

# BE A PART OF | Agriculture, Food and Natural Resources





## **IMPACTING LIVES EVERY DAY: Careers in Agriculture, Food and Natural Resources**

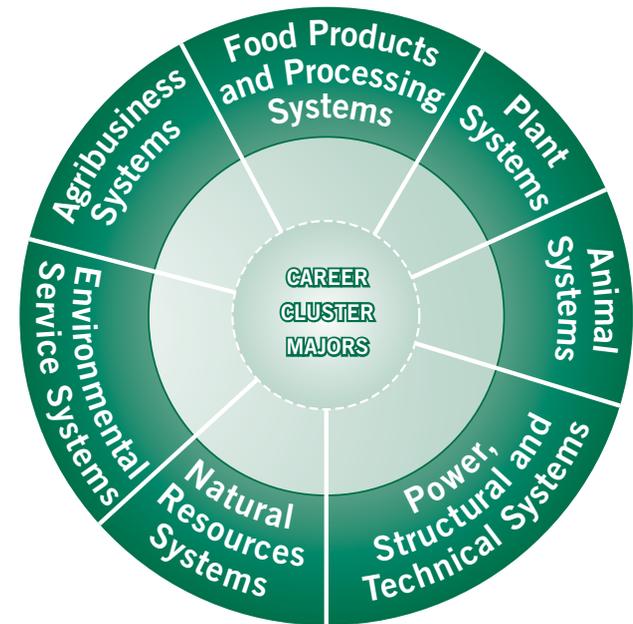
This diverse career cluster has a wide range of occupations, including the production, processing, marketing, financing and development of agricultural commodities and resources including food, fiber, wood products, natural resources, horticulture and other plant and animal products. The career cluster also includes related professional, technical and educational services.

## THE AGRICULTURE, FOOD AND NATURAL RESOURCES CAREER CLUSTER

The Agriculture, Food and Natural Resources Career Cluster is divided into seven majors. They are as follows:

- Food Products and Processing Systems
- Plant Systems
- Animal Systems
- Power, Structural and Technical Systems
- Natural Resources Systems
- Environmental Service Systems
- Agribusiness Systems

Each of these majors is grouped by common knowledge and skills required of occupations in these career fields. The knowledge and skills needed for jobs in each major can be obtained via on-the-job training as well as at two-year institutions such as Midlands Technical College and four-year colleges, such as the University of South Carolina and Clemson University, which has curricula in agricultural sciences and agricultural education at both the undergraduate and graduate levels.





**FOOD PRODUCTS AND PROCESSING SYSTEMS:** People who work in this major discover new food sources, analyze food content and develop ways to process, preserve, package or store food according to industry and government regulations.

**IF YOU CHOOSE FOOD PRODUCTS AND PROCESSING SYSTEMS AS YOUR CAREER MAJOR, YOU MAY BE A PART OF:**

- Inspecting food-processing areas to ensure that sanitation, safety, quality and waste management standards are met
- Performing a cut in the production of a meat, poultry, or fish product
- Designing and supervising environmental and land reclamation projects in agriculture and related industries
- Analyzing sales data to determine how much farm goods to buy and at what price customers will pay for such goods

**SAMPLE CAREERS**

**Associate's Degree or Less**  
**Annual Salary Range**  
**\$20,000-\$50,000**

- Food and Drug Inspector
- Meat, Poultry, and Fish Cutter and Trimmer
- Food Batchmaker
- Food Cooking Machine Operator and Tender
- Slaughterer and Meat Packer

**Bachelor's Degree**  
**Annual Salary Range**  
**\$50,000-\$100,000**

- Quality Assurance Manager
- Bacteriologist
- Food Science Professor
- Research and Development Manager
- Toxicologist

Career	Entry-Level Education	Annual Median Salary & Hourly Pay (2010)	Job Outlook (2010-20)	Responsibilities	Skills
<b>Graders and Sorters, Agricultural Products</b>	High School Diploma or On-the-Job Training	<b>\$19,080/year</b> <b>\$9.17/hour</b>	<b>2%</b> (Little to no change)	<ul style="list-style-type: none"> <li>• Grade, sort or classify unprocessed food and other agricultural products by size, weight, color or condition</li> <li>• Discard inferior or defective products and/or foreign matter</li> <li>• Weigh products or estimate their weight visually or by feel</li> <li>• Place products in containers according to grade and mark grades on containers</li> <li>• Record grade and/or identification numbers on tags or on shipping, receiving or sales sheets</li> </ul>	<ul style="list-style-type: none"> <li>• Concentration</li> <li>• Coordination</li> <li>• Decision-making skills</li> <li>• Judgment skills</li> <li>• Listening skills</li> <li>• Physical strength</li> <li>• Reading comprehension</li> <li>• Stamina</li> </ul>
<b>Food Processing Occupations</b>	High School Diploma or On-the-Job Training	<b>\$23,950/year</b> <b>\$11.51/hour</b>	<b>12%</b> (Average)	<ul style="list-style-type: none"> <li>• Cut steaks and chops and shape and tie roasts</li> <li>• Perform a cut in the production of a meat, poultry or fish product</li> <li>• Grind meats for sale as chopped meats or sausage</li> <li>• Inspect products for defects and irregularities</li> <li>• Label or identify goods to make transporting and using them easy</li> <li>• Clean all knives, equipment and workspaces to meet health guidelines</li> </ul>	<ul style="list-style-type: none"> <li>• Concentration</li> <li>• Coordination</li> <li>• Customer-service skills</li> <li>• Listening skills</li> <li>• Stamina</li> <li>• Teamwork</li> </ul>
<b>Agricultural and Food Science Technicians</b>	Associate's Degree	<b>\$32,760/year</b> <b>\$15.75/hour</b>	<b>7%</b> (Slower than average)	<ul style="list-style-type: none"> <li>• Measure and analyze the quality of food products</li> <li>• Test food, food additives and food containers to ensure they comply with established safety standards</li> <li>• Assist food scientists with food research, development and quality control</li> <li>• Analyze chemical properties of food to determine ingredients and formulas</li> <li>• Compile test results that go into charts, presentations and reports</li> <li>• Keep a safe, sterile laboratory environment</li> </ul>	<ul style="list-style-type: none"> <li>• Analytical skills</li> <li>• Critical-thinking skills</li> <li>• Interpersonal skills</li> <li>• Listening skills</li> <li>• Speaking skills</li> </ul>
<b>Food Scientists</b>	Bachelor's Degree	<b>\$58,450/year</b> <b>\$28.10/hour</b>	<b>10%</b> (Average)	<ul style="list-style-type: none"> <li>• Work to ensure food safety</li> <li>• Create new food products and develop new and better ways to process, package and deliver them</li> <li>• Conduct research and experiments concerning animal nutrition and field crops</li> <li>• Discover ways to improve the quality, quantity and safety of agricultural products</li> </ul>	<ul style="list-style-type: none"> <li>• Communication skills</li> <li>• Critical-thinking skills</li> <li>• Data-analysis skills</li> <li>• Decision-making skills</li> <li>• Observation skills</li> </ul>



**PLANT SYSTEMS:** People who work in this major study plants and their growth, as well as develop ways to improve the nutritional value of crops and the quality of seeds.

### **IF YOU CHOOSE PLANT SYSTEMS AS YOUR CAREER MAJOR, YOU MAY BE A PART OF:**

- Helping producers of food, feed and fiber crops continue to feed a growing population while conserving natural resources and maintaining the environment
- Using genetic engineering to develop crops resistant to pests and drought
- Studying the composition of soil as it relates to plant growth
- Monitoring forestry and conservation activities to assure compliance with government regulations

### **SAMPLE CAREERS**

#### **Associate's Degree or Less**

#### **Annual Salary Range**

**\$20,000-\$50,000**

- Agricultural Sciences Teacher
- Seed Analyst
- Agricultural Laboratory Technician
- Research Associate

#### **Bachelor's Degree**

#### **Annual Salary Range**

**\$50,000-\$100,000**

- Plant Breeder
- Soil and Water Specialist
- Certified Crop Advisor
- Botanist
- Geneticist

Career	Entry-Level Education	Annual Median Salary & Hourly Pay (2010)	Job Outlook (2010-20)	Responsibilities	Skills
<b>Agricultural Technicians</b>	Bachelor's Degree	<b>\$33,550/year</b> <b>\$16.13/hour</b>	<b>9%</b> (Slower than average)	<ul style="list-style-type: none"> <li>Set up or maintain laboratory equipment and collect samples from crops</li> <li>Plant seeds in specified areas and count the resulting plants to determine the percentage of seeds that germinated</li> <li>Prepare data summaries, reports or analyses that include results, charts or graphs to document research findings and results</li> <li>Collect samples from crops so testing can be performed</li> <li>Operate laboratory equipment, such as centrifugal air samplers</li> </ul>	<ul style="list-style-type: none"> <li>Coordination</li> <li>Critical-thinking skills</li> <li>Decision-making skills</li> <li>Judgment skills</li> <li>Listening skills</li> <li>Monitoring skills</li> <li>Reading comprehension</li> </ul>
<b>Soil and Plant Scientists</b>	Bachelor's Degree	<b>\$63,290/year</b> <b>\$30.43/hour</b>	<b>19%</b> (Average)	<ul style="list-style-type: none"> <li>Conduct research in breeding, physiology, production, yield and management of crops and agricultural plants and trees</li> <li>Classify and map soils and investigate effects of alternative practices on soil and crop productivity</li> <li>Identify or classify species of insects or allied forms, such as mites or spiders</li> <li>Develop improved measurement techniques, soil conservation methods, soil sampling devices or related technology</li> <li>Investigate soil problems and poor water quality to determine sources and effects</li> </ul>	<ul style="list-style-type: none"> <li>Critical thinking</li> <li>Decision-making skills</li> <li>Judgment skills</li> <li>Monitoring skills</li> <li>Problem-solving skills</li> <li>Reading skills</li> <li>Speaking skills</li> <li>Writing skills</li> </ul>
<b>Agricultural Engineers</b>	Bachelor's Degree	<b>\$71,090/year</b> <b>\$34.18/hour</b>	<b>9%</b> (Slower than average)	<ul style="list-style-type: none"> <li>Design agricultural machinery components and equipment, using computer-aided design (CAD) technology</li> <li>Test agricultural machinery and equipment to ensure that they perform adequately</li> <li>Design food-processing plants and supervise manufacturing operations</li> <li>Provide advice on water quality and issues related to managing pollution, controlling rivers and protecting and using other water resources</li> <li>Design and supervise environmental and land reclamation projects in agriculture and related industries</li> </ul>	<ul style="list-style-type: none"> <li>Listening skills</li> <li>Math skills</li> <li>Problem-solving skills</li> <li>Systems analysis</li> <li>Teamwork</li> </ul>
<b>Biochemists and Biophysicists</b>	Doctoral or Professional Degree	<b>\$79,390/year</b> <b>\$38.17/hour</b>	<b>31%</b> (Much faster than average)	<ul style="list-style-type: none"> <li>Study the evolution of plants to understand how genetic traits are carried through successive generations</li> <li>Develop genetically engineered crops that are more resistant to drought, disease, insects and other afflictions</li> <li>Develop alternative fuels, such as biofuels and renewable energy sources from plants</li> <li>Develop ways to protect the environment and clean up pollution</li> </ul>	<ul style="list-style-type: none"> <li>Analytical skills</li> <li>Critical-thinking skills</li> <li>Interpersonal skills</li> <li>Math skills</li> <li>Perseverance</li> <li>Problem-solving skills</li> </ul>



**ANIMAL SYSTEMS:** People who work in this major strive to develop better, more efficient ways of producing and processing meat, poultry, eggs and dairy products.

**IF YOU CHOOSE ANIMAL SYSTEMS AS YOUR CAREER MAJOR, YOU MAY BE A PART OF:**

- Studying genetics, nutrition, reproduction, growth and development of domesticated farm animals
- Inspecting and grading livestock food products or purchasing livestock
- Advising agricultural producers on how to upgrade animal housing facilities properly, lower mortality rates, handle waste matter or increase production of animal products, such as milk or eggs
- Training, feeding, watering, grooming, bathing and exercising animals, as well as cleaning, disinfecting and repairing their fences and cages

**SAMPLE CAREERS**

**Associate's Degree or Less**  
**Annual Salary Range**  
**\$20,000-\$50,000**

- Animal Breeder
- Animal Trainer
- Poultry Farm Worker
- Veterinary Assistant
- Laboratory Animal Caretaker

**Bachelor's Degree**  
**Annual Salary Range**  
**\$50,000-\$100,000**

- Animal Geneticist
- Aquaculturalist
- Animal Nutritionist
- Animal Scientist
- Poultry Manager
- Zoo Curator

Career	Entry-Level Education	Annual Median Salary & Hourly Pay (2010)	Job Outlook (2010-20)	Responsibilities	Skills
<b>Animal Care Workers</b>	High School Diploma or Equivalent	<b>\$19,780/year</b> <b>\$9.51/hour</b>	<b>23%</b> (Faster than average)	<ul style="list-style-type: none"> <li>Care for the needs of animals, including feeding, watering, grooming, bathing and exercising them</li> <li>Clean equipment and living spaces of animals</li> <li>Monitor animals and record information such as their diet, physical condition and behavior</li> <li>Examine animals for signs of illness or injury</li> <li>Train animals to do specific behaviors</li> </ul>	<ul style="list-style-type: none"> <li>Compassion</li> <li>Detail oriented</li> <li>Patience</li> <li>Problem-solving skills</li> <li>Stamina</li> </ul>
<b>Veterinary Technologists and Technicians</b>	Associate's Degree	<b>\$29,710/year</b> <b>\$14.28/hour</b>	<b>52%</b> (Much faster than average)	<ul style="list-style-type: none"> <li>Perform medical tests under the supervision of a licensed veterinarian to treat or to diagnose the illnesses or injuries of animals</li> <li>Provide emergency first aid to injured animals</li> <li>Collect laboratory tests, such as urinalyses and blood counts</li> <li>Administer medications, vaccines and treatments prescribed by a veterinarian</li> <li>Take and develop x-rays</li> </ul>	<ul style="list-style-type: none"> <li>Compassion</li> <li>Detail oriented</li> <li>Interpersonal skills</li> <li>Manual dexterity</li> </ul>
<b>Zoologists and Wildlife Biologists</b>	Bachelor's Degree	<b>\$57,430/year</b> <b>\$27.61/hour</b>	<b>7%</b> (Slower than average)	<ul style="list-style-type: none"> <li>Study the characteristics and habitats of animals and wildlife, such as their interactions with other species, reproduction, diseases and movement patterns</li> <li>Develop and conduct experimental studies with animals in controlled or natural surroundings</li> <li>Write research papers, reports and scholarly articles that explain the findings of an experimental study</li> <li>Give presentations on research findings</li> </ul>	<ul style="list-style-type: none"> <li>Critical-thinking skills</li> <li>Interpersonal skills</li> <li>Observation skills</li> <li>Problem-solving skills</li> <li>Speaking skills</li> <li>Writing skills</li> </ul>
<b>Veterinarians</b>	Doctoral or Professional Degree	<b>\$82,040/year</b> <b>\$39.44/hour</b>	<b>36%</b> (Much faster than average)	<ul style="list-style-type: none"> <li>Care for the health of animals, by diagnosing, treating or researching medical conditions and diseases of pets, livestock, and animals in zoos, racetracks and laboratories</li> <li>Examine animals to diagnose their health problems</li> <li>Treat and dress wounds</li> <li>Perform surgery on animals</li> <li>Test for and vaccinate against diseases</li> <li>Operate medical equipment such as x-ray machines</li> <li>Prescribe medication</li> <li>Advise animal owners about general care, medical conditions and treatments</li> </ul>	<ul style="list-style-type: none"> <li>Compassion</li> <li>Decision-making skills</li> <li>Interpersonal skills</li> <li>Management skills</li> <li>Manual dexterity</li> <li>Problem-solving skills</li> </ul>



**POWER, STRUCTURAL AND TECHNICAL SYSTEMS:** People who work in this major apply knowledge of engineering, hydraulics, pneumatics, electronics, power structures and controls to the field of agriculture.

**IF YOU CHOOSE POWER, STRUCTURAL AND TECHNICAL SYSTEMS AS YOUR CAREER MAJOR, YOU MAY BE A PART OF:**

- Designing and maintaining architectural structures, machinery and equipment
- Developing ways to conserve soil and water and improve the processing of agricultural products
- Collecting data and providing spatial information to specialists in water resource engineering, forestry and other fields in agriculture
- Researching and selling spare and replacement parts for heavy farm equipment

**SAMPLE CAREERS**

**Associate's Degree or Less**  
**Annual Salary Range**  
**\$20,000-\$50,000**

- Agricultural Equipment Operator
- Mobile Heavy Equipment Mechanic
- Farm Equipment Mechanic
- Service Technician
- Parts Salesperson
- Welder

**Bachelor's Degree**  
**Annual Salary Range**  
**\$50,000-\$100,000**

- Remote Sensing Specialist
- Global Positioning Systems Technician
- Electronics Systems Technician
- Communication Technician
- Recycling Technician
- Equipment Parts Manager

Career	Entry-Level Education	Annual Median Salary & Hourly Pay (2010)	Job Outlook (2010-20)	Responsibilities	Skills
<b>Welders, Cutters, Solderers and Brazers</b>	High School Diploma or Equivalent	<b>\$35,450/year</b> <b>\$17.04/hour</b>	<b>15%</b> (Average)	<ul style="list-style-type: none"> <li>• Maintain farm equipment and machinery</li> <li>• Weld or join metal parts</li> <li>• Fill holes, indentions or seams of metal products, using hand-held welding equipment</li> <li>• Study blueprints, sketches or specifications</li> <li>• Calculate dimensions to be welded</li> <li>• Ignite torches or start power supplies</li> <li>• Monitor the welding process to avoid overheating</li> <li>• Smooth and polish all surfaces</li> </ul>	<ul style="list-style-type: none"> <li>• Detail oriented</li> <li>• Dexterity</li> <li>• Physical strength</li> <li>• Stamina</li> <li>• Technical skills</li> <li>• Troubleshooting skills</li> <li>• Visual acuity</li> </ul>
<b>Machinists and Tool &amp; Die Makers</b>	High School Diploma or Equivalent	<b>\$39,910/year</b> <b>\$19.19/hour</b>	<b>7%</b> (Slower than average)	<ul style="list-style-type: none"> <li>• Set up and operate a variety of computer-controlled or mechanically-controlled machine tools to produce precision metal parts, instruments and tools for farm use</li> <li>• Work from blueprints, sketches or computer-aided design (CAD) or computer-aided manufacturing (CAM) files</li> <li>• Calculate dimensions using measuring instruments</li> <li>• File, grind and adjust parts so they fit together properly</li> <li>• Measure, examine and test completed products for defects</li> </ul>	<ul style="list-style-type: none"> <li>• Analytical skills</li> <li>• Detail oriented</li> <li>• Math and computer skills</li> <li>• Mechanical skills</li> <li>• Stamina</li> <li>• Technical skills</li> </ul>
<b>Heavy Vehicle and Mobile Equipment Service Technicians</b>	High School Diploma or Equivalent	<b>\$42,630/year</b> <b>\$20.50/hour</b>	<b>16%</b> (Average)	<ul style="list-style-type: none"> <li>• Inspect, maintain and repair vehicles and machinery used in farming and other industries</li> <li>• Read and understand operating manuals, blueprints and drawings</li> <li>• Perform scheduled maintenance, such as cleaning and lubricating parts</li> <li>• Diagnose and identify malfunctions, using computerized tools and equipment</li> <li>• Inspect, repair and replace defective or worn parts, such as bearings, pistons and gears</li> <li>• Disassemble and reassemble heavy equipment and components</li> </ul>	<ul style="list-style-type: none"> <li>• Dexterity</li> <li>• Mechanical skills</li> <li>• Physical strength</li> <li>• Technical skills</li> <li>• Troubleshooting skills</li> </ul>
<b>Electrical and Electronics Engineering Technicians</b>	Associate's Degree	<b>\$56,040/year</b> <b>\$26.94/hour</b>	<b>2%</b> (Little or no change)	<ul style="list-style-type: none"> <li>• Help engineers design and develop computers, communications equipment and navigational equipment for farm use</li> <li>• Work in product evaluation and testing, using measuring and diagnostic devices to adjust, test and repair equipment</li> <li>• Build, calibrate and repair electrical instruments or testing equipment</li> <li>• Design basic circuitry and draft sketches to clarify details of design documentation</li> <li>• Identify and resolve equipment malfunctions, working with manufacturers to get replacement parts</li> </ul>	<ul style="list-style-type: none"> <li>• Deductive-reasoning skills</li> <li>• Information-ordering skills</li> <li>• Manual dexterity</li> <li>• Math skills</li> <li>• Monitoring skills</li> <li>• Problem-solving skills</li> <li>• Writing skills</li> </ul>



**NATURAL RESOURCES SYSTEMS:** People who work in this major perform a variety of tasks from helping to develop, maintain and manage the forest and natural environment to catching and trapping various types of marine life for human consumption, animal feed, bait and other uses.

### IF YOU CHOOSE NATURAL RESOURCES SYSTEMS AS YOUR CAREER MAJOR, YOU MAY BE A PART OF:

- Supplying wood products, livestock forage, minerals and water for forests and rangelands
- Managing, developing and protecting habitats for wildlife and other natural resources
- Patrolling assigned areas to prevent fish and game law violations and investigating reports of damage to crops or property by wildlife
- Directing fishing operations, finding fish using specialized equipment and supervising a fishing crew

### SAMPLE CAREERS

#### Associate's Degree or Less Annual Salary Range \$20,000-\$50,000

- Water Monitoring Technician
- Forest Worker
- Logging Equipment Operator
- Park Naturalist
- Fisher or Fishing Worker

#### Bachelor's Degree Annual Salary Range \$50,000-\$100,000

- Wildlife Manager or Technician
- Park Manager
- Forest Manager or Technician
- Geological Sample Test Technician
- Geophysical Data Technician

Career	Entry-Level Education	Annual Median Salary & Hourly Pay (2010)	Job Outlook (2010-20)	Responsibilities	Skills
<b>Logging Workers</b>	High School Diploma or Equivalent	<b>\$32,870/year</b> <b>\$15.80/hour</b>	<b>4%</b> (Slower than average)	<ul style="list-style-type: none"> <li>• Cut down trees with hand-held power chain saws or mobile felling machines</li> <li>• Fasten chains around logs to be dragged by tractors</li> <li>• Separate logs by species and type of wood and load them onto trucks</li> <li>• Drive and maneuver tractors and tree harvesters to shear trees and cut logs into desired lengths</li> <li>• Calculate total board feet, cordage or other wood measurement units using conversion tables</li> </ul>	<ul style="list-style-type: none"> <li>• Decision-making skills</li> <li>• Detail oriented</li> <li>• Listening skills</li> <li>• Physical stamina</li> <li>• Physical strength</li> </ul>
<b>Forest and Conservation Technicians</b>	Associate's Degree	<b>\$33,390/year</b> <b>\$16.05/hour</b>	<b>-1%</b> (Little or no change)	<ul style="list-style-type: none"> <li>• Measure and improve the quality of forests, rangeland and other natural areas</li> <li>• Gather data on water and soil quality, disease and insect damage to trees and other plants, and conditions that may pose a fire hazard</li> <li>• Locate property lines and evaluate forested areas to determine the species, quality and amount of standing timber</li> <li>• Select and mark trees to be cut</li> <li>• Patrol forest areas and enforce environmental protection regulations</li> <li>• Suppress forest fires with fire control activities, including training other forestry workers and coordinating detection programs</li> </ul>	<ul style="list-style-type: none"> <li>• Analytical skills</li> <li>• Critical-thinking skills</li> <li>• Interpersonal skills</li> <li>• Listening skills</li> <li>• Physical stamina</li> <li>• Speaking skills</li> </ul>
<b>Fish and Game Wardens</b>	Bachelor's Degree	<b>\$49,400/year</b> <b>\$23.75/hour</b>	<b>8%</b> (Slower than average)	<ul style="list-style-type: none"> <li>• Patrol assigned areas by car, boat, airplane, horse or on foot to enforce game, fish or boating laws</li> <li>• Investigate hunting accidents and reports of fish and game law violations</li> <li>• Issue warnings or citations and file reports</li> <li>• Serve warrants, make arrests and compile and present evidence for court actions</li> <li>• Protect and preserve native wildlife, plants and ecosystems</li> <li>• Promote or provide hunter or trapper safety training</li> </ul>	<ul style="list-style-type: none"> <li>• Coordination</li> <li>• Critical thinking skills</li> <li>• Decision-making skills</li> <li>• Judgment skills</li> <li>• Listening skills</li> <li>• Negotiation skills</li> <li>• Persuasion skills</li> <li>• Problem-solving skills</li> </ul>
<b>Conservation Scientists and Foresters</b>	Bachelor's Degree	<b>\$57,420/year</b> <b>\$27.60/hour</b>	<b>5%</b> (Slower than average)	<ul style="list-style-type: none"> <li>• Manage overall land quality of forests, parks, rangelands and other natural resources</li> <li>• Supervise activities for other forestry and conservation workers</li> <li>• Negotiate terms and conditions for forest harvesting and land-use contracts</li> <li>• Determine ways to remove timber with minimum environmental damage</li> <li>• Choose and prepare sites for new trees using controlled burning, bulldozers or herbicides to clear land</li> </ul>	<ul style="list-style-type: none"> <li>• Analytical skills</li> <li>• Critical-thinking skills</li> <li>• Decision-making skills</li> <li>• Interpersonal skills</li> <li>• Physical stamina</li> <li>• Speaking skills</li> </ul>



**ENVIRONMENTAL SERVICE SYSTEMS:** People who work in this major are involved in water and air pollution control, recycling, waste disposal and public health issues.

### **IF YOU CHOOSE ENVIRONMENTAL SERVICE SYSTEMS AS YOUR CAREER MAJOR, YOU MAY BE A PART OF:**

- Conducting hazardous-waste management studies and evaluating the significance of a hazard
- Offering analysis on treatment and containment and developing regulations to prevent hazardous-waste mishaps
- Designing municipal sewage and industrial wastewater systems
- Analyzing scientific data, researching environmental projects and performing quality control checks

### **SAMPLE CAREERS**

#### **Associate's Degree or Less Annual Salary Range \$20,000-\$50,000**

- Environmental Sampling Technician
- Environmental Engineering Technician
- Hazardous Materials Handler
- Solid Waste Disposer/Recycler
- Recycling and Reclamation Worker
- Recycling Coordinator

#### **Bachelor's Degree Annual Salary Range \$50,000-\$100,000**

- Pollution Prevention and Control Manager
- Health and Safety Sanitarian
- Water Environment Engineer
- Environmental Compliance Inspector
- Wastewater Treatment Plant System Operator
- Water Quality Manager

Career	Entry-Level Education	Annual Median Salary & Hourly Pay (2010)	Job Outlook (2010-20)	Responsibilities	Skills
<b>Hazardous Materials Removal Workers</b>	High School Diploma or Equivalent	<b>\$37,600/year</b> <b>\$18.08/hour</b>	<b>23%</b> (Faster than average)	<ul style="list-style-type: none"> <li>Identify and dispose of asbestos, radioactive and nuclear waste, arsenic, lead and other hazardous materials</li> <li>Clean up materials that are flammable, corrosive, reactive or toxic</li> <li>Comply with safety procedures and federal laws regarding waste disposal</li> <li>Construct scaffolding or build containment areas before cleaning up</li> <li>Operate equipment that removes and stores waste materials</li> </ul>	<ul style="list-style-type: none"> <li>Detail oriented</li> <li>Math skills</li> <li>Mechanical skills</li> <li>Stamina</li> <li>Teamwork</li> <li>Troubleshooting skills</li> </ul>
<b>Environmental Science and Protection Technicians</b>	Associate's Degree	<b>\$41,380/year</b> <b>\$19.90/hour</b>	<b>24%</b> (Faster than average)	<ul style="list-style-type: none"> <li>Monitor the environment and investigate sources of pollution and contamination</li> <li>Inspect public places and businesses to ensure that there are no environmental, health or safety hazards</li> <li>Set up and maintain equipment used to monitor pollution levels, such as remote sensors that measure emissions from smokestacks</li> <li>Collect samples of air, soil, water and other materials for laboratory analysis</li> <li>Perform scientific tests to identify and measure levels of pollutants in samples</li> </ul>	<ul style="list-style-type: none"> <li>Analytical skills</li> <li>Critical-thinking skills</li> <li>Interpersonal skills</li> <li>Listening skills</li> <li>Speaking skills</li> <li>Writing skills</li> </ul>
<b>Environmental Scientists and Specialists</b>	Bachelor's Degree	<b>\$61,700/year</b> <b>\$29.66/hour</b>	<b>19%</b> (Average)	<ul style="list-style-type: none"> <li>Identify problems and find solutions that minimize hazards to the health of the environment and the population</li> <li>Determine data collection methods for research projects, investigations and surveys</li> <li>Collect environmental data, such as samples of air, soil, water, food and other materials for scientific analysis</li> <li>Develop plans to prevent, control or fix environmental problems, such as pollution and harm to land or water</li> </ul>	<ul style="list-style-type: none"> <li>Analytical skills</li> <li>Interpersonal skills</li> <li>Problem-solving skills</li> <li>Speaking skills</li> <li>Writing skills</li> </ul>
<b>Environmental Engineers</b>	Bachelor's Degree	<b>\$78,740/year</b> <b>\$37.86/hour</b>	<b>22%</b> (Faster than average)	<ul style="list-style-type: none"> <li>Use the principles of engineering, soil science, biology and chemistry to develop solutions to environmental problems</li> <li>Join efforts to improve recycling, waste disposal, public health and control of water and air pollution</li> <li>Address global issues, such as safe drinking water, climate change and sustainability</li> <li>Prepare, review and update environmental investigation reports</li> <li>Design projects leading to environmental protection, such as water reclamation facilities, air pollution control systems and operations that convert waste to energy</li> </ul>	<ul style="list-style-type: none"> <li>Communication skills</li> <li>Problem-solving skills</li> <li>Reading comprehension</li> <li>Systems analysis</li> <li>Teamwork</li> </ul>



**AGRIBUSINESS SYSTEMS:** People who work in this major are involved in the coordination of all activities that contribute to the production, processing, marketing, distribution, financing and development of agricultural commodities and resources.

**IF YOU CHOOSE AGRIBUSINESS SYSTEMS AS YOUR CAREER MAJOR, YOU MAY BE A PART OF:**

- Working in all facets of agribusiness, including food, fiber, wood products, natural resources, horticulture and other plant and animal products and services
- Using high-tech innovations to increase efficiency and profitability, including satellite systems, biotechnology, computer databases and spreadsheets
- Advising, instructing and assisting individuals and families engaged in agriculture and agricultural-related processes
- Supervising all steps of the crop production and ranging process, including planting, fertilizing, harvesting and herding

**SAMPLE CAREERS**

<b>Associate's Degree or Less</b> <b>Annual Salary Range</b> <b>\$20,000-\$50,000</b>	<b>Bachelor's Degree</b> <b>Annual Salary Range</b> <b>\$50,000-\$100,000</b>	<b>Bachelor's Degree + Graduate Degrees and/or Certifications</b> <b>Annual Salary Range</b> <b>\$100,000+</b>
<ul style="list-style-type: none"> <li>• Farmworker or Crop Laborer</li> <li>• First-Line Supervisor</li> <li>• Groundskeeping Worker</li> <li>• Agricultural Salesperson</li> </ul>	<ul style="list-style-type: none"> <li>• Feed/Farm Supply Store Manager</li> <li>• International Agri-Marketing Specialist</li> <li>• Agricultural Loan Officer</li> </ul>	<ul style="list-style-type: none"> <li>• Vegetable Farm Owner</li> <li>• Cattle Ranch Owner</li> <li>• Dairy Farm Owner</li> <li>• Plant and Flower Nursery Owner</li> <li>• Landscaping Company Owner</li> <li>• Florist Owner</li> </ul>

Career	Entry-Level Education	Annual Median Salary & Hourly Pay (2010)	Job Outlook (2010-20)	Responsibilities	Skills
<b>Agricultural Workers</b>	On-the-Job Training	<b>\$18,970/year</b> <b>\$9.12/hour</b>	<b>-3%</b> (Declining rapidly)	<ul style="list-style-type: none"> <li>Harvest and inspect crops by hand</li> <li>Irrigate farm soil and maintain ditches, pipes and pumps</li> <li>Operate farm machinery</li> <li>Spray fertilizer or pesticide solutions to control insects, fungi and weeds</li> <li>Move shrubs, plants and trees with wheelbarrows or tractors</li> <li>Feed livestock and clean and disinfect their pens, cages, yards and hutches</li> <li>Herd livestock to pastures for grazing or to scales, trucks or other enclosures</li> </ul>	<ul style="list-style-type: none"> <li>Listening skills</li> <li>Manual dexterity</li> <li>Physical stamina</li> <li>Physical strength</li> <li>Technical skills</li> </ul>
<b>Floral Designers</b>	High School Diploma or Equivalent	<b>\$23,610/year</b> <b>\$11.35/hour</b>	<b>-9%</b> (Declining rapidly)	<ul style="list-style-type: none"> <li>Grow or order flowers from wholesalers to ensure an adequate supply to meet customers' needs</li> <li>Determine the type of arrangement desired, the occasion and the date, time and location that each arrangement is needed</li> <li>Recommend flowers and greenery for each arrangement</li> <li>Consider the customer's budget when making recommendations</li> <li>Answer telephones, take orders and wrap arrangements</li> </ul>	<ul style="list-style-type: none"> <li>Artistic ability</li> <li>Creativity</li> <li>Customer service skills</li> <li>Organizational skills</li> </ul>
<b>Farm and Home Management Advisors</b>	Masters Degree	<b>\$47,640/year</b> <b>\$22.90/hour</b>	<b>19%</b> (Average)	<ul style="list-style-type: none"> <li>Advise, instruct and assist individuals and families engaged in agriculture, agricultural-related processes or home economics activities</li> <li>Demonstrate procedures and apply research findings to solve problems</li> <li>Instruct and train in product development, sales and the use of machinery and equipment to promote general welfare</li> </ul>	<ul style="list-style-type: none"> <li>Active listening skills</li> <li>Coordination skills</li> <li>Critical thinking skills</li> <li>Decision-making skills</li> <li>Instructing skills</li> <li>Judgment skills</li> </ul>
<b>Farmers, Ranchers, and Other Agricultural Managers</b>	High School Diploma or Equivalent	<b>\$60,750/year</b> <b>\$29.21/hour</b>	<b>-8%</b> (Declining rapidly)	<ul style="list-style-type: none"> <li>Supervise all steps of the crop production and ranging process, including planting, fertilizing, harvesting and herding</li> <li>Determine how to raise crops or livestock according to factors such as market conditions, federal program availability and soil conditions</li> <li>Maintain farm facilities, including its water pipes, hoses, fences and animal shelters</li> <li>Serve as the sales agent for livestock and crops</li> <li>Keep financial, tax, production and employee records</li> </ul>	<ul style="list-style-type: none"> <li>Analytical skills</li> <li>Critical-thinking skills</li> <li>Interpersonal skills</li> <li>Machine-operation skills</li> </ul>



# Online Resources

## MEBA EDUCATION RESOURCES

### COLLEGES AND UNIVERSITIES

Allen University  
[www.allenuniversity.edu](http://www.allenuniversity.edu)

Benedict College  
[www.benedict.edu](http://www.benedict.edu)

Clemson University  
[www.clemson.edu](http://www.clemson.edu)

Columbia College  
[www.columbiasc.edu](http://www.columbiasc.edu)

Columbia International University  
[www.ciu.edu](http://www.ciu.edu)

Limestone College-Extended Campus  
[www.limestone.edu/extended-campus](http://www.limestone.edu/extended-campus)

Midlands Technical College  
[www.midlandstech.edu](http://www.midlandstech.edu)

SC State University  
[www.scsu.edu](http://www.scsu.edu)

South University  
[www.southuniversity.edu/columbia](http://www.southuniversity.edu/columbia)

Southern Wesleyan University  
[www.swu.edu](http://www.swu.edu)

University of South Carolina  
[www.sc.edu](http://www.sc.edu)

Webster University  
[www.webster.edu](http://www.webster.edu)

## MEBA EDUCATION RESOURCES

### EDUCATION DEPARTMENTS, ALLIANCES AND RESOURCES

CTE: Career Technical Education  
[www.careertech.org](http://www.careertech.org)

Mapping Your Future  
[www.mappingyourfuture.org](http://www.mappingyourfuture.org)

Midlands Education and Business Alliance (MEBA)  
[www.mebasc.com](http://www.mebasc.com)

Midlands Regional Education Center (MREC)  
<http://recs.sc.gov>

SC State Department of Education  
[www.ed.sc.gov](http://www.ed.sc.gov)

SC Independent Colleges & Universities  
[www.scicu.org](http://www.scicu.org)

SC Career Information System  
[sccis.intocareers.org](http://sccis.intocareers.org)

SC Technical College System  
[www.sctechsystem.com](http://www.sctechsystem.com)

## AGRICULTURE, FOOD AND NATURAL RESOURCES

Agriculture.com  
[www.agriculture.com](http://www.agriculture.com)

BrainPOP-Natural Resources  
[www.brainpop.com/science/ourfragileenvironment/naturalresources](http://www.brainpop.com/science/ourfragileenvironment/naturalresources)

Future Farmers of America (FFA)  
[www.ffa.org](http://www.ffa.org)

House Committee on Natural Resources  
[www.naturalresources.house.gov](http://www.naturalresources.house.gov)

Natural Resources Defense Council  
[www.nrdc.org](http://www.nrdc.org)

Palmetto AgriBusiness Council (PABC)  
[www.scagribusiness.org](http://www.scagribusiness.org)

SC Agricultural Education  
[www.scaged.org](http://www.scaged.org)

SC Association of County Agricultural Agents  
[www.clemson.edu/scacaa](http://www.clemson.edu/scacaa)

SC Department of Agriculture  
[www.agriculture.sc.gov](http://www.agriculture.sc.gov)

SC Department of Natural Resources  
[www.dnr.sc.gov](http://www.dnr.sc.gov)

US Department of Agriculture  
[www.usda.gov](http://www.usda.gov)

## MILITARY

Army Ed Space  
[www.armyedspace.com](http://www.armyedspace.com)

Peace Corps  
[www.peacecorps.gov](http://www.peacecorps.gov)

SC National Guard  
[www.facebook.com/SCGuard](http://www.facebook.com/SCGuard)

Today's Military  
[www.todaysmilitary.com](http://www.todaysmilitary.com)

US Air Force  
[www.airforce.com](http://www.airforce.com)

US Air Force Reserve  
[www.afreserve.com](http://www.afreserve.com)

US Army  
[www.GoArmy.com](http://www.GoArmy.com)

US Army National Guard  
[www.NationalGuard.com](http://www.NationalGuard.com)

US Army Reserve  
[www.goarmy.com/reserve](http://www.goarmy.com/reserve)

US Coast Guard  
[www.uscg.mil](http://www.uscg.mil)

US Coast Guard Reserve  
[www.uscg.mil/Reserve](http://www.uscg.mil/Reserve)

US Marines Corps Reserve  
[www.marines.com/eligibility/service-options/reserve](http://www.marines.com/eligibility/service-options/reserve)

US Marines Corps  
[www.Marines.com](http://www.Marines.com)

US Navy  
[www.navy.com](http://www.navy.com)

US Navy Reserve  
[www.navyreserve.com](http://www.navyreserve.com)



# Agriculture, Food and Natural Resources in the Midlands

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*“Farming today is much different than it was over 60 years ago when my grandfather started our family farm. Today, farmers not only plow fields, plant crops and irrigate, they work with state-of-the-art irrigation technology and GPS systems, implement soil and water conservation practices and work daily in operations and business management to improve the efficiencies of farm production.”*

*— Chris Rawl, Co-Owner  
Clayton Rawl Farms, Inc.*

# WHAT'S TRENDING NOW



## CERTIFIED ORGANIC FOOD – The Pros and Cons of Organic Crop Farming

Many consumers today are looking for healthy, environmentally sustainable alternatives to typical food, resulting in the recent demand for organically produced food. However, there's more research to be done on whether organic food is truly better for you than food grown on a conventional farm. For many farmers, while organic farming is a growing trend, the amount of resources needed to grow organic food is not worth the return on investment.

### Conventional vs. Organic Farming

CONVENTIONAL FARM	ORGANIC FARM
› Uses pesticides to fight insects that damage crops	› Uses predatory bugs that feed on damage-inducing insects in place of pesticides
› Requires fewer workers to harvest the crops	› Requires more workers to harvest the crops, as the process involves additional requirements than conventional farming requires
› Harvested quickly due to a simple process	› Harvested longer due to a more complicated process
› Uses standard inspection processes	› Uses the “Certified Organic” seal where a farm must pass inspection by an accredited certifying agency
› Produces more food on less land	› Produces less food on more land





-  [www.facebook.com/mebasc](http://www.facebook.com/mebasc)
-  [www.twitter.com/mebasc](http://www.twitter.com/mebasc)
-  [www.pinterest.com/mebasc](http://www.pinterest.com/mebasc)
-  [www.youtube.com/mebaconnects](http://www.youtube.com/mebaconnects)
-  [www.linkedin.com/company/mebasc](http://www.linkedin.com/company/mebasc)

