

Lesson 1 - Mango History & Production

Objectives: After completing this lesson students will be able to:

- Highlight key historical events in the mango industry, and explain the mango's cultural significance
- Describe how the mango is cultivated
- Understand the process of getting fresh mango to the marketplace

Lesson Plan

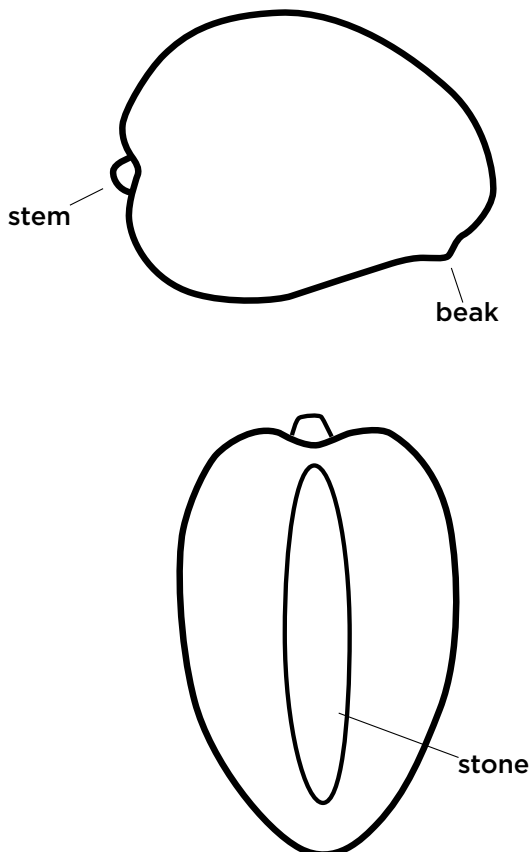
Topic	Suggested Activity	Suggested Time
What is a Mango	Lecture/Discussion	5 minutes
Mango History & Culture	Lecture/Discussion	10 minutes
Mango Production	Lecture/Discussion	10 minutes
Mango Popularity	Lecture/Discussion	5 minutes





What is a Mango?

- Mangos are the succulent, aromatic fruits of an evergreen tree (*Mangifera indica*), a member of the cashew family (*Anacardiaceae*) of flowering plants.
- Botanically, mango is a drupe, consisting of an outer skin, a fleshy edible portion, and a central stone enclosing a single seed – also called stone fruit, like plum, cherry, peach.
- Mango flavor is complex, and may be dominated by the compounds that characterize peaches and coconuts (lactones), generically fruity esters, medicinal or even terpenes, and caramel notes.
 - A ripe mango is known to be 14% sugar by weight and 0.5% acid by weight, with a sugar acid ratio of 28.
 - Generally the sweeter a fruit is, the tastier it is; but even a sweet fruit will seem one-dimensional without some counterbalancing acidity. The vanilla aroma notes in fresh mango rounds out the flavor and makes it more complex.



FUN FACTS

- The species name of the mango is *Mangifera indica*, which means “an Indian plant bearing mangos.”
- The mango is a symbol of love in India.
- The paisley pattern, developed in India, is based on the shape of the mango.
- Mango bark, leaves, skin, flesh, and the pit have been used in folk remedies for centuries.

Mango History & Culture

- The mango is thought to have originated over 5,000 years ago in the Indo-Burma region, which extends from eastern India and southern China across Southeast Asia.
- Mango seeds traveled from Asia to the Middle East, East Africa and South America beginning around 300 or 400 A.D.
- The cultivation of mango began slowly moving westward with the spice trade. The Portuguese, who landed in Calcutta in 1498, were the first to establish a mango trade.
- Spanish explorers brought mangos to South America and Mexico in the 1600's.
- Mango is a staple in the cuisines in all of the tropical and subtropical countries where it's grown, from Southeast Asia to South America.
- There are over 1,000 different mango varieties grown throughout the world.
- The first attempt to introduce the mango into the U.S. came in 1833 to Florida. The mango has had a tumultuous history in Florida, due primarily to weather, minimizing the commercial production of the fruit in the early 1990's.
- A very small percentage of fresh mangos available commercially in the U.S. are grown in south Florida and southern California.



Where Mangos Grow & Seasonality

- Mangos grow in tropical and subtropical climates throughout the world.
- Primary source countries for the U.S. supply: Brazil, Ecuador, Guatemala, Haiti, Mexico and Peru.
- The variety of source countries contributes to the year-round supply of fresh mangos.

Cultivation of a Mango Tree

- Mango trees thrive in tropical and subtropical climates, particularly in places with good rainfall followed by a dry season to stimulate fruit production. Exposure to temperatures below 30° F can kill or severely damage a mango tree.
- A mango tree can reach a height of 60 feet or more with a canopy of 35 feet; commercial mango groves are pruned for manageable husbandry and harvest.
- The leaves on a mango tree are thick, leathery and oblong in shape, with short, pointed ends. Leaves remain on the tree for a year or more. Leaves are purple when young and usually mature to a deep green.
- The mango tree will bear fruit 4 to 6 years after planting and the fruit is harvested once a year.
- Flowers are produced in terminal panicles (loosely branched flower clusters forming a pyramid-like shape) 4 to 16 inches long. Each panicle holds 1500 or more flowers. Each flower is small with white petals and a mild sweet aroma.
- Insects pollinate the flowers and less than 1% of the flowers will mature to form a fruit.
- Mangos can range from 2 to 20 inches in length and from 4 ounces to 5 pounds; their shape can vary from flat, to round, to long and slender.
- The color of the mango's skin depends on the variety. In some varieties, fruits hanging in the sunlight are usually brighter than those inside the canopy of the same tree and can develop a red blush. Skin color is not an indicator of ripeness.
- It takes about 4 months for a mango to mature on the tree; each fruit is harvested by hand.
- Mangos can be raised from seed or propagated by grafting (the joining of a woody shoot from a mature tree with a seedling). A seedling tree will take longer to produce fruit and usually will be more difficult to manage, compared to a grafted tree.





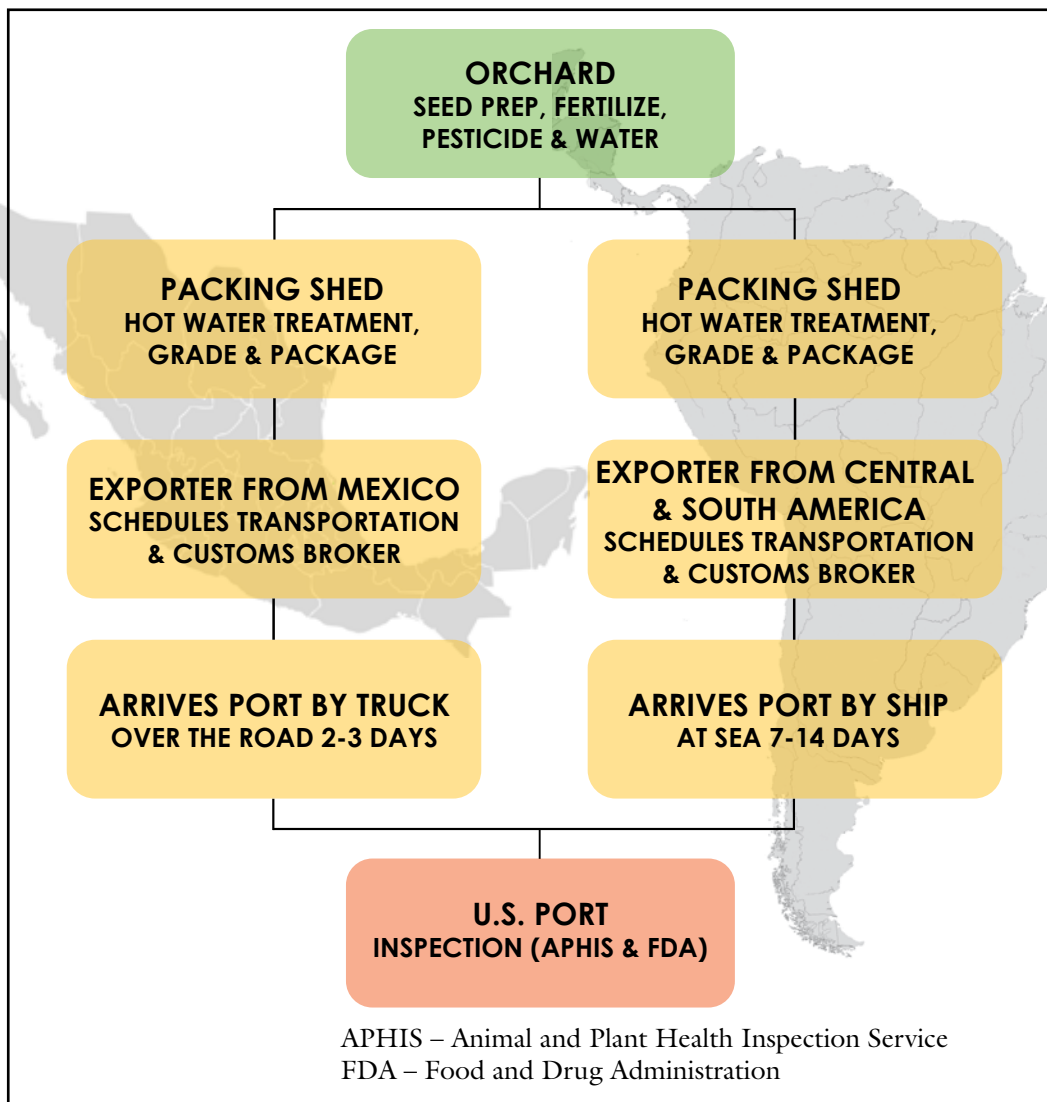
Harvesting & Packing Mangos

- When to harvest is one of the most important decisions a grower faces when it comes to providing the marketplace with superior quality fruit.
- Growers use the following parameters to determine if the fruit is mature and ready to harvest: fruit shape, peel color and texture, flesh firmness, flesh color, and soluble solids.
- Varietal differences, growing regions, climatic conditions and growing practices also influence when the fruit is ready to harvest.
- Mangos are transported to packinghouses as soon as possible and the utmost care is taken to keep them in the shade to protect the quality of the fruit.
- At the packinghouse inspectors review phytosanitary documentation and test each load for fruit fly infestation. Mangos are also tested for maturity and general quality.
- All mangos imported into the U.S. are washed, sized, and undergo a hot water treatment for control of fruit flies. Some mangos imported into the U.S. undergo irradiation, e.g. mangos from India.
- Careful handling of mangos at every stage in the packinghouse helps minimize bruising, cuts and abrasions.
- Mangos are packed in 8.8-pound cartons designed for airflow and to protect the fruit.
- Labeling on mango cartons should provide the following information: mango variety name; count and net weight; source country; special treatments; U.S. contact information.

Transportation

- Depending on the origin, mangos are transported by truck, ship or plane.
- It takes from 1 to 14 days for mangos to travel from the orchard in the country of origin to the U.S. port.

From Tree to Port



Mango Consumption in the U.S.

Mango consumption has grown 32% since 2005 to an estimated 2.47 pounds per year. Import volume for 2012 was 804 million pounds and 2013 is on the way to being even bigger. Consumer demand for fresh mango in the U.S. continues to grow. According to the National Mango Board's 2013 Mango Attitude and Usage Survey, the incidence of eating mango increased from 67% in 2007 and 78% in 2011 to 82% in 2013, with out-of-home consumption and liking mango flavor at high levels. Specifically:

- In 2013, almost all consumers (95%) who have eaten a mango like the flavor.
- Consumers feel mangos are tropical (83%), healthy and nutritious (75%) and a special treat (47%).
- Over half of consumers who have never purchased a mango (51.9%) have eaten a mango at a restaurant.



THE MANGO TREE'S CARBON FOOTPRINT

- The growth of the mango tree causes a process called carbon sequestration - the process of removing carbon from the atmosphere.
- Mango trees absorb carbon dioxide from the environment and use it to form the trunk, branches, leaves and fruit of the mango tree. The tree produces oxygen and releases it into the atmosphere during this process.
- The process of growing, harvesting and transporting mangos to the U.S. generates greenhouse gas. Research studying both the emissions and the sequestration of a typical mango found that in the Mexican states of Nayarit and Sinaloa, the average mango tree could sequester two to two-and-a-half times the carbon that is emitted during growth, harvest and transport to the U.S.
- The average mango tree in the Mexican state of Chiapas could absorb seven times the carbon that is emitted.
- The mango tree produces the delicious mango fruit, while absorbing carbon dioxide, producing oxygen and supporting the livelihoods of thousands of workers.

QUIZ/REVIEW QUESTIONS

1. Mango is a member of the cashew family.
TRUE or FALSE
2. Mangos do not have a seed.
TRUE or FALSE
3. Spanish explorers brought mangos to South America and Mexico:
 - a. in the 1600's
 - b. about 5,000 years ago
 - c. beginning around 300 or 400 AD
4. Mangos thrive only in tropical and subtropical climates.
TRUE or FALSE
5. Name two primary source countries that export fresh mangos to the U.S.

6. Mangos are harvested 6 times a year.
TRUE or FALSE
7. It takes about 4 months for a mango to reach maturity on the tree.
TRUE or FALSE
8. Mangos are harvested:
 - a. by hand
 - b. by machine
9. Consumer research shows that consumers feel mangos are tropical, healthy and nutritious and a special treat.
TRUE or FALSE
10. A mango tree removes two-and-a-half times the carbon than is emitted during the growing, harvesting and transportation to the U.S.
TRUE or FALSE

QUIZ/REVIEW ANSWERS

1. TRUE
2. FALSE
3. a. in the 1600's
4. TRUE
5. Brazil, Ecuador, Guatemala, Haiti, Mexico and Peru
6. FALSE
7. TRUE
8. a. by hand
9. TRUE
10. TRUE



mango.org/foodservice