

CTE: THE KEY TO ECONOMIC DEVELOPMENT

Agriculture and related industries:

Account for more than

\$400 billion

in U.S. GDP ¹

Employ **2.8%**
of the nation's workforce ²

Export **\$139.6 billion**
in goods ³

What is the pathway to these fulfilling and essential careers?

Career and Technical Education!



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Agriculture, Food and Natural Resources

Agriculture, food and natural resources (AFNR) is a diverse sector that:

- includes animal and plant systems, agribusiness, food products and processing, environmental science, natural resources and biotechnology
- forms a vital part of the economy for many states
- requires skilled workers

What jobs are available in AFNR?

The AFNR sector is a critical part of the U.S. economy that produces the nation's food supply, supports healthy plants and animals, and protects our environment and natural resources. Farming, food processing, forestry, fishing and related activities employ 5.6 million individuals.⁴ There are about 2 million farms across the country, 98% of which are operated by individuals and families.⁵ The fastest-growing occupations in this diverse sector include veterinary technician jobs, which are expected to grow by 16% through 2029, and jobs for environmental science and protection technicians, which are projected to grow by 8% during the same period.⁶

Workers in AFNR with some postsecondary education can earn more than the national median wage. For instance, environmental science and protection technicians with an associate degree make, on average, nearly \$47,000 – more if they work in local government or for engineering services firms.⁷ Agricultural and food science technicians with the same level of education earn, on average, about \$43,000 when employed in food manufacturing.⁸ Earnings are particularly strong for individuals with education and training in conservation science, food science, forestry, agriculture and natural resources management, and agricultural economics.⁹

Many jobs in AFNR require some postsecondary education, such as a postsecondary certificate, an associate or bachelor's degree, or a doctoral or professional degree. This education and training prepares individuals with technical, academic and employability skills for managing natural resources, caring for plant and animal life, and analyzing food quality, among other activities. The following is a small sample of occupations available in AFNR:

- agricultural equipment operators
- agriscience educators
- farm managers
- animal and food science technicians
- conservation scientists and foresters
- soil scientists and agronomists
- veterinary technicians
- agriculture product salespeople



Endnotes

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12. Advance CTE. (2019). *Excellence in Action Awards 2019: Mishicot High School*. Retrieved from https://cte.careertech.org/sites/default/files/Mishicot2pager_final.pdf
13. Itasca Community College. (N.d.). *Natural resources*. Retrieved from <https://www.itascacc.edu/nr>

How does CTE prepare the AFNR workforce?

Career and technical education prepares high school, postsecondary and adult students for careers in AFNR through:

- the national Career Clusters® Framework—including Career Clusters and pathways in AFNR, STEM, business management and administration, and marketing—which outlines course progressions that help students explore career options and prepare for college and career success
- CTE courses in plant and animal systems, agribusiness management, sustainable agriculture, veterinary science, turf and landscape management, agricultural processing, forestry management and more, all integrated with rigorous academics
- Supervised agricultural experiences (SAE) and other work-based learning experiences, such as LEAP Forward, a six-week paid internship hosted by the University of Wisconsin–Madison and the Madison Metropolitan School District’s Personalized Pathways program, which includes opportunities for high school veterinary interns to work in a clinical setting at the university’s small animal hospital¹⁰
- career and technical student organization experiences, such as industry-based competitions and leadership institutes through FFA; the Professional Agricultural Student Organization; the National Society for Minorities in Agriculture, Natural Resources and Related Sciences (MANRRS); and Jr. MANRRS
- opportunities to earn stackable credentials, such as the Certificate in Agribusiness Technology from Southeastern Community College in Whiteville, North Carolina, which can lead to an Associate in Applied Science degree¹¹

What are promising programs in AFNR?

The **Mishicot High School** plant science program in Mishicot, Wisconsin, has evolved from a single plant science class to a full program of study with the help of more than 30 local businesses and the community. The program offers learners the opportunity to earn up to nine college credits in plant science, take Advanced Placement courses, and earn industry certifications in plant science and floral design. In addition, students participate in the local FFA chapter, which operates a floral business, and can apply for a paid apprenticeship program in agronomy or horticulture. In 2018, 100% of Mishicot plant science learners graduated, participated in work-based learning and earned postsecondary credit and 88% enrolled in postsecondary education. This program won an Advance CTE Excellence in Action Award in 2019.¹²

At **Itasca Community College** in Grand Rapids, Minnesota, students in the Natural Resources program gain knowledge and skills in the management and protection of forest resources as well as an understanding of the relevant social, economic and environmental issues. The program leads to a variety of stackable credentials, including certificates, diplomas and associate degrees in forest resources, geospatial technology, geographic information systems and wildland firefighting. A shared campus with the U.S. Department of Agriculture (USDA) Forest Service–Northern Research Station and the University of Minnesota North Central Research and Outreach Center means that learners have 500 acres available for study.¹³ The college works closely with the USDA, other forestry agencies and employers to provide students with internship opportunities and access to experts in the field. Graduates have opportunities to articulate to Bachelor of Science degree programs at various University of Minnesota campuses. Itasca Community College’s Natural Resources program is accredited by the Society of American Foresters and is a member of the Council of Eastern Forest Technician Schools.



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