

SCIENCE & EDUCATION Impact

Benefits from USDA/Land-Grant Partnership

Real World Education

Learning inside and outside the classroom.

Students who have hands-on experience are better prepared for success in the work force. The U. S. Department of Agriculture (USDA) and Land-Grant university research connection gives students the opportunity to apply what they have learned even before they graduate. Experiential learning opportunities that blend theory and practice are necessary to develop society-ready graduates. Other innovative programs offer education under real-world conditions for senior students while making sure freshmen acquire the tools to succeed.

Payoff

- **Real life problems.** Undergraduate research programs allow young scientists to work on actual problems. A **Maine** senior microbiology student is developing a diagnostic system to detect four viruses that infect salmon. A junior horticulture student investigating European corn borer larvae effects on potato also collected digital pictures of corn borer damage for grower education programs. A research paper by a senior food science student on the effects of fortifying cereals with antioxidants was honored by the Institute of Food Technologists as one of the five top undergraduate projects in the country.
- **Using their bean.** Two **Purdue** students took top honors and \$4,500 in the Indiana Soybean Market Development Contest that brought the world soybean crayons and soybean birthday candles. This year's winning entry was a soy-based gelatin for high-nutrition hospital diets. The new product is made from water, fructose, high-gelling soy protein and a seaweed component. Another Purdue team won the Institute of Food Technologists' national student development competition with a high protein soybean breakfast cereal.
- **Labor saver.** Undergraduate agricultural engineering students at **South Dakota State** designed a robot to assist in swine breeding and production and to help herd stubborn pigs. The robot, called a "Boar Bot," is a radio-controlled vehicle that can pull tremendous weight. It also makes swine breeding safer by reducing human handling. It won top honors at the U.S. Engineering Expo and the World Pork Expo and is slated for commercial production.

**RESEARCH,
EXTENSION AND
EDUCATION
AT WORK**

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- **Education at ground level.** Senior-level **Iowa State** agricultural students make the management decisions on the university's 850-acre crop and livestock farm. These students use the farm for problem-solving activities, group decision-making and applying material learned from other courses in an actual farming situation. Other students help run a self-sufficient organic farm on 20 acres. Conducting an organic research project at the farm is required for academic credit. Students learn all aspects of organic farm management—business, production and marketing—in a way that could never be taught as effectively in a classroom. In separate, but similar university dairy programs, **Vermont** and **Maine** students gain hands-on experience with large animals and managing a dairy herd. The **Vermont** students engage in all aspects of the enterprise. Their 32 milking cows annually produce 700,000 pounds of milk worth \$100,000.
- **Extending education.** Nursery industry professionals and **Maryland** undergraduates collaborated on a Web-based course that taught water and nutrient management for nurseries. By the course's end, both students and professionals could write an effective nutrient management plan for almost any kind of greenhouse or nursery, and the professionals earned state certification. **Purdue's** landscape architect student group helped Delphi, Indiana, residents create a park, preserve part of their heritage and win a \$2 million grant for the park project. **Texas A&M** students designed the next major park for College Station, Texas. The city is seeking funding for the 515-acre wilderness park.
- **Stay in school.** The attrition rate for African-American students who graduate from historically black institutions and pursue advanced degrees is generally very high. During their senior year, **University of Maryland-Eastern Shore** undergraduate students spend one semester at **Michigan State**, return to Maryland to complete bachelor's degrees and begin master's programs. They return to **Michigan** for another semester as graduate students, where they work with USDA scientists. Nine have participated since 1996. Five students are completing their master's degrees, one has started a doctorate and three will graduate in 2000 and pursue terminal degrees. Agriculture and human resource freshmen at **Nebraska** get help with the challenging first year of college. Ninety-three percent

of the participants returned as sophomores in fall 1999, compared to a university-wide retention rate of 79 percent for the same period. **Nevada** agriculture faculty created an intensive first-year college skills course that students say helped them improve study skills. The rate was 10 percent above the rest of the campus.

- **Astral applications.** A team of **Purdue** students is working on building Internet-based geographical information systems (GIS) models to give small towns access to computerized urban planning tools now used only by large cities. They've also used GIS to help state agencies solve problems in the Indiana state forest and to study water quality around confined animal feeding operations. A recent graduate works for the EPA and uses GIS to map contaminated industrial sites in Michigan.
- **Forest and firearms.** Wildlife science and forestry students learn a lot in the classroom, but to succeed in their first jobs, they need practical experience. **Mississippi State** forestry students work with 44 private forest owners to develop forest management plans for 44,186 acres. They are graded on both their technical work and their ability to incorporate individual landowners' objectives and management philosophies into the plan. **Wisconsin** wildlife students who have never hunted are the target audience of a unique program to expose them to the animal population management tool. A better understanding of hunting and what motivates hunters will help the students work effectively with hunters when they start their careers. The program has attracted attention from 30 other universities and agencies.



Cooperative State Research, Education,
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