United States Department of Agriculture

# Employment Opportunities for College Graduates

## in Food, Renewable Energy, and the Environment

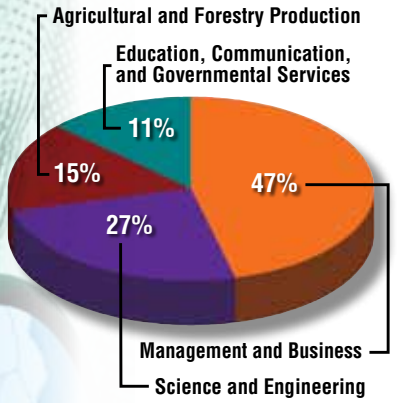
### United States, 2010–2015

*Allan D. Goecker, P. Gregory Smith, Ella Smith, Rebecca Goetz*

## Overview

**The agricultural, food, and renewable natural resources sectors of the U.S. economy** will generate an estimated 54,400 annual openings for individuals with baccalaureate or higher degrees in food, renewable energy, and environmental specialties between 2010 and 2015. Seventy-four percent of the jobs are expected in business and science occupations; 15 percent in agriculture and forestry production; and 11 percent in education, communication, and governmental services.

### Employment Opportunities




During 2010–15, five percent more college graduates with expertise in agricultural and food systems, renewable energy, and the environment will be needed when compared to 2005–10. More than enough graduates will likely be available in the beginning of the study period in some occupations, but a shortfall of new graduates with preparation in priority business and science specialties is forecast in the latter half of the period.

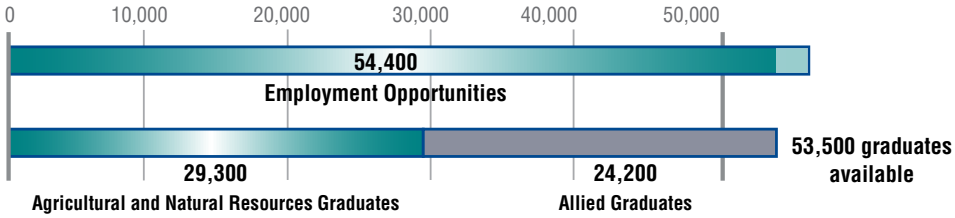
Four major factors shape the market for graduates between 2010 and 2015:

- Macroeconomic conditions and retirements
- Consumer preferences for nutritious and safe foods
- Food, energy, and environment public policy choices
- Global market shifts in population, income, food, and energy

www.csrees.usda.gov/nea/education/part/education_part_employment.html

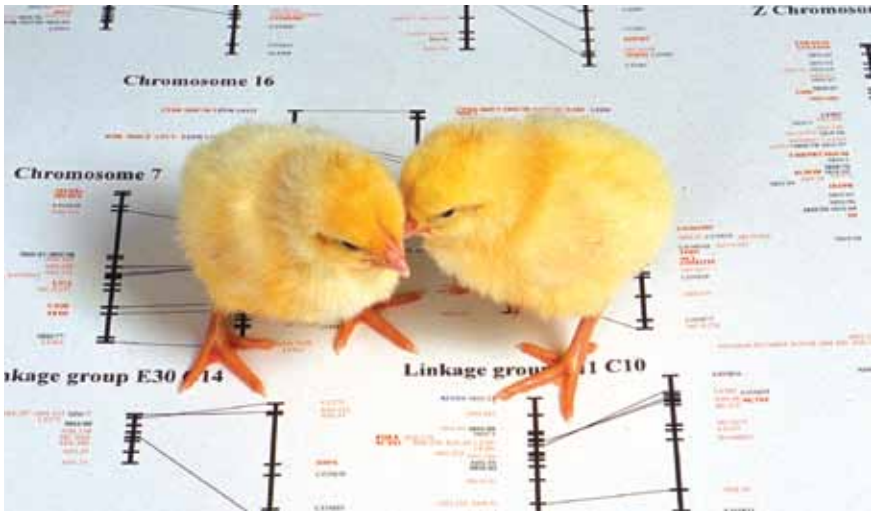
## Graduates

Expect approximately 53,500 qualified graduates to be available each year. About 55 percent of the total, 29,300 are expected to earn degrees from colleges of agriculture and life sciences, forestry and natural resources, and veterinary medicine. The other 45 percent, an estimated 24,200 graduates, will come from allied disciplines including biological sciences, engineering, health sciences, business, and communication.




Employers have expressed a preference for graduates from colleges of agriculture and life sciences, forestry and natural resources, and veterinary medicine who tend to have relatively stronger interests and more extensive work experiences for careers in food, renewable energy, and the environment than those from allied fields of study. These graduates will likely continue to be preferred by many employers, but it is important to note that there were nearly 10 percent fewer agriculture and life sciences, forestry and natural resources, and veterinary medicine graduates produced in U.S. colleges and universities in 2008 than in 2002.

The Food and Agricultural Education Information System maintains enrollment data by academic specialty that are reported by colleges of agriculture and life sciences, forestry and natural resources, and veterinary medicine. Enrollments during 2004–09 suggest some increases in agribusiness management, agricultural mechanization and engineering, animal science, food science, and natural resources management graduates during 2010–15. In contrast, fewer graduates in the plant sciences, soil sciences, and horticultural specialties are anticipated during the next five years, and there will likely be little change in the annual production of forestry and wildlife science graduates.

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Relatively more graduates from the allied fields of biological and health sciences will be required to fill positions that address consumer preferences for a safe and nutritious food supply. Likewise, more earth and atmospheric scientists and environmental engineers will be required to deal with the evolving public policy choices in energy and the environment.

Shortfalls of qualified graduates to work as plant geneticists and plant breeders, climate change analysts, and food safety and security specialists are anticipated during 2010–15.

## Growth Occupations

The U.S. Department of Labor projects significant growth in selected food, renewable energy, and environment jobs during 2008–18 in the *Monthly Labor Review* published in November 2009.

### Occupation – Percent Increase

Agricultural Inspectors – 12.8
Animal Scientists – 13.2
Biochemists and Biophysicists – 37.4
Computer and Information Systems Managers – 16.9
Credit Analysts – 15.0
Environmental Engineers – 30.6
Environmental Scientists and Specialists, including Health – 27.9
Financial Analysts – 19.8
Food Scientists and Technologists – 16.3
Hydrologists – 18.3
Management Analysts – 23.9
Market Research Analysts – 28.1
Natural Sciences Managers – 15.5
Pest Control Workers – 15.3
Public Relations Specialists – 24.0
Recreation Workers – 14.7
Sales Managers – 14.9
Soil and Plant Scientists – 15.5
Technical Writers – 18.2
Veterinarians – 33.0

Projected growth in these occupations is in tune with our nation's shift toward creating new businesses and jobs in local and regional food systems, capitalizing on climate change opportunities, developing renewable energy, and restoring and sustaining natural resources.

The ability to maintain a safe food supply that is more affordable and nutritious while also expanding energy production from renewable sources will increasingly depend upon the strategic integration of action teams. Those teams will need strong research and development and efficient business management skills. There will be growing opportunities for specialists who will manage our nation's water resources.

## *Projected Employment Opportunities and Available Graduates*

# Management and Business

**Expect about 25,700 average annual job openings for management and business representatives** in agricultural and food systems, renewable energy, and the environment during 2010–15. An estimated 12,100 qualified graduates will be available from agricultural and life science, forestry and natural resources, and veterinary medicine disciplines and 11,700 from allied fields of study.

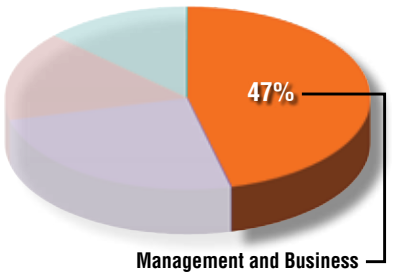
Sales and service occupations will continue to be the primary source of jobs in this employment cluster. Private practices in veterinary medicine will be major providers of jobs along with businesses that buy and sell agricultural commodities and forest products.

Look for good opportunities as credit analysts, information systems managers, financial planners, renewable energy economists, retail sales managers, and human resources specialists. Management jobs will continue to shift from production and manufacturing to the services sector of the economy. A growing number of managerial jobs will be found in environmental compliance and restoration ecology.

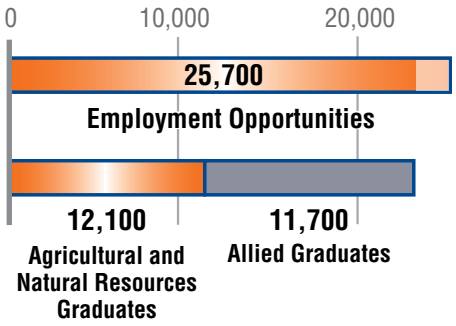
### *Priority Occupations*

- Agricultural Sales and Service Representative
- Environmental Compliance Specialist
- Financial Planner and Manager
- Food Marketing Manager
- Forest Products Manager
- Grain Merchandiser
- Green Industry Products Manager
- Human Resources Specialist
- Land Use Planner
- Resource and Alternative Energy Economist

### *Employment Opportunities*




### Management and Business



## *Projected Employment Opportunities and Available Graduates*

# Science and Engineering

**Anticipate about 14,500 average annual job openings for science and engineering positions** in agricultural and food systems, renewable energy, and the environment during 2010–15. Relatively more of the openings are expected during the latter portion of the period with the anticipation of a stronger macroeconomy and the need to replace retired workers. An estimated 6,200 qualified graduates will be available from agricultural and life science, forestry and natural resources, and veterinary medicine disciplines, and 7,900 from allied fields of study.

Animal science, food science, environmental science, and agricultural and biological engineering will provide one-half of all graduates from agricultural and life science, forestry and natural resources, and veterinary medicine disciplines. In contrast, plant scientists will account for fewer than ten percent of the total graduates from these academic programs.

There will be good opportunities for plant geneticists and breeders, climate change analysts, food safety specialists, renewable energy engineers, nutritionists, biostatisticians, public sector veterinarians, nanotechnologists, biochemists, and animal pathologists.

### *Priority Occupations*

- Animal Pathologist
- Biological Engineer
- Biostatistician
- Environmental Scientist
- Food Scientist
- Human Nutritionist
- Nanotechnologist
- Plant Geneticist and Breeder
- Public Practice Veterinarian
- Renewable Energy Engineer

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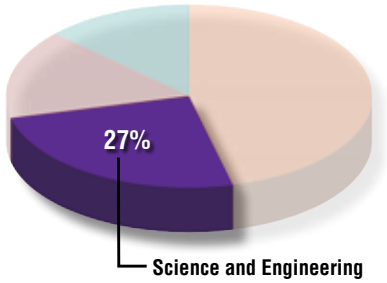


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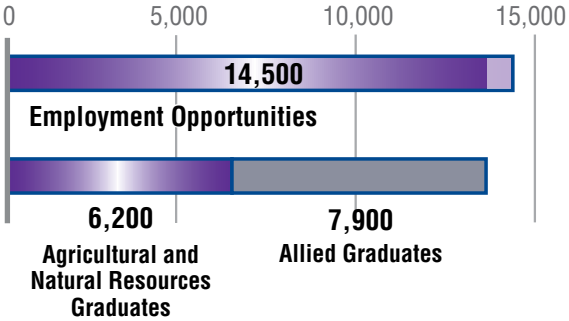

## *Projected Employment Opportunities and Available Graduates*

# Agricultural and Forestry Production

**Look for approximately 7,900 average annual job openings for graduates in agricultural and forestry production occupations** — the foundation of the U.S. food, agricultural, and natural resource system. An estimated 7,100 qualified graduates will be available from agricultural and life science, forestry and natural resources, and veterinary medicine disciplines, and 950 from allied fields of study.

Fewer commercial farm and ranch operators are forecast by 2015, but a higher percentage will have a baccalaureate or higher degree. Anticipate more growers of specialty food crops, including organic fruits and vegetables, and bioenergy crops. Advancing technologies will require additional precision agriculture specialists. There will be good opportunities for restoration foresters in managing natural resources.

Poultry production managers and livestock herd managers are expected to have good employment opportunities along with food animal veterinarians. Crop management consultants will continue to have good job prospects.

### *Priority Occupations*

- Crop Management Consultant
- Food Animal Veterinarian
- Herd Manager
- Land Use Manager
- Poultry Production Manager
- Precision Agriculture Specialist
- Organic Agriculture Entrepreneur
- Renewable Energy Crop Producer
- Restoration Forester
- Seed Producer

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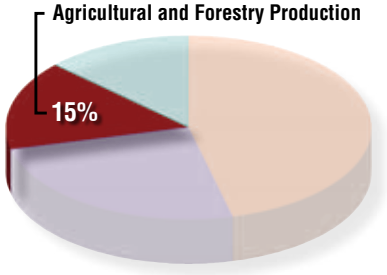


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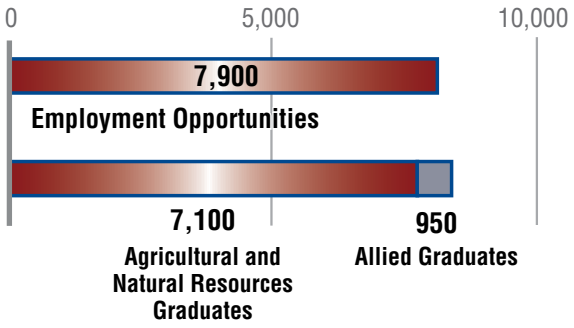

## *Projected Employment Opportunities and Available Graduates*

# Education, Communication, and Governmental Services

**Expect approximately 6,200 average annual job openings during 2010–15 in education, communication, and governmental operations** involved with agricultural and food systems, renewable resources, and the environment. Agricultural and life sciences, forestry and natural resources, and veterinary medicine disciplines will produce about 3,900 qualified graduates annually, and approximately 3,600 are anticipated from allied fields of study.

The strongest agricultural education opportunities are projected in community colleges, and in higher education specialties including plant and animal health, climate change, food safety, and bioenergy. Government agencies are expected to hire graduates with expertise in food safety and security, and in natural resources and environmental management.

Communicators who are proficient in multimedia and social media operations will be in the strongest employment position. Individuals with specialized talents in electronic information architecture, computer graphics, health communication, and science communication will be needed.

### *Priority Occupations*

- Climate Change Analyst
- Computer Graphics Technologist
- Distance Education Specialist
- Ecotourism Specialist
- Electronic Information Architect
- Food Safety Information Specialist
- Health Communicator
- Natural Resources Conservation Specialist
- Rural Development Specialist
- Science Communicator

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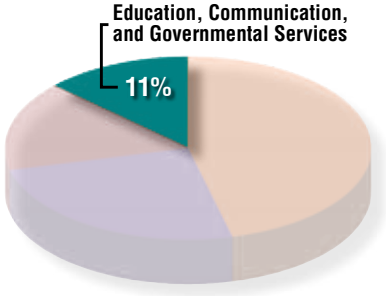


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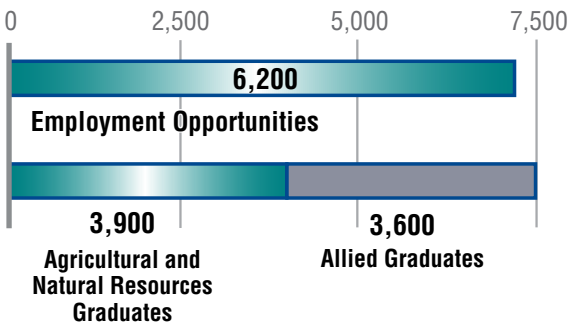

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