

## The Splendid Soybean

When you hear the word soy, do you imagine a rich, salty Asian sauce? Well, that is one thing that many of us think about. You may be surprised to learn that soy sauce comes from soybeans. Let's find out more about this amazing crop!



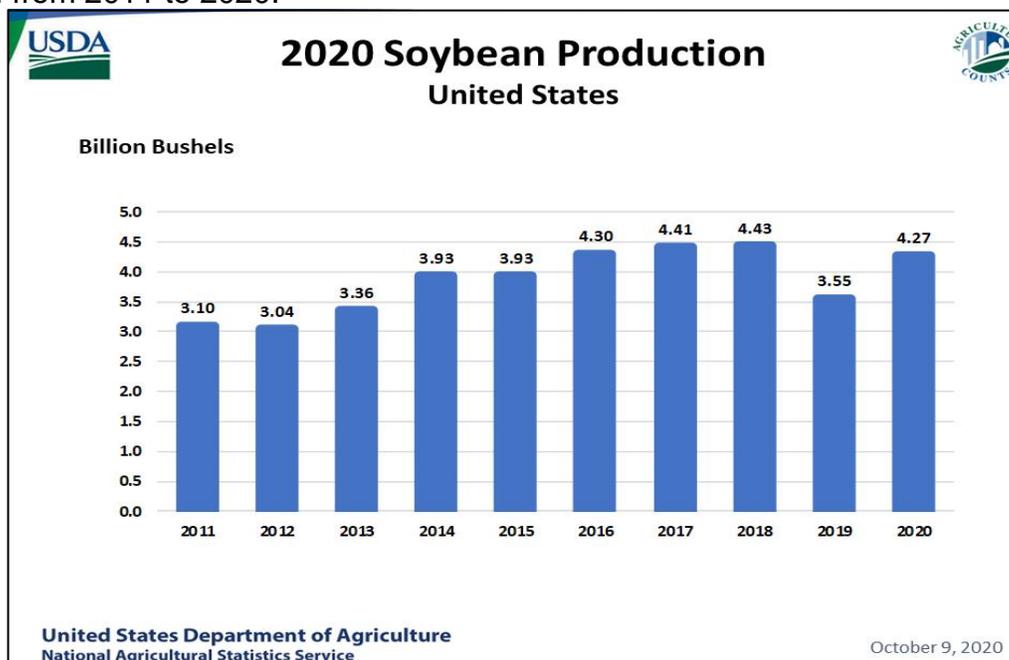
### What are Soybeans?

Soybeans are a type of vegetable called a **legume**. Legumes include other types of beans, peas, and peanuts. Soybeans grow on plants that are about 3-4 feet tall. If picked before they dry, the plants produce pods that have seeds inside a fuzzy, protective green shell. Soybeans in Maryland are typically left to dry in the fields until November, preserving the small, tan soybeans inside. Each pod has up to 4 seeds inside.

Legumes, including soybeans, are excellent crops because of their ability to complete **nitrogen fixation**. Nitrogen fixation is a process certain plants use to convert the nitrogen in the air into helpful bacteria for the plants to grow. Many farmers will rotate their crops, planting soybeans, for example, one season, followed by corn the next. This way, the soil remains healthier naturally, and requires less maintenance by the farmer.

### Where do Soybeans Grow?

Soybeans originated in East Asia, where they have been grown as crops for thousands of years. They were introduced to America in the 18<sup>th</sup> century. Soybeans are now one of the most popular crops worldwide. They can grow in most places where there is a long, warm growing season and fertile, well-drained soil. The top producers of soybeans are the United States, Brazil, Argentina, and China. This graph shows how many soybeans have been grown in the U.S. from 2011 to 2020.



You may have noticed soybeans are measured by the bushel in this graph. A **bushel** is a measure of capacity equal to 64 pints. Crops are often measured in bushels, shown below.



bushel: 18x12"

## How are Soybeans Used?

The popularity of the soybean is a result of its **versatility** – it can be used for many different purposes. Soybeans are an excellent source of plant-based protein. Due to the relatively low cost to grow and high nutritional value, about 70% of the soybeans in the United States are used as animal feed.

Humans enjoy soybeans in a multitude of ways. You most likely have eaten soy in one form or another. In addition to soy sauce, soy milk, tofu, miso and edamame, soybeans are made into oil that other foods are cooked in. Soy is added to many different types of foods to add nutritional value. Soy protein is a perfect staple for families who eat a vegetarian or vegan diet. You can find soy-based meats, cheeses, yogurt, and ice creams at most grocery stores.



Soybeans are also made into a variety of the non-food products that we use every day. The oil that is extracted can be turned into fuel, soaps, shampoos, and other cleaning products. Soy products also include plastic, rubber, carpets, clothing, foam, asphalt, adhesives, and cosmetics. Ink made from soy is used for most printing today, as it is brighter and doesn't smear like **petroleum (oil) -based** inks.

Soybeans are a **renewable resource**, meaning we can easily grow more of them to make the products that we need. Petroleum is a fossil fuel; it takes millions of years for it to develop, and it must be extracted from deep inside the Earth. Many of the products that were formerly made from petroleum can now be made from soybeans!

## Henry Ford's Soybeans

Have you ever heard of Henry Ford? He grew up on a farm but didn't want to be a farmer himself. Henry was famous as the founder of Ford Motor Company, and his car, the Model T. Henry was never satisfied with just having one job, so he decided to do some experimenting with soybeans. He developed a device that would extract the oil from the bean and found many uses for this oil. Believe it or not, he was able to create a car with most of its parts made from a strong, soy-based plastic. Today, Ford Motor Company still uses many soy and other plant-based materials to make their vehicles. Here he is swinging an axe at his car to show how durable the soy body is! He also created fibers from the beans that he made into fabric for the suit he wore on his 78<sup>th</sup> birthday in 1941.



Image from [Dealer's dandy idea leads to Ford research tie-up \(autonews.com\)](http://www.autonews.com)



Henry Ford Wearing Soybean Suit on His 78th Birthday, July 30, 1941 - The Henry Ford

## The Splendid Soybean

Directions: Read each question and fill in the best answer.

1. Which is NOT a legume?

- A. Peanut
- B. Soybean
- C. Wheat
- D. Peas

2. What does *crop rotation* mean?

- A. Turning the plants around every few days
- B. Alternating crops every season
- C. Turning the soil
- D. Switching crops every decade

3. Why is soy-based ink more likely to be used than petroleum-based ink?

- A. It is a renewable resource
- B. It is brighter
- C. It is less messy
- D. All of the above

4. How many bushels of soybeans did the U.S. produce in 2017, according to the USDA graph?

- A. 4.41 million
- B. 4.27 billion
- C. 4.41 billion
- D. 3.55 billion

Name \_\_\_\_\_

Date \_\_\_\_\_

5. What was the author's purpose in writing this article?

- A. To persuade you to eat soybeans
- B. To inform you about the many uses of soy
- C. To persuade you to be a farmer
- D. To inform you about cars

6. Which of these did Henry Ford NOT develop? Choose ALL that apply.

- A. Model T car
- B. Soybean fabric
- C. Tofu
- D. A device to extract oil from soybeans

**Extended Response:** Choose either question.

1. Explain the difference between a renewable and a nonrenewable resource. Why is it important that we use renewable resources?
2. How has the development of the soybean over time affected its use in the United States?  
Use details from your own experience and information from the article in your response.

### Did you know...

- One acre of soybeans can produce more than 82,000 crayons
- Soybeans are the only plant that is a complete protein
- Soybeans have white, pink, or purple flowers
- The seed coat of soybeans can be black, blue, green, or yellow colored, depending on the type of soybean
- Goodyear, the tire company, recently found that soy-based tires have better traction than petroleum-based rubber tires



## TRY THIS AT HOME! (ASK AN ADULT FIRST!)

### MAKE YOUR OWN SOY INK:

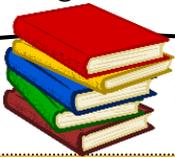
1. In a small cup, stir together 2 tsp. unsweetened drink powder (the color of ink you want) and 2 tsp water.
2. Add ¼ tsp of soybean oil and ¼ tsp of soy lecithin powder (buy at most nutrition stores).
3. Stir until your ink is evenly mixed.
4. Fold a paper towel in fourths and put onto a small paper plate. Pour on the ink. Use rubber stamps to try out your new ink pad!

### HEALTHY SOYBEAN SALAD:

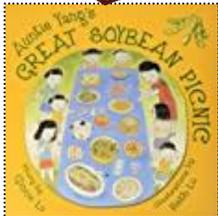
#### Mix together in a salad bowl:

- 1/2 cup chopped red onion
- one package frozen edamame
- 1-14 oz can drained black beans
- ½ of 14 oz can drained garbanzo beans
- 1 chopped bell pepper
- 2 Tbsp chopped Italian parsley
- 1 Tbsp grated fresh ginger
- 1 cup rice vinegar
- 1 Tbsp olive oil
- Salt and pepper to taste

Refrigerate before serving. (Adapted from allrecipes.com)



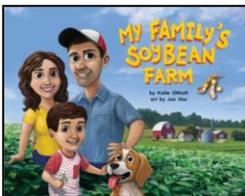
### CHECK OUT THESE BOOKS:



#### AUNTIE YANG'S GREAT SOYBEAN PICNIC

BY GENNIE LO

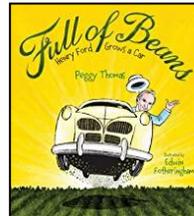
On a Sunday drive among the cornfields near Chicago, Auntie Yang spots something she has never seen in Illinois. Could it be one of their favorite Chinese foods-soybeans?



#### EXTRA MY FAMILY'S SOYBEAN FARM

BY KATIE OLTHOFF

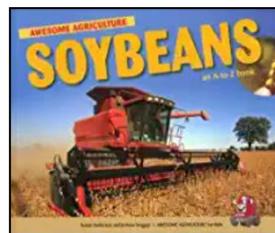
Alexander lives on a soybean farm. What's a soybean farm and what's it like to live there? Join Alexander on his family's farm as he shows us how soybeans grow, are harvested, and are used.



#### FULL OF BEANS: HENRY FORD GROWS A CAR

BY PEGGY THOMAS

After the Great Depression struck, Henry Ford wanted to support ailing farmers. For two years, Ford and his team researched ways to use farmers' crops in his Ford Motor Company. They discovered that the soybean was the perfect answer.



#### SOYBEANS: AN A TO Z BOOK

BY SUSAN ANDERSON

Dive deep into the world of soybeans and how farmers work hard to grow and harvest them.