

Commodity Fact Sheet

Rice

Information compiled by the California Rice Commission

How Produced – In March, farmers begin to prepare their fields for planting. Fields are carefully leveled with precision, GPS-guided grading equipment. Level fields allow rice farmers to conserve water. Fertilizer is then added, and shallow furrows are rolled into the field. Next, rice seed is soaked and loaded into planes. Flying at 100 miles per hour, planes plant the fields from the air. The heavy seeds sink into the furrows and begin to grow. The high-tech land leveling and recirculating irrigation systems have allowed farmers to maximize yields and improve water use efficiency by more than one-third in the last 30 years.

It takes rice plants four to five months to reach maturity. The rice grows rapidly, ultimately reaching a height of three feet. By September, the grain heads are mature and ready to be harvested. On average, each acre will yield more than 8,000 pounds of rice. Farmers drain the fields and use mechanical harvesters to collect the ripe grain. Harvesters are designed to both gently and rapidly bring the grain in from the fields. Specialized tractors, or bankout wagons, come alongside to receive the rice and deliver it to waiting trailers.

Finally, the rice is dried to an ideal moisture level and processed. At a rice mill, it undergoes various stages of processing. Brown rice is the result of simply removing the hull, which covers the grain. White rice is the result of removing the bran layers to leave just the inner, pearly grain.

California rice fields are home to hundreds of wildlife species and is the only crop that replicates the once-abundant wetlands. Ducks, geese, and shorebirds by the millions rest and feed in California ricelands during the annual migrations. Most recently, it was determined that nearly 230 species of wildlife are sustained by California rice growers.

Varieties – Rice is grouped by size: long, medium, or short grain. Most rice grown in California is medium grain, *japonica*, which is best suited to the state's temperate growing conditions. Japonica rice is prized by many for its unique taste. California medium grain rice is soft, clings together, and is slightly translucent which makes it well suited for Asian cuisine, paella, risotto, and desserts.

Commodity Value – The California rice industry provides thousands of jobs and contributes more than \$5 billion to the state's economy each year. Approximately half of the crop is sold in domestic markets including breakfast cereals, baby food, rice cakes, beverages, and table rice. In 2013, California production totaled nearly five billion pounds of rice. California grows about 20 percent of the rice produced in the U.S., second only to Arkansas.

History – It is believed that rice was first cultivated in ancient Asia and from there spread to Africa and Europe. Rice was later introduced to South and North America and Australia with the advent of sea voyage.

Rice farming in California began in the early 1900s, mainly in response to the increasing Chinese population during the Gold Rush. California rice farmers were able to provide the staple of the immigrants' diet and solve the problem and expense of having the grain shipped from China or Japan.



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Nutritional Value – More people around the world eat rice as the primary staple of their diet than any other single food. Rice is a nutritious, affordable source of carbohydrates, and is packed with vitamins and minerals. It includes thiamin, riboflavin, niacin, phosphorus, iron, and potassium, and is an excellent source of amino acids.

Only a trace of fat is found in either brown or white rice. Experiments have shown that brown rice and rice bran may help reduce cholesterol in the blood. Brown rice is a good source of fiber and an essential ingredient in a healthy diet.

For additional information:

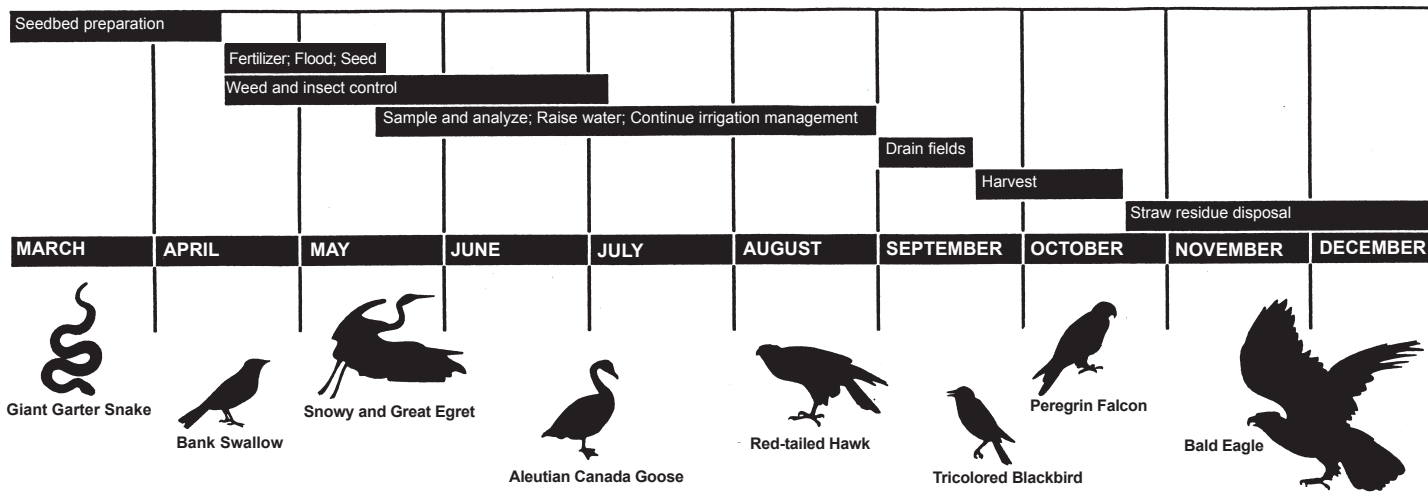
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Rice Activity Sheet

Rice Lifecycle

CALIFORNIA CALENDAR OF RICE OPERATIONS AND WILDLIFE



Lesson Ideas

- Find five items at home whose main ingredient is rice.
- Using a calorimeter, compare the caloric content of brown rice and white rice.
- Create a mosaic using naturally and artificially colored rice.
- Research the various types of rice and their uses.
- Research the climatic and environmental characteristics necessary to grow rice.
- Discuss the various uses of rice straw (ethanol, straw board, straw bale homes).
- Create a class book that describes the growing and processing of rice.
- Write a poem that begins with the sentence "I think rice is nice!"
- Research the properties of gluten and compare the gluten content of short, medium, and long grain rice.
- Determine the energy transfer available from rice straw.

Fantastic Facts

1. Most rice fields in California are planted by airplane.
2. California grown rice is used for processed products such as baby food, rice cakes, beverages, and table rice.
3. Rice farmers conserve water by recirculating irrigation water and using laser-guided grading equipment to level fields.
4. It takes four to five months for rice to reach maturity.
5. Nearly 230 species of wildlife are sustained by California rice growers.
6. *Japonica* rice is the most common variety grown in California because it is well-suited to the state's temperate growing conditions.
7. Thiamin, riboflavin, niacin, phosphorus, iron, potassium, amino acids, and fiber are nutrients found in rice.

Lesson Plan: A Journey Through the Rice Mill

Introduction: In order for the harvested rice to be edible, the hulls must be removed to reduce the amount of unusable materials and to prevent the rice kernels from germinating. White rice is obtained by milling further to remove the rice bran. This leaves the rice with a soft texture which reduces cooking time.

Objective: Students will replicate the process of rice milling by turning rough rice into milled white rice. Students will research the commercial process and summarize their findings in paragraph form.

California Standards: CC ELA: W.3-12.4, 7, 8; RI.3-4.3; RI.6-12.2

Materials: 2 mouse pads or flat rubber pieces, 2 pieces of 70-100 grit sand paper, rough rice.

Procedure:

A. Turning rough rice to brown rice:

- Have students place a mouse pad or piece of rubber on the desk.

- Place several pieces of rough rice on mouse pad or rubber piece and lay the second mouse pad or rubber piece on top.
- Rub the two pieces back and forth until all of the hulls are removed from the rice kernels.

Rice hulls are often burned in biomass plants to produce energy or incorporated into animal feed. Brown rice is packaged and sold.

B. Turning brown rice to milled white rice:

- Place one piece of sandpaper flat on the desk.
- Place several kernels of brown rice on sandpaper and lay a second piece of sandpaper on top.
- Rub the two sheets of sandpaper together for 3-5 minutes.

When finished, the students will be able to observe two distinct rice products—milled white rice and rice bran. Rice bran is used as an additive in several different food products.