Trends and Issues Affecting The Future of Agricultural Education
Will They Vote Agricultural Education Off the Island?

By Greg Thompson and George Cope

This summer on CBS, over 51 million people tuned in to watch the final episode of "Survivor." To find out who would win the $1,000,000 prize, the series featured sixteen castaways marooned on a remote tropical island in the South China Sea. They had to find food, water, shelter, and build a world themselves. Yet, each week they voted one person off the island. The final episode of "Survivor" was watched around the world. "Survivor" theme parties were the fad, and the program received the second highest rating in CBS history.

A recent visit to an agricultural classroom in rural Austin, Texas, even students got into the show. Upon being called for the answer to solve a problem, a student quipped, "I get the answer right, will I be granted immunity?" The teacher joked, "No, but you may get voted off the island if you get it wrong."

Agricultural education has been involved in its own version of "Survivor" throughout its history. We have survived challenging times in our educational system and responded with a defined purpose and focus on the future. As we address trends and issues in agricultural education, it is important to reflect on the foundations that have kept us on the island.

We must rely on the experience of our "survivors" to help guide us into the future and remind us of the premise that has kept us strong and visible in the community. Our education leaders will continue to provide us with the vision and educational philosophy for understanding past decisions, which will help us understand the reasons for educational trends and issues today and give us the opportunity for making the same mistakes in the future. At the same time, we look to our beginning educators to bring to the profession new ideas and a broadened mission to meet the needs of emerging technologies in a dynamic industry and changing society.

In the show "Survivor" an alliance was formed with others on the island to stick together and work toward a common goal. In agricultural education, we have formed alliances that have kept us strong through past educational reforms. In fact, we have won many immunity challenges because our programs have collaborated with business and industry, as well as other educators, to make ours a unique delivery system. Business, industry, and government must continue to support us in our endeavor to educate students, as they won't be successful in the future unless we are successful in educating their future employees.

Team AgEd is an alliance that will help prevent agricultural education from getting voted off the island. The Team AgEd concept should be embraced not only on the national level, but the state level as well. If teacher education, state supervision, and teachers are truly engaged in helping students and bettering agricultural education, we must work as a team. States with a strong agricultural education program have teachers, teacher educators, and state supervisors working together to move agricultural education in a positive direction. The health of agricultural education relies on commitment of effective people in leadership. Team AgEd is a positive move toward unity and strength that will help us survive on the island and meet the challenges that lie ahead.

Teaching is very demanding. It is challenging to teach today and even think about the future. Nevertheless, this is exactly what we must do. We must adopt forward thinking attitudes and actions. We must study the types of skills and knowledge people will need to be successful in the twenty-first century. We must adopt a positive attitude toward professional development. If we have been education very long, we are well aware of the critics and challenges that education has faced on an ongoing basis. These pressures are not "cry wolf" demands, but real and necessary calls to improve. They are not being issued because we are not doing our job. Rather we are being challenged because the world our students live in has changed.

Times have certainly changed in agricultural education. However, we can all agree there are many changes not yet made. Agriculture will have survival and thrive on the island because of our successful history and our commitment to the future. We have been successful in the immunity challenge because our programs have adapted to a changing society. "Survivor" producer Mark Burnett summed up the show "Survivor" by saying, "Each day brings an exciting (continued on page 5)
Agriculture: Trends and Issues

By Dennis Avery

America’s agricultural education will face its biggest-ever challenge in the next 50 years: helping farmers gear up to supply nearly three times as much.

Today, the world’s farmers are feeding only 6 billion people, and only about 15 percent of them are eating high-quality diets. But high technology, freer trade, and spreading democracy are driving higher incomes in emerging countries. By 2050, the world will probably have a peak population of 8.5 or 9 billion people, nearly all of them demanding high-quality diets for their kids. Even Russia and Sub-Saharan Africa may be able to afford high-quality diets.

Americans now have 113 million companion cats and dogs. A rich, one-child China in 2050 is likely to have 500 million companion cats and dogs.

Viewed from a global perspective, American agriculture deserves to prosper in the 21st century as it never did in the 20th. America has the world’s largest tracts of prime farmland. With its pioneering use of conservation tillage, integrated pest management, and biotechnology, America also has the world’s most sustainable farming.

Rural America must plan to have at least as many jobs in farm management, research, farm input supply and food processing in 2050 as we have currently. If the world liberalizes trade so American farm exports can help save the tropical forests in densely populated Asia, there should be even more agriculture-related U.S. jobs in 2050 than 2000.

Without a tripling of U.S. crop yields and a major increase in U.S. farm exports, the world will almost certainly lose a major part of its wildlands and wild species. Equally vital, researchers have found almost as many wildlife species in five square miles of tropical forest as we’ve discovered in the whole of the United States.

If the trend toward freer trade is extended to farm products, Europe will end its export dumping, and world market prices for farm products are likely to rise 25-50 percent. Sales to emerging Asian economies will soar. U.S. farm exports might very well double within a decade, from the current $50-60 billion per year. The extra billions in income are likely to be earned with the land, labor, and equipment already on our farms so net farm income would increase dramatically.

The current organic food fad is likely to fail. Organic officials in both the United States and Britain have recently admitted that their industry has no proof of any nutritional or safety benefits. Katherine DiMatteo of the Organic Trade Association admitted this on ABC-TV’s “20/20” program on February 4, 2000. The British organic industry admitted it to a government hearing in 1999.

The Food and Drug Administration says we get less than 1 percent of the Acceptable Daily Intake of pesticide residue. Their standards take full account of children, with thousand-fold safety factors built in. The research of Bruce Ames, who just received the National Science Medal from President Clinton, says 99.99 percent of the pesticides we ingest are natural, growing in the plants to stave off bugs and bacteria. So much for organic food being pesticide-free.

Organic farmers’ yields are only about half as high, which means a global organic mandate would destroy perhaps 10 million square miles of wildlands. Meanwhile, organic farmers fertilize food crops with animal manure, which contains virulent pathogens such as E. coli O157, which can kill even healthy people, and leaves many of its survivors with permanent damage to internal organs.

In 1997, Dr. Robert Tauxe, of the U.S. Centers for Disease Control, told the Journal of the American Medical Association that “Organic means your food was grown in animal manure.” He said America needs to get animal manure out of its food production, especially because of the virulent new bacterial threats including E. coli O157 and Salmonella typhimurium.

Mainstream farmers prefer to use safer chemical N on the foodstuffs. (It’s taken from the air, which is 78 percent N.) They put the manure on feed crops.

At this moment, thousands of Americans die every year from foodborne bacteria, but we are still looking for the first victim of pesticide residues.

Can we sustain the upward trend in world food production? The latest soil erosion data is highly encouraging. A recent “soil archeology” project in the highly-erodable Coon Creek watershed of Wisconsin found its farms suffering less than 6 percent as much erosion as in the Dust Bowl days of the 1930s. Thanks to conservation tillage (with herbicides) they are now building topsoil depth and organic content.

Even more encouraging, biotechnology is apparently the most powerful tool humanity has ever discovered for improving agriculture:

- The new “golden rice” is engineered to overcome the Vitamin A shortage that currently causes millions of kids to go blind or die each year in poor rice-eating cultures. We need a comparable Vitamin A enriched corn for Africa and Latin America.
- A new rice that carries a corn gene for higher photosynthesis yields 35 percent more grain per acre. This is just one of many biotech avenues for increasing crop yields to save room for wildlife.
- Gene mapping has allowed Cornell researchers to select genes from wild relatives of the tomato that raise yields a whopping 50 percent.

America will need an even more dynamic, higher-tech agriculture to ensure we can feed our kids and our pets in the 21st century without sacrificing the environment. We won’t be able to meet the challenge without agricultural education.

Will They Vote Agricultural Education Off the Island?... (continued from page 2)

new chapter, as unexpected relationships develop and personal dramas unfold... There are no quitters among this courageous group of thrill-seekers. Agricultural educators have aspired to continue to win the immunity challenges by preparing our students for the next millennium, building strong alliances with business and industry, and building a team approach to keep our programs current. It takes courage and leadership.

We hope you enjoy this issue of the Agricultural Education Magazine as authors representing agriculture and education challenge us to survive and thrive on the island. The framework this issue represents views from secondary and post-secondary institutions that house Agricultural Education programs. Authors representing different professional experiences, geographical regions, as well as urban and rural perspectives across the U.S. have given their insights as to trends and issues that they face and their responses in carrying out their professional careers. Professionals representing the field of agriculture as well as education provide insights to agricultural education.

As educators, we must listen to what is happening in our institutions, community, state, as well as on the national level. Authors have given local, state, as well as national perspectives on trends and issues in agricultural education. Will agricultural education get voted off the island or will we adapt and survive to meet the new challenges that await us?

The answer is in our hands.

The Agricultural Education Magazine

November-December 2000
Community and Technical College: Trends & Issues

By Betty Dowall

New trends in community college teaching/learning call for faculty to significantly revise the primary activities in which they engage. Previously, the primary job of the teacher was to choose the material to be presented, to organize that material, and then to present it in an interesting way such that the learner was compelled to learn. Teaching/learning centered on the teacher.

Now, learners have become the center of the teaching/learning enterprise and the role of the teacher in the community college is to diagnose student learning needs and develop learning activities that will enable individual students to learn. Different students within a class may have different learning needs and require differing "prescriptions" for learning.

Often termed active learning, the job of the teacher becomes far more active as well. As coach, mentor, the teacher acknowledges student learning and develops activities that build on the learning already acquired. As part of this activity, students are often brought together as a community whereby they may share learning and learning activities. Such a learning community requires students to be teachers and allows teachers to be learners. The result of active learning is the potential for longer retention of material learned.

New technology is an indispensable trend in learning. Whether used as learning support or as delivery system, the computer and the access it provides to the Internet, provides an unprecedented expansion of teaching/learning opportunities. Students and teachers have access to information beyond any one library or any one person's knowledge. Furthermore, adults are painfully aware that every child and young adult is adept at finding and using this new information delivery tool and expects to use this tool in their formal learning. At a minimum, the new technology provides an opportunity for ease in communication between student and teacher, student and student, and at its best use greatly enhances learning opportunities at the time the learners are ready to learn. Students, with their teacher/coach, may more readily find learning opportunities to meet their prescribed learning needs. The role of the teacher here is far more than Internet traffic director. With the plethora of information available, students need to be taught how to evaluate and choose among available information sources and how those sources can fit with formal classroom learning.

The new technology also provides exciting learning support. Students may literally or virtually work in the field on actual problems, analyze data, test hypotheses, and apply new ideas and information. Teachers no longer have to hope students will see relationships between theory learned in the classroom and application in work. Motivation of learners is bound to increase as a result.

Moreover, faculty are caught up in expectations that they will make use of the new technology. Pressure to put courses on the Internet, to develop personal web pages is great. Questions regarding intellectual property rights — for faculty, students, and institutions — abound. Charges that institutions seek to use web courses (and the ownership of courses and software written for use in developing web courses) as a money-making opportunity cloud the value of this teaching method.

With such new learning activities, an important role of the teacher is assessment of learning. To accurately assess learning achieved, the teacher must have developed the learning goals to be met, the outcomes desired, and to have conveyed these to students. More than a response to calls for accountability, more than the latest buzz word, assessment becomes an integral part of the new learning process by assessing the learning the student brings and new learning achieved.

Outcome measures require teachers to clearly state abilities students must attain at the end of the learning activity. Outcomes require teachers to think broadly about workforce needs and to think specifically about workplace skills. Often inherent in this are hidden remediation needs, basic skills that are only revealed in higher level learning.

As the teacher were not already overwhelmed with new teaching methods and devices, the community college teacher must also prepare for an unprecedented diversity of students within a class. If students were once thought of as homogenous groups, that is no longer the case. Students come from a wide variety of cultural and racial backgrounds with a variety of learning needs and styles. Some students may be entering college and a profession (young); other students may be experienced workers who need to update skills or to retrain for new (continued on page 9)

Improving Career/Technical Studies

By Gene Bottoms

The primary purpose of high school career/technical studies — as perceived by career/technical teachers — is to help students complete a program that prepares them for employment and further study. What changes do career/technical teachers need to make in what and how they teach to meet the demands of an economy that prefers workers with general, high-level academic and career/technical knowledge and skills rather than job-specific skills?

Someone with general, high-level knowledge and skills can upgrade to cope with changing workplace demands. Workers today need to know how to solve problems, communicate and work with others, be creative in dealing with customers, and use computer technology. In light of these requirements, here are 11 things career/technical teachers should stop and an equal number they should start doing in preparing students for the workplace and further study.

Start

• preparing students to advance in broad career/technical fields.
• making assignments that require students to do mathematics, read and interpret technical materials, research, analyze, and organize information; solve problems; and apply academic and technical knowledge and skills in doing authentic workplace assignments.
• creating advisory committees composed of representatives of many different jobs within an industry and professors from two- and four-year colleges that prepare students to enter the field at a higher level.
• joining other career/technical teachers to set higher standards for students in career/technical courses.
• assigning open-ended problems.
• getting students to redo work until it meets standards.
• requiring students to use word processing, spreadsheet, and presentation software — the Internet, and e-mail.
• having students pass a comprehensive exam that includes 1) a written portion on reading and interpreting technical materials, understanding major technical concepts, and applying mathematics to solve problems from broad career fields; 2) an oral report presented to a panel of experts who ask questions to find out if students know and can communicate the technical concepts and can deal with people in a variety of situations; and 3) a project in which students are evaluated on whether they used appropriate ways of thinking to complete the project.
• asking students to do open-ended projects, design and conduct research, read technical books and articles, and demonstrate understanding of what they have read.
• expanding student assessment to include comprehensive tests, portfolios, homework, and employers' exams.
• requiring student assessment to get students to 1) write reports that explain what was done and why; 2) collect, synthesize and use information to complete a project; and 3) apply technical and related academic competencies to assignments.

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Trends in Australian Agricultural Education

By Petrina Quinn

Australian agriculture has many features in common with the United States of America. For example, the progressive intensification of agriculture, increased specialization of enterprises, aggregation of small farms and the reduction in owner operators, and overall fewer people employed in the agriculture and related sectors are similar. This article may be useful to readers in examining the same issues located in a different setting. A global decline in interest in studying agriculture appears to reflect perceptions that agriculture is of declining importance in First World nations and offers few advantages compared to high technology and high personal income careers. These trends may be associated with a bias in university entry towards urban students who are increasingly separated from food production and are thus relatively unformed about agriculture and aspects of natural resource management.

A three-year investigation into Australian tertiary education has quantified enrolment reductions as high as 40% in some years for agricultural diplomas in contrast to steady enrolment levels in other subject areas. This has been linked to the decline in the agricultural work force as well as a general image of agriculture. Vocational oriented courses are more directly tied to employment opportunities and thus can be a problem in areas of the economy, which are in decline.

Demand Profile for Graduates of Agricultural Education

The demand profile for graduates of Australian agricultural education has changed significantly in recent years. In the past, the researcher was a person described as being a good scientist, the technical specialist had a subsector description, and the extension officer was described as being a generalist. The agricultural universities or faculties of agriculture supplied the personnel for each of these layers. This is increasingly not the case with the scientific advances being applied in genetics, microbiology, and chemistry. Pure scientists are complementing agricultural scientists in agricultural research.

In the extension field the required mix of skills has also changed. Increasingly, business and marketing professionals and social workers complement the traditional extension officers. The treatment of farming as a business, the increasing sophistication of agriculture, globalization and the rural urban demographic shift has resulted in a demand for skills of those trained outside of agriculture facilities. Environmental demands, such as natural resource management requirements, are also exerting pressures on agricultural education.

Those engaged in agricultural production for example, the owner-operators, are increasingly acquiring higher levels of knowledge than their previous counterparts. Similarly, those supplying services through advice, sales, financial services, and general information in a changing agricultural environment too have higher levels of knowledge than their previous counterparts. At the same time, there is an increased responsibility to understand the implications of environmental impact and natural resource management, which require sound knowledge of the interactions of biological and social systems both in the present and the longer term.

This leads to the debate about the disciplinary mix and the location within their discipline of those concerned with the teaching of agriculture. It is argued that it is the concern of the teaching with the teaching of agriculture. It is argued that those concerned with the teaching of agriculture should maintain close contact with the production aspects of their science. Professor Richard Bawden, Head of the School of Agriculture and Rural Development, University of Western Sydney, argues that whereas the earlier demand, from employers, was for graduates who could improve productivity, the demand now is for graduates who can manage rural practices which do not degrade biophysical or social cultural environments but enhance them.

Professional employment seems to be based around team assignments and task completion which are very different from memorizing knowledge for representation in a two hour written examination used to assess students training for such positions. Given this, why could not a work-related approach be adopted for at least part of the education experience? The current model of agricultural science courses does appear to leave little scope for students to develop their analytical skills and incorporate their own life experiences. The potential benefits of information technology and, in particular, multimodal as an adjunct to traditional teacher-based lecturer delivery, would seem to be worthwhile exploring.

Australian Faculties of Agriculture are broadening their curricula to reflect a more comprehensive and global vision of the food and agricultural system. Such broadening is important for the future diversity of Faculties of Agriculture; although such a broadening and the diverse knowledge, thinking, and vocational skills required can generate tensions and concerns for those designing, delivering, and evaluating these courses. While teaching programs must remain relevant to general production issues facing producers, relatively few students will own or operate farms in the near future.

Challenges for Tertiary Agricultural Curriculum

The curriculum of faculties and schools of agriculture have been largely concerned with the dissemination of technical and scientific knowledge. It is difficult to be otherwise when technological and scientific knowledge is estimated to be expanding by approximately 40% annually (The National Academy of Science, 1992). With increasing mobility of student enrollment, along with the need for Australian agriculture to become more competitive in a global economy, curriculum revision should focus on educational experiences which do not degrade biophysical or social cultural environments but enhance them.

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Community and Technical College Trends and Issues...

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University courses in the area have undergone extensive reviews and in some cases, the responsible faculties have sought to reinvent themselves.

Betsy Duvall is a Professor in the School of Education at Oregon State University in Corvallis, OR.
Que Sera Sera: What Ever Will Be Will Be...Yea Right

By Rosemary Vernon and J. Scott Vernon

O n the eve of the new millennium, not far from the edge of the world and in the middle of the new economy, agricultural education in California is "virtually" exploding. As we peer into the future, we see a variety of revolutions and evolutions occurring in agricultural classrooms up and down the Golden State.

In a state where diversity in its people and its fertile fields is common, agricultural education is changing to reflect the concept of a new world of talent and tastes needed by the new economy of the cyber space. According to Jim Aschwanden, the executive director of the California Agricultural Teachers’ Association, "Agriculture is experiencing a technological revolution." He sees the dramatic impact of technology (and not just computers) is having on the agricultural industry and notes that "policy makers and opinion leaders must understand the demands of our clientele." He says "students today must be taught how to think, how to learn, and how to use technology in a real world setting."

"We’re living in a global economy that needs a global workforce," Aschwanden said. "This challenges us to rethink what we are teaching and why." He added, "agricultural education is successful because we provide relevance to instruction and help students to make the connection to a dynamic world." He emphasized we "can’t abandon our philosophy of applied learning.

With the tide rising on academic standards as the benchmark of student success, Aschwanden says "there is not enough Mark Twain and Huckleberry Finn in schools today." "Students need opportunities to explore different types of learning and education outside the classroom to capitalize on their inquisitive minds—like Huckleberry Finn did," he said. "When we do this successfully, magic will happen."

Show Me the Scores

Educational reform movements have come and gone and have come again. According to Robert Heuel, the California State Supervisor for Agricultural Education, this time a few key forces are here to stay. "Assessment and accountability are driving educational efforts in California," said Heuel. "This trend will continue to affect what we do in the agricultural classroom. It will also have an impact on how we address the FFA and the SOE/SAE components of our instruction."

He indicates standardized test unfortunately cannot truly measure what a student has learned outside of the classroom. But he said, "we’re being evaluated by the numbers generated on those tests and that drives the system." Yet Heuel believes "the leadership and personal development experiences in the FFA are critical to a student’s career success." "We have to help bureaucrats determine ways to evaluate the value and build support for leadership and career preparation that occurs beyond the walls of the classroom," said Heuel.

A Few Good Men and Women

With the growth of high school agricultural programs up and down the "left coast," an ongoing shortage of qualified teachers exists in California. "The future for young people who want to teach agriculture is bright," said Heuel.

Marc Coleman, the head of the agricultural department at Hilmar High School in Hilmar, California, echoes this need. "The academic standards in agricultural education today and in the future demand quality teachers. We need young teachers who have the energy and ideas to capture the imagination of our students." He added, "I see a fundamental change in the core of our teaching profession. We’re seeing less and less of the ‘good ol’ boys’ with years of practical experience. Teachers today, generally speaking, have less background in the FFA and the agricultural industry.

Coleman says this is not all bad given their increased understanding and use of technology but it does provide a need for “more mentoring relationships in our profession. “The teaching profession must wrestle with helping these young teachers develop strategies to extend their teaching careers beyond the first couple of years. We have some very talented young women teachers we can’t afford to lose, but we have to adjust to help them balance the demands of a family and a career,” he said. The Hilmar High School agricultural department was California’s "Agriculture Program of the Year" for 2000.

It’s the Curriculum

Everyone seems to agree that the future of agricultural education in California relies on the strength of the curriculum. Coleman said, "today’s agriculture classroom in California is more rigorous and dynamic than ever before." "What I teach now is light years ahead of what I was teaching when I entered this profession 20 years ago."

Aschwanden says we must ask "is what we’re teaching what’s needed?" If not then we must evaluate relevance of our instruction and make the necessary changes in our curriculum to remain viable. "The new world of e-commerce in modern agriculture has vastly different rules, not old rhetoric," he said. "The future requires that we prepare our students to apply abstract concepts to tangible problems."

That becomes increasingly difficult with the sweeping changes we’re seeing in communities throughout California. Coleman said, "more of my students are coming from urban backgrounds." "Our programs must evolve to reflect the change in our communities. We can’t keep teaching the same things," he said.

The Agricultural Divide

Just as computers and the cyber world have created a digital divide between those with access to technology, urbanization has created a divide between those who have experiences in agriculture and those who do not. With the rapid winds of change affecting our schools, Heuel predicts a future that values, "collaboration that integrates agriculture across the curriculum."

Successful agricultural literacy efforts will have strategies to teach about agriculture in the social sciences, the life and physical sciences, the language arts, and mathematics," he said.

The Crystal Ball

While change is certain, the trends and issues affecting agricultural education in California are at the same time exciting and challenging. As Doris Day once said in a song, "the future’s not ours to see, que sera sera." But given the collective wisdom of the leaders in our profession, quality assessment, ambitious curriculum standards, teacher quality and quantity, and agricultural literacy will capture our vision for the future.

Whatever the future, a high quality agricultural education program will continue to have a place here in the "land of fruits and nuts."

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Coming Soon!

Learning Takes Center Stage for 2001

March-April 2001
Evaluating Learning in Technical Agriculture
Theme Editor: Kathleen Kelsey
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Most of us involved in the world of agriculture realize that modern agriculture is changing rapidly, and today’s Agricultural Science and Technology programs must change to meet these needs. The urban market presents a whole new set of challenges. The majority of students and parents alike have no agricultural background and possess a low level of agricultural literacy. How can we educate the community and motivate young people to look at the exciting and challenging field of Agricultural Science and Technology?

Today’s urban-agriculture students are working with DNA strands, growing plants in test tubes, raising fish in greenhouses, and growing plants hydroponically. While working in laboratory settings the urban student is learning the same concept as the rural student, but perhaps with more focus on the latest technology. This approach helps to capture the student with a science concentration and/or a non-traditional agriculture interest. Today’s agriculture instructor learns alongside the students through inquiry rather than providing all the information, as well as all the answers.

The trends in the urban market are focusing more on the integration of science and agriculture and using new mediums to learn the basic concepts related to livestock production and management. Courses are being redesigned to meet the interest and needs of today’s students in the urban market. Animal and Plant Science classes are now more specific with names such as: Veterinary Science, Turf and Landscape Management, Equine Science, and Aquaculture, just to name a few. Those involved in the agriculture industry, particularly production agriculture know the difficult economic situation facing today’s farmers. The city folks must understand the plight of the American farmer and how critical he/she is to the welfare of the economy and political strength of the United States. At the same time, city folks need to realize where their bread and butter comes from and what a bargain it is as compared to the rest of the world. They need to have a new appreciation for the agriculturalists that fill their breadbasket.

The 14-acre North Clackamas Agriculture Land Lab, situated in an existing, located ten miles south of Portland, Oregon, is surrounded by expensive homes. The large red barns trimmed in white, white vinyl fences enclosing the land, cattle, sheep, pigs, and John Deere tractors attract students. The program is attractive to the “city kid” because of the hands-on opportunities and relevance to the real world. The Land Lab is home to students from three high schools which make up the North Clackamas School District and also serves as a regional center for three additional high schools.

Students are bussed to the Land Lab every other day for a 2-hour block. During their class time, they receive instruction in the classroom and then get to apply that knowledge in real world applications on the Land Lab. The curriculum is changing from a traditional program to a more integrated science program working with biology and science teachers on joint projects. Through various grants over the last several years, the program has built 3 greenhouses, to give students the opportunity to work with horticulture, aquaculture, hydroponics, aquaponics, aquaculture, and biotechnology. More focus has been placed on agricultural sales and marketing, agriculture issues, agri-business management, and application of leadership skills through project-based learning and service learning.

Some of the key challenges for the agri-science instructor today are keeping current with all the new terminology, equipment, and application of new technology. Grant seeking and writing has also become more important as school funding has changed drastically over the last several years. The titles of the course offerings have changed from the traditional Agriculture 1, 2, 3 and 4 to Introduction to Agricultural Science, Agricultural Science and Technology, Agri-Business Management, Animal and Plant Science, Equine Science, and Veterinary Science. Students and parents alike are more interested in courses that include the word science and have relevance.

A little south of Clackamass is Canby, Oregon also located in the north part of the Willamette Valley between Portland and Salem in a diverse agricultural area that has seen tremendous urban growth in the past 20 years. The row crop and nursery land is now becoming houses, streets, and parks. Canby is serving as a bedroom community for the Portland Metropolitan area. The Agriculture program and FFA date back to 1929 and are valued as an important part of the comprehensive high school program offered to the students of Canby. Nearly 300 students are enrolled in Agriculture Science classes that encompass a traditional 4-year program with numerous semester classes that cater to the diverse needs and interest of the student population.

During the 1989’s the enrollment in the Agriculture Program and FFA started to decline, as the student population was becoming more urban. Through considerable input from the community, the Agriculture Advisory Committee and instructors instituted major changes. The traditional core was retained but was supplemented with numerous courses designed to meet individual needs. Course offerings in Floriculture, Tractor and Equipment Operation and Maintenance, Natural Resources, Landscaping, Equine Science, and Small Animals were the first of many changes. Instruction must be relevant, applicable, and challenging.

Recent changes in the program have focused around the integration of agriculture and biology through a student generated program called AGBE, (Alternative Growing Biologic Environment). The past three years have seen a 300% increase in the number of students who are eager to have the chance to apply science principles in real life applications. Biotechnology applications in aquaculture, hydroponics, aquaponics, and the micropropagation of plants have provided opportunities for students to integrate science, math, communications, business, and English skills. The AGBE class is taught with a biology instructor and an agri-science instructor working together. Students are encouraged to take an active role in their education and work side by side with the instructors who have become more of a facilitator than a teacher.

Program funding has been a challenge, however, with the addition of biotechnology to the Agri-Science Program, we have actively sought grants and industry support. Make education relevant and current and funding resources are available. Program success and exposure have led to continued support. Initial funding came from a $2000 grant aimed at integrating agriculture and science.

To date, the AGBE project has attracted over $140,000 in grants and an additional $50,000 in donated equipment from industry. Students are active in marketing the project; tours are welcome with students making presentations and demonstrations. Much of the funding success has come from a mobile display, which was made possible by a Meyer Foundation Grant and a donated greenhouse that is mounted on a trailer. Workshops and demonstrations have been provided at other schools, in-services, the Oregon Museum of Science and Industry, farm shows, local open house events, and county and state fairs. Students and instructors have worked hard at making the project visible. We are looking forward to a new facility funded by a $3 million bond aimed at a complete remodel of the Professional Technical Facility at Canby High School. The Agri-Science Program is a model for other programs within the school as we constantly strive to infuse new technologies into the curriculum.

Constant evaluation of the curriculum and methods of instruction is necessary for the Agri-Science Program to change to meet the needs of today’s rapidly changing student. The Agri-Science Programs at Canby High and North Clackamas takes full advantage of technology, integration, service learning, and business partnerships to provide today’s urban students with the tools they need to succeed beyond high school regardless of their career path. Today’s Agri-Science Program has seen dramatic change from the Vocational Agriculture Program that served the communities so well for 50 years. Changes in the future will come faster and more often, we look forward to the opportunities and challenges of tomorrow.
Teaching About Genetic Engineering

By Christine E. Beazép and George W. Warfel

The current world population is 6 billion and the United Nations estimates that by 2030 it will increase to 10 billion. Usable farmland will shrink while other land use demands will increase. Some estimates indicate that world food production will have to double on existing farmland over the next 30 years to keep pace with anticipated growth (1). Our food will need to be grown under non-optimal conditions, such as hot water and poor soil, yet it will need to have added nutrition to adequately feed the populace. The biggest question facing agriculture today is how do we provide an increasing population with sufficient quantities of nutritious food while limiting the environmental impact? For agriculture to be sustainable, our food and fiber crops will have to be selected and engineered for optimal efficiency. Genetic engineering is a primary means to accomplish that.

Why Teach About Genetic Engineering?

If you are just now wondering whether you should be teaching about genetic engineering in crop production, you are already late. According to a recent issue of Science, one-half of the 72 million acres of soybeans planted in the U.S. in 1999 were genetically modified. The genie is out of the bottle; the molecular genetic green revolution is here.

So, why teach about genetic engineering in crops in agricultural education? The answer is: because our students represent not only American agriculture, but the American public. The public needs to understand the technology and the implications for the use of this technology in order to make educated decisions regarding these crops and their products. A recent U.S. Senate subcommittee report stated that the Administration, industry, and the scientific community have a joint "responsibility to educate the public and improve the availability of information on the long record of the safe use of agricultural biotechnology products and research activities." (3). The public, including those in agriculture and those who are consumers of agriculture, need to know that:

- genetic engineering of food and fiber crops is being done,
- plants are being used to produce industrial and pharmaceutical proteins,
- specifically what it is that is being done, how it is being done, and what the real concerns are, based on science and reason.

What is Genetic Engineering of Crops?

In conventional breeding, plants with desired characteristics are crossed and the characteristics are selected. This may take many generations over many growing seasons. Humans have conducted traditional plant breeding for thousands of years; and every crop available today is a product of this genetic manipulation. It is time-consuming and imprecise, and the breeder may have little control over the outcome. Plant biotechnology consists of techniques that allow scientists to identify, isolate, and transfer specific genes (DNA fragments) into plants to create desired traits or effects in the plant; it is a very precise genetic modification.

Biotechnologists follow specific steps to create a genetically modified (GM) or engineered plant (see above). The first step is to identify the trait, phenotype or characteristic to be manipulated. Examples include insect resistance or the ability to metabolize excess food from the soil. Genes for these traits define which particular proteins are made and, when, and the proteins cause the desired effect in the plant.

Biotechnologists identify the gene that encodes for the desired protein from a source, then clone it (copy and purify it) as a DNA fragment. After the gene is cloned, it must be put into the plant for expression. While there are different ways to accomplish this, the common method of "transformation" of the recipient plant cells is to use a bacterium, Agrobacterium tumefaciens, to temporarily infect the plant. The bacteria delivers the gene into the plant genome.

Once the plant has gone through the transformation process, those plant cells, which carry your gene of interest, must be selected. The biotechnologist can select for plants that successfully received the genetic material using antibiotic or herbicide resistance marker genes. Marker genes have been inserted into the plant with the gene of interest and any plant that can grow in the presence of these antibiotics, for example, is likely to carry the desired gene. After different lines of plants carrying the gene of interest have been generated, these primary transformation lines are grown for multiple generations to confirm stability and continued transmission of the modified trait.

What are the Benefits of Genetically Engineered Crops?

The potential for impact of GM plants is tremendous with benefits to farmers, consumers, and the environment. Crops with genetically engineered herbicide, disease and insect resistance, along with integrated pest management, have been shown to result in decreased herbicide and insecticide use and less crop losses (3). Carlson et al. (4) reported that GM Bt cotton required 72% fewer insecticide applications versus conventional cotton and had an increased yield of 11%. The increased yields permit the farmers to produce more per acre, conserving land (3). Resulting changes in farming practices include conservation tillage programs, improved pest control, and decreased soil erosion (3).

Genetic engineering can modify plant biochemistry for improved plant survivability under non-optimal conditions such as drought, high salinity, and heat/cold extremes, and to permit plants to absorb nutrients from poor soils. This will allow farmers to tailor plant choices to match specific environments for optimal productivity. Potential benefits for animal production from plant biotechnology include altering feed composition by altering the oil and protein content of corn, and by creating grains with low phytate, increasing the availability of phosphorus for livestock as they consume the feed.

There Are Risks of Genetically Altering Crops?

No risks from directly transferring genes from other organisms into plants, as is currently done in modern plant biotechnology, have been found. The potential for risks associated with GM plants is similar to those associated with plants modified with classical breeding. In fact, the new technology consists of more precise genetic manipulation than with conventional techniques, and that allows developers and producers to assess safety more easily (3.6). Genetically modified plants result from the specific introduction of a small DNA fragment into the plant genome. It has a precise, easily characterized, effect on the plant. Traditional breeding crosses thousands of genes whose functions are generally not known and the plants are introduced into the food supply with large genetic and phenotypic changes that are not characterized (3.6).

Should we be concerned with the movement of introduced genes to...
Genetically engineered rape seed to produce anti-cancer proteins utilizing a vacuum method.

other plants through outcrossing, the transfer of antibiotic resistance to bacteria, or the potential additions of allergens to our food supply? The frequency of outcrossing will be no different between a crop produced by traditional methods and that produced through biotechnology. However, the outcomes of such crosses and the potential effects of possible movement of an engineered gene product to a non-target species need to be addressed with ecological research for each event.

There has been concern raised as to whether antibiotic resistance genes, used to help select for successfully transformed plants, will be passed to bacteria making them resistant to the antibiotic and causing human health threats. Several panels of experts have concluded that the chance of antibiotic-resistance genes getting into intestinal bacteria is exceedingly unlikely and of little concern because the same resistance genes are already present in many of the bacteria (7). Therefore, the risk of a health hazard due to antibiotic resistance genes has little medical significance (3).

Concern exists that GM foods may induce allergic reactions in humans. Many conventional foods already pose similar or higher risks, as plants produced by classical breeding methods may introduce many potential allergens into a product. Additional

ally, GM foods are tested more rigorously than conventional foods before marketing (3,7).

Should there be alterations to the regulatory process for these GM plants? Perhaps, if only to clarify governmental oversight. At this time, USDA, EPA, and FDA each have responsibilities regulating different aspects of the production and use of GM plants. Plant biotechnology products have been extensively researched and reviewed (more so than conventionally bred products) and there is rigorous governmental oversight of the technology (3).

Our students, as the next generation of agricultural producers, consumers, and scientists, will have to make the educated risk-benefit analyses in regard to transgenic versus conventional crops. While the bottom line for agriculture may be yield and cost, the world’s concern is “can we feed the people and food them safely with reduced environmental impact?” These are especially important questions in light of the likelihood that the world’s population will double in the next 30 years or so. Thus, the future of plant genetic engineering is tightly linked to our own future.

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Changing Technologies: Impact on Agricultural Education
By Michael K. Sloan

Remarking informed about the impact of technology on public education, educators should take note of two contemporary authors with very powerful messages:


purports that the Net Generation ("N-Gen") is imposing its culture on all of us, changing the way individuals and society interact. In Failure to Connect: How Computers Affect Our Children's Minds—For Better and Worse, Jane Heasly (1999) examines the impact of increased use of technology in public schools. Informed agricultural educators will synthesize lessons learned from both authors and design instructional strategies that will meet the needs of a generation of interactive learners through the use and application of technology.

Today marks the first time in history that students are outpacing and outsmarting adults on the technology fast track: parents, teachers, and other adults are looking to children for help with computer and computing. In Finland, for example, the government has chosen 5,000 N-Geners to teach the country’s educators how to use technology! The N-Gen is transforming the new media from a cult enclave to a harmonious cauldron of millions. Through their massive demographic muscle and unconstrained minds, N-Geners are creating a new world. This world is one in which any idea, regardless of how threatening it may be to the contemporary social order, has voice and can spew radical views on such topics as business and the process of democratic governance.

N-Geners will soon want power in every domain and will take it. How will non-N-Geners fare in the future? Will they be able to share power? Will educators and others have the courage to accept the N-Gen and its culture and media? Every educator should delve into this issue as they examine what it would be like to grow up digital.

Some probing questions may include: Are computers being used in age-appropriate ways? Do program designers take into account the developmental needs of the student? Are future teachers receiving sufficient technology training? Is learning software really what it purports to be, or is it simply "entertainment" that reinforces indifferent point-and-click behavior in the pursuit of a trivial goal? We all should agree that most public schools are ill positioned to embrace technology and use it properly, and that we need a significant redesign of instructional environments to make technology applications meaningful. N-Gen kids think, learn, work, play, communicate, shop, and create in fundamentally different ways than their baby boomer parents. Tapscott identified the following ten characteristics of N-Gen culture and advises all educators to take each into account as they rethink the teaching and learning environment:

Ten Characteristics of N-Gen Culture

• Fierce independence: a strong sense of autonomy derived from active roles as information seekers rather than passive information recipients;
• Emotional and intellectual openness: a priority for those with Web pages and chat rooms through which they explore and expose who they really are;
• Inclusion: evidenced in the way students from different cultures meet, collaborate, and accept each other as never before;
• Free expression and strong views: the result of access to a wide range of ideas, opinions, and arguments;
• Innovation: encouraged by constant exposure to ways of doing things differently and better;
• Preoccupation with maturity: the need to be taken seriously based on ideas and capability rather than age;
• Investigation: a strong ethos of curiosity and empowerment to change things;
• Immediate: the expectation that things will happen quickly (because in the N-Gen world, they do);
• Sensitivity to corporate interest: the awareness and avoidance of controlling and exploitative businesses; and
• Authentication and trust: the continual questioning of the veracity of what is on the Web.

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Michael K. Swan is an Associate Professor of Biological Systems Engineering at Washington State University at Pullman, WA. (no photo)

Joe Writes Santa
By E.V. Walton
Dear Santa Clause,

It may seem a little strange to you, me, Joe Scatterscrew, writing to tell you what I need for Christmas but it helps a little for a man to get it off his mind. For one thing, I sure would appreciate a new Atmos Supervisor. This one I get is mean. He's always a doggin a man to death to do a better job. I would like an old crowned one out who is wise enough to let a man alone.

Another thing I want is for them fellers at A&M to quit sending out so much stuff. I only got a small waste paper basket and all them teaching plans and stuff like blueprints and so on, overloads my waste paper basket. Besides, it makes me feel maybe I ought to be doing a better job.

I would also appreciate some disaster like a cyclone or a bad spell of lightning which would eliminate my superintendent and principal. They keep a bounding me about my housekeeping and not attending faculty meetings and keeping boys out late from classes and other unreasonable things like that.

Also I sure would appreciate it if you could see that PeeWee, Willie, Adolph, and S-Ball would qualified school. Them boys deal me messy. I would like for the Jackson Motor Company to give me a new pickup without having to turn this one in. I'm pretty sure they aren't going to understand how its possible for a pickup to get so beat up in one year.

Sandy Clause, I would be definitely in favor of Master Bob Cling getting called back in the Army or transferred over to LSU or something like that so he would quit teaching those welding courses. Four or five teachers around me took them courses. Now they have adult classes going and that sort of stuff makes me show up bad in district meetings.

If possible I wish you would transferOld Lewis Taylor off to some desolate place like Texas Tech or Tulane or maybe back to Shelby County. He's so close down there in Austin that the first thing you know he's going to be a wanting some of us to get messy on our own piece. Why can't he be satisfied to let it just take care of itself. Wouldn't cost us more than about two hundred dollars space to grow the whole business.

Give us all Ag teachers less work, more money, 3 months paid vacation, and retirement at the end of ten years. Amen

MERRY CHRISTMAS TO ONE AND ALL

Joe Scatterscrew
Bendcree, Texas
Making a Difference with Volunteers in Agricultural Education Programs

By Carlos Rosencrans and Brenda S. Steevers

Are you using volunteers in your Agricultural Education programs? Have you thought about using volunteers to help you better serve your students and their families and varied agricultural interests? Do you feel comfortable enlisting the aid of volunteers to enhance your agricultural education program? Are other instructors utilizing volunteers, and if so, how are they using them?

Enlisting the aid of volunteers is nothing new to programs of many kinds, including education. Every year, millions of Americans volunteer their time and assistance to programs they consider worthwhile (Katz, 1982). Volunteers in school settings provide widespread benefits to students. Shifflett (1994), states that academic achievement appears to increase when volunteers are utilized. Programs can be expanded to better meet the needs of students when volunteers and their expertise are employed. Volunteers contribute extra resources without adding additional costs to programs.

State and national statistics indicate that not only is enrollment in agricultural education programs growing but the availability of qualified teachers is shrinking. Involving community volunteers is essential to maximizing resources and meet needs. Teachers must look to the community and actively engage them.

A recent study conducted in New Mexico (Rosencrans and Steevers, 2000) described the use of volunteers in New Mexico Agricultural Education programs.

Identification and Selection

The volunteer experience will be most successful when the agricultural educator determines specifically what his/her needs are, matches the volunteer with the need, and provides clear and specific guidance about roles, responsibilities, and needs. Individuals should be accepted as volunteers in your program not just based on their willingness to participate but also on the competence and capability they contribute. Teachers in New Mexico rated the degree of helpfulness provided by volunteers in their programs as very high, clearly indicating that with proper planning and coordination, volunteers are an asset to their programs.

Orientation and Supervision

Clear communication about needs and expectations is essential to make the volunteer experience work. An orientation meeting with volunteers at the beginning of each school year or prior to an activity or event should be conducted to clearly communicate expectations. Teachers should be encouraged to develop and use a Volunteer Handbook that outlines policies, procedures, expectations, and guidelines for using volunteers in their program. The handbook not only ensures that consistency of information was provided to all volunteers involved in the program, but it can also serve as a valuable documentation tool in the event that an issue of liability occurs.

Successful utilization of volunteers requires some degree of supervision. A system of teachers could be that this supervision could be too time consuming. The amount of responsibility delegated to a volunteer and the degree of supervision required is dependent upon selection of the right person for the job, degree of competence of the individual, and their understanding of expectations, policies, procedures and guidelines related to your program. Regardless of how competent your volunteer is, however, some supervision is still necessary. Ultimately you are accountable for what happens within your program. The Back Stops With You!

Administrative Support

Agricultural education teachers in New Mexico clearly indicated that administrative support is essential for successful utilization of volunteers in their programs. Successful issues of safety have become prime concerns for almost every school district. Individuals on school grounds without approval or authorization cannot be allowed. Consequently, it is essential for administrators to not only understand the uniqueness of agricultural education programs but the vital role the community and its citizens have in contributing to the overall success of the program. Teachers need to discuss with administrators the roles and responsibilities volunteers will be assuming. When possible, a list of names and responsibilities of volunteers should be provided to the school office. Administrators should be encouraged to visit the agricultural education program facilities and meet and observe first hand volunteers involved.

Recognition

A volunteer can be defined as any person who gives freely of their time, expertise, or resources. Appropriate recognition (letters, plaques, banquet, etc.) needs to be extended to all who participate.

Volunteers are an invaluable community resource and should be utilized whenever possible in agricultural education programs. Good communication, organization, and management of the volunteer program will establish a solid and beneficial relationship for all.

So are you utilizing volunteers in your agricultural education program? Are you making the most of this precious commodity, the volunteer?

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Swan Song... (continued from page 27)

Some of these include having the state agricultural education officials located at the universities, state departments of agriculture, agricultural organizations, and private foundations. These models appear to be working. We need to look closer at these models and emulate them in other states.

6. Agricultural Education needs a strong national voice. While not everyone may always like everything the National Council for Agricultural Education does, the actions of the Council have benefited the profession. The Council needs our continued support. We need them to speak out for us and to continue to provide leadership at the national level.

Conclusions

During my tenure in agricultural education, and in my study of the history of agricultural education, there have been numerous times when agricultural education was perceived to be at some type of crossroads. Our leadership has wisely led us through these crossroads. The future indeed does look good for agricultural education. However, if we don’t constantly change and grow, we may be contributing to the Swan Song of agricultural education.

Gary Moyster is a Professor in Agricultural Education at North Carolina State University, Raleigh, NC.
Crystal Ball Predictions for Agricultural Education

By Leah Schwichtenberg and Brian Albers

What makes the future? Who will decide what the trends of the future will be? Will these trends become reality? If so, how will they become reality? The answer to these questions of course lies in all of us - teachers of agriculture, students, administrators, fellow educators, community members, researchers, business leaders, politicians, etc. No one teacher is an island that is able to make decisions and impact the future without the influence of many others. So instead of trying to figure out a plan to "get our own way," it is imperative now and for the future, that we find any way possible to work together toward a common goal. What is the goal? What will the future bring for Agricultural Education? What do we hope the future to be in Agricultural Education? Obviously no one has a crystal ball and we don't intend to say, "this is how it is going to be." But, we can share our perspective of the future based on current trends and ideas for improving the delivery of agricultural education.

One trend that has begun and will continue to advance is agricultural education beyond the traditional 9-12 Agriculture Program. This begins in the elementary school. Right now, some teachers of the early grades incorporate lessons on agriculture into their curriculum. This is typically the choice of the individual teacher, providing varying levels of quality and quantity to the students. Although improving the students’ literacy in and about agriculture is valuable, it is not enough to only hit some of the students some of the time. In the future, we must work together with all of the stakeholders to provide our young people with a background in the importance of agriculture in their world. Accomplishing this task begins with today's teachers of agricultural education. On the local level, we must provide the expertise to elementary teachers and assist them in accessing available resources. Increasing agricultural literacy must continue throughout middle school and high school. What lies in the future and beyond for students at this level? Increased integration with other core subjects and with industry. First, we cannot be an island, even within the school system. Integration is already occurring in many schools across the United States. There are many examples of courses where teachers of agriculture are teamed up with teachers in science, math, English, business, and others. The future needs to bring us more integration for all students, not just those electing to take those courses. More integration will provide all students at the secondary level with an understanding of and appreciation for the role agriculture plays in the economy and in their everyday lives. This may mean some teachers of agriculture will need to step out of their role as a classroom teacher and become a resource for other teachers. As we find increased pressure to come up with new ways to deliver education to today's youth, it will become time to do away with Carnegie units and provide students with a more holistic educational system.

Life long learning will take on greater importance in this new era. The need for knowledgeable farm management instructors will only increase as the options for marketing agricultural product changes. The new age farmer will need to become a student of change, willing to adapt to new opportunities, production practices and, global demands. Financial institutions may place education standards into loan agreements guaranteeing that their clients remain abreast to the most recent marketing strategies. These standards will be met with the aid of qualified management instructors.

Integration will occur not only within the school system itself but also increasingly with industry as well. Increased interest in public education will lead to partnerships between high schools and business partners. For example, a cooperative effort between horticulture classes and neighboring garden centers could result in lowered operating costs, real-life learning opportunities for students, and better potential for small businesses to remain competitive. Major agricultural corporations will find it beneficial to link with local schools to create a pool of future workforce members, researchers, and product developers. Incentive programs will prompt increased cooperation between education and industry. This scenario is not without its drawbacks. The harsh reality is that not all schools will benefit equally from this affiliation. Smaller schools and more remote districts face the reality of being excluded from this situation. The world of the Internet cannot even solve the difficulties distance presents for students to gain real-life experience in industry. However, schools that can draw from the expertise of industry will be able to enhance their curriculum well beyond what their own facilities can provide. Students will work side by side on a regular basis completing tasks and learning skills while completing high school graduation requirements.

School funding will continue to be a point of concern across the nation. Traditional funding formulas will give way to incentive based funding based on a high school agricultural education department's ability to meet established program standards. Many states are already developing graduation standards: the time will come where Agriculture Departments will be held accountable to performance standards as well. The more standards a school is able to meet, the more funding they will receive. A baseline number of standards will need to be met for the program to receive financial support from the state or federal government.

Teacher licensure will meet with some controversial changes. Teachers of agriculture will be licensed based more on their knowledge and skills and less on their formal educational training. A continued shortage of qualified teachers will lead to a broadened view of what qualities make up an agricultural educator.

Mentorships and first year supervision will prove key to guaranteeing that agriculture departments continue to be served by dedicated instructors. Perhaps we will see the resurgence of 'in the job pay, job security based on students' success, and incentive pay for teaching state or national graduation standards and even periodic performance reviews for staff members. Whatever the outcome, we as educators are sure to face continued scrutiny by the general public.

So what makes the future? In part, we as educators do. So also will industry, financial institutions, politicians, and many other facets of society that we affect and that affect us. Which trends will become reality? That is difficult to say, but no matter which philosophy you hold as true, it can be agreed upon that the future is sure to be directed by change. It is our responsibility to develop these trends so that our audience receives the very best from us, and skills that will most greatly benefit them no matter what stage of their life long learning process we call agricultural education.
"Show me the money" was the memorable phrase screamed by Cuba Gooding Jr. in the 1997 film Jerry Maguire. Gooding's character, Rod Tidwell, used this phrase to show his admiration for big money. Jerry Maguire is portrayed by Tom Cruise, how much advertising income Maguire had not generated for him. "Show me the money" was Tidwell's performance-based assessment of Maguire's work and efforts. Educators often ask their students to "show them the money" by demonstrating what they have or have not learned in the classroom. Educators often rely on paper and pencil tests using true/false, multiple choice or short answer questions to measure students' abilities. However, these assessment strategies test the students' short-term memory or ability to memorize and regurgitate facts. The Performance-Based Skills Certification for Natural Resource Management in the Utah Agricultural Education Program uses authentic or alternative assessment to measure students' ability to complete a set of performance skills within a multitude of standards. Authentic assessment is based on nontraditional measurements of student performance; for example, a student's understanding of range management is measured by having the student establish a range unit, collect and interpret data, and report the results instead of administering a multiple choice test. Authentic assessment applies the FFA motto of "Learning By Doing" to the assessment of student performance. A natural resources emphasis area was recently added to the Agricultural Education Program in Utah high schools. The Utah State Office of Education contracted with agricultural and natural resource educators at Utah State University (USU) to develop a performance-based skills certification assessment for this emphasis area. In 1996, an Agricultural Education-Natural Resource Management Committee was assembled to determine the objectives and competencies necessary to prepare students for careers in natural resources. Twenty-one competency standards were developed through curricular reviews combined with teacher and industry validation. Utah teachers and representatives from such groups as the U.S. Forest Service and Bureau of Land Management participated in a Q-sort activity to identify and prioritize topics and skills that needed to be addressed in a natural resource emphasis area. Topics (standards) include areas such as: range, forestry, recreation, fisheries/wildlife, soil, and watershed management; ecological concepts; environmental ethics and conflict management; energy resources; waste disposal; land classification and planning; inventory and monitoring methods; business and economic principles; and career opportunities (see table 1 for a complete listing). Each standard is further supported by a series of objectives. The objectives become the assessment point in determining student learning. The committee also prepared a program planning and curriculum development guide to assist the secondary agricultural education and technology instructors in planning for their teaching of natural resource management. In August of 1998, work began on refining and validating the standards and objectives. Soon after, an activity design format was developed. It is important to note that the objective of the program was not to develop complete instructional units but an assessment guide to test the understanding of material previously instructed. It does not replace the teacher or the teacher's expertise. However, because natural resources was a new and emerging area for Utah's secondary agricultural science and technology instructors, background information and some instructional units were included with each performance activity. These materials can be adapted to a variety of locations, teaching materials, and student interests and backgrounds. For example, teachers in a more urban environment, have the option of establishing a rangeland transect in a school area or local park instead of traveling to an area that would be classified as rangeland.

The performance assessment activities allow students to hear from resource specialists, perform field work, practice public speaking skills, develop teamwork skills, and create a resource "gates" to analyze current natural resource topics. Wherever possible, the activities provide Utah specific examples. For example, an activity discussing population growth and urban planning uses Envision Utah, a public/private community partnership dedicated to studying the effects of long-term growth and development in the state. Some assessment activities have been designed to help prepare students for FFA contest activities. Students can prepare for public speaking contests, sales presentations, and habitat judging events through completion of assessment activities. The assessments for each standard follow a similar format. The following headings were designated for the Natural Resource Management assessment guide:

**Standard** - A 5000-series number is used for Natural Resource Management. This describes the subject addressed by the standard e.g. Standard 5011 Evaluate water resources, wetlands and management.

**Objective** - The specific areas of the standard that are to be met. Objectives were written at the highest practical learning level. These levels ranged from basic knowledge objectives to advanced levels of discovering a relationship, and ultimately the application learning level. There are 11 objectives for Standard 5011, including: Evaluate the water supply/demand principle, and calculate the potential water holding/capacity of a watershed.

**Concept** - A statement designed to orient both the teacher and student to the general idea of the standard and objective. The concept statement for Standard 5011 provides a brief description of water supply issues and their relationship with watershed management.

**Background Information** - A detailed description of the topic. A more detailed description of water distribution worldwide, ownership and sources of Utah water supplies, issues surrounding watershed management, and federal and state regulations regarding water pollution.

**Teacher Responsibilities** - Outlines what the teacher must do to prepare and conduct the assessment. For standard 5011 this included gathering materials (maps and background information about water-sheds) and helping students find information regarding local water sources.

**Materials/Resources** - Items needed to conduct the assessment as proposed, including colored pencils, topographic maps, and student information, and assessment sheets.

**References** - Suggested texts, videos, and websites, where teachers can find more information or activities. References applicable to standard 5011 include Project Wet Curriculum and Activity Guide, Western Water Made Simple, and the Internet site www.enviroliteracy.org/water.html.

**Activity/Procedure** - A detailed, step-by-step list of instructions and the procedure to allow for the successful completion of the assessment. Some activities address one objective while others may address several objectives. Watershed activities for standard 5011 begin with an investigation of water ownership in Utah followed by students identifying and calculating the area of a local watershed on a topographical map. The last activity provides students with a map of a watershed with identified land types such as agricultural or woodland. Students calculate holding capacity and runoff from different landscapes.

**Performance Assessment** - A detailed description of what is expected of the student. A scoring rubric is not provided, but could be developed with the criteria listed. For example, students' complete short answer questions that relate to the watershed activity, and turn in labeled maps and calculations for assessment.

The teachers involved in the Agricultural Education Program were introduced to the standards, objectives, and associated activities at a 3-day workshop in August 1999. Teachers toured a wildlife refuge, a National Forest, and a private ranch to gain more of an understanding of natural resources issues and management practices. They were also given suggestions on how to partner with resource specialists from industry and government land management agencies. While at these sites, they observed demonstrations of assessment activities. Teachers also practiced with software applications in a computer lab setting because many of the references and activities are computer-based. Workshop participants indicated that receiving natural resource materials and being introduced to assessment activities were the most valuable parts of the 3-day workshop.

For more information, please visit the website: http://www-usu-edu/faculty/ru/, was established to inform teachers of updates in the performance assessments as well as provide resources and links to other natural resource related websites. Teachers can also e-mail questions or comments about the Natural Resource Program to program developers. USU and State Office of Education specialists will
Table 1 Natural Management Resource Standards

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<tr>
<td>Standard 5001</td>
<td>Understand and demonstrate role of FFA in Agricultural Education</td>
</tr>
<tr>
<td>Standard 5002</td>
<td>Understand and demonstrate role of SAE in Agricultural Education</td>
</tr>
<tr>
<td>Standard 5003</td>
<td>Appraise career opportunities in natural resources science and management</td>
</tr>
<tr>
<td>Standard 5004</td>
<td>Demonstrate written and oral communication skills</td>
</tr>
<tr>
<td>Standard 5005</td>
<td>Identify and determine appropriate uses of natural resources</td>
</tr>
<tr>
<td>Standard 5006</td>
<td>Examine the relationship between natural resources and society, including conflict management</td>
</tr>
<tr>
<td>Standard 5007</td>
<td>Analyze the basic concepts of ecology</td>
</tr>
<tr>
<td>Standard 5008</td>
<td>Compare and contrast the various energy resources and their uses and impacts</td>
</tr>
<tr>
<td>Standard 5009</td>
<td>Differentiate between the various biomes of the world</td>
</tr>
<tr>
<td>Standard 5010</td>
<td>Assess soil resources and management</td>
</tr>
<tr>
<td>Standard 5011</td>
<td>Demonstrate an understanding of water resources, water sheds, and management</td>
</tr>
<tr>
<td>Standard 5012</td>
<td>Demonstrate an understanding of air resources and management</td>
</tr>
<tr>
<td>Standard 5013</td>
<td>Demonstrate an understanding of fisheries/wildlife resources and management</td>
</tr>
<tr>
<td>Standard 5014</td>
<td>Demonstrate an understanding of forest resources and management</td>
</tr>
<tr>
<td>Standard 5015</td>
<td>Demonstrate an understanding of range resources and management</td>
</tr>
<tr>
<td>Standard 5016</td>
<td>Demonstrate an understanding of recreation and cultural resources and management</td>
</tr>
<tr>
<td>Standard 5017</td>
<td>Analyze waste generation, waste reduction, disposal and impacts</td>
</tr>
<tr>
<td>Standard 5018</td>
<td>Demonstrate understanding of land classification and planning</td>
</tr>
<tr>
<td>Standard 5019</td>
<td>Demonstrate understanding of inventory and monitoring methods</td>
</tr>
<tr>
<td>Standard 5020</td>
<td>Use computer technologies to solve environmental problems</td>
</tr>
<tr>
<td>Standard 5021</td>
<td>Demonstrate understanding of business and economic principles and procedures</td>
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</tbody>
</table>

Swan Song...

(continued from back cover)

In the Southern region there has been a regional conference involving teachers and educators for decades. Several years ago it was decided, by a majority vote, to change the time, location, and rotation of the conference so the conference could meet in conjunction with the Southern Association of Agricultural Scientists. This would enhance the image of agricultural education and build external bridges (for the next point). Unfortunately, the supervisors were not willing to accept the democratic decision and chose to become a splinter group meeting on their own. Several times during the last few years the National Association of Agricultural Educators (NAAE) have chosen to hold their national convention "apart front" instead of as "a part of" the annual meeting of the Association for Career and Technical Education (ACTE, formerly the American Vocational Association) which the members of the profession attend. Philosophically, this doesn't promote harmony and unity within the profession and pragmatically, it makes it nearly impossible for a member to attend both meetings. Our profession cannot advance like it should with these splinter actions. We must work together. The Eastern regional conference is an example of what all of us should be doing. The agriculture teachers, teacher educators, and state supervisors all meet together in a regional conference. But why?

We must do what is best for the profession as a whole, not what our own professional group wants to do based upon tradition or what our personal ego dictates. This may be hard to accomplish given that the NAAE has six regions and the other two professional agricultural education groups (NAASE - National Association of Supervisors of Agricultural Education and NAAE - American Association for Agricultural Education) have four regions. Which group(s) should change to promote the building of bridges? While I question the wisdom of continuing to have regions given modern transportation and communications, we need to get back to holding meetings with all the members of the profession in attendance. And even though we may not agree with everything the ACTE does, we need to continue to meet as part of this group. It is stupid to deliberately destroy bridges. We must rebuild internal bridges within the profession of agricultural education and within vocational education.

3. Agricultural Educators must build external bridges. Agricultural education is a small profession when compared to other education groups. In order to survive and thrive, we must build as many bridges as we can with other groups. We can't make it alone and in isolation. We should consider becoming involved with other educational, agricultural, and scientific groups. We have a lot of expertise and ideas that can be shared with other groups. Agricultural education is the best-kept secret in the world. We need to let our light shine. We must build external bridges.

4. Agricultural Educators must embrace new models for preparing teachers. No matter how hard they try, universities just aren't producing enough agriculture teachers. They haven't been able to keep up with the demand for the past 20 years and there is no expectation they will in the future. One of the problems is that the teacher educators often don't embrace lateral entry or alternatively certified teachers. They prefer to work with the traditional 18-year-old freshman that comes to college with the goal of becoming an agriculture teacher. This is great, but there simply are not enough of these students. Teacher educators must aggressively embrace non-traditional models of preparing agriculture teachers if we have any hope of filling vacant and new positions.

One such alternative model is the LEAP (Licenses in Education for Agricultural Professionals) program offered through North Carolina State University. This is an Internet based alternative certification program in agricultural education. Education and agricultural education faculty from the University of Arizona, the University of Missouri, the University of Delaware, and Utah State University and Wayne State University are involved in developing the courses in the LEAP program. Other universities are invited to become partners in this endeavor. For more information on the LEAP program, visit http://www.ecsu.edu/caes/aged/leap

Recruitment of future agriculture teachers should be the job of the agriculture teacher, state supervisor, and university agricultural educator. We all must become involved in recruitment and we must be positive about agricultural education. It is hard to recruit agricultural students into agricultural education when all they hear from their agriculture teacher is how bad the job is. Teachers need to be more positive about agricultural education. Remember the NAAE creed, we are teachers of agriculture by choice.

5. Agricultural Educators must embrace new models for providing state level leadership. During the Smith-Hughes era, there was a legislative mandate for strong state leadership in agricultural education. However, the Smith-Hughes Act was replaced by the Vocational Education Act of 1963, which did not require strong state level leadership. In a
Swan Song

By Gary Moore

This is the final issue of The Agricultural Education Magazine to be published during my reign as editor. Previous editors wrote editorials that appeared in each issue of The Magazine. These editorials were interesting and informative. However, during my tenure as editor I chose not to write editorials because I didn’t want to use the “bully pulpit” to foist my ideas upon the profession. Also, I wanted to devote as much space as possible for articles from the profession. But since this is my last issue as editor, I have chosen to exercise my editorial prerogative and write an editorial.

The title of this editorial is Swan Song. According to the Merriam-Webster dictionary, a swan song is a “farewell appearance or final act or pronouncement.” I don’t plan on leaving the profession and will be making contributions to future issues of this publication, so this really isn’t my swan song. The reason I chose this title is to acknowledge an 1826 book titled Swan Song that was written by Johann Pestalozzi.

Many education experts consider Johann Pestalozzi the father of vocational education. This Swiss educational reformer established an educational model in Switzerland in the late 1700s that gave rise to many of the educational ideas used in schools today. He advocated the teaching of agriculture (and home economics) in schools. He believed students should work with their hands and education should start with the familiar by studying the local community. He thought students should be taught in groups (as opposed to tutoring) and that teaching should be geared to the developmental level of the students. While these ideas and practices are commonplace today, they were not widely accepted when he proposed them.

In the latter part of Pestalozzi’s career he was resentful and negative because his educational ideas were not widely accepted and his school had folded because of financial and administrative problems. He thought he was a failure and wrote the book Swan Song to defend his ideas and lament his situation. Pestalozzi’s Swan Song was bitter and pessimistic.

My Swan Song is just the opposite of Pestalozzi’s. I think agricultural education is in the strongest position it has been in years. Recently I heard an educator state that the 1960 era was the golden age of agricultural education. I disagree. If the 60s were the golden age, then we are in the platinum age today and the future looks even brighter. I feel more positive about the current status of agricultural education and its future than at any time since I started teaching in 1969.

However, there are several issues that must be addressed in order to insure the bright future. We cannot rest upon the accomplishments of the past and coast into the future. We are headed in the right direction but we must be visionary and continue to think outside the box (this may be hard because the recent StrengthFinder work by the Gallup group found agricultural educators to be the weakest in the Thinking area). Just as Pestalozzi envisioned how education needed to change at the dawning of the 19th century and penned these thoughts in the Swan Song, it is time that agricultural educators envision what needs to change in the 21st century. If I were to revise the Swan Song for agricultural education today, here are the key points I would make:

1. Agricultural Educators must continue to think globally, but teach locally. While it is commendable to teach about global agriculture and other “cutting edge” topics, we can’t forget to first meet the needs of the community in which our programs reside. An agriculture program that first teaches what is important in the local community and serves as a resource for the local community will thrive. Pestalozzi emphasized that education should start in the community some 200 years ago. In the rush to standardize the curriculum in some states and teach high tech, global content we may have forgotten the importance of maintaining strong community ties.

2. Agricultural Educators must become more unified. When Pestalozzi wrote Swan Song he was very sad. If there is one thing about agricultural education today that saddens me, it is the splintering within the profession. If our profession is to move forward, it must become more unified.

For years, teacher educators and state supervisors in the Central Region met for an annual conference. Because of budget problems and travel restrictions in the 1980s, the supervisors stopped attending the regional conference. After the budget crisis eased, they didn’t come back. The Central Region conference today is merely a shell of what it once was.

(continued on page 27)