Iowa agriculture is central to the state’s economic vitality and to food security for the nation and the world. Now, Iowa agriculture is poised to fulfill a new role in energy security. Iowa agriculture — with its unparalleled soils, climate and educated people — will make possible the transformation from a petroleum economy to a bioeconomy.

That is why Iowa is synonymous with agriculture around the world. Similarly, few places in the world offer the breadth and depth of agricultural sciences and education found in Iowa State University’s College of Agriculture and Life Sciences. For over 150 years, Iowa State’s mission-oriented agricultural programs have played a significant role in the state’s economy and society. When people turn to leadership in agricultural sciences, they cite Iowa State. Iowa State is the fifth most cited university in the world for agricultural sciences (1994-2004, Thomson ISI).

Today, the College of Agriculture and Life Sciences continues to work on the frontiers of science, including biorenewables. The College provides significant leadership and resources for Iowa State’s Bioeconomy Institute to achieve the goals of the Bioeconomy Initiative.
Role in the Bioeconomy

Research

Portfolio of sciences: The College of Agriculture and Life Sciences supports an outstanding corps of 280 faculty members in academic departments. Also, nearly 50 faculty members in other colleges receive support for their work through the College's 121-year-old research program, the Experiment Station. Research related to biorenewables is conducted in areas as diverse as agricultural and biosystems engineering, agronomy, animal science, biochemistry, biophysics and molecular biology, economics, food science, natural resource ecology and management, and statistics. A brief list of current biorenewables research led by College faculty members includes:

- Developing and introducing crops for biomass production
- Biomass production and harvesting systems
- Biomass storage and transportation
- Economic impacts of increased energy production from agriculture
- Enhancing ethanol and biodiesel production efficiencies
- Economic implications of corn-based ethanol industry
- Crop-based plastics, composites, and other biobased products
- Nutritional studies on feeding ethanol co-products to livestock
- Biomass production and processing at the first-in-the-nation BioCentury Research Farm, a research and demonstration facility

Economic development: Nationwide, state experiment station research and development has a huge economic impact. Public investment in agricultural research meant a 50% annual rate of return to society from 1970 to 2000. In Iowa, the College research provides science-based information used by producers, businesses and communities to make daily management and business decisions and to help them address new opportunities and be prepared for new challenges. Also, discoveries based on the College's Experiment Station resources are a key reason why Iowa State is one of the nation's top universities in technology transfer. Sixty-five percent of Iowa State's FY09 active invention disclosures were linked to Experiment Station-supported research.

Federal science partners: Long-standing collaborations between the College and its federal partners in the U.S. Department of Agriculture Agricultural Research Service bring a strong emphasis to critical scientific issues, including water quality, air quality, crop and animal genetics, biometrics and computational genetics, and sustainable agricultural systems. USDA labs on campus include the National Laboratory for Agriculture and the Environment, Corn Insects and Crop Genetics Research Lab, North Central Regional Plant Introduction Station and the USDA-Iowa State Crop Genome Informatics Laboratory. The College is a partner in the Center for Biorenewable Chemicals, a National Science Foundation center focused on development of chemicals from biorenewable sources.

Technology transfer: The College has a strong track record in support of industrial business applications. Examples include the work of the Center for Crops Utilization Research and its Industry Incubator Facility and pilot plants; the Center for Integrated Animal Genomics for its work for the animal genetics industry; the Department of Agricultural and Biosystems Engineering's work to help firms improve new technological systems for the benefit of agriculture; the Department of Economics' work with many companies, communities and associations to analyze critical issues; the Department of Food Science and Human Nutrition's work with crop-based new products; the Seed Science Center's development of new technology and tests to benefit the nation's seed industry; and the BioCentury Research Farm's novel capabilities for commercialization of biobased technologies.

Education

Future careers: The bioeconomy promises new career opportunities for a highly skilled and educated workforce. Educating these future leaders is a top priority for the College of Agriculture and Life Sciences. The College successfully places 98 percent of its graduates. Two-thirds of recent graduates begin their careers in Iowa, finding opportunities in diverse fields of business, research, education, government, and service. In its 2006 "America's Best Colleges" report, U.S. News & World Report's said: "At premier ag schools like Iowa State, old stereotypes about colleges of agriculture have little in common with the broad-based, interdisciplinary education [that] students encounter."

Biorenewables education: The College has more than a century of bioeconomy-relevant educational programs, from agricultural engineering to economics to statistics. More than two dozen College faculty members play a key role in Iowa State's first-in-the-nation Biorenewable Resources and Technology graduate program. With U.S. Department of Education funding, College faculty lead a consortium of U.S. and European Union schools in a renewable resources and clean technology program that takes students abroad to introduce them to international biorenewables topics. The College and the Bioeconomy Institute hosted an intensive program in biorenewables for graduate students from around the world. Faculty in agricultural and biosystems engineering established a bachelor of science degree in biosystems engineering to fill emerging needs for biological engineers.

Entrepreneurs and science mentors: The Agricultural Entrepreneurship Initiative in the College promotes entrepreneurial skills, experiences and resources among students and faculty. The College's "Science With Practice" program is in its second year of matching undergraduates with faculty mentors to gain experience in scientific fields, while earning funds and academic credit for their education.

Extension

Extension to Agriculture and Natural Resources: Iowa State Extension serves as a source of unbiased, research-based information and education for farmers and agribusiness professionals to maintain the economic base of Iowa agriculture. Extension to Agriculture and Natural Resources is the largest unit in Iowa State Extension, involving 86 campus faculty and staff members in 10 departments and 46 field specialists, who work with regional extension education directors, agribusiness, farm organizations, and service providers to provide information and education to producers. Nine centers based at Iowa State also support this work. The director of ANR Extension serves as associate dean of the College of Agriculture and Life Sciences and coordinates extension activities in agriculture and veterinary medicine.

The research-extension hallmark: The relationship of College research and Iowa State Extension typifies Iowa State's commitment to "Science with Practice." Iowa State Extension, with its statewide network, has been the primary conduit for transferring the fruit of mission-oriented science and technology to Iowans. Through Extension, Iowans provide direct feedback to shape research in the College and campus-wide.