Government Work: Agricultural Research, Education, Extension and Farm Support

Grades: 6–12

Purpose
Students will:
• Read about the history of government policy and legislation related to wheat research, education, extension and farm support and debate the role of government in these areas.
• Research career opportunities in government agencies that address wheat production and other agricultural issues.

Keywords
wheat, careers, agricultural research, government policy, land grant universities, agricultural extension, farm bill

Materials
• Reading pages, included with this lesson
• “USDA Agencies and Careers” worksheet, included with this lesson
• “USDA Career Questionnaire,” included with this lesson
• Internet access for research

Interest Approach or Motivator
Invite someone from the agriculture department of one of your state’s land grant universities to talk to your class about agricultural education and government careers in agriculture, the basic importance of agriculture as it applies to economics (nationally and in state), and the importance of careers and job growth in the agriculture sector. Ask your speaker to also address the following topics, along with any questions students might have. Students should prepare and submit questions ahead of time.
  • School’s origins and history as a land grant university
  • Fields of study for which the school is best known
  • Some recent successful research projects related to agriculture.

Background
From the beginning, our nation’s founders thought it was important to build and support strong agriculture. Many were farmers themselves and spent large amounts of time and money experimenting with crops that would grow well in the New World. Wheat was an experimental crop for George Washington, Thomas Jefferson and others, who included it in a diversification program after they found that crops like tobacco and corn, planted as principal crops year after year, took too much nitrogen from the soil.

As the country grew, government’s role in agriculture grew as well, both at the state and federal levels. Some of the states had their own departments dedicated to agriculture, but during his term in office, Abraham Lincoln signed legislation creating a national Department of Agriculture at the cabinet level. Lincoln later signed legislation creating land grant universities in every state by granting the use of public lands to support colleges whose purpose was to teach agricultural or mechanical education. Later legislation created agricultural research stations and an extension service whose purpose was to share research from the universities with farmers out in their fields.

In the 20th Century, when economic difficulties threatened to drive many farmers off their farms, the government stepped in with a series of support programs to make sure farmers could afford to keep producing wheat and other crops.
In the 21st Century, government involvement in agriculture continues to change with a changing world, but agricultural research and other government services are still crucial for feeding a growing population, both in our country and around the world.

Procedures

**ACTIVITY ONE**
1. Divide the class into three groups. Assign one of the three reading pages included with this lesson to each group.
2. Students will read and discuss their assigned passages and write summaries of the passages by finding the central idea and supporting details.
3. Each group will divide into two sides for a debate about the topic presented in their passage.
4. Students will organize their groups for the debate and prepare arguments on both sides of the question provided.
5. To begin the debate, one person from each side will present a brief summary of the issue.
6. Conduct a debate using questions provided with the reading passages. You may also open the floor to questions from the class.

**ACTIVITY TWO**
1. Provide copies of the “USDA Agencies and Careers” information sheet included with this lesson. Students will research career opportunities in the agencies listed. Agency web addresses are provided. Students will find the “Careers” link on the agency website, usually somewhere at the top. Some agencies may require applicants to use the search engine on the usajobs website.
2. Students will use the career questionnaire included with this lesson to report on one career of interest within one of the agencies listed.

Enriching Activities

**ACTIVITY ONE**
Students will use online or library resources to research and write about one of the following topics. Students will answer these questions in the course of writing about their topics: What was the issue this legislation or agency was meant to address? How was the issue addressed? Was it successful? Why or why not?

- Farm Credit Act
- Agricultural Adjustment Act of 1933
- Capper Volstead Act
- Agricultural Credit Act
- Farm Bill
- Morrill Acts of 1862 and 1890
- Hatch Act of 1887
- Smith Lever Act of 1914
- Hawley Smoot Act

**ACTIVITY TWO**
Students will identify the elected officials involved in state and federal government who help set agricultural policy (agricultural committee members and committee chair).

**ACTIVITY THREE**
Students will find the budgets of ag-related state agencies in your state and determine the percentage of the state budget. Compare the agriculture budget in your state with those of other states.
Vocabulary

agribusiness— the business of agricultural production
agriculture— the science or occupation of cultivating the soil, producing crops, and raising livestock
bioenergy— renewable energy made available from materials derived from biological sources
biomass—organic matter derived from living, or recently living organisms. Biomass can be used as a source of energy and it most often refers to plants or plant-based materials which are not used for food or feed.
cabinet— a group of advisers to the political head of a government
career— a profession followed as a permanent occupation
compensate— to make equal return to, or pay
conservation— a careful preservation and protection of something, especially planned management of a natural resource to prevent exploitation, pollution, destruction, or neglect
commodity— a product of agriculture or mining
cultivate— to prepare land for the raising of crops
crop rotation— the practice of growing first one and then another crop on the same land especially to preserve the ability of the soil to produce crops
desegregate— to eliminate segregation, especially to end by law the isolation of members of a particular race in separate units
devaluation— reduction in the value of something
diversify— to increase the variety
drought— a long period of dry weather
economic— of, relating to, or based on the production, distribution, and consumption of goods and services
experimentation— to carry out procedures or operations under controlled conditions in order to discover something, to test a hypothesis, or to serve as an example
export— to carry or send abroad especially for sale in another country
extension— education by special programs at a distance from a school
fertility— producing vegetation or crops plentifully
genome sequencing— a laboratory process that determines the complete DNA sequence of an organism’s genome at a single time
harvest— the season when crops are gathered from the fields or the activity of gathering crops
inflation— a continual increase in the price of goods and services
innovative— introducing something new
invasive species— plants, animals, or pathogens that are non-native (or alien) to the ecosystem under consideration and whose introduction causes or is likely to cause harm.
labor— physical or mental effort especially when hard or required
legislation— the laws made by a governing body
milling— to process in a mill (as by grinding into flour, meal, or powder or by shaping with a cutter)
nitrogen— a colorless tasteless odorless element that occurs as a gas which makes up 78 percent of the atmosphere and that forms a part of all living tissues
nonformal— not following or agreeing with established form, custom, or rule
price gouging— a situation in which a seller spikes the prices of goods, services or commodities to a level much higher than is considered reasonable or fair
public— of, relating to, belonging to, or affecting all the people
reform— to correct or improve one’s own behavior or habits
renewable— capable of being replaced by natural ecological cycles or sound management procedures
research— careful study and investigation for the purpose of discovering and explaining new knowledge
rural— of or relating to the country, country people or life, or agriculture
staple— something in widespread and constant use or demand
stewardship— the careful and responsible management of something entrusted to one’s care
subsidy— a grant by a government to a private person or company to assist an undertaking thought helpful to the public
yield — the amount or quantity produced

Ag Facts

• The New York State legislature set up the New York State Board of Agriculture in 1819, the first organization of this sort.
• An Agriculture Committee was established in the US House of Representatives in 1820 and in the US Senate in 1825.
• Massachusetts became the first state to conduct a soil survey in 1830.
• Early county extension agents travelled by train, horse, horse and buggy or by foot to the farms where they provided advice and demonstrated the latest agricultural techniques.
• In 1906 Booker T. Washington of the Tuskegee Institute started an agricultural wagon, or moveable farmers’ school, to teach Southern African-American farmers better methods of farming.
• Nearly every industrialized nation on Earth subsidizes agriculture to some extent. It’s a way to make sure production stays high, and prices stay low.
• Farm bills traditionally have focused on farm commodity support for a handful of staple commodities—corn, soybeans, wheat, cotton, rice, dairy and sugar.

Standards

National Ag Literacy

2. Plants and Animals for Food, Fiber and Energy
   • Discuss reasons for government’s involvement in agricultural production, processing, and distribution

3. Food, Health and Lifestyle
   • Identify the careers in food production, processing, and nutrition that are essential for a healthy food supply

4. Science, Technology, Engineering and Mathematics
   • Identify science careers related to both producers and consumers of agricultural products
   • Correlate historical events, discoveries in science, and technological innovations in agriculture with day-to-day life in various time periods
   • Identify current and emerging scientific discoveries and technologies and their possible use in agricultural systems (e.g., biotechnology)
   • Predict the types of careers and skills agricultural scientists will need in the future to support agricultural production and meet the needs of a growing population

5. Culture, Society, Economy & Geography
   • Consider the economic value of agriculture in America
   • Highlight the interaction and significance of state historical and current agricultural events on governmental and economic developments (e.g., the building of railroads, the taxation of goods, etc.)
   • Explain the role of government in the production, distribution, and consumption of food
   • Describe essential agricultural careers related to production, consumption, and regulation
   • Evaluate and discuss the impact of major agricultural events and agricultural inventions that influenced world and U.S. history

Content Standards

Social Studies—Civics, Economics, Geography, History
Common Core

English Language Arts—Reading for Information, Writing, Speaking and Listening, Reading History

Resources

• Food, Agriculture and Natural Resources Careers, USDA Living Science, https://www.agriculture.purdue.edu/usda/careers/contactus.html
• “Partners and Extension Map,” (land grant universities and extension offices), National Institute of Food and Agriculture (NIFA), US Department of Agriculture (USDA), https://nifa.usda.gov/partners-and-extension-map?state=All&type=Extension

Sources/Credits

• Thompson, Pat, “Extending the Knowledge,” Oklahoma Ag in the Classroom.
Wheat production played a central role in the building of our nation. Founders George Washington, Thomas Jefferson, and others were also farmers, passionate about the importance of strong agriculture. They experimented continuously with new crops and innovative methods.

Tobacco and corn were the first important cash crops, and tobacco was our first important agricultural export. Planters soon found that planting only one crop in a field year after year exhausted the soil by removing all the nutrients. Since land was still plentiful, some planters just changed location and kept on planting when the soil was worn out. Others, like Washington and Jefferson, were interested in conserving the land they had and finding a better way to farm. Some research in Europe, where land was not so plentiful, had shown that diversifying and rotating crops could help preserve the fertility of the soil while providing successful yields. Washington had experimented with wheat seed selection and, with Jefferson and other wealthy planters, decided to diversify, with wheat as the main crop some years and tobacco and corn other years. Jefferson explained his crop rotation plan in the letter to George Washington at right. It was designed to preserve the soil and operate over a span of seven years.

Jefferson’s experimentation was part of an agricultural reform movement that took place after the Revolutionary War among wealthy American planters and gentleman farmers. They recognized that experimentation was too risky for most farmers. Washington believed it was the responsibility of wealthy farmers to undertake experimentation, as failures would be inevitable and losses would have to be absorbed while new techniques were perfected. Benjamin Franklin founded the first American organization devoted to agricultural pursuits—the Philadelphia Society for the Promotion of Agriculture. By 1861 there were 900 agricultural societies studying and adapting agriculture to American farm conditions.

In 1862 Congress passed the Morrill Act, which established land grant colleges in every state for the purpose of teaching agriculture and mechanics. Many of the agriculture teachers worked on local farms to study problems first-hand and try to solve them through experiments and research. The president of Iowa Agricultural College, Seaman Knapp, saw the value of this hands-on experimentation and asked Congress to create agricultural experiment stations.

The Hatch Experiment Station Act of 1887 gave federal funds to state land-grant colleges to create agricultural experiment stations and pass along new information. An agricultural experiment station (AES) is a scientific research center that investigates difficulties and potential improvements to food production and

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**THOMAS JEFFERSON’S CROP ROTATION PLAN**

_The highlands where I live have been cultivated about sixty years. The culture was tobacco and Indian corn as long as they would bring enough to pay the labor. Then they were turned out. After four or five years rest they would bring good corn again, and in double that time perhaps good tobacco. Then they would be exhausted by a second series of tobacco and corn. Latterly we have begun to cultivate small grain; and excluding Indian corn, and following, such of them as were originally good, soon rise up to fifteen or twenty bushels* the acre. We allow that every laborer will manage ten acres** of wheat, except at harvest. I have no doubt but the coupling cattle and sheep with this would prodigiously improve the produce._

—Thomas Jefferson, letter to George Washington, June 28, 1793

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* One bushel is equal to 8 gallons, used for dry goods.
** One acre is about the size of a football field.
agribusiness. Experiment station scientists work with farmers, ranchers, suppliers, processors, and others involved in food production and agriculture.

Some of the most current wheat research at agricultural experiment stations across the country addresses such problems as drought, climate change, development of bio-energy crops for alternative energy, milling quality of wheat, disease resistance, finding natural enemies of invasive species, on-farm biomass processing, wheat genome sequencing, pest management and much more.

DEBATE QUESTION
To prepare for your debate, write a brief summary of your passage. What are the central ideas? What are the supporting details.

Prepare to take the pro or con side to the following debate question.

George Washington believed it was the responsibility of wealthy farmers to conduct agricultural research because they could more easily recover from inevitable failure and losses. Some of the most important wheat research of the 20th Century, the development of semi-dwarf, high-yield, disease-resistant wheat varieties, was financed by the Rockefeller Foundation, a private organization. However, the lead researcher was Norman Borlaug, who was trained at the University of Minnesota, a land grant university. In the 21st Century there are still wealthy individuals, like Bill Gates, who contribute to agricultural research. Do you think government should continue to be involved in agricultural research? Why or why not?
In 18th and 19th Century America, agriculture was the nation’s most important activity. Strengthening agriculture meant strengthening the nation. However, agricultural research and education were not part of the American system of higher education at that time. Only wealthy people could afford to go to college, which mostly prepared students to be ministers, doctors or lawyers. Education for 95 percent of all Americans ended after a few years of school.

President Abraham Lincoln’s primary concern was holding the union together, but he believed improving agriculture would contribute to that effort. In a speech to the the Wisconsin State Agricultural Society in 1859, Lincoln argued that free labor, laborers who had the opportunity to become landowners, would be more productive than slave or hired labor. Lincoln also recognized the need for agricultural education. Free labor could only achieve its highest potential if workers were educated. As Lincoln put it: “...no other human occupation opens so wide a field for the profitable and agreeable combination of labor with cultivated thought, as agriculture.”

In 1862 Lincoln signed the Morrill Act, granting the use of public lands to support land grant colleges, whose purpose was the teaching of agricultural or mechanical education in every state. The bill was designed to make college available for a larger portion of the population. Under this law a state could receive 30,000 acres of federal land for each of its congressmen. The state could then sell the land to fund at least one college. The Morrill Act of 1890 continued support for land-grant colleges but required that states practicing racial segregation could not receive funds unless they desegregated their colleges or provided separate colleges for African American students.

Eventually land-grant colleges began to look for ways to get the results of their research out to the people who needed it most, the farmers and ranchers. Colleges began arranging extension courses for farmers who were unable to go to the college campuses. Home economics departments followed this example and began to provide information to help women improve rural home life. Programs for young people were set up to demonstrate new methods which the young people could share with their families. This was the beginning of 4-H clubs.

In 1914 Congress passed the Smith-Lever Act, which gave land-grant colleges the money to establish an extension program in every state. The Act created a partnership between county, state and federal governments to fund the program.

Today the extension service uses a blend of 21st century technology to help fulfill its mission, but in extension’s earliest days, agents crisscrossed their states on demonstration trains, sharing the latest trends and knowledge for farm and family.

Agents conducted meetings in the leading towns along the railroad line. They organized institutes at each stop and gave lectures on a variety of farm topics. In partnership with the railroads, demonstration trains were part of Extension work for the next 10 years.

Extension today provides non-formal education and learning activities to people throughout the country — to farmers and other residents of rural communities as well as to people living in urban areas. As in its beginning, extension continues to take knowledge gained through research and education directly to the people to create positive changes. Extension educators use modern technology to share knowledge, but they also rely on traditional human values and relationships as residents of the communities in which they work.

By educating farmers about business operations and modern agricultural science and technologies, extension contributes to the success of farms, ranches, and rural business. These services also improve the lives of consumers and families through nutrition education, food safety training, and youth leadership development.
Over the last century, extension has adapted to changing times and landscapes, and it continues to address a wide range of human, plant, and animal needs in both urban and rural areas. Today, extension works to:

- Translate science for practical application
- Identify emerging research questions, find answers and encourage application of science and technology to improve agricultural, economic, and social conditions
- Prepare people to break the cycle of poverty, encourage healthful lifestyles, and prepare youth for responsible adulthood
- Provide rapid response regarding disasters and emergencies
- Connect people to information and assistance available online.

DEBATE QUESTION
To prepare for your debate, write a brief summary of your passage. What are the central ideas? What are the supporting details.

Prepare to take the pro or con side to the following debate question.

Abraham Lincoln believed free labor could only achieve its highest potential if workers were educated and that “...no other human occupation opens so wide a field for the profitable and agreeable combination of labor with cultivated thought, as agriculture.” When Lincoln was president, farmers made up 58 percent of the labor force. Today it is less than 2 percent. Do we still need government support for agricultural education? Why or why not?
Agricultural price controls are governmental restrictions on the prices that can be charged for agricultural commodities. The purpose may be to keep food affordable, to prevent price gouging during shortages and to slow inflation or to insure a minimum income for farmers.

The US government implemented price controls during World War I, when the disruption of European agriculture caused crop prices to rise dramatically. In response, many American farmers stepped up production with the help of new machines, like the combine harvester. As prices rose, farmers grew more grain to increase their profits. The government responded by restricting prices on wheat and other crops to make sure there was enough food for the people at home as well as for our allies in Europe.

After World War I, the government removed the wartime price supports as European markets began to recover. Agricultural exports declined, and grain prices plummeted. Farmers increased production to compensate for low prices. Wheat farmers were producing 2.5 times more wheat than people were consuming. The result was further devaluation of crops.

Farmers have historically been among the most vulnerable to boom and bust cycles like those experienced during and after World War I. A boom and bust cycle is a process of economic expansion and contraction that occurs repeatedly. The nature of farming does not allow for quick recoveries, particularly after farmers have made major investments in land, equipment, and crops. Many farmers struggled in the 1920s. Between 1924 and 1928, Congress repeatedly passed legislation to help farmers by regulating crop prices, but President Calvin Coolidge consistently vetoed farm relief, declaring that agriculture must stand “on an independent business basis.”

Things got even worse for farmers when the Great Depression hit in 1929. By 1932, crop prices were less than a third of what they had been in 1920. Within days of his inauguration in 1933, President Franklin Roosevelt introduced, and Congress approved, the Agricultural Adjustment Act (AAA). For the first time, Congress made it a policy to balance supply and demand for farm commodities so that prices would support a decent purchasing power for farmers. The Act controlled the supply of wheat and six other crops by offering subsidies—payments to farmers in return for taking some of their land out of farming. In 1937, the Supreme Court ruled that the AAA was unconstitutional, but the basic program was rewritten and again passed into law.

Although government support for farm income was originally intended as an emergency measure, it has continued in various forms up until today as part of a recurring farm bill that is reworked and renewed about every five years. Seventeen farm bills have been enacted since the 1930s.

Farm bills traditionally have focused on farm commodity supports for a handful of staple commodities—corn, soybeans, wheat, cotton, rice, dairy and sugar. In recent years it has grown to include more areas of concern. The most recent farm bill (2014) includes the following:

I. **Commodity Programs**—Provides support for major commodity crops, including wheat, corn, soybeans, peanuts, rice, dairy, and sugar, as well as disaster assistance.

II. **Conservation**—Encourages environmental stewardship of farmlands and improved management through land retirement and/or working lands programs.

III. **Trade**—Provides support for US agricultural export programs and international food assistance programs.
IV. **Nutrition**—Provides nutrition assistance for low-income households through programs including the Supplemental Nutrition Assistance Program (SNAP).

V. **Credit**—Supports federal direct and guaranteed loans to farmers and ranchers.

VI. **Rural Development**—Supports business and community programs and coordination activities with other local, state, and federal programs.

VII. **Research, Extension, and Related Matters**—Supports agricultural research and extension programs.

VIII. **Forestry**—Supports forestry management programs run by USDA’s Forest Service.

IX. **Energy**—Supports the development of farm and community renewable energy systems through various programs, including grants and loan guarantees.

X. **Horticulture**—Supports the production of specialty crops—fruits, vegetables, tree nuts, and floriculture and ornamental products—through a range of initiatives.

XI. **Crop Insurance**—Enhances coverage of the permanently authorized federal crop insurance program.

XII. **Miscellaneous**—Other types of programs and assistance not covered in other bill titles, including provisions affecting livestock and poultry production.


**DEBATE QUESTION**

To prepare for your debate, write a brief summary of your passage. What are the central ideas? What are the supporting details.

Prepare to take the pro or con side to the following debate question.

Farmers struggled to stay in business during the 1920s due to low prices for their crops. Congress passed legislation to help by regulating crop prices, but President Calvin Coolidge consistently vetoed farm relief, declaring that agriculture must stand “on an independent business basis.” By the time Franklin Roosevelt came to office, conditions were even worse for farmers. Roosevelt responded by introducing legislation to pay subsidies to farmers for taking some of their farm land out of production. This would keep crop prices high enough so that farmers could earn a living wage. Over the years, the government has experimented with different plans for keeping farmers in business during good times and bad. Currently the government provides support for major commodity crops, including wheat, corn, soybeans, peanuts, rice, dairy, and sugar. Some argue that government support for these commodities keeps their prices artificially low, to the disadvantage of other food crops, like fruits and vegetables. Some support for fruit and vegetable production was included in the most recent farm bill, but not to the extent that major commodities receive support. Do we still need to provide price support for farmers? Why or why not?
The United States Department of Agriculture (USDA) works to support the American agricultural economy to strengthen rural communities; to protect and conserve our natural resources; and to provide a safe, sufficient, and nutritious food supply for the American people. The Department’s wide range of programs and responsibilities touches the lives of every American every day. Listed below are a few of the agencies under the USDA, with information their missions, responsibilities, and services they provide.

The Agricultural Marketing Service (AMS) administers programs that facilitate efficient, fair marketing of U.S. agricultural products, including food, fiber, and specialty crops. AMS identifies and promotes the development of marketing opportunities for the agricultural community by conducting and supporting research and providing information on farmer direct marketing activities. AMS programs promote a strategic marketing perspective that adapts product and marketing practices and technologies to the issues of today and the challenges of tomorrow.

The Agricultural Research Service (ARS) is the principal in-house research agency of the USDA. ARS is charged with extending the Nation’s scientific knowledge through the administration of its national programs, as well as by conducting research projects in animal and crop production and protection, human nutrition, food safety, bioenergy, the environment, and other topics that affect the American people on a daily basis.

The Economic Research Service (ERS) is a primary source of economic information and research in USDA. ERS conducts its research program to inform public and private decision making on economic and policy issues involving food, farming, natural resources, and rural development. ERS’s economists and social scientists conduct research, analyze food and commodity markets, produce policy studies, and develop economic and statistical indicators. ERS staff disseminates economic information and research results through an array of outlets.

The Foreign Agricultural Service (FAS) works to improve foreign market access for U.S. products and administers market development and export financing programs. FAS helps U.S. exporters develop and maintain markets overseas for U.S. food and agricultural products. FAS helps developing countries improve their agricultural systems and build their trade capacity.

Grain Inspection, Packers and Stockyards Administration
The Grain Inspection, Packers and Stockyards Administration (GIPSA) facilitates the marketing of livestock, poultry, meat, cereals, oilseeds, and related agricultural products. The agency promotes fair and competitive trading practices for the overall benefit of consumers and American agriculture.

The National Institute of Food and Agriculture (NIFA) impacts the lives of millions of Americans each day by supporting exemplary research, education, and extension that address many challenges facing our Nation through collaboration with historically Black colleges and universities, Hispanic-serving institutions, and Tribal colleges. You are connected to NIFA through your nearest Extension office, which provides answers to concerns through educational materials and web-based information.
Name____________________________________

USDA Job Questionnaire

For each of the USDA agencies listed on the page provided, go to the link and find information about careers in that agency. Look for the “Careers” link at the top of the page for some agencies. For others you may need to click on “About Us” or use the search engine at usajobs to find positions for that agency. Summarize general information about that agency in the “Agency Overview” section below. Find one example of a job available and record the information in the space below.

Name of Agency______________________________

Agency Overview:

Job Description and Duties:

Job Location___________________________ Salary Range_______________________

Job Requirements (Education/Training)