

Growing California through farming and water

Food Grows Where Water Flows

Farming and water are very important in California, stretching all the way back in history to 1806 and the days before Statehood during the 19th Century..

The Spanish missionaries may have been the first to redirect water from natural flowing streams and rivers to provide water to gardens and fields that surrounded the early Missions. The Mission at Santa Barbara provides a look into water history during a tour of its grounds as visitors are able to view a stone-lined ditch originally dug to carry water captured by a small dam during the Mission's early years.



A sign at Mission Santa Barbara identifies a ditch used to move water.

As the years passed many people lived adjacent to rivers and streams and relied on the flowing water for drinking and household purposes. Farmers would also use these sources of water to provide needed irrigation to grow their crops while some farmers dug wells to bring water from the aquifer to the surface. Many other farmers simply relied on the water provided by rainstorms that would sweep across their fields.

The California Gold Rush during the mid-1800s saw an increase in farming in order to provide food for the explosion of people who came to find their fortunes during the gold boom. Farmers would select which crops to grow depending on their source of water. Those with an available supply of water might choose to plant crops that required water during the growing season. Others would select crops such as wheat and barley that could be dry land farmed with the only water for irrigation provided by rains.

As the calendar moved into the late 1800s and into the next century, more and more regions within California witnessed an establishment of local farms. Imperial Valley farmers in the desert southeast corner of the state realized that a reliable supply of water in combination with warm to hot temperatures allowed them to provide vegetables to markets across the nation while crop production declined in other areas during the winter months.

Imperial Valley

In 1901 the California Development Company began diverting water from the Colorado River to the Imperial Valley via the Alamo Canal. The Imperial Irrigation District was formed in 1911 and acquired the properties of the bankrupt California Development Company. By 1922 the District had acquired an additional 13 mutual water companies and an extensive series of distribution canals that delivered water to farms.

The states of Arizona, California, Colorado, Nevada, New Mexico, Utah and Wyoming entered into the 1922 Colorado River Compact with the United States. The major purposes of this Compact were to divide the use of water from the Colorado River to the signatories. Since the Imperial Irrigation District was already using

water from the river, it had a “perfected right” to 2.6 million acre-feet, resulting in one of the most secure water rights in California. In 2003, with the completion of the Quantification Settlement Agreement that provides for water transfers and supply programs that allow California to stay within its 4.4 million acre-foot basic annual apportionment of Colorado River water, IID’s annual water entitlement was capped at 3.1 million acre-feet.



Today, this reliable supply of water is delivered through the All-American Canal from the Colorado River and has enabled Imperial Valley farmers to grow their crops on a year-round basis. Imperial County farmers harvested 322,589 acres in 2014 and produced a crop and livestock value of nearly \$1.8 billion.

Top left: The All-American Canal delivers water from the Colorado River to Imperial Valley farms.



Bottom left: A drip irrigation line is placed next to plants in this field of kale in the Imperial Valley.

San Joaquin Valley

West Side

Spanish explorers crossed into the San Joaquin Valley in the 1770s from lands bordering the Pacific Ocean. Their recorded writings indicated their belief that the land would be ideal for raising cattle. As years passed and the influence of the Spanish diminished into the 1800s, the land along the west side of the valley attracted more livestock as sheep were introduced to the area. The vast swaths of grazing land and the occasional stream that flowed into the west side provided suitable conditions for the raising of livestock.

Oil was discovered in 1864 near modern day Coalinga and the Southern Pacific railroad soon followed. Communities began popping up and the need for drinking water resulted in some very interesting attempts to quench the thirst of the early settlers. Almost immediately after the railroad stretched into the west side, efforts were undertaken to use tank cars to deliver drinking water.

As time passed the number of cattle declined along the west side and even the sheep that were cared for largely by Basque shepherders from the Spanish Pyrenees migrated to the lands along the rolling hills of the Coast Range Mountains. This shift was caused by more land along the valley floor being turned into small farms of 160 to 320 acres in size. Farmers dug wells to irrigate their crops and by the 1920s cotton became the leading crop grown along the west side. Today the acreage of cotton has dropped as farmers turn to other crops. *(Right: cotton blossom open that later become cotton "bolls"*



containing the cotton fibers that will be harvested for use in making fabrics like t-shirts and denim jeans)

The first deep well was drilled in the region in 1909. More followed as turbine pumps were employed to raise the water from depths of 1,000 feet and more.

California Governor James Rolph signed the Central Valley Project Act of California on Aug. 5, 1933. The plan was to bring water from areas in Northern California that were rich in water through canals to the San Joaquin Valley west side. But the State failed in achieving the needed financing for the Project during the Depression era (1929-1939) and the U.S. Bureau of Reclamation took over the Project and secured initial authorization in 1935 to develop the Northern California waters for use in the San Joaquin Valley.



Filters are used to remove sand and other particles from water before flowing through drip irrigation lines stretched through a nearby field of processing tomatoes.

Improved irrigation technology adopted by farmers

The history of water application to crops has changed over the years as new technology provides ways for farmers to apply just the amount of water that their plants need to grow.

Irrigation wells were initially dug by hand and today mechanical drills are used to reach water levels that are more than a thousand feet under the soil's surface.

Farmers directed the water across their fields from border to border and through furrows between rows of plants. Later, sprinklers were adopted that rose above the plants and would spread the water over a larger area. Most recently the introduction of low-volume irrigation has emerged.

Low-volume irrigation includes both drip and spray emitters that apply the amount of water to the plant that is needed for growth.

East Side

During the mid-1800s and early 1900s, most people opted to settle along the east side of the San Joaquin Valley over the west side because of the available supply of water flowing through the rivers that began in the Sierra Nevada mountains. The hunt for gold in the nearby mountains was also an attraction.

The introduction of cattle to the region established agriculture as a viable industry. The presence of water abundantly flowing through rivers and streams provided an incentive to the planting of wheat and later alfalfa fields to provide feed for the livestock. Farmers began planting other crops in the late 1800s. The arrival of the railroad at this time also spurred an increase in crop plantings in order to fill orders for food in markets in the eastern United States.

The first orange tree was planted in modern day Tulare County in 1860. The region eventually became the leading citrus producing area in California. The growth came as urbanization in Southern California prompted citrus farmers to relocate to the San Joaquin Valley. The same transformation occurred in the dairy industry.

Many of the early farmers dug wells and found water at depths ranging from 20 to 70 feet. Many of these wells provided irrigation water for vineyards of grapes, walnut and almond orchards, and a wide range of vegetables and tree fruit.



Sacramento Valley

The importance of weather, along with water, was very important to the early farming efforts in the Sacramento Valley. John Sutter began building his fort in 1841 in what was to become modern day Sacramento. The crops planted near Sutter's Fort were ruined two years later in 1843 by heavy rains. The crops were also ruined the following year but this time drought was the cause. Sutter received a shipment of 2,000 fruit trees in December 1847, which marked the beginning of the tree fruit industry in the Sacramento Valley.

Many of the farms that were formed in the 1850s were pieced together from land holdings under the previous Mexican government. In addition to orchards of tree fruit, farmers planted wheat and alfalfa to support their cattle and sheep. Many of these farms were located near the rivers and streams that flowed from the Sierra Mountains into the Valley.

John Bidwell, who once worked for Sutter, developed an extensive landholding that totaled 33,000 acres stretching from the Sacramento River eastward to the Sierras. Little Butte Creek ran through his land and provided needed water for livestock and crops. Bidwell developed an experimental orchard in which he eventually grew more than 400 different varieties of trees that could grow in the region. Today, the leading crops grown in the Sacramento Valley are walnuts, almonds and rice.

Rice importance extends to wildlife

Rice has become one of the primary crops planted in the Sacramento Valley with farmers regularly planting about 550,000 acres each year.

Fields are prepared for planting and water is added usually during April to a depth of only 5 inches in each "paddy." Water flows from one paddy to the next to maintain a constant water level across the entire field. The same water can be recycled up to nine times.

During the growing season the rice fields provide habitat to multiple species, including the endangered giant garter snake. Following harvest, more than 1.5 million ducks and 750,000 geese traveling the Pacific Flyway will use the rice fields as a stopover point to rest and feed.



A Black-necked Stilt walks among young rice plants in the Sacramento Valley. (Courtesy: California Rice Commission)

The Wright Act

The Wright Act of 1887 was approved by the California Legislature on March 7, 1887, and it allowed farming regions to form and create irrigation districts when owners of small farms banded together, pooled resources and built the dams and canals needed to get water to their farms. It initially enabled the diverting of waters from the Merced, San Joaquin and Kings rivers in California's Central Valley. The first irrigation district formed under The Wright Act was the Turlock Irrigation District in 1887. It is one of only four irrigation districts in California that provides irrigation water as well as electric retail energy directly to homes, farms and businesses.



Right: Assemblyman C.C. Wright, author of the Wright Act