls, shells and any debris such as sticks and rocks.

7 HANDLER/PROCESSOR:

Once almonds arrive at a handler, they are further screened and sorted to remove defects, and they are also fumigated. The almonds are then sized and graded according to parameters outlined by the United States Department of Agriculture (USDA). USDA grades establish minimum tolerances for various quality factors and kernel characteristics. The California almond industry can supply almonds to customers’ unique specifications, based on the intended application. Almonds are stored at



CALIFORNIA IS ONE OF THE FEW PLACES ON EARTH WITH A MEDITERRANEAN CLIMATE characterized by mild winters, a defined rainy season and hot, dry summers—perfect for growing almonds. As a result, California almond acreage has grown over time and represents **nearly 80%** of the world’s almond supply,¹ and almonds are California’s #1 agricultural export.



the handler facility under cool, dry conditions. Prior to shipping, the almonds may be pasteurized based on the customer and market.

8 SHIPPING: After being sized and graded, the almonds are packed, stored and prepared for shipping. Depending on customer specifications and the shipping destination’s regulations, almonds may be further sorted or tested to ensure compliance. California almonds are commonly shipped in 25- or 50-pound cartons, 1-ton fiber bins

or 1-ton “super totes. The almonds are trucked to a port, loaded on a ship and sent to over 100 countries around the world. The U.S. remains the #1 global destination for California almonds; top export destinations include India, Spain, China/Hong Kong, Germany, Japan and United Arab Emirates.

9 STORAGE: Almonds are relatively low-moisture, high-oil-containing nuts with a long shelf life when properly handled and stored. The following recommended conditions

will optimize the shelf life of almonds:

- Store under cool and dry conditions (<15°C/59°F and <60% relative humidity)
- Almond moisture should be maintained within 3% to 6% for optimal stability
- Use packages with good barrier property against water and air transmission, and prevent infestation to maximize shelf life.
- Avoid exposure to light and avoid storing adjacent to materials with extraneous odors

PASTEURIZATION

USDA regulations require that California almonds marketed in the U.S., Canada and Mexico be subjected to a treatment to reduce pathogens and ensure a safe, nutritious food. Several types of validated pasteurization processes effectively eliminate potential contamination in almonds without diminishing the quality, nutritional value or sensory characteristics. These include: Oil Roasting, Dry Roasting, Blanching, Steam, Moist Heat and Propylene Oxide (PPO). New technologies are being identified which expand the treatment options that can be utilized.

1. Almond Board of California. 2019 Almond Almanac. 2019. 2. USDA-ERS. Land Use, Land Cover and Pollinator Health: A Review and Trend Analysis. July 2017.