



Soybean Meal Information Center



FACT SHEET

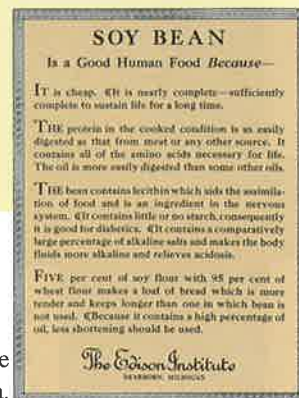
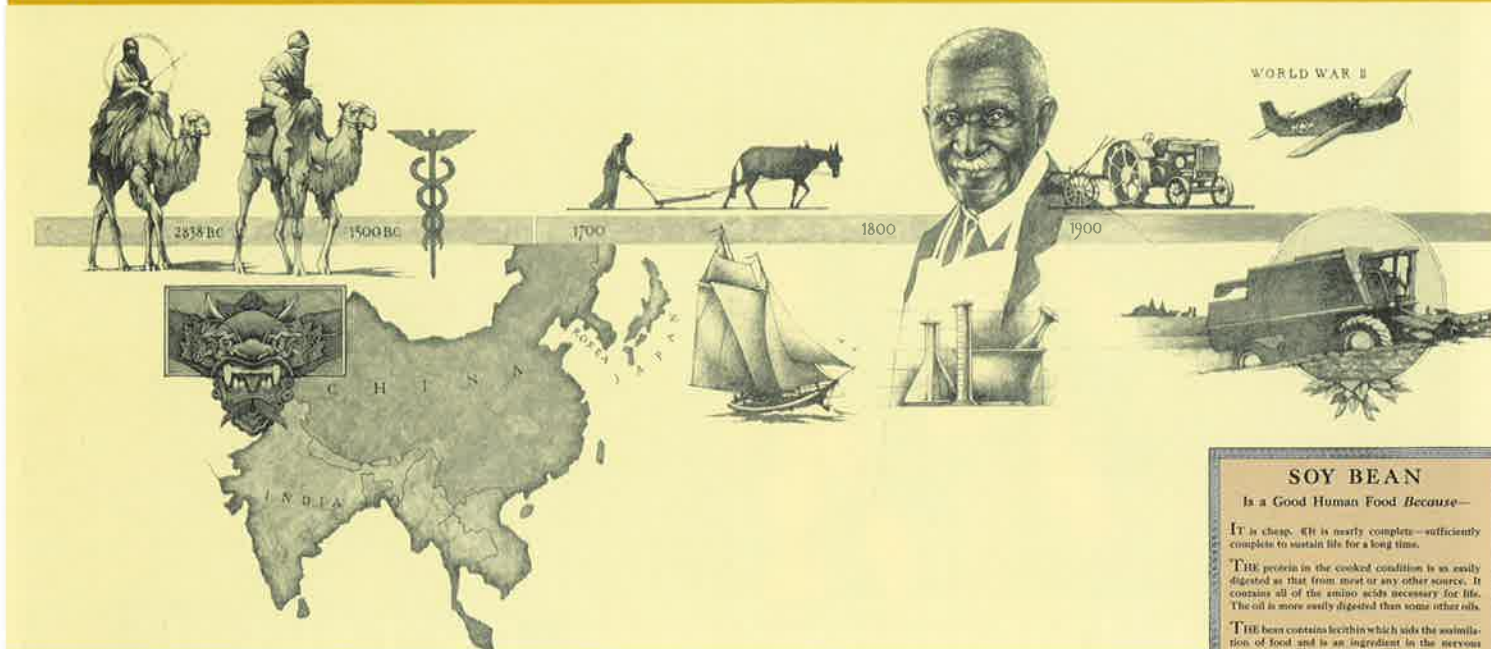


Soybeans - History and Future



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Soybeans: History/Future



Soybeans have a colorful history. While most of the early history of soybeans is unknown due to the lack of records, historians have pieced together a colorful history of the soybean. Dr. Theodore Hymowitz, an authority on the history of the soybean crop at the University of Illinois, indicated the beginnings of the domestication of the soybean might never be exactly known. Evidence suggests that the soybean emerged as a domesticate during the Zhou dynasty in the eastern half of northern China. The oldest records appear in bronze inscriptions and in early writings that date not much earlier than the 11th century. Since domestication is a process of trial and error and is not a time-datable event, this process probably took place during the Shang dynasty (ca 1500-1100 B.C.).

By the first century A.D. soybeans were probably distributed throughout China by trade missions and with time to other Asian countries. The earliest Japanese reference to the soybean was found in the *Kojiki* (Records of Ancient Matters) that was completed in 712 A.D.

In the 16th and 17th centuries there are several references to native soy foods in diaries of European visitors to China and Japan. They reported that the Asians were quite creative in converting the soybean into several staple foods such as tofu, soy milk, miso and soy sauce. These foods were unfamiliar to these early explorers and merchants.

The early history of soybean in the United States involves many famous Americans. A few of the key dates and persons involved in the growth of soybeans in the United States are as follows:

1765 The first soybeans were brought to the United States by Samuel Bowen, a seaman employed by the East India Company, and planted by Henry Yonge on his plantation "Greenwich," located at Thunderbolt a few miles east of Savannah, Georgia. Mr. Bowen used the soybean to produce soy sauce and a soybean noodle for export to England. Mr. Bowen exported several agricultural products to England that ended or were drastically reduced-by the Revolutionary War in 1776.

1770 Benjamin Franklin sent seeds from London to the Botanist John Bartram for planting near Philadelphia, PA. He also described in a letter to Bartram how a cheese (tofu) was made from the soybeans in China.

1829 Professor Thomas Nuttall grew soybeans in the Botanic Gardens in Cambridge, Mass.

1851 Dr. Benjamin Franklin Edwards received a gift of Japan peas (soybeans) for professional services he provided to a group of Japanese sailors. Dr. Edwards provided the soybeans to a friend John H. Lea for planting in his garden in Alton, IL. Lea distributed seeds, some were planted by J.J. Jackson in Davenport, Iowa and by A.H. Ernst in Cincinnati, Ohio the following year. The significance of these events was that soybeans were being distributed in the Midwest for trial plantings.

1854 Commodore Matthew Perry's expedition that opened Japan to western trade recorded the use of a bean called the Japan pea (soybean) and obtained seeds for U.S. farmers. The Perry Expedition (1852-1854) provided ample publicity to soybeans.

1878 George Cook and James Nielson of the New Jersey Agricultural Experiment Station obtained soybean seeds while on a trip to Europe that they planted on the College Farm in 1879. The results of these successful tests were repeated at other agricultural experiment stations.

1890s Soybeans were widely tested as pasture, hay, silage and green cover crops. Feeding studies with horses, cattle, sheep, dairy cows and poultry were conducted at several state university research facilities. Plant parts were analyzed to assess the value of the potential crop.

1893 W.P. Brooks at the Massachusetts Station conducted classic studies showing the benefits of inoculation of soybean at planting and the relationship of nodules to seed yield. Researchers at the New Jersey and Kansas stations confirmed his results.

1898 United States Department of Agriculture established the Office of Foreign Seed and Plant Introduction. This organization developed the formal Plant Introduction system to provide permanent numbers to seed lots.

1904 George Washington Carver at Tuskegee Institute discovered soybeans were a rich source of protein and oil. He also encouraged farmers to rotate their crops with soybeans.

1905 A commercial soybean inoculum was marketed. This advance was an important step in assuring successful soybean rooting, growth and development.

1910 Charles V. Piper and William J. Morse, two USDA researchers, co-authored a paper entitled "The Soybean: History, Varieties and Field Studies".

1911 Soybeans imported from Manchuria were first processed in this country in a plant near Seattle, Wash. Domestically produced soybeans were first processed in a cottonseed oil mill owned by Elizabeth City Oil and Fertilizer Co. at Elizabeth, N.C.

1917 T.B Osborne and L.B. Mendel demonstrated that heating improved the nutritional quality of soybeans by inactivating some of heat-labile antinutritional components in soybeans.

1920 William Morse founded the American Soybean Association.

1920s John Harvey Kellogg developed meat substitutes and soy milk from soybeans for American Consumers.

1922 A. E. Staley Company converted a corn extraction plant to process soybeans, and the company provided a guaranteed market for Illinois grown soybeans.

1929-31 P.H. Dorsett and William Morse, two USDA researchers, collected nearly 4,500 soybean accessions from Northeast China, Japan and Korea. This soybean collection trip had a major impact on the crop. (See the paper by Hymowitz for details.)

1930 The trade association, the National Soybean Processors Association, was formed.

1930 Soybeans were grown on 3.5 million acres of U.S. land. A University of Illinois bulletin indicated that 56 percent of the crop was used for hay, 14 percent grazed and 30 percent harvested for seed. Forty-two percent of the soybean crop was crushed for oil and meal, 34 percent saved for seed, 23 percent fed whole to livestock and two percent used for human food.



"There can be no doubt that the soybean is one of the most promising of all agricultural plants for an almost unlimited variety of industrial uses, and that it is going to play an outstanding role in the future economic life of this country."

Henry Ford

1930's Henry Ford was an early promoter of soybeans. The Ford laboratory produced several proto-type plastics, new food items and even cloth material from soybeans. In the 1930's, a lot of research on the industrial uses of soybean was initiated to find uses for soybean's protein and oil that had not found wide food or feed uses. Soy products found use in paints and coating, inks, soaps, adhesives, fertilizers and other industrial applications.

1940's Prior to the 1940's, poultry rations were formulated with meat scraps, fish meal, milk products and yeast supplying the protein source. During the 1940's nutritionists were successful in determining the vitamin, mineral and amino acid needs of poultry and swine. Soybean meal use grew as the nutritionist gained an understanding of formulating diets to meet the animal's/bird's nutrient requirements.

1940's In the late 1940's, oil chemists conducted a lot of research to improve the soy oil's flavor stability problem. They found that oxidative flavor and odor changes occurring during refining could be prevented. The improved oil quality allowed soybean oil to be competitive with other quality vegetable oils.

1947 A major soybean utilization breakthrough occurred that greatly increased the demand for soybeans. Several research groups demonstrated that the "animal growth factor" supplied by animal by-products was vitamin B-12. This allowed the swine and poultry nutritionist to develop high performance diets based on corn and soybean meal.

1950's The 1950's were a time of applying nutritional research findings to commercial agriculture. Researchers at the University of Illinois and other land grant institutions were successful in developing practical swine and poultry diets based primarily on corn and soybean meal, with minimal or no "animal protein

factor," or alfalfa meal. The diets were accepted by the commercial producer and feed manufacturer.

1960's The development of computer formulated least-cost rations for livestock and poultry allowed the nutritionists to make greater use of soybean meal. Soybean meal's balanced nutrient composition, reasonable cost and availability to the feed manufacturer have catalyzed the rapid growth of the livestock and poultry production. Today, efficient livestock and poultry production relies on

cereal grain and soybean meal rations. The feed demand for soy protein drives the growth of soybeans worldwide.

1970's During the 1970's, state experiment stations developed research programs to improve the management of the crop. Research on cultural practices, tillage, fertility needs, weed and pest control were initiated. Soybean breeding efforts



were also initiated at each state institution and several private soybean breeding companies were founded.



1990's The 1990's are known in some groups as the beginning of the era of biotechnology. Researchers developed knowledge on the individual gene function, the ability to insert genes in elite germplasm and ways to use genomics to

improve soybean growth and development. One of the most signifi-



cant advances was the wide acceptance of herbicide-resistant soybean varieties that would reduce the cost and labor involved in controlling weeds in soybeans.

2000's Research is proving soybeans are a valuable renewable resource that is finding increased use in biodiesel fuels, biodegradable polymers, environmentally-friendly lubricants and many industrial chemicals.

Summary Comments

Today, soybeans are extremely important to the U.S. farm economy, valued at about \$15 billion dollars, annually. Soybeans are planted on more than 73 million acres, with trend lines averaging about 40 bushels per acre and total production of 2.8 billion bushels.

Soybean meal is the protein of choice for feed manufacturers. The United Soybean Board estimates about 46 percent of the soybean meal produced is used by broilers, layers and turkeys. Swine uses another 25 percent, with beef (13%), dairy (8.5%), pet foods (2.5%), other feed (2%) and food and industrial uses (2.5%), respectively.

Soy oil historically accounts for about 35 percent of the value of soybeans and over 80 percent of the total fats and edible oil consumption in the United States. A breakdown of soybean oil uses

include baking and frying oils (46%), salad or cooking oil (43%), margarines (7%), other edible products (1%) and industrial products (3%). It is anticipated that industrial oil uses will rapidly expand with greater use of biodiesel, polymers and industrial chemicals developed from soybean oil.

Soybeans indeed have a colorful history, involving ancient cultures and early explorers. The soybean is a protein source that had a pivotal role in expanding commercial livestock and poultry industries, an edible oil important to world nutrition, and many dedicated individuals with the foresight to see the potential of the soybean. It is a truly remarkable crop that has changed the world.

References for further study:

Hymowitz, Theodore. 1988. Soybeans: The Success Story; in *Advances in New Crops, Proceedings of the First National Symposium, New Crop: Research, Development, Economics*; Indianapolis, IN. October 23-26, pages 159-163.

Hymowitz, Theodore. 1984. Dorsett-Morse Soybean Collection Trip to East Asia: 50 Year Retrospective. *Economic Botany* 38(4): 378-388.

Hymowitz, T. and J.R. Harlan. 1983. Introduction of Soybean to North America by Samuel Bowen in 1765. *Economic Botany* 37(4): 371-379.

Hymowitz, Theodore. 2004. Soybean: Improvement, Production & Uses; Chapter 4.1 Origin of the soybean and its dissemination. #rd Ed. *Agronomy Monograph No. 16.*, pages 97-99.

Steward, C.L., W.L. Burlison, L.J. Norton and O.L. Whalin. 1933. *Supply and Marketing of Soybeans and Soybean Products*. University of Illinois Agricultural Experiment Station Bulletin 386: 429-544.

Soy Stats 2003: A reference guide to important soybean facts and figures. www.soystats.com

Windish, Leo C. 1981. *The Soybean Pioneers: Trailblazers, Crusaders; Missionaries*. M&D Printers, Henry, IL.



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