

The

# Agricultural Education

Magazine

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## Placement Opportunities for Agricultural Education Graduates

### Public Schools

- agriculture or agriculture/science teacher
  - junior high school
  - high school
- adult instructor
- agriculture specialist for elementary schools

### Agribusiness

- adult educator
- public relations specialist
- sales/service representative
- association representative
- trainer/educator

### Governmental Agencies

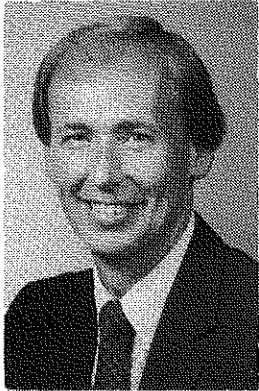
- educator with:
  - Cooperative Extension Service
  - Soil Conservation Service
  - other USDA agencies

### Community Agencies

- adult educator
- youth educator
- youth counselor

## Agricultural Educators in Non-School Settings

# Marketing University Ag Ed Programs - A Delicate Balance



BY ED OSBORNE

*Dr. Osborne is associate professor and chair of agricultural education at the University of Illinois, Urbana-Champaign.*

This issue of *The Agricultural Education Magazine* is somewhat unique in that it focuses on university agricultural education programs. Behind a seemingly straightforward theme lies a number of major concerns that need immediate attention. In the last 10 years the number of university agriculture teacher certification graduates has declined by nearly 50%. Many universities have attempted to counter this loss in student enrollments with new programs/options in extension education. But student numbers in extension education programs have been small, and the outlook for growth in this area is marginal, given the economic troubles that continue to confront the Cooperative Extension Service in most states.

With a few notable exceptions, university agricultural education programs are small in terms of students and faculty when compared to their academic counterparts. Unfortunately, the adage "bigger is better" was never more true than it is in today's university climate. While some agricultural education departments have responded aggressively to growth opportunities in the last 10 years, most have been unable to mobilize their resources and successfully move into significant growth areas. Why? Because faculty in these departments have remained almost exclusively focused on teacher education initiatives. And now that the need and opportunity to be broader than teacher education has become so painfully clear, the timing of program growth initiatives could not be worse. Expanding a program requires expanding resources - not impossible, but highly improbable on most college campuses today. Reallocation of existing resources to higher priority areas is another option, and some departments have already moved in this direction.

On most, but not all college campuses, agricultural education is viewed as synonymous with teacher education in agriculture. This is true even though diverse graduate programs in agricultural education exist on many campuses. And while we tell each other that we are much broader than teacher education, most of our undergraduate programs suggest just the opposite. Our actions and others' perceptions about our programs reinforce a narrow view of agricultural education.

We have a huge program marketing challenge ahead of us. But we must be careful. In

many states the demand for certified graduates for teaching agriculture far exceeds the annual supply. If university agricultural education programs are expanded, will enrollments in teacher education options decline even further? What is the best balance between certification and non-certification options in terms of enrollments, staffing, courses offered, and overall resource commitment? We can no longer afford to direct nearly all of our human and financial resources available for undergraduate education toward teacher education programs and activities. Programs and courses that prepare students for educational positions in non-school settings must be given status and resource commitment at least equal to that provided to teacher education programs. Non-school emphasis must include, but not be limited to, extension education. A significant number of university faculty in agricultural education must become specialists in agricultural education programs in non-school settings, especially agribusiness and public agencies. These new initiatives will have tremendous implications for instruction, research, and service activities.

An expanded undergraduate program is critical to effective positioning of agricultural education in today's university climate. Historically, a large percentage of B. S. graduates in agricultural education have accepted a variety of positions in non-school settings. Yet, faculty have typically glossed over these placements and allowed their programs to be evaluated almost exclusively on the number of graduates placed into teaching. Marketing efforts must inform both internal and external audiences, as well as potential students, of the diverse opportunities for agricultural educators in schools, extension, agribusiness, and community and governmental agencies. Like in teacher education, instructional activities and research programs in training and leadership options must be interconnected. University faculty must reduce their overall involvement in service activities; this traditionally heavy service load has stifled the ability of faculty to engage in program expansion efforts, new course development, and programmatic research. Growth opportunities were passed by in good economic times because of a preoccupation with teacher education and an unusually high percentage of faculty time devoted to service, especially for

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## Agricultural Educators in Non-School Settings



BY ALFRED J. MANNEBACH  
Dr. Mannebach is professor of education in the Department of Educational Leadership at the University of Connecticut, Storrs.

Agricultural educators are found in a variety of settings. Although they are thought of primarily as secondary, post-secondary, or adult teachers employed in local public school systems, a further review will show that many agricultural educators fill vital educational roles and positions in non-school settings. Supply and demand of agriculture teacher studies show that over the last ten years, less than half of the agricultural education graduates prepared to teach actually enter teaching in public schools. In addition, there is an annual agriculture teacher turnover rate of approximately 10 percent. Where do these agricultural education graduates and former teachers go? What do they do? Is their education wasted, or are they able to apply their knowledge and skills in other areas?

A cursory review shows that they are employed or self-employed as trainers or human resource development specialists in business and industry, tour guides in parks and recreation areas, educators in museums and arboretums, extension agents on farms and in cities, program developers in international settings, administrators in governmental agencies, public relations personnel for breed associations, representatives of agricultural firms, and managers of agricultural businesses. They are entrepreneurs and hold a host of other job titles in a variety of work environments.

As graduates of agricultural education programs, and many times teacher preparation programs, most agricultural educators feel well prepared to teach agriculture in local school systems throughout the nation. Their agricultural experience, coupled with the college preparation in general education, technical agriculture courses, professional education courses, and a supervised student teaching or practicum experience, provide excellent preparation as teachers of agriculture. Add to this preparation program a few years of success in teaching agriculture, and you find a person well prepared for employment or entrepreneurship in many of the roles or positions listed above. Because of the value-added aspects of agricultural education, teachers are not only prepared to teach in public school agriculture programs, they are also prepared to compete for positions and contribute to educational endeavors in a variety of non-school settings.

What are the dimensions of quality or the value-added components of preparation of teachers of agriculture which may contribute to success in teaching or in other areas? Several factors come to mind.

First, many agricultural education students have a farm or agricultural background where they have learned desirable work habits and competencies. In many settings, a farm or agricultural background is perceived as a valuable asset.

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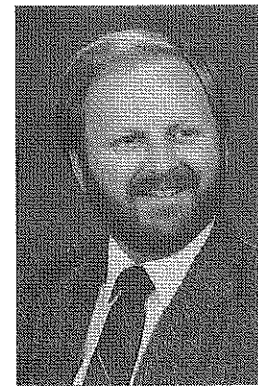
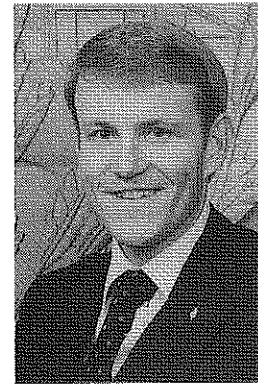
Second, many agricultural education students tend to be graduates of secondary or postsecondary agriculture programs. This prior association with the program has helped them develop a broad and/or in-depth technical background in agriculture, hands-on laboratory experience, leadership skills through the FFA, ownership or employment experience through the supervised agricultural experience program, and knowledge, skills, and attitudes needed for success in a variety of settings.

A third factor leading to success is the program of preparation in agricultural education. The breadth of general education and the in-depth study provided by a technical subject matter major in agriculture are important components which add to the versatility of agricultural education graduates. By adding the professional dimension to the general and technical education requirements in agricultural education, individuals are developing an important philosophical, psychological, and sociological background. In addition, they develop managerial and human relation skills, as well as program planning, development, implementation, supervision, and evaluation skills.

A fourth factor of success is the experience

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## Agricultural Education: A Degree with Options



BY JOHN P. MUNDT AND RICK WAITLEY  
Dr. Mundt (top) is assistant professor of agricultural and extension education at the University of Idaho, Boise. Mr. Waitley (bottom) is president of Waitley Associates Meridian, ID.

It has long been accepted that individuals with a degree in agricultural education are uniquely diverse and are prepared for a variety of careers. Most of us can quickly reflect and identify former agriculture teachers who hold positions of leadership and management in a variety of different fields - everything from representatives of business and industry to leaders in education. As an example, in Idaho former high school agriculture teachers have recently held the presidencies of two of the major universities in the state, Boise State University and University of Idaho.

What is it that makes a degree in agricultural education different? Is it different? If a degree in agricultural education makes a person holding such a degree more marketable in a diversity of career options, why is it so? Is it because we in agricultural education do such an outstanding job with the professional course work that leads to a degree in agricultural education? Or, on the other hand, is it because the degree, coupled with the experience of teaching high school agriculture, is a mutually beneficial relationship and creates an opportunity for professional growth that really builds a stepping stone to other career opportunities?

### Teacher-Leader-Manager

At all levels, whether in business, elected public service, or community service, there is a desperate need for effective leadership. The words teacher, leader, and manager are different, yet the basic characteristics of their function indicates a great deal of similarity. Successful agriculture teachers have been, perhaps because of the nature of their occupation, forced to engage themselves in activities which build recognized competence in the areas of leadership, teaching, and management. Teachers of agriculture face global organizational and management issues relating to a broad and diverse program of secondary agricultural education. The issues faced are problems, but when dealt with successfully they add to the strength of the individual. Teachers of agriculture are forced to cope, and when successful, their individual growth is tremendous. The professional growth experienced is what adds to their marketability in a variety of career options.

### Competence Of The Successful Agriculture Teacher

The skills and competencies of the agriculture teacher are generally well known. These skills and competencies are practiced on a regular basis and they include:

1. Presenting in front of a group,
2. Demonstrating leadership in practice,
3. Demonstrating organization and management skills,
4. Solving problems and making decisions,
5. Working with others,
6. Motivating others,
7. Demonstrating initiative,
8. Demonstrating a vision for future planning,
9. Establishing goals and objectives,
10. Creating the opportunity for the success of others as well as self,
11. Sharing the credit for a job well done, and
12. Demonstrating integrity and consistency in interactions with others.

The list, although not totally inclusive, highlights skills and activities which successful agriculture teachers must practice on a frequent basis. The key word here is "successful." Those

***Successful agriculture teachers have been, perhaps because of the nature of their occupation, forced to engage themselves in activities which build recognized competence in the areas of leadership, teaching, and management.***

who experience success as our program teachers, managers, and leaders find that they have strengthened their abilities. A stepping stone has been laid to other career opportunities.

### Commentary From A Former Agriculture Teacher

I enrolled in the University of Idaho College of Agriculture with a major in Agricultural →



Education because I wanted to be a county extension agent. This desire came from a cooperative work experience placement at the local county extension office during my senior year in high school. The cooperative placement was part of my high school agricultural education experience. It was exciting to think that I could help people learn about the industry of agriculture. It was challenging to think that I would be impacting the very process of food and fiber production in some county in rural America.

The four years of college flew by quickly. My college experiences included course work in food science, animal science, and plant and soil science. I rounded out my college diploma with education, communication, and psychology classes. Then reality hit; I had to complete a student teaching experience. I dreaded the very thought of going into a classroom with high school students, cause I wanted to work in a county setting. I often reflected in that final

***I do not know of a career that could have better prepared me to serve as a lobbyist for agriculture than my years as a teacher of agriculture. There are a host of us who have the confidence and integrity to serve the industry because we came through the rank and file of agricultural education.***

month prior to student teaching on earlier experience at the local county agent's office.

Finally, I was assigned to a high school less than ten miles from where I grew up. It was a single-teacher program in a rather run down facility. The FFA program was strong, and the instructor was well versed in agricultural mechanics, my weakest area of expertise. During the fourth week of student teaching, something began to happen in me as a person. All of a sudden, I saw the students as challenges -- people with possibilities. New friendships were building in my life, and I realized that I had some natural ability to teach people. I was excited. The school asked if I might be interested in applying for a position as the second agriculture teacher. My hopes of being a county agent now seemed light years away as I waited for the results of the interview with the superintendent. One day while I was back home on my dad's farm helping with summer irrigation, the superintendent drove into our yard and announced that he had selected me to be the second teacher that fall.

The next four years were some of the best in my life. The students were my whole life. I became involved in their personal and family lives. Home visits, listening to their struggles as adolescents, and helping them lay plans for their future were all exciting challenges that drove me each year with eagerness into the fall classroom setting. During my fourth year of teaching, I was approached by the National FFA organization and asked to come to Alexandria to work on The National Future

Farmer Magazine. I struggled with the decision, leaving the comforts of the West, leaving my school, and leaving my students and their families, but I finally made the transition.

That has been almost 15 years ago. Today I own an agricultural consulting business where I serve a variety of clients who broadly range in scope and dimension. The clients I currently serve are: The Idaho Cooperative Council, Food Producers of Idaho, and The Idaho Vocational Association. I lobby not only for these previously mentioned groups, but also for Idaho Feed and Grain Association, Northwest Grain and Feed Association, and Idaho Eastern Oregon Seed Association. In July of this year, I contracted with the Idaho Department of Agriculture to conduct a statewide leadership program called Leadership Idaho Agriculture (LIA). LIA is designed to train men and women about Idaho and the world's agricultural picture.

I often think back to my agriculture classroom and lives of students I was impacting as a teacher. Now I find my classroom to be much larger in scope and size, and my student load is much more varied and diverse. Farmers, ranchers, business owners, and legislators make up my clientele of students -- people who have a need to learn and communicate about agriculture. I find my classroom to be the State capitol building, agencies of state government, conventions, seminars, workshops, and annual meetings.

Do I ever use my agricultural education degree and my experience as a high school agriculture teacher? Almost daily! The high school teaching experience was invaluable in fine tuning and honing the skill and knowledge gained in my college experience. I draw upon

***During the fourth week of student teaching, something began to happen in me as a person. All of a sudden, I saw the students as challenges—people with possibilities.***

my college course work as well. Those courses broadened by base of knowledge and expertise in technical agriculture and in the business of teaching and motivating others. I still find myself digging for the minor facts or the difficult terms, but that is because of the dynamic dimensions of the agricultural industry. Agriculture is no longer 40 acres and a plow. Computers, biotechnology, electronic communication, and mechanization have changed the traditional agriculture of my past. To keep up-to-date, I must teach myself about the fast pace of change taking place in the world of agriculture. I have lobbied for the past 14 years. I do not know of a career that could have better prepared me to serve as a lobbyist for agriculture

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## Teachers of Agriculture- They're Everywhere!



BY CHRISTINE D. TOWNSEND  
Dr. Townsend is associate professor of agricultural education at Texas A&M University, College Station.

The year was 1993 and it was thought many people in the United States did not know where their food came from or how agricultural products were produced. At that point, a popular film was released—a love story set in post-Civil War times. As they watched the movie screen, the audience saw the story unfold and, unbeknownst to them, learned about agriculture! In "Sommersby," lessons on tobacco seed costs, seed germination, fertilization, insect damage, harvest, and selling practices were vividly depicted on the screen. The audience gasped for breath when they viewed the intensive hand labor required for tobacco production. It was an amazing experience for them to see just how an agricultural product was grown. This film was a dramatic example of how education about agriculture occurs in unlikely places, and unlikely audiences gain an appreciation for agricultural techniques.

The screening of this popular movie makes one think about the unusual places where agricultural education might occur. Someone was a very effective agricultural advisor for the film; this advisor was an agriculture teacher with the entertainment medium as the classroom. What other non-traditional places host agricultural education?

### Assignment: Locate Agricultural Education

Suppose you have been tapped as the new environmental photographer for the local newspaper. Your first assignment is to illustrate the question, "Where do people learn about agriculture?" You may expect the people you interview to say, "Hey, I had a great 'ag' teacher in high school...take a picture of my teacher!" Others might indicate that as 4-H'ers, their county agent was their agricultural information source. But looking deeper into agricultural education, you find there are numerous people trained in agricultural education—certified to teach high school agriculture who do not teach in the classroom but continue instruction about agriculture in very different arenas.

### Snapshot: PH. D. Teaches Agriculture To An Unsuspecting Audience

As a teacher educator, Dr. Bill Weeks teach-

es agriculture to rather unique clientele at Oklahoma State University. Along with the traditional agricultural education majors, he teaches agriculture to a critical audience. Indirectly, Bill incorporates agricultural education into his reports, conversations, and discussions with superintendents, principals, deans, and faculty from non-agricultural backgrounds. Because agricultural industries are unfamiliar to so many people, it is important to make contacts with those who are not agriculturalists.

Educators like Dr. Bill Weeks teach to a very important audience. People who are not directly involved with agriculture learn from Dr. Weeks about the complexity, intensity, and diversity of the industry. Bill uses his skills in teaching methods, leadership, and group communication techniques to build understandings of the importance and components of agriculture. Agricultural education is being taught to a wide audience; people who never thought about how and where agricultural products are produced are now learning it!

### Snapshot: Agriculture Found In A Children's Home

The agricultural teachings of Sara Hobbs has spanned a wide arena. After teaching in a traditional agricultural science program, Sara initiated an agriculture program at a children's home in the panhandle of Texas. In this situation,

***Today, she is teaching plenty of agriculture in her job as production and marketing coordinator for a company specializing in production and export of Chinese vegetables.***

Sara was not a teacher in the classroom. She found herself building a farm and planning production schedules. Sara was also a house parent; she lived with 18 girls in one of the cottages at the children's home. Sara did not teach agriculture with conventional methods. She was not a classroom teacher and did not have a chalkboard or slide projector. The girls in her cottage went to school off-site; Sara was not an FFA Advisor.

But Sara's training in agricultural education did not go dormant at this time. Rather, Sara used her experience as an agriculture teacher →

and FFA Advisor to teach leadership and life skills to the residents. She taught leadership, citizenship, and responsibility. The girls learned to plan their daily tasks and prioritize their activities. There were no "Star Chapter Farmers," but there were girls armed with a foundation of leadership and life skills to face the world beyond their home. Sara taught agricultural values in a non-agricultural system.

### Snapshot: Four Year Olds Learn Ag

Teach agriculture before kindergarten? Novella Perkins Byrd has found that it may be one of the best places for students to begin an understanding of agriculture. Trained as a high

*From a children's home to a utility company, in fields and movie theaters, and in kindergarten classes and university offices, agricultural education is taking place. Teachers trained for traditional educational settings are carrying the message of agriculture to locations far removed from a classroom with walls.*

school agriculture/horticulture teacher, Novella uses her knowledge of plants and teaching methods to make her pre-kindergarten class come alive! The young students learn to plant seeds and identify what is produced from that seed. She uses hands-on approaches in teaching and gives the children opportunities of planting and harvesting!

Novella's agriculture teaching spreads beyond the pre-kindergarten classroom. As the children took the plants home, moms and dads learned a little about agriculture too. Although not in the traditional agriculture classroom, this teacher is making agriculture available to all the community.

### Snapshot: Export Executives Learn Of Oriental Vegetables

Mary Ellen Bell has an interest in horticulture, organic agricultural production, and unusual crops. Mary Ellen is using her teacher training in the agribusiness setting. Today, she is teaching plenty of agriculture in her job as production and marketing coordinator for a company specializing in production and export of Chinese vegetables. Mary Ellen's clientele are special because many do not speak English; they are visitors from mainland China with a desire to learn agricultural production techniques. In this unique teaching situation, Mary Ellen does not lecture to her "students." Instead, she finds herself in the field using demonstration methods and directing her students to learn by doing.

### Snapshot: Agriculture And Youth Leadership Sponsored By A Utility Company

Would you guess working in the utilities

industry yields opportunities to teach agriculture? Rob Darcey markets power and utilities to commercial accounts for a good part of his work week. As a trained teacher of agriculture, however, he maintains a goal to teach leadership and life skills to youth. A significant part of his job is to coordinate youth leadership training efforts on behalf of the company. His assistants travel to banquets and high schools and "teach." The group conducts small group workshops, as well as formal programs to large audiences. As guest speakers, Rob and his associates provide real-world situations for the students. This group of leadership instructors has a classroom with no walls; they travel to their ever-changing student population.

### Mission Accomplished: Agricultural Education Located Everywhere!

Browse through the snapshots you accumulated for your news article. It is evident that agricultural education is being practiced in many unique and unusual places. From a children's home to a utility company, in fields and movie theaters, and in kindergarten classes and university offices, agricultural education is taking place. Teachers trained for traditional educational settings are carrying the message of agriculture to locations far removed from a classroom with walls. Lessons about agriculture are being received by unsuspecting audiences, and they are being taught by all types of teachers of agriculture.

It is not surprising that agricultural education is happening all around us. What may be a new concept is that those with agricultural education training retain their teaching effectiveness regardless of the situation. The highlighted teachers made use of the knowledge they learned in their educational training. They had objectives, varied their methods, and understood their "students." Teachers of agriculture are IMPORTANT to agriculture. They can tell the story, teach the concepts, and focus on solutions to problems. Teachers of agriculture have the ability to extend the classroom, help shape the future, and make a tremendous impact on the success of the industry. ■

## Coming in July...

### Theme:

- Strengthening Programs

### Feature Column:

- Teaching Agriscience

### Plus 1994 Themes

# Leadership and Youth



BY RUBY D. RANKIN  
Ms. Rankin is a graduate student in agricultural and extension education at Mississippi State University and an area 4-H extension agent, DeKalb, MS.

The one claim to fame that all youth organizations seem to share is that we are developing leaders. What kind of leaders are we developing? Are we developing leaders who will work with others in obtaining mutual goals? Or are we developing leaders who will work only with those who are a part of an elite group? When I think of organizations that claim to be developers of leaders, the first two organizations that come to mind are 4-H and FFA. Both are advocates of leadership development, but are they practicing what is being preached? An important value of youth organizations is the opportunity that they afford for their members to participate in projects and activities of sufficient quality and importance to win favorable recognition in the school and community. Participation in contests gives youth the opportunity to develop citizenship skills, but what about leadership characteristics?

All young people and many adults have a role model—someone they strive to become like. Are our leaders displaying characteristics that they want to see imitated in the future? Over the last few years we have seen many of America's leaders being closely scrutinized and their actions questioned.

Are these the kind of leaders we want in the



Winning isn't everything but these 4-H'ers are sure happy that they won the first place trophy for shooting skills at an Area Rifle match.

future? Are we setting good examples for America's youth? Can we continue being a strong nation if we have weak leaders? What kind of images are we projecting for our youth?



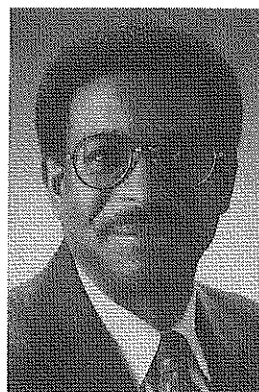
The enthusiasm shows as this young lady accepts a first place trophy for a visual presentation in the 4-H Health and Personal Development project.

Teaching leadership skills is not an easy task and is made more difficult daily. Today's youth are tomorrow's leaders; America's success is directly related to her leaders.

Youth should and must be given guidance, direction, and the opportunity to learn and develop citizenship and leadership skills, if they are to be successful leaders in the future. Why are citizenship skills important in leadership development? Because one is first a follower, then a leader. Social skills, getting along with others, being competitive, and gracefully accepting losses are a vital part of being a good citizen, as well as a good leader.

Have you ever stopped to wonder why America is plagued with teenage pregnancy, substance abuse, suicide, run-aways, teenage prostitution, and all the other evils facing our young people? Is it because everyone has loose morals? Are they a weaker generation, or is it simply because they are imitating others? Participation in youth organizations will not solve all the problems of today's youth, but it will give them the chance to learn, to grow, and to develop socially. Let's not handicap our youth by denying them the opportunity to experience and explore the many avenues that can be afforded to them through participation in youth organizations. Let's help youth to learn to be good decision-makers, followers, and leaders. ■

# Agricultural Literacy in Michigan: A Success Story



BY EDDIE A. MOORE  
Dr. Moore is professor of agricultural and extension education at Michigan State University, East Lansing, MI.

In the early 1970s, an attempt was made at the national level to integrate into public school curricula more information about American industries, including the agricultural, natural resources, and food enterprises. The popular words at that time were "career education." Although some school districts were successful in teaching children more about various American industries, this effort fell short of achieving its goals. The lack of knowledge regarding the U. S. food system concerned former Secretary of Agriculture John Block and former Secretary of Education Terrel H. Bell in the early 1980s. In light of this concern, in 1983 these two cabinet officials asked state governors to add their signatures to those of all living former Secretaries of Agriculture, endorsing the Agriculture in the Classroom Declaration of Principle. The Declaration of Principle stated:

Agriculture is the foundation of human life. The production and distribution of food and fiber have shaped the development of mankind since the beginning of time.

American agriculture affects all of us as consumers, workers, and citizens. As consumers, 20 percent of our personal expenditures are for food. The farming sector provides employment for one out of every five workers in our labor force. And where this Nation was once a rough-hewn rural society in which more than 98 percent of the population farmed, America has evolved into a prosperous urban society in which less than 2 percent of the population produces the food and fiber for the other 98 percent, plus tens of millions of people throughout the world.

The issues confronting modern American agricultural production are complex and far-reaching . . . Well thought-out policies covering . . . critical issues require a knowledgeable citizenry. And the foundation for that knowledge can best be started in the Nation's schools. It is essential that our elementary and high school students, as part of their basic instruction, learn about . . . fundamental issues. Only then will they be prepared as adults to help make responsible decisions in this critical area.

Thirty governors, including Michigan's governor, signed the Declaration of Principle along with the living former Secretaries of Agriculture. The purpose of the Declaration of Principle was to provide state action groups with a tool they could use to call school officials' attention to the significance of the Agriculture in the Classroom effort. The initiative by Bell and Block came at a good time, because the agriculture and food industry was confronted with a number of challenges, including a major shortage of personnel. Coulter and others (1986) projected the annual employment opportunities for college graduates through 1990 to be as follows:

Marketing, merchandising, and sales representatives	32%
Scientists, engineers, and related specialists	29%
Managers and financial specialists	14%
Social services professionals	11%
Agricultural production specialists	8%
Education, communication, and information specialists	6%

**A key strategy in Michigan's Agriculture in the Classroom program thrust has been to encourage various groups to give agricultural literacy a higher priority in their overall operations in order to assure its success.**

Today, Agriculture in the Classroom is present in 50 states, as well as Micronesia, Guam, the Virgin Islands, and Puerto Rico. The National Academy of Sciences established the Committee on Agricultural Education in Secondary Schools, and this committee (1988) reported that Agriculture in the Classroom is a model program which could be used to improve education about contemporary agriculture.

## The Michigan Experience

As a result of the workshop entitled, "The Crisis in Agricultural Education," held during the 1985 Governor's Conference on the Future of Michigan Agriculture, key education and agricultural leaders identified the need to formulate a statewide plan to restore vitality to agricultural education at all levels. The workshop participants requested a leadership council

to study ways of strengthening agricultural education programs in the state. The governor responded by establishing the Task Force on the Revitalization of Agriculture Through Research and Education. In examining agricultural education programs in the state, the Task Force (1988) asked, "What can be done to

*I grew up around agriculture most of my life. However, I was not aware of many of the issues and topics which were addressed during the class. . . I plan to use many of the concepts that I learned at the Institute this fall in my sixth grade math class, and I also plan to pass on some of my resources to the geography and science teachers of the sixth grade.*

ensure that Michigan's food and agriculture industry meets the educational and employment challenges of the next century?" Based on their analysis of agricultural education, the Task Force stated:

Dynamic, futuristic agricultural education and research programs must be offered to give K-12 and college students the knowledge and career awareness necessary to keep pace with the demand for well-qualified professionals.

At a time when taxpayers are overburdened and economic resources are scarce, new partnerships must be formed to revitalize Michigan's second largest industry.

Education, government, and private-sector partnerships are needed to make students aware of and prepared for jobs in the food and agriculture industry. Special efforts should be made to identify the best and brightest students, both urban and rural, and to put their talents to work in Michigan when they complete their education.

Having made the preceding statements, the Task Force (1988) focused its attention on what was needed for the future. They stated:

Michigan needs a broad, innovative agricultural education program that can be incorporated into the K-12 curricula in school systems throughout the state. Such a program would not only help funnel young people into agricultural careers and expand the state's economy, but also would create more informed consumers and responsible citizens. Education about the food and agriculture system can incorporate important wellness, environmental quality, international trade, and foreign cultures.

## Summer Institutes for Educators

Even though the task force made a number of other major recommendations with funding implications, the Department of Agricultural and Extension Education at Michigan State

University decided to address this particular recommendation, but on a limited basis in light of low financial support.

During the summer of 1990, the department provided the leadership for offering a summer institute for educators entitled, "Understanding Agriculture: New Directions for Education." The summer institute was designed to explore creative ways for teaching K-12 students science, math, social studies, and other subjects with the use of resources from the agricultural, natural resources, and food industries. The institute was jointly sponsored by the Department of Agricultural and Extension Education at Michigan State University, Michigan Farm Bureau, Michigan Economic Education Council, Michigan 4-H Youth Programs, and the Michigan Association of Agriscience Educators. The institute was so successful that the department decided to provide the leadership for offering another institute during the summer of 1991. The enrollment in the 1991 institute was twice the enrollment of the 1990 institute. The department offered two institutes during the summer of 1992, with an enrollment twice that in 1991. With a 300% increase in enrollment in three years, it is believed that agricultural literacy can benefit the state in a number of areas.

## Views of General Educators

The operational definition for Agriculture in the Classroom in Michigan has been defined by Moore (1988) as follows:

. . . the use of agricultural and natural resource concepts and materials to enhance student learning. Ideally, these concepts and materials could be utilized in all academic disciplines (science, math, social studies, language, art, etc.) at all grade levels."

Following are some of the views of general educators regarding the value of their participation in the institutes.

"I found as a science teacher that there are many agriscience topics that can be easily incorporated into our middle school science curriculum. . . The ideas of incorporating more agricultural topics into our science curriculum led me to write a grant. . . (from the) Department of Education. . . It is titled, "Agricultural Experiences for the Middle School Student within the Life Science Classroom". . . I hope with my new knowledge and renewed enthusiasm that more students will become agriculturally literate, thus becoming aware of the impact of agriculture on the American way of life."

Department Chairperson and Science Teacher  
Kinawa Middle School  
Okemos, Michigan →



"The Institute with Dr. Moore was terrific. I grew up around agriculture most of my life. However, I was not aware of many of the issues and topics which were addressed during the class. . . I plan to use many of the concepts that I learned at the Institute this fall in my sixth grade math class, and I also plan to pass on some of my resources to the geography and science teachers of the sixth grade. I see the importance for our students to have an understanding of what agriculture is and its importance to our nation."

Math and Computer Teacher  
Cranbrook Kingswood Elementary  
Bloomfield Hills, Michigan

"Agriculture and natural resource concepts are such an important part of our lives. Through the Institute I have learned how to incorporate these concepts into the teaching of biology and chemistry."

Biology and Chemistry Teacher  
Redford High School

### College Involvement

A key strategy in Michigan's Agriculture in the Classroom program thrust has been to encourage various groups to give agricultural literacy a higher priority in their overall operations in order to assure its success. The participation of college administrators, faculty, and students in agricultural literacy efforts has increased at Michigan State University. College

*The challenge for educators who are most interested in improving the learning of basic subjects, as well as those who are interested in agricultural literacy, will be the extent to which the profession is able to bring these groups closer together in the interest of students.*

of Agriculture and Natural Resources administrators and department chairs have provided 20 scholarships worth \$6,000 to assist educators in attending the summer institutes. This was done at a time when college units were asked to cut their respective budgets. The college has adopted two urban school buildings for the purpose of teaching educators and students about the agricultural and natural resources industries. College students have spent many hours in elementary classrooms assisting urban teachers and students in understanding agriculture and natural resources. During the 1991-92 academic year, a University sorority consisting of about 70 students worked very closely with three urban elementary schools in the university community. In many cases, that was the first time these college students had the opportunity to work with students from different ethnic, racial, social, and economic backgrounds. College students who participated in the program last year indicated that the experiences were the most rewarding and satisfying they had encountered since enrolling in college.

### Farm Bureau and Agricultural Commodities Involvement

The involvement of the Michigan Farm Bureau and other agricultural commodity groups in Michigan's agricultural literacy program has been exceptional. During the 1991 annual meeting of Michigan Farm Bureau, the organization identified agricultural literacy as a major priority in the state. The president has personally promoted the institute and served as a key resource person for the last three years. The Michigan Farm Bureau Promotion and Education Committee has continued to give agricultural literacy a priority program thrust. Local Farm Bureau members have promoted the institute and provided scholarships for local educators. Additionally, many local Farm Bureau members have given lectures in the schools on a variety of topics and offered their businesses as sites to enhance the learning of students. For the last several years, one Michigan family who owns and operates an 800 acre crop farm has provided tours of their farm, with an annual attendance rate of over 800 fourth graders. A variety of agricultural commodity groups has served as resource persons and provided scholarships to assist educators in attending the institutes.

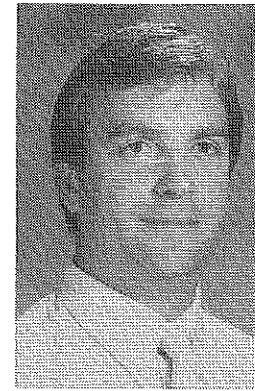
### Agriscience, FFA, and 4-H Involvement

Since 1975, the National FFA Organization has offered a national program titled, "Food for America." This ". . . program seeks to communicate to elementary students a fundamental, yet broad, understanding of the American agricultural industry." Michigan's agriscience teachers have promoted and used these materials in a variety of ways throughout the state. Some agriscience teachers have supplemented local Food For America program thrusts by using projects from the internationally known Coturnix Poultry program, which is being conducted under the direction of Dr. Sam Varghese, Professor of Animal Science at Michigan State University. Staff from the Cooperative Extension Service have continued to work with educators on a number of agricultural literacy program thrusts. Educators have been particularly pleased with the quality and content of the agricultural literacy materials. During the 1991-92 academic year, 4-H staff offered a number of workshops throughout the state for school administrators. These workshops facilitated ongoing agricultural literacy program activities in the schools.

### The Michigan Department Of Education, W. K. Kellogg Foundation, And Other Educational Agencies

Personnel in the Michigan Department of  
*(continued on page 23)*

## The Urban Student Challenge



By RAY GLESS  
Mr. Gless is an agriculture teacher at Red Mountain High School, Mesa, AZ.

In the world of urban agriculture programs, size and yields are not as important as the results and successes of the individual. Urban students do not have the resources or the capabilities to support a large SAE project or the capacity of producing great amounts of a product, when compared to students from rural areas.

There are seven major obstacles that exist for urban agriculture students.

### PROBLEM ONE: Square Feet vs. Acres

When individuals consider SAE projects they must realize the space restrictions that will be imposed on them, such as:

- \*Greenhouse space availability
- \*Land Lab area availability (4' x 6' per student)
- \*Container plant growing (apartment living)
- \*Number of livestock allowed per student (usually one head per student)
- \*Lack of facilities for expansion of project
- \*Must use smaller domesticated animals (rabbits, for example)

Most often the student's project is determined by the program land lab facilities and not by home or family-owned dwellings.

### PROBLEM TWO: Lack of General Agriculture Knowledge

In the traditional setting most students have grown up on a farm or have been associated with some kind of agricultural life. But in an urban setting there are individuals with very little understanding of agriculture and it's industries. Most students who become involved with the agriculture program have done so because of the advice or encouragement of a friend, teacher, other students, or a counselor. Another factor is a love for animals, and they are not able to have them at home so they enroll in an animal science class.

This is why agriculture classes in the urban setting must teach agricultural literacy. The knowledge rural students take for granted urban students must continually learn while in class.

### PROBLEM THREE Lack of Home Support

Just like the students in urban America, par-

ents, family, and friends have either a misconception of agriculture or they lack the knowledge and experience that rural parents have. It is very hard for them to support something they do not understand or lack the time to learn about. In many cases they feel agriculture classes are only for those who want to become farmers. They have no idea of the many different areas of employment in the agricultural industry.

### PROBLEM FOUR: Lack of Resources to Secure Loans

Unlike the rural student, the urban student lacks the stability of a long-term relationship of doing business with the family banker or leading institution that understands the agriculture program. Families in the urban area deal with banks that treat them as a file number, and they never build a relationship with the manager or the loan officer for several reasons:

- \*Good loan officers are moved upward into the banking system or find better opportunities at another institution.



Each student has assigned space on the school land lab for SAE projects.

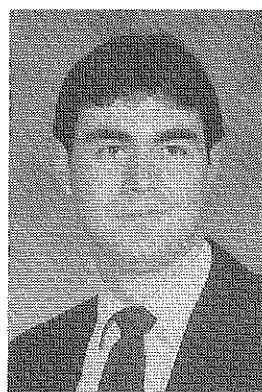
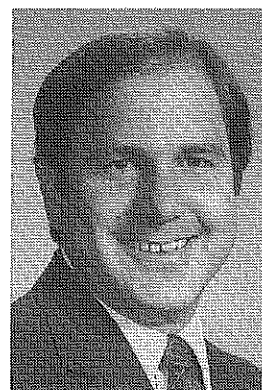
- \*Families have a larger market to shop for a loan or bank service. Few have all of their loans or services at one bank.
- \*Banks are unwilling to make small loans.
- \*The student or parent has little or no collateral for the loan.

### PROBLEM FIVE: Non-Traditional Agriculture Employment Opportunities

Finding a pure agricultural placement for a student in an urban setting is a very difficult task. No longer do feed stores, cooperatives, and feed mills hold the exclusive rights for sell-

*(continued on page 21)*

# Supervised Agricultural Experimentation



BY JOE G. HARPER AND JONATHAN C. ATHERTON

Dr. Harper (top) is an associate professor and Mr. Atherton (bottom) is a graduate research associate in the Department of Agricultural Education at Clemson University, Clemson, SC.

Agriculture has a rich and fascinating history, yet we seem to ignore the past. There have been many significant historical figures in the evolution and development of American agriculture, but none more significant than Thomas Jefferson. There is little doubt that Jefferson, often recognized as the father of agricultural experimentation, would be fascinated with the development and implementation of agricultural research in the United States today.

Some 200 years after Jefferson's life, it is time to get serious about agriscience. Over the past several years a great deal of time and effort have been devoted to developing the concept of incorporating agriscience into agricultural education instructional programs. If this rapidly evolving concept is to become a reality, it must be applied to a broad range of instructional activities. All facets of agricultural education, including FFA and 4-H, as well as the supervised experience programs and adult education programs, need to broaden in scope to encompass agriscience research activities.

Agriculture programs must become actively involved in research in order to be considered viable agriscience programs. Agriscience without research is not science. Furthermore, science instruction must go beyond classroom and laboratory settings. Science is of little value until it is applied. Students must be afforded opportunities to not only learn science concepts in agriculture classrooms and laboratories, they must also be able to apply scientific principles and concepts in agricultural and environmental settings. James Spiess provided an excellent example of this strategy in the November 1992 issue of *The Agricultural Education Magazine* with research on bacterial inoculant on alfalfa, resulting in the adoption of the technology by students and adults in the community.

## Applied Agricultural Science

Agriscience instruction must go beyond the classroom and the laboratory. The processes of technology transfer involves not only the research and development of new technologies, but also the adoption, diffusion, and improvement of technologies. In today's agricultural, business, and industrial environments it is not enough to merely expect students to be able to learn science without putting into practice the applied components of science and technology.

Recent advances in scientific inquiry and

technology transfer have expanded the traditional approaches of conducting research to actually conducting research on farms and ranches. These innovative techniques of scientific inquiry have been described as applied "on-farm research." On-farm research can be classified into three basic types:

- 1. Producer-initiated research:** This type of on-farm research is designed, conducted, and evaluated by the agricultural producers. Professional researchers, either from industry and/or scientific communities, are not involved in conducting this type of research.
- 2. Researcher-initiated research:** These research activities are conducted by professional researchers, with the cooperation of agricultural producers, on actual farm and production facilities. The professional researchers, either from industry or the scientific community, design, conduct, and evaluate the research activities. However, agricultural producers provide very little input for the research activities.
- 3. Participatory agricultural research:** These research activities are conducted with cooperative planning of both professional researcher and agricultural producers. Agricultural producers are actively involved with the design, development, evaluation, and dissemination of research projects. This type of research appears to be the most appropriate for implementation in and application by secondary agriculture programs.

These approaches for conducting on-site agricultural research are ideal for integrating into supervised agricultural experience programs. Students should not only have opportu-

***Agriculture programs must become actively involved in research in order to be considered viable agriscience programs.***

nities to develop supervised agricultural experience programs related to occupations and entrepreneurship, they should also have opportunities to conduct supervised experience programs of applied agriscience research.

## Strategies for Applied Agricultural Research in Agricultural Education

The following strategies have been devel- →

oped to facilitate the incorporation of agricultural research into agricultural education supervised experience programs. These strategies are based upon the concept of agriculture programs being actively involved in participatory agricultural research activities in the local communities.

First, we must incorporate research techniques and activities in agriculture programs. Of particular importance is the integration of applied agricultural research activities as components of supervised experience programs. This could be described as **Supervised Agricultural Experimentation**. Agriculture students would actively conduct applied research projects under the supervision of agriculture teachers. These strategies call for different approaches for thinking about supervised experience based upon scientific inquiry. Students need to be taught the basic principle of conducting quality research. This proposed strategy is very consistent with the ideals of Total Quality Management. The fundamental plan would be to:

1. Teach the basics of conducting research in the classroom;
2. Conduct experiments utilizing school facilities, such as agricultural mechanics laboratories, greenhouses, and school farms;
3. Develop supervised agricultural experiments where students apply research methods in real settings.

Just a few examples of supervised agricultural experimentation projects would include: conducting on-farm variety tests, determining wildlife populations, assessing water qualities, conducting marketing research, and conducting trials of conservation tillage practices.

Each of these projects would require fundamental applications of scientific principles and research methodologies. Teachers would assist in research design, collection of data, analysis of information, interpretation of findings, reporting of findings, and follow-up strategies. Assisting students with these types of research activities will require considerable "re-tooling" of agriculture teachers and programs, which leads us to the second strategy.

Second, we need to significantly increase teacher knowledge about research methods. We need to devote more teacher preservice and inservice activities to scientific inquiry, if we are to get serious about teaching agriscience. Every agriculture teacher and student will need to have a foundation of knowledge and skills in statistics, basic scientific research methods, and have applied experiences in scientific research projects.

Third, and most important, we must change our attitudes toward research. We can no longer

view research as something that we do not understand, are incapable of doing, and has little value in secondary agricultural education. The present trends in education are based upon critical thinking, preparation for technologies, technology transfer, systems approaches, and applied sciences. The number of agriculture programs will continue to decline if we continue to ignore these trends.

In conclusion, agricultural education is facing a challenging future. Agricultural producers are becoming more and more involved in developing, conducting, evaluating, and disseminating research projects. Agricultural education must develop programs related to supervised agricultural experimentation. Thomas Jefferson believed in agricultural experimentation, and agricultural education must also. Agricultural education without agricultural experimentation is not education in or about agriculture for the year 2000. ■

## References

- Harper, J. & Shinn, G. (1992). *Technology transfer instructional models*. 1991 Winter Meeting of the American Society of Agricultural Engineers, Chicago, IL.
- Spiess, J. (1992). Using experimentation as experiential learning. *The Agricultural Education Magazine*, 65(5), 13-15.

## Marketing Univ. Ag Ed. . .

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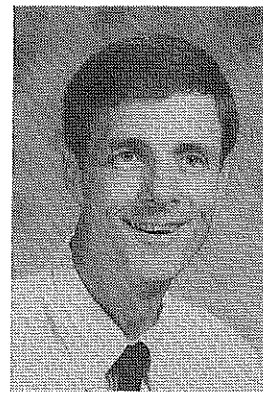
public school agriculture programs and teachers.

There is a certain irony in the present scenario whereby university faculty have been so focused on stimulating program improvement in high school agriculture programs that they have jeopardized the status and strength of their own programs. Especially for those agricultural education programs located in Colleges of Agriculture, establishing closer ties to the agricultural industry, paralleled with redirected instructional and research programs, will reposition agricultural education as a secure and respected field of study. At the same time, agricultural education is the best link between Colleges of Agriculture and public schools. The time for humility has passed; we must be aggressive in selling all aspects of our university programs to campus colleagues, prospective students, and the public. Future program development and marketing efforts at the undergraduate level must be more balanced between teacher education and training and leadership options in order to better meet industry needs and to ensure viable university agricultural education programs in the future. ■



# Food Science

## Adding Instructional Units and Experience in Food Science



BY STEVE MILLER  
Mr. Miller is an agriculture teacher at Conrad Weiser High School, Rt. 1, Robesonia, PA 19551.

One of most difficult decisions agriculture teachers have to make is what to teach and how much time to spend on each unit once it is selected. Everything done in agricultural production and agribusiness is geared toward producing food that will ultimately be purchased by the public. Take a close look at your students. Are most of them going to be food producers or are most of them interested in becoming better informed about how our food items are produced, processed, preserved, marketed, and researched? I'll bet some of them are also interested in animal and human health care, elementary and secondary education, and the environmental sciences.

A unit in food science at each grade level can be used to help your students investigate each of these areas. Food Science is definitely a multidisciplinary subject. How can you best add food science to your existing curriculum? Should you do separate food science units or add sections of this huge area to existing units of instruction? Using both strategies can be effective.

A new, brief introductory unit for ninth graders which highlights career opportunities and educational requirements for job entry in the food industry can be a good start. Where do you get reliable and current information about these career opportunities? Go right to your university food science department. They will give you some statistics showing where their graduates are being placed. I'm sure you'll be surprised at their placement percentage. They can also provide you with occupations that are available to students who want an associate degree, and even positions available to the high school graduate. Many food companies have a good record of providing career advancement once an employee has a proven record of service. They'll probably suggest using some materials available from the Institute of Food Technologies (IFT - address and phone listed later). There is a free videotape available and some usable curriculum materials that are very inexpensive.

The food science departments at the university level were created because the food processing industry needed skilled professionals that had more than just a "general" degree in chemistry, biology, dairy science, or plant and animal husbandry. Industry representatives met

and formulated a standardized curriculum for the B.S. degree in Food Science that would guarantee them an employee that could be productive. Then they hired those students upon graduation. Food science departments responded to an industry request and their placement and salary opportunities for students are still excellent. Your students need to know about these opportunities. Many university food science majors do not find their way into the major until they are juniors or seniors. They do this because they didn't know about food science, and they finally realized that there is a greater career opportunity available than is afforded them with a B.S. in chemistry or biology.

Food science departments will welcome your talented agriculture students with open arms and, very often, with scholarship opportunities. Many of you may be saying, "That only applies to a few of my students, what about the rest of them?" Be careful that this question doesn't get you headed in the wrong direction. Is a student who declares veterinary medicine as a career goal "too good" a student to be in your department's classes? I hope the answer is a resounding, "No!" The same should be true for talented students throughout your school population who want "science with career potential."

A good introductory ninth grade unit will get some of your students thinking about a career in food science. It can also set the stage for all of your students to think seriously about the positive impact agriculture and food have on our nation's economy. Other units in food science can be added to existing curriculum areas like dairy, beef, sheep, swine, poultry, and fruits. These "add-on" sections to existing units can save you class time and allow you to make a smoother transition to a more science-based curriculum in your agriculture classes.

I am really suggesting a three- or four-year period to phase-in this very large area of instruction. Some teachers will prefer to keep a food-related area tied to the animal or plant production instruction. This can be effective if your students can see the food item develop from research (idea) to the supermarket (product). Other teachers will prefer to separate the food science units and offer them at the appropriate grade level. I believe both strategies can work. The important thing to do is sit down →

with a good food science introductory text and a few trade journals. It won't be long until you'll have plenty of ideas about how you can best incorporate activities, reading, and career information in food science. You can use these units to help them bring chemistry, biology, and the "finished" components of agriculture to life for your students.

In the article that appeared in the March issue of *The Magazine*, I mentioned the need to contact your food science professor, work with agricultural education staff, and your Department of Education to establish inservice classes, and do plenty of reading on your own. The following is a listing of materials and ideas that can be helpful.

### Textbooks

1. **Food Science**, Norman N. Potter, VNR, F625 Empire Drive, Florence, KY 41042-0668. (606) 525-6600

This text is used in the university level introductory courses for food science majors. It can be used as a teacher reference and as a student text. We still use it in our program as a student text. There are many others. Contact your food science department for the one they use.

2. **Food Science and You**. Kay Mehas and Sharon Rodgers, Glencoe Division: McMillon/McGraw-Hill, 809 West Detweiller Drive, Peoria, IL 61615-2190

### Food Science and You: Teachers Resource Guide

Mehas and Rodgers  
These were written for use in a high school home economics curriculum. It has good organization of chapters and nice laboratory ideas. Look at the college level texts and this one and decide which one could best suit your program.

### Journals

1. **Agriculture Research**. U.S.D.A., ARS, Rm. 318, B-005, BARC-West, 10300 Baltimore Ave., Beltsville, MD 2075-2350

Every agriculture department in the nation should be getting one of these each month. If you are not, contact assistant editor Linda McElreath at (301) 504-6280. Make use of this one! Photocopy it and have your students contact scientists by phone or mail. We've never had a student disappointed by an ARS scientist. They'll send information, samples, and more reading materials and laboratory protocols that you can use in improving your teaching. \*Ask one of the scientists to send you last year's copy of the ARS Directory.

Then your students will be able to get in touch with any ARS station in the country. We get plenty of mileage out of this resource.

2. **Prepared Foods**. Gorman Publishing Company, 8750 West Bryn Mawr Ave., Chicago, IL 60631. (312)693-3200.

This trade journal is \$80.00 per year. I couldn't convince the company to give us a free subscription, but a food company can get a \$39 per year rate and donate it to you. Also, most scientists at a food company receive a copy and will mail you their copies free. The articles are excellent for current food technologies and food engineering technology. It is full of advertisements with company names and phone numbers. We've contacted several of them and had product samples sent to us with specifications for laboratory experiments. It is full of ideas and contacts and worth the effort to get it on your journal rack.

3. **Science of Food and Agriculture**. CAST-Council for Agricultural Science and Technology, 137 Lynn Ave., Ames, IA 50010-7197. (515) 292-2125.

This journal is \$10 per year - 4 issues. \$35 per year brings you all of CAST's publications on a monthly basis. Well worth the money.

Agriculture journals are an important source for our students. Ninth and tenth grade student have bi-weekly graded assignments that send them to the journal rack. Juniors and seniors go there on their own after two years of gentle "forced" exposure. Photocopied articles are a regular part of the reading in all units of instruction. Our agriculture students have made over 200 phone or mail contacts with scientists or professors from September-March this year. Agriculture topics are used as a basis for their English, chemistry, biology and physics term papers/projects, as well as for their written papers for agricultural science classes.

### Laboratory Ideas

1. Carolina Biological Supply Company (800-547-1733 for states west of Texas, 800-623-1231 for Texas and east.)

Every agriculture department should have a copy of this catalog. Try some of the "package" labs for starters. They save you time and set up. After you do them once, all you have to order is the ingredients or active chemicals.

2. Kemtec, 9889 Crescent Park Drive, West Chester, OH 45069, 513-777-3535  
Ask for Dr. Harry Stone. They have a →

catalog of "packaged lab ideas." This company makes many of the lab packages that are sold by larger distributors like Carolina Biological and Fisher Scientific.

3. **Student Research Projects in Food Science, Food Technologies, and Nutrition.** Edited by Edward E. Darrow, College of Agriculture, The Ohio State Univ., 2120 Fyffe Road, Columbus, OH 43210, (614)292-1734

This booklet includes numerous laboratory exercises with a complete description of materials needed. We use several of these labs.

4. **Experiments in Food Science (and Teacher's Guide).** Institute of Food Technologist, 221 North LaSalle St., Chicago, IL 60601, (301)782-8424

This inexpensive lab manual and guide has eight laboratories and a teacher's guide to help you prepare the exercises.

5. **Videotapes**

1. An IFT-produced video to inform students about career opportunities in food science. It is available free from IFT.
2. **How To Create A Junk Food.** This tape is produced by Coronet Films and is expensive. You can obtain a copy from your food science department. It is an excellent broad-based film about a complex industry. It takes the viewer from a market idea to a complete product. It showcases advanced technology and many career areas in action.
3. Venar, Modern, and other free loan videotape companies. They all have several good food science tapes that can be used to enhance several of your units.

6. Your State University Phone Book

Get last year's copy before it hits the trash heap. Ask a professor or secretary. It will have all of the professors and extension specialists phone numbers and addresses listed by their area of expertise. Make sure your students can use this one too.

7. Guest Speakers

Through your own contacts or from a food science professor's recommendation, contact a scientist to come in and speak to your classes. We use at least two each year. This led to an invitation for us to visit the Hershey Foods Tech Center, not usually available to high school classes.

8. Field Trips

This is a natural for agriculture departments. Don't forget your summer schedule. You'll be surprised at the number of students that will attend a field trip to a food company that showcases careers from research through processing and engineering.

9. Summer Sessions

Offer a three- or four-day class in food science. We do this for no-credit. The class covers material not usually taught in classes during the year. It is a chance for students and the teacher to go in-depth into a specialized area. The class runs from 8:30 a.m. to 3:00 p.m. There is plenty of time for laboratory activities and a field trip or guest speaker. These look good on students' resumés. Administrators like the full use of facilities in the summer months, not to mention the number of students that you're serving as opposed to individual visits.

It is important to select challenging and interesting reading material for each grade level and use laboratory exercises to help apply the reading and make the learning practical. There is something else agriculture teachers should seriously consider. Your students attend classes other than your during their school day. Our subject is quite unique. It is broad-based and multidisciplinary. While many of us categorize agricultural education as an applied science, let's not forget agriculture's impact on history, math, economics, sociology, health & nutrition, and English (written and oral communication). The way we present our instructional units in agricultural education can enhance the success our students can have in their "other subjects." It is important for agriculture teachers to examine the textbooks used in biology, chemistry, physics, social studies, and math. This affords the chance to make relevant examples/application about the importance of your subject area. Agriculture topics are woven throughout almost all of the "other" subjects, but students are rarely given a chance to see it. I've also obtained several good ideas for laboratories and additions to my units of instruction by taking a look at the textbooks my students use in other classes.

I believe our classes can add a new insight to high school studies for our students. Many of our agriculture students can see how studies from all of their subjects can lead to a successful career in agriculture. In addition, those high school agriculture students who decide to pursue careers in non-agricultural occupations will not be among the agriculturally illiterate. In fact, they will be allies of the agricultural sector.

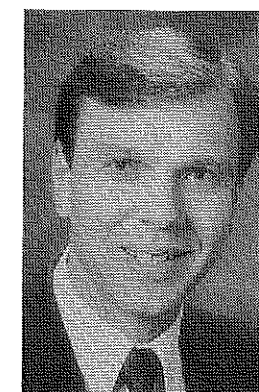
The final food science article will deal with specific content areas we use and a few laboratory activities that we use in our program.

### Summary

1. Get your hands on food science reading materials.
2. Contact food science professors for advice on laboratory protocols, procedures, or lab

(continued on page 21)

## Ag Ed in Elementary Schools Time To Celebrate Our Interdependence



BY LOIS ANDRÉ BECHELY & MARK P. LINDER  
Ms. Bechely (top) is an elementary teacher in the Los Angeles Unified School District. Mr. Linder (bottom) is Executive Director of California Foundation for Agriculture in the Classroom and program director of the California Farm Bureau Federation's agricultural education program.

It was noon and very warm on that memorable fall day in the heart of California's Central Valley. Our bus pulled into the Big Fresno Fairgrounds on time and our hosts and the media were there to welcome us. I gave the students a few last minute reminders about staying with their partners, listening to direction, and remembering their manners. At the bottom of the stairs anxiously waited our adopted farm family, Don and Clara Laub and their daughter and son-in-law, Debbie and Ray Jacobsen, owners J & L Vineyards of Fresno County.

The first few students to get off the bus were greeted with hugs and lots of questions about our trip up from Los Angeles, and then the excitement seemed to explode. It was just like popcorn! The rest of the students bounced out of the bus into the arms of the Laubs and Jacobsens. Every eye was wide open; every face had a big smile. In the few moments I stayed inside the bus ushering my students out, my heart, too, was pounding.

The joy I was sharing with my students that day touched me in a special way, for it was six months earlier that I had to rush those same students out of our classroom bungalow, with police helicopters circling overhead, to safety as the rioting in our city approached our school. For many days after, we spoke of the importance of learning to understand and appreciate the differences and concerns of all people. We wrote about our thoughts to the Laubs and Jacobsens and they wrote to us. Then they invited us to come and see their farm.

There we were—city and country, producer and consumer, present and future. Those 40 city kids had traveled to the most fertile agricultural land in California for two fulfilled days of learning about agriculture. Leaving behind the "them and us", we were all ready to celebrate our interdependence!

### Professional Development With A Big Payoff

For the past several years, education in California has been moving toward a meaning-centered, thinking curriculum. Each new subject matter framework adopted by the California State Board of Education stressed thematic, integrated instruction which would enhance critical thinking skills and be personal-

ly relevant to students. Since all subject areas are taught at the elementary level, my classroom was the perfect place to develop innovative and creative ways of meeting curriculum reforms. With the vast number of language minority and ethnically diverse students entering the public schools each year, the challenges for the elementary teacher are great.

At the time I discovered Ag in the Classroom, I was teaching first/second grade and using a core literature reading program. I began to notice that many of the themes in the books I shared with my students had to do with foods and farming. Born in New York City and raised in Los Angeles, I was as much a product of the urban environment as my students. I knew very little about agriculture. Yet, as I wondered about the stereotypes of the farmer, the lack of current information about agriculture, and how agriculture impacted my life and the environment, there were few objective resources available to me to answer my questions. Fortunately, I found the Summer Agricultural Institute for educators sponsored by the California Foundation for Agriculture in the Classroom (CFAITC). After one week of being immersed in agricultural issues from international trade to biotechnology and interacting in honest and probing dialogue with farmers and ranchers, my interest in agriculture as a dynamic and critical industry soared.

I returned to my classroom with agriculture as an umbrella theme for the whole year's study. When I read aloud, *Little House in the Big Woods*, by Laura Ingalls Wilder, I discussed the historical importance of agriculture. Eric Carle's, *The Very Hungry Caterpillar*, got a new twist when I asked the students what would they do if they were the farmer growing the fruit that the little caterpillar was eating a hole through. Would they want to buy the farmer's crop? We hatched chicks and examined the eggs that didn't hatch. We watched lady bugs eat aphids off roses; grew beans, tomatoes, and wheat; and performed a play of the *Little Red Hen*. Agriculture was underlying the instruction in language arts, science, history/social science, art, dance, and drama. I had the students engaging in fun, meaningful, and relevant learning experiences, while at the same time I was implementing many of the new curriculum reforms. →

The frameworks don't specifically recommend broad, year-round themes like agriculture. But by correlating the different strands from key frameworks such as the History/Social Science, English Language Arts, and Science frameworks with an agricultural theme, I was able to validate my belief that studying about agriculture is clearly one of the best ways to integrate subject areas at all grade levels. Following is a sample from the complete document.

### Correlating Curriculum Strands and Themes

HISTORY-SOCIAL SCIENCE	SCIENCE	
Goal of knowledge and Cultural Understanding	Major Themes of Science	Agricultural Themes
<b>Cultural Literacy</b> -understanding the complex a given culture	Scale and Structure Systems and Interactions Patterns of Change	regions dependent on nature of agriculture
-understand human movement	Scale and Structure	migration for food and shelter
<b>National Identity</b> -understand the unique experiences and contributions of immigrants to the United States	ENGLISH LANGUAGE our rich and diverse literary heritage which connects students to political, social, and ethical issues central to our society	immigrant farmers, ranchers, engineers, scientists, and businessmen who developed Ag in the U.S. & in California
-recognize the role of minorities in different times in American history		the contributions of Native Americans and Immigrant labor to U.S. agriculture

For the past two years, I have been teaching third/fourth grade modified-bilingual classes. My agricultural, literature-based language art program, combined with the study of California history, from its hunter-gatherer beginnings to the top agricultural producer in the U.S., is once again a great motivator for student learning. With many of my current students being recent immigrants, I have found that they are more aware of agriculture in their native homelands that we are here.

***There we were—city and country, producer and consumer, present and future. Those 40 city kids had traveled to the most fertile agricultural land in California for two funfilled days of learning about agriculture. Leaving behind the “them and us”, we were all ready to celebrate our interdependence!***

Last year, during our unit on *Charlotte's Web*, we borrowed a 10-week-old Blue Butt swine from a university agriculture program and kept it in our classroom for five days. While we all fell in love with our own “Wilbur”, we talked openly about his inevitable auctioning for food. A few of the students were able to share how, in their native countries, their fathers, uncles, and grandfathers would kill and roast a hog for special family meals. This kind of participation by students reinforces that education about agriculture is a learning context that all cultures can share.

### Wanted: A Few Good, Creative Teachers

I have often been asked how I would interest other teachers in teaching about agriculture. First, I would define all that agriculture is, since this is an area that most urban dwellers know very little about. I would challenge teachers to do a critical analysis of the history of agriculture from the global to the local perspectives. There would be no doubt as to the importance agriculture played in the rise of civilization, but this discussion would also generate an unbiased aspect of agriculture's impact on the peoples and the lands of the earth.

To this I would add a scientific challenge to the misinformation that exists about agriculture and encourage teachers and students to search for honest representations. At the heart of all good teachers is a desire to engage their students in provocative discussion and thinking from multiple perspectives for objectivity and for future relevance. Agriculture can capture the interest of teachers by offering a strong, rigorous, content-based curriculum. Agriculture must support teacher training and curriculum development about agriculture as part of its vision for the future.

Finally, and most importantly, I would impress upon farmers and ranchers, agriculture professors and graduate students, farm bureaus and commodity organizations, and FFA chapters and 4-H Clubs, the need for all of them to share their work with teachers and students in the classroom. I know that I cannot stand next to my farm family without being appreciative of the careful stewardship they give to their land or being envious of the closeness in which they live and work with nature, or being filled with pride that we are friends and a family . . . and everyone hugs all the time!

### Closing Comments From The Executive Director of CFAITC

Lois' teaching method of integrating agricultural instruction into all areas of the curriculum effectively demonstrates the Foundation's philosophy. The success of AITC is directly related to the partnership between education and agriculture working together to implement information about agriculture through existing state frameworks of study.

As the 1992 SAI Graduate of the Year, Lois has been an outstanding “Ambassador” for agriculture. She has presented her methods of teaching at the USDA National AITC Conference and throughout California at a variety of teacher inservice programs and conferences. Lois is an excellent representative of the many educators we utilize for program development and implementation and is always eager to share new ideas and resources with her students and colleagues. Her dedication to

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### The Urban Challenge . . .

*(continued from page 13)*

ing animal feeds and agricultural supplies. No longer is agricultural equipment sold just by agricultural dealerships. Almost every chain



*An urban agriculture student receives instructions on proper grooming of her market lamb for the county fair.*

store or independently owned variety store will have a large selection of agricultural products for its customers.

What students find in urban settings is that they must be flexible in their work environment. They may have been hired for their agribusiness skills and knowledge of animals or plants but they are expected to function in other non-agricultural areas as well. This makes it very difficult for a student to apply for different award programs in the FFA.

### PROBLEM SIX: Transportation Needs

Many urban students (especially freshmen and sophomores) have problems with transportation. Many families have both parents working, students come from single parent homes, or families do not own suitable vehicles to transport equipment, supplies, and animals. They become totally dependent on the agriculture department for transportation, which places greater demands on the teacher and the program budget.

### PROBLEM SEVEN: FFA Competition

Urban FFA members find it almost impossible to compete against rural FFA members for proficiency and degree programs. Most award programs center around two factors: quality and quantity. The urban student can develop a quality program, but because of the obstacles that have been mentioned in this article, it is very difficult for them to develop a program of sufficient scope.

The problems that have been discussed are what separate the urban agriculture student from the rural agriculture student. These challenges will continue to exist for the urban student. Because of these obstacles we must look to develop programs that will not only support the urban student, but also the rural student as well. We must make sure that both urban and rural agriculture students receive the credit that they so rightly deserve for their work and achievement in the agriculture program.

### Food Science . . .

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equipment you are unsure about.

3. Start obtaining a list of videotapes and integrating them into your units.
4. Bring in at least one guest speaker that has a food science degree and works in the private sector.
5. Plan at least one field trip to a company that does research in a food science area.
6. Keep reading, making contacts, and thinking about what parts of this large agricultural area can best suit your student's education.
7. Devote a little time in your summer schedule to organizing and “running” at least four new laboratory exercises for use in next year's classes. Then conduct a top-notch summer session or seminar when you are ready.

### Ag Ed in Elementary Schools

*(continued from page 20)*

promoting the Foundation's mission to foster a greater public knowledge of the agricultural industry is exemplary.

### Note to Teachers:

The September through December issues of *The Magazine* will focus on the nature of teaching, effective teaching, teaching agriculture, and teaching special populations. We need articles written by teachers! Check the back cover of the July 1992 issue for the name and address of theme editors, or call the Editor (217-333-3165). September articles are due to the theme editor by June 1, October articles are due July 1, and so on. Take some time this summer to share your ideas and strategies.



## Agricultural Educators in . . .

(continued from page 4)

gained as student teachers, and more importantly as teachers of agriculture. As experienced teachers, agricultural educators are recognized as unique professionals who, at one time or another, have fulfilled one or more of the following roles:

1. Teachers, who have developed presentation skills, program planning and curriculum development abilities, and individual and program evaluation skills to help students prepare for careers in agriculture.
2. Artisans, who have a broad background of technical knowledge and skill, have various areas of agricultural expertise, and know the language and customs of agriculture and of education.
3. Advisors, who assist and motivate students in developing leadership abilities and employability, employment, and entrepreneurship skills.
4. Counselors, who have experience in helping others with academic, vocational, personal, and social problems and opportunities.
5. Administrators or managers, who arrange schedules, submit FFA and state reports, procure materials, and oversee the agriculture program.
6. Planners, organizers, and developers, who identify and plan curricula, organize agricultural groups and adult classes, and develop supervised agricultural experiences for students.
7. Supervisors, who review career goals of students and supervise experience programs in agriculture.
8. Evaluators, who are proficient in measuring and reporting pupil progress and who measure and evaluate program success.
9. Researchers, who search continually to improve personally, technically, and professionally.
10. Public relations specialists, who recruit students, preserve agriculture's history and heritage, promote its image, and educate about its importance as a modern, productive, competitive, and progressive food and fiber system.

The above roles are played by teachers of agriculture and are readily transferable to other non-school agricultural education settings. Perhaps that is why there are always opportunities for persons prepared as teachers of agriculture; their background, experience, and preparation are broad and diverse; they are focused on an important area in which they believe, namely, the importance of agriculture and the need for education in and about agriculture; and they are active participants in implementing the many diverse roles that they play. These experiences make them employable in many areas

outside the formal school setting. They have had our education and training, they have relevant backgrounds and agricultural experience, and they have found a role in society in which they can contribute. They are our allies and our friends. Let's welcome their diversity and consider them as part of our profession. ■

## Ag Education - A Degree . . .

(continued from page 6)

than my years as a teacher of agriculture. There are a host of us who have the confidence and integrity to serve the industry because we came through the rank and file of agricultural education.

My affiliation with agriculture teaching and the FFA continues to build bridges of opportunity. I find in each of the groups I serve a host of bright, aggressive leaders who primarily attribute their personal growth and success to their experiences in agricultural education and FFA. My hat is off to teachers of agriculture.

In cooperation with the University of Idaho, The Idaho Cooperative Council just completed a recruitment film which promotes a degree in agricultural education. The theme of the film emphasizes the lives of several individuals who left the classroom but are still involved in serving the people of the agricultural industry. Field representatives, bankers, salespersons, scientists, lobbyists, and agribusiness professionals are the careers that the film showcases. The one common thread that each of these people shares is their basic foundation in agricultural education—still by far the most diversified and worthwhile degree for preparation in agriculture.

### The Paradox

We may tend to conclude that an agricultural education degree stands alone and is unique. In a sense it does. A degree in agricultural education provides students with a diversity of course work in technical agriculture, as well as course work in the body of knowledge specific to teacher education. The experience of putting the degree into practice through teaching creates the symbiotic relationship which strengthens the degree and makes those individuals who hold such a degree uniquely marketable in a variety of agricultural career options.

The question is then, is that good? We have always said that we must retain our best teachers. But if we keep our best teachers for at least three, five, or even ten years and then they move on to other occupations in agriculture - is that all bad? It can be argued that it is not. At least these individuals have served the profession that period of time, and it speaks well for the profession of teaching agriculture. A degree in agricultural education, coupled with several years of successful teaching, creates numerous career options. ■

## Agricultural Lit. in Mich. . . .

(continued from page 12)

Education have been very supportive of Michigan agricultural literacy efforts during the last several years. Members of the State Board of Education have served as key resource persons at the Summer Institutes for Educators. One of the Department of Education's most important contributions to Michigan agricultural literacy efforts has been its support of teacher mini-grants in the amount of over \$6,000.

A number of school districts in Michigan have viewed the agricultural literacy thrust as viable means for enhancing students' learning of basic academic subjects. In light of the positive views, several school districts in the state have covered the costs for selected personnel to attend the Summer Institutes. The greatest support for personnel to attend the Institutes has come from the Detroit Public Schools. Building administrators in the district allocated more than \$1,500 in 1992 to help their teachers attend the 1992 Summer Institute for Educators.

In recent years, the W. K. Kellogg Foundation has been most interested in helping Michigan improve science education at the elementary level. This interest has prompted the Foundation to fund a number of elementary school science projects to explore more creative ways of improving students' science scores. In 1992, the Foundation funded two major elementary education science projects in Michigan, which will focus on using food system concepts and materials as a means of improving elementary students' science test scores. Nearly a million dollars will be spent in a three-year period to determine whether using food system resources is likely to improve elementary students' science test scores.

As a result of the progress that has been made in Michigan with regard to agricultural literacy, the W. K. Kellogg Foundation has announced a new program, called "Food for Thought." In announcing this program, the Foundation's program officer stated:

The K-8 Innovative Education Program initiative seeks to foster creative approaches to teaching that will increase understanding among young people about food issues. This initiative will support comprehensive projects which recognize the full spectrum of challenges facing American children, parents, and educators - including the need for nutrition and health competencies for kids.

The W. K. Kellogg Foundation will fund up to five projects in Michigan during the first year of this initiative and later expand to 20 projects nationwide.

(W.K. Kellogg Foundation, 1993, p. 1)

It is anticipated that the five projects in Michigan and 20 projects nationwide will each receive about \$300,000 from the W. K. Kellogg Foundation. This represents an investment of nearly \$6 million over the next several years.

### Future Challenges

Educational researchers and educators have proven over and over again that students are more interested in learning, if given the opportunity to use their hands in the learning process. This finding has also been most prevalent in classrooms whereby teachers have used agricultural and natural resource materials to teach basic academic subjects. The challenge for educators who are most interested in improving the learning of basic subjects, as well as those who are interested in agricultural literacy, will be the extent to which the profession is able to bring these groups closer together in the interest of students. We have been successful in this effort in Michigan due to the commitment and dedication of many groups. Moreover, Michigan has been successful because we have encouraged more groups to give agricultural literacy a higher priority within their own operations. Considering that the profession elected to recognize a fourth grade teacher and her students for their agricultural literacy program activities at the 1992 State FFA Convention, we are making good progress on developing additional agricultural literacy program partnerships in the state. ■

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## **Producing Vegetable Crops**

Swiader, John M.,  
Ware, George W., and  
McCollum J. P.  
(1992). Danville, IL:  
Interstate Publishers, Inc.

REVIEWED BY:  
DALE R. CARPENTIER

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According to the authors, *Producing Vegetable Crops* was designed to be a comprehensive text for the study of vegetable production (olericulture) and to provide a vast array of information about all aspects of the vegetable industry. The authors are to be commended for their work on this text. It would be useful for anyone interested in vegetable production.

The authors divided the text into four general areas. Chapters 1 through 11 present basic information and fundamental principles associated with vegetable production in general. These chapters discuss many scientific principles and their applications to the vegetable industry.

Chapters 12 through 28 present detailed information about the production of over 60 specific vegetable crops. Some chapters discuss only one vegetable, while other chapters contain information about several similar vegetables. However, the authors utilize the same sequence for each of the chapters, which was very helpful while reading the book and when looking up specific information about vegetables in my garden.

Chapter 29 provides a very thorough discussion of producing vegetables in controlled environments, such as greenhouses, hydroponic greenhouses, and plant factories. Chapter 30 is devoted to home vegetable gardening and is designed to inform the reader of the main prin-

## **Managing Our Natural Resources**

Camp, W. G. &  
Daugherty, T. B.  
(1991). Albany, NY:  
Delmar Publishers.

REVIEWED BY:  
E. F. COWAN

*Mr. Cowan is an agriculture teacher at Mitchell Baker High School, Camilla, GA.*

The title is descriptive of the overall content of this book and is appropriate to the education of our young people today. The book is well planned and organized from the preface to the index. It is divided into eight sections, including Introduction, Soil and Land Resources, Water Resources, Forest Resources, Fish and Wildlife Resources, Outdoor Recreation Resources, Energy, Mineral and Metal Resources, and Advanced Concepts. Each section is further divided into several chapters. The chapters begin with the objectives of that particular area of discussion. Terms that will be found in the chapter are pointed out and highlighted. A chapter summary is provided and discussion questions are presented that are

principles, practices, and considerations of home gardening.

The appendices provide information about careers in vegetable production, sources of additional information, nutrient content of vegetables, sources of seeds, and conversion tables. The authors also include a glossary of terms used in the text. There is a separate glossary of terms at the end of the chapter devoted to the role of biotechnology in the vegetable industry. The text was written at a 9th or 10th grade level.

My overall impression of this text is very positive. My main concern is that no objectives are provided at the beginning of the chapters and no questions and/or activities are provided at the end of the chapter. This concern was alleviated, however, when I read the teacher's manual for the text. The teacher's manual contains instructional objectives and review questions for each chapter, in addition to a chapter overview; instructional strategies to reinforce, extend, and enrich the learning experience; and other useful information.

This would be an excellent text for teaching a course or unit in olericulture. Instructors who do not teach a separate course or unit in vegetable production would find this text very useful as a reference book. In either case, it would be very beneficial to obtain a copy of the teacher's manual if you purchase this text. ■

relevant to the subject area. Some activities are suggested that will give students experience in the area of discussion. Each chapter is fairly well covered and should be of interest to high school students. The criticism of this book, if any, would be that it tries to cover too much. Personally, I think, it should possibly be made into more than one book and cover some of the areas in greater detail. The glossary is well thought out and organized. It gives simple, understandable definitions for high school students.

I plan to use this book as a resource book in a Forestry Wildlife class that I teach. It would be desirable to use as a student text if funds were available. ■