

SC Farm Bureau Ag in the Classroom Post Office Box 754 Columbia, SC 29202

803.936.4237
SC Ag in the Classroom
Cagintheclass
scagintheclassroom

July 2023 Monthly Book Full of Beans: Henry Ford Grows a Car Written by Peggy Thomas and illustrated by Edwin Fotheringham Grade Levels: K-8 Google Slides: CLICK HERE





Book Summary:¹

Famous car-maker and businessman Henry Ford

loved beans. And he showed great innovation with his determination to build his most inventive car-one completely made of soybeans.

With a mind for ingenuity, Henry Ford looked to improve life for others. After the Great Depression struck, Ford especially 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. Soon, Ford's cars contained many soybean plastic parts, and Ford incorporated soybeans into every part of his life. He ate soybeans, he wore clothes made of soybean fabric, and he wanted to drive soybeans, too. Award-winning author Peggy Thomas and illustrator Edwin Fotheringham explore this American icon's little-known quest.

Background Agricultural Connections:

South Carolina Soybean Connections

The South Carolina Soybean Board is a farmer-run organization dedicated to investing our checkoff dollars to keep South Carolina soy growing.³

The South Carolina Soybean Board (SCSB) collects checkoff dollars when soybean farmers sell their soybeans. Each farmer contributes to the soy checkoff one-half of 1 percent of the price of each bushel at the first point of sale. These funds are used for research, promotional and educational interests as they pertain to soybeans and the soybean industry. The volunteer directors decide how to invest the funds of the soybean checkoff. Half of the soybean checkoff funds are kept in the state where they originated and the other half goes to the United Soybean Board (USB) to invest in projects at the national level.³

The SCSB is dedicated to using the checkoff dollars we receive from you each year to keep your operation growing forward. As we move into each year, we conduct in-depth research on the latest cutting-edge technology that can be used to benefit you, the farmer. Checkoff programs allow us to further strengthen the industry in which we work. Year after year, your checkoff dollars are invested in a multitude of projects that solidify our industry as a staple of the American economy.³

The U.S. Congress passed a provision as part of the 1990 farm bill to form the soy checkoff at the request of soybean farmers throughout the nation. The law required a referendum in 1994 to determine if the national checkoff program should continue. In this referendum, producers voted to continue the program. A request for referendum is held every four years to allow soybean farmers the opportunity to vote to discontinue the checkoff. By law, there are only certain areas where soybean checkoff dollars may be spent. Under no circumstance can funds be used for lobbying purposes.³

Performance of South Carolina breeding lines with regard to seed yield, agronomic traits and nematode/disease resistance are tested each year in comparison to the performance of known, productive, commercial soybean cultivars. See <u>Clemson's Variety Trial website</u> for results of SC official variety performance tests.²

From 2008 to 2013 soybeans were the second or third highest value field crop in SC, averaging over \$100 million. The top producing counties were Clarendon, Dillon, Darlington, Florence, Lee, Horry and Williamsburg. It is estimated the demand for soybean meal is expected to increase with the increase in livestock production over the next decade. Also, the demand for soybean oil is expected to increase over the next decade, due to the increase in biodiesel produced from soybean oil and improvements being made to the oil that reduces the need to hydrogenate the oil, eliminating trans fats.²

Each state has different growing conditions (climate, disease and insect pressure, etc.) and most of which vary from region to region within the state. Having a local soybean breeder is important for local farmers, consumers and the economy. For each Bu/A increase in yield from genetic gain, insect resistance, disease resistance, etc. equals increased income for South

Carolina soybean producers. In addition, any traits including high oleic acid or seed composition that might add desirability and value will be beneficial to South Carolina farmers.²

Funding is provided by the Public Service Activities Department at Clemson University and through grants from the South Carolina Soybean Board (Check-off funds). Funds provided by this grant supply a portion of the operating funds required for the winter nursery project, supplies, travel, small equipment purchases, and part-time labor. Funding provided by the South Carolina Soybean Board is vital to the on-going soybean breeding effort and future success of the program. In addition, grants from the United Soybean Board, the USDA-NIFA and others are appreciated and vital to the continued success of the soybean breeding program at Clemson University.²

CLICK HERE to read a summary of some soybean product research that was completed.³

CLICK HERE to read about the variety of uses of soybeans.³

Book Discussion:

- How can we apply Henry Ford's perseverance and determination to our own lives?
- What were some of the soybean products that Henry Ford developed?
- What event started the soybean research?

Agricultural Vocabulary:

- crude tractor the crude oil engine is a type of internal combustion engine similar to the hot bulb engine. A crude oil engine could be driven by all sorts of oils such as engine waste oil and vegetable oils. Even peanut oil and butter could be used as fuel if necessary. Like hot bulb engines, crude oil engines were mostly used as stationary engines or in boats/ships.⁵
- hayseed grass seed obtained from hay
- soybean the most highly proteinaceous vegetable known; the fruit of the soybean plant is used in a variety of foods and as fodder (especially as a replacement for animal protein)⁴
- crops a cultivated plant that is grown as food, especially a grain, fruit, or vegetable.
- fuel material such as coal, gas, or oil that is burned to produce heat or power.
- revenue income, especially when of a company or organization and of a substantial nature.
- acre a unit of land area equal to 4,840 square yards
- production the action of making or manufacturing from components or raw materials, or the process of being so manufactured.

Did you know?

- 1. One acre of soybeans converts to 40,000 servings of tofu or 2,500 gallons of soy milk.¹³
- 2. One acre of soybeans can produce 82,368 crayons.¹⁴
- 3. Soy ink is used to print newspapers and textbooks.¹⁴

Activities:

Morning Meeting / Morning Work

- 1. Soybean Word Search
 - a. <u>CLICK HERE</u>
- 2. Sensory Bin
 - a. Add different kinds of beans (uncooked) to a bin and have students learn through play.
 - i. Some of the things they could work on with the sensory bin:
 - 1. Color identification
 - 2. Sorting
 - 3. Fine motor practice
 - 4. Language development
 - 5. Vocabulary

Reading/Writing

- 1. Research Henry Ford and the soybean in depth using the sources in the back of Full of Beans: Henry Ford Grows a Car. Create a poster to visually display what you have learned about Henry Ford and soybeans.
- 2. Listen to this read aloud about how a soybean can end up on your plate at dinner.
- 3. Create a timeline as a class OR individually about soybeans. You can use the back of the book for reference.

Math

- <u>CLICK HERE</u> to access the Grow Next Gen bean activity. In this activity you will provide students with a small cup of a variety of beans and have students make predictions, graph and sort the different beans that they are given. ⁶
- 2. Use soybeans to add/subtract/multiply/divide
 - a. Third grade: Review set model, arrays and area model

Science

- 1. <u>CLICK HERE</u> to access the Grow Next Gen "Soybeans are everywhere" coloring activity. See if students can guess where the soybean product is used in our everyday lives.⁷
 - a. After students have time to guess show them <u>this⁸</u> presentation on soybean uses
 - b. Have students share with their tables and fix their coloring sheet if needed.
- 2. Watch this video to learn about the life of a soybean.
 - a. For more connections to soybeans watch this video.
- 3. Growing Soybeans activity¹⁰
 - a. Materials needed:
 - i. Clear plastic cup (9 oz.)
 - ii. Potting soil

- iii. Soybeans
- iv. Water
- b. Procedures:
 - i. Fill a clear plastic cup about halfway full of soil.
 - ii. Sprinkle about 5 soybean seeds on top of the soil.
 - iii. Lightly cover beans with enough soil to fill the cup about ³/₄ full.
 - iv. Water just enough to moisten the soil.
 - v. Place the cup in a sunny window.
 - vi. Keep soil moist but do not overwater.
 - vii. Soybeans will sprout in about 5–7 days!
- 4. Life Cycle of a Soybean <u>CLICK HERE</u>
 - a. Science for Success: Soybean Growth Stages
 - b. 😐 The Life of a Soybean
 - c. Answer Key <u>CLICK HERE</u>
- 5. Soy Ice Cream
 - a. Materials
 - i. 1 gallon sized freezer ziploc bag ice
 - ii. 1 pint-sized ziploc bag (optional 2 of these)
 - iii. 6 Tbsp. sugar
 - iv. 1 tsp. Vanilla
 - v. 1 cup soy milk (vanilla soymilk is great)
 - vi. ¼ cup of chopped berries
 - vii. Multi-colored sprinkles
 - viii. Gloves or mittens (your hands will get cold) (optional)
 - b. Procedures
 - i. Fill the gallon-sized freezer bag half full with ice and then add salt. Close the bag and set it aside.
 - ii. Mix sugar, soy milk, Vanilla and berries into the pint-sized ziploc bag. Make sure to seal it tight - remove as much excess air as possible.
 - iii. Optional (place that ziploc inside of a second ziploc to prevent leaking.
 - iv. Place the pint-sized bag into the gallon-sized bag. Shake for 5-7 minutes.
 - v. Open the gallon-sized bag and enjoy the ice cream. If it is still very liquidy, keep shaking and make sure ice and salt is surrounding the bag on all sides.

Art

- 1. <u>CLICK HERE</u> to access activities that involve using soybeans.⁹
 - a. Soybean seed necklace
 - b. Bean buddy (make beans into a little animal)
 - c. Soybean stress balls
 - d. Soy lip balm
 - e. Biodegradable soy plastic

Variety of Soybean Activities¹¹

- <u>The Seemingly Simple Soybean</u>
 - Soybean Graphing Activity
 - Soybean Math Activity
 - Soybeans in the U.S.
 - The Seemingly Simple Soybean (text to read for more information)

Extension Activities:

- From Soybeans to Car Parts
- My Family's Soybean Farm
- Grains and Legumes of the World
- Topsy-Turvy Soybeans
- <u>Auntie Yang's Great Soybean Picnic</u>
- <u>https://agclassroom.org/matrix/lesson/79/</u>

Sources/Credits:

- 1. https://www.goodreads.com/en/book/show/49759192
- 2. https://www.clemson.edu/public/seed/soybean.html
- 3. https://scsoybeans.org/checkoff-at-work/uses-of-soybeans/
- 4. https://www.vocabulary.com/dictionary/soybean
- 5. <u>https://en.wikipedia.org/wiki/Crude_oil_engine</u>
- 6. <u>https://grownextgen.org/media/pages/curriculum/meet-the-bean/seed-sort/1b7c6b01a6-1</u> <u>565628892/seed-sort.pdf</u>
- 7. <u>https://grownextgen.org/media/pages/curriculum/meet-the-bean/soybeans-are-everywhere.pdf</u>
- 8. <u>https://grownextgen.org/media/pages/curriculum/meet-the-bean/soybeans-are-everywhe</u> re/efbd5b9060-1583247770/uses-of-soybeans.pdf
- 9. <u>https://grownextgen.org/media/pages/curriculum/meet-the-bean/fun-and-games-with-soy</u> <u>beans/ab67338ea0-1565628893/fun-and-games-with-soybeans.pdf</u>
- 10. https://kansassoybeans.org/recipe/growing-soybeans/
- 11. <u>http://counties.agrilife.org/comal/files/2011/08/seeminglysimplesoybean_28.pdf</u>
- 12. <u>https://kansassoybeans.org/wp-content/uploads/2014/06/1_Worksheet_LifeCycleOfASoy</u> <u>bean.pdf</u>
- 13. <u>https://www.aexcelcorp.com/blog/eco-friendly-traffic-paint/20-interesting-facts-about-ame</u> <u>ricas-soybeans#:~:text=One%20acre%20of%20soybeans%20converts.toxic%20and%2</u> <u>Osafer%20for%20children</u>.
- 14. https://farmflavor.com/lifestyle/soybean-fun-facts/