RESEARCH

Susan Black

Understanding Agriculture

Even though the quality of programs vary from state to state, schools are finding new ways to educate students on how food is grown and raised

Are your students agriculturally literate? That is, by federal government definition, do they know about food and fiber production and processing, domestic and international marketing, and policies affecting competitive agriculture worldwide?

If your answer is no, consider the words of Donald Sprangers, a science teacher at Washington Academy, a private high school in northern Maine. Sprangers believes that agricultural literacy should be a national priority.

Sprangers clearly places a high priority on agricultural education. He received a 2007 Excellence in Teaching Award from Agricultural in the Classroom, a 50-state program sponsored by the U.S. Department of Agriculture. He and his students created community garden and greenhouse projects. His students did research on renewable energy and learned about restoring salmon habitats in local watersheds. They studied precision agriculture, using GPS and remote sensing technologies to plant, cultivate, and harvest crops.

Across the country, another teacher also places a high priority on agricultural education. Second-grade teacher Dianne Swanson, recently named an outstanding teacher by the California Foundation for Agriculture in the Classroom, strives to educate inner-city students about agriculture.

Seven years ago, Swanson started "an agricultural revolution" at Long Beach Unified School District's 450-student Los Cerritos Elementary School. She and her students designed a 22-bed garden where they grow vegetables, herbs, and flowers. Last year, she added an "urban farmyard" with a barn and coops for chickens, ducks, rabbits, and guinea fowl.

Los Cerritos teachers say the outdoor site is "an oasis" for city children where they often read, study, and conduct experiments.

In fact, urban schools increasingly are using agricultural education to reconnect their students to the idea that food is grown and raised—a foreign concept to many children who believe fruits and vegetables magically appear on the supermarket shelves. Unfortunately, the quality of agricultural education programs, if they exist at all, varies from state to state and school to school.

Agricultural education in the past

In 1917, Congress passed the Smith-Hughes National Vocational Act, which authorized federal funds to train people "who have entered upon or who are preparing to enter upon the work of the farm."

The federal law established separate funding for agricultural education and other vocational programs; required states to set up separate boards for vocational education; and mandated separate instructional programs for academic and vocational students.

Still, agricultural education programs declined as decades passed and fewer students went into farming work after they graduated from high school. By the 1950s, says West Virginia University researcher Harry Boone, many agricultural programs had become outdated and uneven in quality, and many struggled to survive.

In 1988, the National Research Council's Committee on Agricultural Education in Secondary Schools recommended reinstating and revitalizing agricultural programs. Schools, the committee said, should teach *all* students agricultural literacy.

Agricultural education today

Kentucky's Task Force on the Future of Agriculture Education is developing a statewide plan based on goals nearly identical to those in the 1988 report:

- Schools will increase the number of high school and middle school agriculture programs.
- Schools will incorporate agriculture into the core academic curriculum.
- Schools will ensure that all students study a broadly defined agriculture curriculum that includes the food supply, natural resources, controversial agricultural issues, the role of agriculture in the state's economy and society, and careers in agriculture.

At last count, 138 of 238 Kentucky high schools, and three middle schools (down from six a year ago), offer some agricultural education. Louisville, Lexington, and other metropolitan dis-

tricts offer students "little or no access" to agricultural education, and Bowling Green, Frankfort, and other independent school districts offer no agricultural programs.

The task force says it may take up to seven years—perhaps until 2015—to fully implement agricultural education in all Kentucky schools.

Illinois also plans to expand and improve agricultural education in the state's 671 rural and urban public schools, a move that could take until 2016 to complete.

In 2006, Gov. Rod Blagojevich signed HB 4986, an amendment to the Illinois School Code that requires districts accepting state funds for high school agricultural education to follow the state board of education's approved curriculum. The law stipulates that schools must offer students "supervised agricultural experiences," defined as out-of-school lessons that promote "learning by doing."

Last year, the Illinois State Board of Education (ISBE) provided $1 million in agricultural education incentive grants to the state's schools. Seven high schools are using funds to start programs from scratch, and 300 schools are using funds to train teachers, upgrade equipment, and develop curriculum to "educate children about the state's number one industry."

Urban agriculture's roots are spreading. Six hundred students attend the Chicago High School for Agricultural Sciences (CHSAS), a magnet school established in 1985 by the Chicago Public Schools. Admission is competitive: Each year, CHSAS accepts only 150 out of 1,000 students who apply to enter in ninth grade.

CHSAS students take agricultural courses in careers, leadership, food science, and agricultural-based courses in calculus and trigonometry, biology and chemistry, history and law, and foreign languages. The students—61 percent African American, 27 percent white, and 12 percent Hispanic—score at or above district and state averages in reading and math, and nearly all graduate.

Chicago Mayor Richard M. Daley recently announced plans to open a second CHSAS in Chicago's Garfield Park district. Two state associations, Committee for Agricultural Education and Leadership Council for Agricultural Education, say Chicago's agricultural schools will serve as models for other high schools statewide.

Realistic reminders

Will agricultural education succeed this time?

Getting high-quality agricultural education programs off the ground requires more than laws and leadership, and more than money and models. It also depends on school leaders who have the patience and persistence to work on problems researchers have identified.

University of Florida researcher Cynthia Malecki says many teachers are reluctant to infuse agricultural literacy into math, science, and social studies. Her study shows teachers' mixed attitudes:

- Many teachers have little interest in improving their agricultural awareness and literacy. Many say they would attend workshops only if they were paid.
- High school teachers and teachers from urban areas are less favorable toward agricultural education than elementary teachers and teachers from rural areas.
- High school teachers are less confident about teaching agricultural topics than elementary teachers.
- All teachers are less positive about teaching agriculture than about teaching biology and environmental science.

Southern Illinois University's Seburn Pense says two recent studies, conducted in Oklahoma and Illinois, found low agricultural literacy among 12th graders. Pense gauged students' knowledge according to the *Food and Fiber Systems Literacy Framework* (FFLF), an agricultural curriculum developed in Oklahoma and used in several schools across the country.

In the *Journal of Southern Agricultural Education Research*, Pense reports group variations among the low scores: Agricultural education students fared somewhat better than general education students, and rural students fared somewhat better than urban and suburban students. All students scored lowest on business and economics concepts and on understanding food, nutrition, and health.

What's the problem?

Agriculture in the Classroom, a grassroots program coordinated by the United States Department of Agriculture, aspires "to help students gain a greater awareness of the role of agriculture in the economy and society so that they may become citizens who support wise agricultural policies," according to the program's website.

Most goals are broad and ambitious, but they're not the problem. Poorly designed lessons that will never, by any stretch of the imagination, teach stu-

Tips for improving agricultural education

- Provide a rigorous, relevant, standards-based curriculum in agriculture, food, and natural resources.
- Determine the best way to teach all students agricultural literacy.
- Increase students' access to agricultural education instruction and programs.
- Ensure that agricultural educators at all levels are fully qualified and highly motivated.
- Evaluate teaching and learning and use data to continuously improve agricultural programs.

Adapted from National Research Agenda 2007-2010—Agricultural Education and Communication, a joint project of five national agricultural associations (http://aaae.okstate.edu/researchagenda.html).

dents agricultural literacy are the problem.

A typical lesson, gleaned from the website, is a case in point. The lesson supposedly teaches elementary students about agriculture while reinforcing skills in math, reading, social studies, and visual arts.

A teacher's script includes three lesson segments: a story about counting; a discussion about counting things; and "practice sorting and counting a variety of objects related to agriculture." What objects do children sort and count? Animal crackers.

The purpose of the lesson is to show students "how to take an agricultural census." Students tally their animal crackers and make a "livestock report" to the class. (The box of animal crackers I bought to test the lesson included mostly lions, bears, elephants, rhinoceroses, and camels.)

Students then have a second chance to perfect their census-taking skills by counting and sorting ingredients in a snack mix. (Teachers tell students that the ingredients—pretzels, peanuts, rice and corn cereal, sunflower seeds, and raisins—represent crops.) To wind up the lesson, teachers allow students to eat the animal crackers and the snack mix.

Agricultural education will flounder without high-quality teaching and learning, I believe. Agricultural experts need to help teachers develop lessons that are genuine and meaningful, and teachers need to give students authentic experiences.

Sprangers says most students are three generations removed from farm life.

Time passes quickly. I hope agricultural education improves before our nation's students are four generations removed from understanding agriculture. ■

Susan Black, an *ASBJ* contributing editor, is an education researcher and writer in Hammondsport, N.Y.