

Lesson 3: Agriculture in San Diego

Focus Question: What farm products are produced in San Diego?

Explain to students that one of San Diego's most important **natural resources** is its soil. Agriculture (farming) is the raising of crops and farm animals for sale. Agriculture in San Diego is a big business. A business is an activity in which workers make or sell goods for others. People in the agriculture business are the **human resources** that grow and sell the crops. They also need **capital resources or money** to buy land, water and equipment.

Activity #1 San Diego's Agriculture is Different.

San Diego County's agriculture is a billion-dollar industry. A top producer of nursery products, flowers, foliage plants, and avocados, San Diego is the 20th largest agricultural producer in the nation. San Diego's soil and the differing topography, the water, the size of the farms, and the climate all make San Diego's farms **different** from farms throughout California and the country.

Ask students, "What do you think makes farming in San Diego different from other parts of California and the country?"

Explain to students the word *farm* usually brings to mind rich soil, plentiful water, and large acreages of land. But in San Diego the word farm often means poor soil, scarce water, and small acreages.

Farms throughout California and the Country	Farms in San Diego County
Rich soil	Poor soils – steep terrain and the soil is easily washed away.
Plentiful water	Water is scarce and expensive
Large acreages. The average farm size in California is 373 acres.	More than half the farms of San Diego are 9 acres or less. Most of the rest are 49 or fewer acres.

Poor Soil

San Diego farmers do well even though the soils are poor. Only a small amount (about 6%) of the county's soils are considered good for agricultural use, and some of that is already built over with houses. As a result, most of the existing agricultural use occurs in poor soils. Much of the soil here is considered of poor quality because the terrain is steep and the soil is easily washed away.

Water is Scarce and Expensive

Ask a San Diego farmer what the highest cost on the farm is, and the answer is likely to be "water." San Diego growers pay some of the highest prices in California for imported water. Although some parts of the county have groundwater supplies, many farmers must rely on water that is piped in from the Colorado River and Northern California-- and that water is expensive. However, San Diego farmers are known for their low- use irrigation methods and their ability to grow crops with the least amount of water.

Small Farms, But Numerous

You may have driven right by a farm in San Diego County without even noticing it. That is because the farms in San Diego are small.

- More than half (65%) of the farms in San Diego are nine or fewer acres (4,298 of the 6,565 farms in the county are fewer than nine acres).
- Almost every farm (90%) is 49 or fewer acres.
- San Diego has the second highest number of farms in the country.
- San Diego has the highest number of small farms in the country.
- The number of small farms in San Diego County is increasing.
- While the farms are growing in number, they are getting smaller.

Writing Contrast Sentences

Using the above information, have students write sentences to contrast the farms in San Diego to most farms in California and the country.

Explain to students that writers use certain **signal words** when they write *contrast* sentences. Duplicate the following chart on chart paper:

Signal words when you write contrast sentences:

but	different	yet	does not appear
however	instead	otherwise	even though
in contrast			

For example:

- The farms in San Diego have poor soil. This is **different** from most farms throughout California and the country.
- Farms usually have a lot of water. **In contrast**, farms in San Diego have to get most of their water from the Colorado River or Northern California.
- More than half the farms in San Diego are less than 9 acres, **however**, the average farm in California is 373 acres.

Have each student write at least one contrast sentence and share it with the class.

Activity # 2 Top Farm Products in San Diego

Materials needed: For each student, copies of **San Diego's Ranking Among Counties in the United States** (Handout # 3.1) For each group of students, a copy of a map of the San Diego County Region.

San Diego is nationally ranked in many of the crops that it grows. Working in groups, have students brainstorm a list of what they think are the top farm products (commodities) grown or raised in San Diego County.

Provide each student with a copy of **San Diego's Ranking Among Counties in the United States (Handout # 3.1)** Review the list and have the students underline each farm product listed. The farm products include:

nursery and greenhouse crops	eggs	oranges
mushrooms	chickens	vegetables
sod	strawberries	sweet corn
avocado	grapefruit	melons

Have students compare their list with Handout # 3.1.

San Diego ranks 16th in the value of fruits, nuts and berries sold. Look over the list of farm products. **Sort the farm products on Handout #1 according to fruits, nuts, and berries.**

Not every farm product on the list is used for food. Make a list of farm products that are not eaten (nursery and greenhouse crops and sod).

- What are nursery and greenhouse products? (People use plants to decorate their home and yard and they buy flowers for special occasions.)
- Why do people buy sod? (Sod is used for lawns and for fields used for sports such as soccer.)

Explain to the students that most farms are specialized. They produce one or two main crops.

Locate the following areas on a map of San Diego County.

- **Encinitas** is home to many nursery and flower growers, including Ecker Ranch, world-renowned for its poinsettias. Moderate coastal temperatures make the area ideal for raising indoor nursery products.
- **Fallbrook** has many avocado groves.
- **Valley Center** has a variety of citrus and other orchard crops.
- The **San Pasqual Valley** growers raise everything from citrus to strawberries.
- **Julian**, located in the mountains, is known for its apples.
- The desert area has successful citrus operations.

The City of San Diego is California's second largest city and the nation's sixth. Land prices are high. Although it might not seem like a good place to grow some crops, San Diego farmers have specialized in mixing agricultural activity and urban living. Farmers grow crops like nursery products and flowers, so they don't need hundreds of acres to make a living. These crops bring a high dollar value per acre. San Diego crops earn more dollars per acre than most other regions of California or the nation.

Marketed Locally

While San Diego growers do a great business exporting their products to other places, many of the fresh fruits and vegetables grown in the County stay here, ending up on the local dinner plate. San Diego has 24 certified farmers markets where growers can sell their produce. And, there are dozens of roadside stands and "you pick" farms. In fact, San Diego ranks 19th nationally among counties in the value of products sold at farmstands, farmer's markets and other places where the products bought will be directly consumed.

Ask students: Where do we get the food we eat that is not grown in San Diego County?

Activity # 3 San Diego's Climate affects Agriculture

Materials needed: For each student, a copy of the **Daily Weather Log** (Handout # 3.2).

Definitions: **Climate** is defined here as the meteorological conditions, including temperature, precipitation and wind, that characteristically prevail in a particular region. **Weather** is the state of the atmosphere at a given time and place. A **region** is a large, indefinite portion of the earth's surface. In this unit, the region is defined as San Diego and the surrounding area.

Ask students:

- What is the climate of San Diego? (warm, mild winters and cool, dry summers, semi-arid with little rain occurring throughout the year)

- What are the temperature ranges? (San Diego’s average annual temperature is 63 degrees)
- How much precipitation falls annually? (The average rainfall is 10 inches annually)
- What are the wind conditions?

Have students keep a **Daily Weather Log** (Handout # 3.2) of the temperature, relative humidity, precipitation, and the air quality index to explain some of the factors that affect weather in San Diego. Local newspapers report on local weather conditions and are a good source for the weather log. (Optional topics to include are wind velocity and direction and dew point.)

Ask students: How does the local environment change as the seasons change?

Knowing the environment of an area throughout the year, such as climate, availability of water, types of plants and animals is important in understanding the lifestyles of the people. In San Diego, the sun shines 70 percent of the time. The warm Pacific Ocean waters help San Diego to be one of the mildest areas in the world. San Diego has the ideal climate to raise many crops. While the growing seasons in San Diego tends to be long, in some parts of the county the season is year-round. With its many microclimates and farming areas, San Diego growers raise more than 100 different crops and commodities throughout the region.

Activity # 4 San Diego’s Agriculture is Constantly Changing

In 1927, the first year statistics were available, San Diego growers planted mostly field crops. The most valuable crops produced were lemons, canning tomatoes, celery, alfalfa hay, table grapes and navel oranges. The entire cut flower production was estimated to have a value of just \$1,000.

Farming in San Diego today is very different. Hay is one of the county's least valuable crops, and table grapes do not even appear in recent crop reports. As markets and farming conditions have changed, so have the kinds of crops grown. Instead of celery, herbs are now one of the most valuable vegetable crops grown here. San Diego's nursery and flower production has grown and accounts for more than 60% of the County's agricultural value.

Then	Now
Lemons, canning tomatoes, celery, alfalfa hay, table grapes, navel oranges	Nursery plants, flowers, avocados, herbs, citrus such as grapefruit and oranges, apples, strawberries, sod, mushrooms, eggs, chickens, vegetables, sweet corn, melons

Using the **signal words** to write **contrast sentences**, introduced in Activity # 1, have each student write a *contrast* sentence to tell about agriculture in San Diego “Then” and “Now.”

San Diego agriculture is clearly a successful industry and vital to the region's economy. Can it remain that way? Weather, the availability of water, and pest infestation will always pose some threat. In addition, the ruling by the United States Department of Agriculture (USDA) to allow the importation of Mexican avocados may affect San Diego's industry.

Based on past performances, the future looks bright. The county's domination in the production of nursery products, flowers and foliage is extensive. Growers continue to explore new markets, such as herbs and other gourmet products. The agricultural industry is likely to be successful and to remain a big business in San Diego's economy.

Activity # 5 Write a Circle Book Page about Agriculture in San Diego

Materials Needed: For each student, a copy of the **Circle Book Writing Template** (Handout # 3.3) (Note using a light-colored paper will make the final project more vibrant.)

ASSESSMENT: Economic Resources of San Diego – a Circle Book

Prompt: Create a “circle book,” *The Economic Resources of San Diego*, with one page describing the significance of each of the following top four industries in San Diego:

- Agriculture
- Manufacturing
- Military and Defense
- Tourism

Rubric

Indicator: Historical Interpretation and Analysis of Significance

Recommended Correlation: Information/Expository Writing Rubric

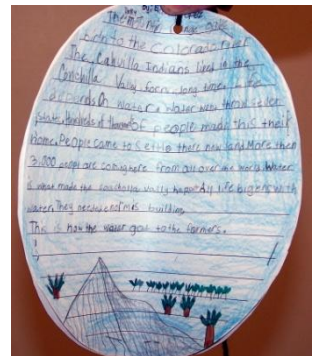
Procedure:

Using the **Circle Book Writing Template** (Handout #3.3), have each student write and illustrate information he/she learned about agriculture in San Diego.

Do not cut out the circle at this time. **Keep the copy of the circle page.** Three more pages will be written during the next lesson and then the circle book will be assembled. The completed circle books will tell the story of the *Economy of San Diego*.

Assessment

The major assessment for this unit is to create a **Circle Book – The Economic Resources of San Diego**. In this lesson, students write and illustrate the first page of the Circle Book with information learned about agriculture in San Diego.



Additional assessment for this lesson occurs throughout the lesson. The focus question provides a framework for evaluation of the lesson. Student work to be assessed includes:

- Write at least one contrasting sentence to explain how San Diego’s agriculture is different from the rest of California and the country (Activity #1)
- With classmates, brainstorm a list of the top farm products (commodities) grown or raised in San Diego County and compare their list with **San Diego’s Ranking Among Counties in the United States** (Activity # 2, Handout # 3.1).
- On a map of San Diego County, work with group members to locate some of the agriculture areas (Activity #2).
- Keep a **Daily Weather Log** (Handout # 3.2) of the temperature, relative humidity, precipitation, and air quality index to explain some of the factors that affect weather in San Diego (Activity #3).
- Using the signal words introduced in Activity # 1, write a contrasting sentence to tell about agriculture in San Diego “Then” and “Now” (Activity #4).

San Diego's Ranking Among Counties in the United States

Ranking	Commodities –San Diego County
1 st	value of nursery and greenhouse crops, mushrooms and sod (grass) sold
1 st	number of small farms (under 10 acres)
1 st	avocado acreage and production
2 nd	number of farms (6,565)
6 th	market value of farm land and buildings
6 th	the number of horses and ponies
7 th	in hens and pullets for laying eggs
8 th	the number of chickens (3 months or older)
8 th	pounds of strawberries harvested for sale
9 th	pounds of grapefruit produced
9 th	agricultural production in California (20 th in the nation)
10 th	value of crops sold, including nursery and greenhouse crops
17 th	the amount of money (net cash return) received from agricultural sales
19 th	the value of products sold at farmstands, farmer's markets and other direct consumption outlets
19 th	the amount of land in orchards
19 th	pounds of oranges produced
20 th	market value of agricultural products sold
28 th	value of vegetables, sweet corn and melons sold

Climate of San Diego - a Daily Weather Log

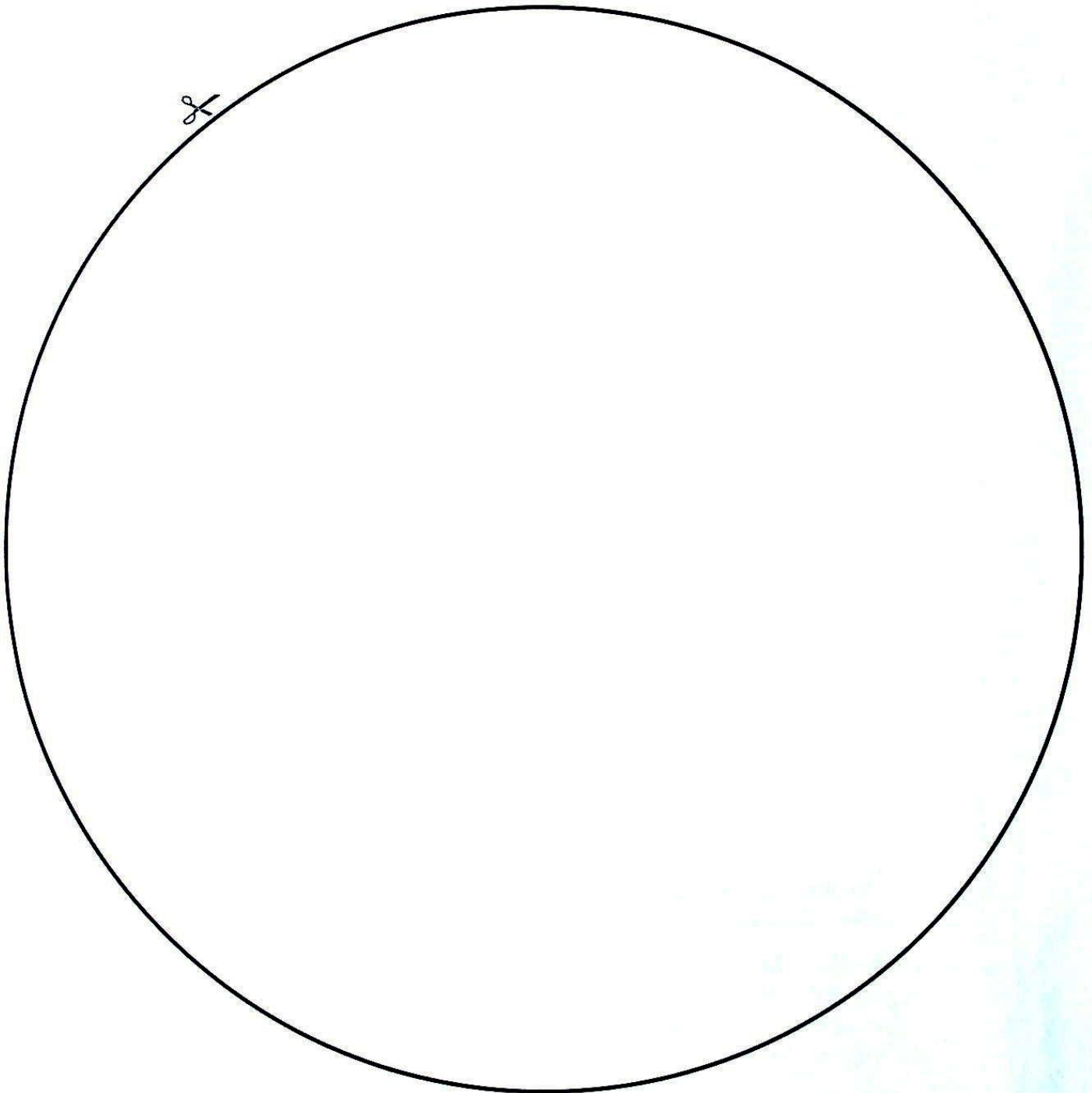
Keep a **Daily Weather Log** of the temperature, relative humidity, precipitation, and the air quality index to explain some of the factors that affect weather in San Diego.

Local newspapers report on local weather conditions and are a good source for the weather log. Complete as many columns of the chart as possible.

Date/Time	Location	Temperature	Relative Humidity	Precipitation	Air Quality Index

Name _____ Date _____

Circle Book Writing Template



Teacher Background

San Diego Agriculture - Not Your Average Farm

Different. That's what San Diego agriculture is.

In many parts of the country the word farm brings to mind rich soil, large acreages, plentiful water, and green fields. But in San Diego the word farm often means poor soil, small acreages and scarce water.

And it works! San Diego agriculture is a billion-dollar industry, the fourth largest in the county. In fact San Diego agriculture is so vibrant that it ranks 10th in the nation for the value of agricultural products sold. What makes San Diego farming different and why is it so successful? Water, climate, the soil, the size, the differing topography—all make San Diego's farms unique from their counterparts throughout California and the country.

Poor Soil

San Diego farmers have prospered despite the poor soils characteristic of this county. Only about six percent of the county's soils are considered prime for agricultural use, and some of that acreage is already urbanized or unsuitable for other reasons. As a result, most of the existing agricultural use occurs in non-prime soils. Much of the soil here is considered of poor quality because the terrain is steep and the soil is errodible.

Expensive Water

Ask a San Diego farmer what the highest cost on the farm is, and the answer is likely to be "water." San Diego growers pay some of the highest prices in the State for imported water. Although some parts of the county have ample groundwater supplies, many farmers must rely on water that is piped in from the Colorado River and Northern California-- and that water is expensive. In fact, agricultural water rates in the County Water Authority are more than 30 times those of the Central Valley Project or Imperial Irrigation District. As a consequence, San Diego growers can not compete with other counties in growing water-intensive crops like alfalfa and Sudan hay, two of the largest crops grown in neighboring Imperial County, where water is cheap. If you want to farm in San Diego County the high cost of water makes irrigation efficiency one of your top priorities. San Diego farmers are known statewide for their low- use irrigation methods and their ability to grow crops with the least amount of water. The county's level of efficiency is extremely high when compared to other agricultural areas in California and has increased over the past five years. While the value of agriculture continues to rise steadily, agricultural water use has fallen from its peak in 1990, at 122,297 acre-feet, to just 56,069 acre-feet in 1995.

Climate

San Diego shares its latitude with Bermuda, Shanghai and Casablanca. Combine that location with the warm Pacific Ocean waters and you have one of the most temperate regions in the world. With an average annual temperature of 63.2 degrees and sunshine 70 percent of the time, San Diego has the ideal climate to live and raise many crops. And there are many sub-climates within the county. While most growing seasons here tend to be long, in some parts of the county the season is year-round.

Some weather stations along the coast have never recorded a freezing temperature! Moderate coastal temperatures make it ideal for raising indoor nursery products, keeping cooling and heating costs down. Encinitas is home to many nursery and flower growers, including Ecker Ranch, world-renowned for its

poinsettias. Head northeast from there and you will find many of our avocado groves in Fallbrook and a variety of citrus and other orchard crops in Valley Center. A quick trip south takes you to the spectacular views of the San Pasqual Valley, where growers raise everything from citrus to strawberries. Apples in the mountains of Julian will mark your trip east, just before you drop down into the seemingly inhospitable desert and its successful citrus operations. With its many microclimates and farming areas, San Diego growers raise more than 100 different crops and commodities throughout the region.

Small But Numerous

You may have driven right by a farm in San Diego County without even noticing it. That's because the farms are small. Of the 6,565 farms in the county, 4,298 of them, or 65%, are nine or fewer acres. Ninety percent are 49 or fewer acres. In fact, San Diego has the second highest number of farms in the country and the highest number of small farms! The number of small farms in San Diego County is increasing, from 3,522 in 1982 to 4,298 in 1992. While the farms are growing in number, they are getting smaller--from an average of 101 acres in 1982 to 79 in 1992. That's less than one-quarter of the statewide average farm size of 373 acres.

Urbanized

The City of San Diego is California's second largest city and the nation's sixth. The county's population is increasing, surpassing 2.7 million people and placing it fourth in counties in the nation. This number includes the residents of 18 incorporated cities as well as a large unincorporated area. Land prices are high and soil conditions are sometimes poor.

Although it might not seem like the ideal place to grow some crops, San Diego farmers have specialized in integrating agricultural activity and urban living. Farmers grow crops with a high dollar value per acre, like nursery products and flowers, so they don't need hundreds of acres to make a living. San Diego far surpasses its fellow top-ten producing counties in terms of average dollar value per acre. And compare San Diego's agricultural production to other urbanized areas of California, such as San Francisco and Los Angeles, and you will find it is more valuable than both of those counties combined.

Marketed Locally

While San Diego growers do a great business exporting their products to other places, many of the fresh fruits and vegetables grown in the County stay here, ending up on the local dinner plate. San Diego has 24 certified farmers markets where growers can sell their produce, not to mention dozens of roadside stands and "you pick" farms. In fact, San Diego ranks 19th nationally among counties in the value of products sold at farmstands, farmer's markets and other places where the products bought will be directly consumed.

Constantly Changing

In 1927, the first year statistics were available, San Diego growers farmed a little more than 97,000 acres, with 64,500 of those acres planted in field crops. The population was on the rise, reaching 209,659 by 1930, an increase of 87% from 1920. The most valuable crops produced were lemons, canning tomatoes, celery, alfalfa hay, table grapes and navel oranges. The entire cut flower production was estimated to have a value of just \$1,000.

Farming in San Diego today is vastly different. Growers now cultivate more than 169,000 acres of land. Hay is one of the county's least valuable crops, and table grapes do not even appear in recent crop reports. As markets and farming conditions have changed, so have the kinds of crops grown. Instead of

celery, herbs are now one of the most valuable vegetable crops grown here. San Diego's nursery and flower production has prospered and currently accounts for more than 60% of the County's agricultural value.

A Thriving Industry

San Diego agriculture is clearly a successful industry and vital to the region's economy. Can it remain that way, considering the many pressures placed on the county's farmers? Weather and pest infestation will always pose some threat. In addition, this year's ruling by USDA to allow the importation of Mexican avocados may affect San Diego's industry. But based on past performances, the future looks bright. San Diego agriculture has posted an increase in value in eight of the past ten years and has shown an overall increase of 94% during that same period. The county's domination in the production of nursery products, flowers and foliage is extensive, with local growers producing more than 30% of the state's total value. Take flowers and foliage alone and the figure is staggering--almost 46% of the state's production. Growers continue to explore new markets, such as herbs and other gourmet products. Although the agricultural industry will probably change in the next century to meet what ever demands are placed upon it, it is likely to be successful and to remain an integral part of San Diego's character and economy.

http://www.sdcounty.ca.gov/reusable_components/images/awm/Docs/stats_sdagriculture.pdf

Nationally Significant

San Diego is nationally ranked in many of the crops that it grows. Among counties in the United States, San Diego ranks:

- 1st in value of nursery and greenhouse crops, mushrooms and sod sold.
- 1st in number of small farms (under 10 acres).
- 1st in avocado acreage and production.
- 2nd in number of farms (6,565).
- 6th in market value of land and buildings.
- 6th in the number of horses and ponies inventoried.
- 7th in hens and pullets of laying age inventoried.
- 8th in the number of chickens (3 months or older) inventoried.
- 8th in pounds of strawberries harvested for sale.
- 9th in pounds of grapefruit produced.
- 9th in agricultural production in California (20th in the nation).
- 10th in value of crops sold, including nursery and greenhouse crops.
- 16th in value of fruits, nuts and berries sold.
- 17th in net cash return from agricultural sales.
- 19th in the value of products sold at farmstands, farmer's markets and other direct consumption outlets.
- 19th in the amount of land in orchards.
- 19th in pounds of oranges produced.
- 20th in market value of agricultural products sold.
- 28th in value of vegetables, sweet corn and melons sold.