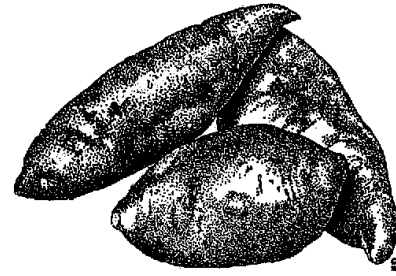


What is a Sweetpotato?



Market:

The sweetpotato (*Ipomoea batatas*, morning-glory family, *Convolvulaceae*) is an enlarged storage root that comes in various shapes, sizes, and colors. Varieties, particularly those used for market use, are classified as “**dry-fleshed**” or “**moist-fleshed**,” according to the feel sensation experienced in the mouth when eating a cooked or baked sweetpotato. The “moist-fleshed” potato is sometimes referred to as a “yam” and the “dry-fleshed” as a “sweetpotato.” They are, however, *both sweetpotatoes*.

California sweetpotato growers produce both types. For many years, the varieties **Hanna and Golden Sweet** (sometimes also called Hanna Gold) were the main “dry-fleshed” types grown. They have cream colored outer layer skin with yellow interior flesh. Dry matter content is typically 30 – 35%. More recently, **O’Henry** has displaced in terms of both acreage and production. O’Henry is actually an off-type Beauregard that naturally mutated to have white skin and flesh. It contains about 20 – 22% dry matter, and does not have the dry-flesh flavor and texture profile like that of Golden Sweet.

The major “moist-fleshed” or “yam” type varieties include **Diane, Beauregard**, and very recently, **Covington**. Diane has dark-red, smooth skin with deep orange flesh. It is considered the premium yam-type sweetpotato because of these characteristics. It is often labeled incorrectly as Garnet, the former red-skinned variety that established this market class in the 1970’s. Beauregard and Covington have copper-colored skin with deep orange flesh. For 20 years, Beauregard was the most commonly grown variety in California and the United States, but was displaced by Covington after 2009. It is still widely grown, especially in Louisiana and Mississippi. Beauregard, while nematode susceptible, has superior yield and storage characteristics as compared to Covington.



An important and growing part of the industry now includes oriental, or more commonly, **Japanese yams**. These may have a variety of flesh and skin colors, including white, purple, and red, but are typically dryer than a Beauregard, with subtler flavor. The most common has burgundy skin and white, dry flesh. The most common varieties are **Kotobuki** and **Murasaki**. The Livingston Coop, Livingston Farmers Association, has exclusive marketing rights to the Kotobuki variety.



Potatoes vs yams vs sweetpotatoes: what’s the difference?

Where did the term “yam” come from? A *true yam* is a large **underground tuber** in the family *Dioscoreaceae*. Native to Africa, it may vary in the size range of a white potato to enormous yams weighing 30 – 40 pounds and measuring as much as 3 feet in length.

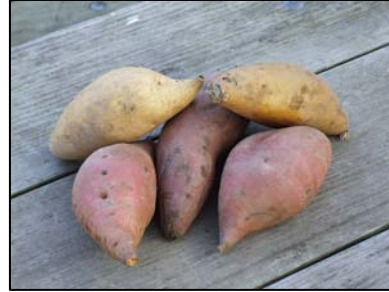
The **sweetpotato** is native to Peru and Central America and some South Pacific islands. It is in the Morning Glory family, *Convolvulacea*. The **yam** is more specific to Africa.

The word “yam” comes from the African word, “nyami.”

It is said that the word “yam” was used for sweetpotatoes in Colonial America by the slaves and indigenous people from Africa because of their similarity to true yams. As time went on, the state of Louisiana picked up the term “yam” and used it in the advertising of their sweetpotatoes, in order to distinguish theirs from the sweetpotatoes grown in the northeastern

states. Now, the term “yam” is market terminology to denote a moist-fleshed sweetpotato after it is cooked or baked. All yams grown in the United States are sweetpotatoes, and the USDA requires that they be labeled as such.

Sweetpotatoes are botanically unrelated to the Irish potato (*Solanaceae* family, which includes tomatoes, peppers, eggplant, and the weedy nightshades). Irish, or “white” potatoes are tubers, which are thickened stems and are essentially carbohydrate storage reservoirs for the plant. Sweetpotatoes are a true root, and as a result contain much higher amounts of complex carbohydrates. The term “sweet potato” is really a misnomer, because it implies they are potatoes that are sweet, when in reality they are as different from potatoes as carrots are. Recognizing this, the National Sweetpotato Collaborators Group and the National Sweetpotato Association endorsed spelling sweetpotato as one word in 1989. Nonetheless, in the current lexicon of American English, it is still spelled with two words. Both spellings are correct.



History:

Scientists believe that sweetpotato was domesticated more than 5000 years ago. There is still much debate as to just where in the Americas this took place—South America or Central America—although recent evidence suggests that it was the latter. The crop was reportedly introduced into China in the late 16th century. Columbus found the sweetpotato being eaten by the natives of the West Indies and brought it back to Europe in the early 16th century. They were grown in Spain by 1562 and in Virginia in 1650. Because of its hardy nature and broad adaptability, and because its planting material can be rapidly multiplied from very few roots, sweetpotato production spread through Asia, Africa, and Latin America during the 17th and 18th centuries. It is now grown in more [developing countries](#) than any other root crop.

Nutrition:



The sweetpotato is very high in nutritive value, and merits wider use on this account alone. Contrary to popular opinion, it is not a starchy food when baked, since most of the starch is broken down to maltose and other soluble sugars. They rank as one of the healthiest vegetables, because of high levels of vitamin A, C, iron, potassium, and fiber. They are also an excellent source of the vitamin A precursor, beta-carotene. One cup of the orange-flesh types contains four times the recommended daily allowance of this

Nutrition Facts

Serving size: one medium or 1 cup (100 g)

Amount per serving	% Daily Value
Calories 103 Calories from fat: 1	
Total Fat 0 g	0%
Saturated Fat 0 g	0%
Cholesterol 0 mg	0%
Sodium 10 mg	2%
Total Carbohydrate 24 g	5%
Dietary Fiber 3 g	12%
Sugars 6 g	
Protein 2 g	3%
Vitamin A	218%
Vitamin C	41%
Thiamin	5%
Riboflavin	8%
Niacin	3%
Vitamin B6	12%
Folicin	11%
Potassium	17%
Calcium	4%
Magnesium	6%
Iron	6%
Copper	5%
Manganese	16%

important nutrient. The dry-fleshed types contain considerably less vitamin A than the moist-fleshed types.

Production:

Sweetpotatoes are one of the most important carbohydrate crops in the world in developing countries. There are about 100,000 acres of sweetpotatoes grown in the United States, with most of these being grown in Louisiana, Mississippi, and North Carolina. California ranks third in area planted to sweetpotatoes (about 18,000 acres), and second in total production (about 5.0 million 40 lb boxes) after North Carolina. About 85% of the California production is located in Merced County with another 10% in neighboring Stanislaus County. Sweetpotatoes are harvested in the late summer through fall, and are packed and stored for sale throughout the year.



Due to its large size and concentration of the industry here, Merced County is the #1 sweetpotato producing county in the United States. The 4-yr average production (1998 – 2002) was 5.36 million 40 lb boxes. California average yields are about 50 to 100% higher than most other states where the crop is grown, a result of the combination of nearly ideal climate, drip irrigation, and virus-tested seed.

Sweetpotato production is concentrated in Merced County primarily because of the climate, soil, and history. A long, dry growing season combined with good quality irrigation water gives this area the potential for very high yields compared to other areas in the United States. The sandy soils around Atwater and Livingston, where most production fields are located, are preferred for sweetpotatoes because they result in more attractive roots. Yield and quality typically decline in heavy soils. This is not to say that sweetpotatoes cannot be grown in other soil types. Loam soils dominate many production areas in the southeast U.S., for example. Loams also tend to produce a root with thicker skin that is better able to resist scuffing during the harvest and packing process.



Sweetpotato production is a long and labor-intensive operation. A typical growing season begins in February, when seed potatoes (small sweetpotatoes that are not sold for market) are put into hotbeds to grow plants (called *slips*) that will later be transplanted into fields. All sweetpotatoes are grown from transplants, which are set in the field from April through July using mechanical transplanters. Most sweetpotatoes in Merced are grown using drip irrigation, which is surface applied after transplanting. Harvest typically begins in late July and continues into

November. During the winter, sweetpotatoes are stored, washed, sorted, and packed to be shipped throughout California and other western states.

Family farms dominate production in Merced County. Of the approximately 60 growers in the county, about half farm 75 acres of sweetpotatoes or less. Production costs often exceed \$6,000 per acre. The crop supports numerous full and part-time jobs in the county, and in 2009 had an estimated value of \$172 million (2009 Merced County Annual Report of Agriculture).

Marketing:

Most (80%) of the crop grown in California is purchased for fresh market consumption throughout the western United States and Canada. Improved storage management has allowed sweetpotatoes to be available year-round, which has given them a place in the market as a consumer staple that can be purchased in any month, though the majority of sales still occur during the important Thanksgiving to Christmas holiday season. Recently, sweetpotato fries have become an important outlet for jumbos and off-grade roots for California producers, though because of high freight costs to ship the raw roots to processing facilities in Washington this may not be a viable, long-term outlet. A very small percentage of the crop is also canned, made into chips, and dehydrated for flour and pet foods.

County History:

Merced County has a long history of growing sweetpotatoes. On December 9, 1865, the weekly Merced Herald carried this item: “Thanks—Mr. S.P. Jackson has our thanks for an arm full of huge sweet potatoes raised on the ranch of Jackson and Henderson. They are the largest and best we have seen this year.” By 1873 there were 26 acres in the county, which produced 161 tons.



The commercial growing of sweetpotatoes in Merced County began the 1890's. In 1888 Frank Souza came to Merced County and went into business for himself in Buhach Colony. Around 1900 he made his first shipment of sweetpotatoes, 240 sacks. He went on to become one of the largest shippers of sweets in the Valley. In 1903, the first transplanters were used. These were tobacco transplanters shipped from Texas. With these machines, acreage increased rapidly to the point that marketing the crop was a problem and shippers were fighting for business. Early day shippers included ATB, Pacific Fruit, Joseph Souza, Castro and Son, and Rodriguez.

By early in the 20th century, packing sheds were the preferred method of selling the crop. Packers bought lots from small growers, sorted and graded the yams into wooden hampers, then shipped under their own labels. In the 1950's, the fiberboard box was introduced, which led to field packing. The cheaper container made it possible for any grower to become a packer-shipper, and most of them did. Unfortunately, quality of the product and demand also started to go downhill. Grading was mixed, and the boxes frequently contained a lot of dirt. In 1960, Yagi Bros, a grower-packer in Livingston, made the decision to regain control of packing and handling by building new, highly efficient metal packing and storage houses where quality control could be maintained. Soon, the rest of the industry followed suit, until virtually all of the Merced-Stanislaus county production was back where it started—packing under a roof. This system, where the sweetpotatoes are brought in from the field, washed, graded, and packed, is still in use today.



In the mid 1980's, another prominent sweetpotato producer Manuel Vierra, with A.V. Thomas Produce Company, decided to try and store sweetpotatoes year round so that grocery stores would have product to sale at all times. At the time, a typical grower would only store sweetpotatoes until late spring/early summer, because it was thought that the roots would not be

able to make it through the warm California summer without severe losses. Careful post harvest treatment and management of storage conditions in the sheds was found to keep losses to a minimum, and now sweetpotatoes occupy shelving space in grocery stores throughout the year.

In the mid 60's, in an effort to cut down on harvest costs, the industry made the switch to 1-row mechanical diggers and 1000 lb bins. Prior to this, sweetpotatoes were typically dug with a plow, large disc, or digger outfitted with a conveyer belt to lay the roots back on the ground. They were then picked up by hand and placed into 40 – 50 lb wooden lug boxes. The switch to the mechanical diggers was very successful and now represents the standard method of harvest. Since 2000, 2-row diggers are becoming increasingly common. Also in the 1960's a method was developed by UC Cooperative Extension to produce virus-free seed. This technology has resulted in substantial yield increases over the years.



In the 1980's, through the efforts of Bob Weimer and UC Cooperative Extension Advisor Bob Scheuerman, drip irrigation was introduced. Initial experiments were unsuccessful, as root intrusion into the buried tape made the system non-functional half way through the growing season. Further work demonstrated that surface applied tape could sufficiently wet the bed. The resulting increase in yield, uniformity, and quality has led to this being the predominant method of irrigation, and is now used on almost all acres.

Thanks to the efforts of these men and others plus the innovations that have occurred over the last century, Merced County has been and remains the principal sweetpotato growing and shipping area in the West. In the 21st century, sweetpotato production in California continues to slowly expand in both acreage and production, although mainly as a result of successful farmers getting larger. Simply put, there are fewer farmers now than 20 years ago, farming more acres. Equipment continues to get larger, as larger size offers greater time and human capital efficiency. Four-row and 6-row transplanters dominate, and 2-row harvesters were introduced in 2000. Variety development continues to be an integral component for the industry to improve yield, pest resistance, and storability. Some of the challenges currently facing the industry include fumigation regulations that severely restrict the time and location of application, lack of registered herbicides for weed control, air and water quality regulations, rapidly escalating costs of labor, fuel, and insurance, and loss of farmable land to housing and other development.