STORIES IN PICTURES

NEW FOR 1993

Beginning with the January issue, eight new feature columns plus a Book Review column will appear on a rotational basis in 1993 issues. Feature columns will include international agriculture, Ag Ed in the elementary schools, teaching agriscience, SAE programs, FFA Advisement, marketing your program, food science, and research on teaching. Special Editors for the 1993 Feature Columns will appear on the inside front cover of each 1993 issue, beginning with the January issue. If you have ideas for one of these feature columns, please contact the respective Special Editor.

As indicated in the November issue, space will be allocated in 1993 issues for two new article types. First, teachers, teacher educators, state supervisors, and others are invited to share success stories with others in their profession via The Magazine. Original copy should be two to three double-spaced typewritten pages forward to the Editor. Any aspect of agricultural education at all levels is appropriate for the Success Stories Feature.

Also new for 1993, agricultural educators are invited to share their views on specific aspects of agricultural education through a new Forum feature column. This column will allow members both within and outside the profession to debate specific issues in agricultural education. Original copy should be sent directly to the Editor and should be two to three double-spaced typewritten pages. Copy for the Success Stories and Forum columns may be submitted to the Editor at any time. Let others learn from your successes and views on agricultural education!
THE AGRICULTURAL EDUCATION MAGAZINE
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MANAGING EDITORS
Editor
EDWARD W. O'BRIEN, Agricultural Education, 124
Marriott Hall, University of Illinois, Urbana, IL 61801

Business Manager
GLEN ANDERSON, 2401 Sudder Rd., Medan, 109

Consulting Editor
PHILIP ZUKIN, 161 Forbes Blvd., Dept. of An
Ed, University of Arizona, Tucson, AZ 85721

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EDITOR'S COMMENTS
Going to Extremes

The committee on Agricultural Education in Secondary Schools forwarded two major findings in their landmark report Understanding Agriculture - New Directions for Education. "First, agricultural education must become more than vocational agriculture (and) second, major revisions are needed within vocational agriculture." (p. 1). As we approach the end of five full years since the release of the report, it is time for an honest progress check.

With regard to updating and improving vocational agriculture, the committee was critical of the lack of female and minority programs, outdated curricula, uneven program quality, and the singular vocational focus of state and federal funding systems. So, how have we done in the past five years? While a significant percentage of secondary enrollments today is female, we could and should be doing better. The percentage of minorities remains extremely low. Of course, there are numerous barriers that suppress female and minority enrollments in agriculture, especially at the secondary level. Foremost among these is a lack of female and minority role models. This became painfully obvious as I reviewed pictures for this issue depicting national level initiatives in agricultural education. Sometimes we must cultivate a much higher percentage of females and minorities into our profession, especially into leadership roles.

Much progress has been made over the last five years in updating, expanding, and improving the curriculum in vocational agriculture programs. Many universities and state vo-ag programs have been involved in the development of new curriculum materials for use in their states. As a result of leadership provided by the National Council for Agricultural Education, new materials have been developed for use in agriscience, agri-marketing, and agricultural management with more new materials on the horizon. If secondary vocational programs in agriculture have not been updated, it's not due to a shortage of excellent, new curriculum materials. In addition, we have brought about significant reform and revitalization in supervised experience programs and the FFA.

What can be done about uneven program quality? In addition to administrative and resource factors, a teacher difference clearly exists. Just as in any other profession, there are those who excel beyond imagination, and there are those who are unimaginative. In response to this, we must continue to seek a larger share of imaginative agriculture teachers, but dramatic improvement will take more than five years. However, a majority of our teachers appears to be enthusiastically pursuing renewal in agricultural education, as evidenced by the excellent teacher response to in-service programs and new materials. The challenge for those who preserve teacher improvement rests primarily with teacher education programs.

The Committee on Agricultural Education in Secondary Schools also recommended that teacher seek out and use more high quality computer software for instruction and program management. While in isolated cases computers are very effectively used in teaching and in program management, we still have much to accomplish in this area. This is an area where agricultural education significantly trails the pack.

The committee found that "the federal and state system of vocational education requires that instruction in agriculture in secondary schools be designed primarily, not exclusively, for vocation, and for vocational purposes. These systems need to promote the status quo..." (p. 4). With the legislative basis for vocational education funding now 75 years old, we hope for significant shifts in policy in just five years is unreasonable. By and large, secondary agricultural education is still synonymous with vocational education in agriculture, and the lack of creative programming beyond vocational purposes is due in part to funding restrictions.

The committee issued a huge challenge to the profession to provide agricultural literacy programs at all levels of education. We have responded with only very successful agricultural literacy initiatives in grades K-6. We should be proud of our accomplishments in this area over the past five years. Unfortunately, we have neglected the most promising challenge...
THE NATIONAL REPORT — Five Years Later

This issue of The Agricultural Education Magazine is devoted to examining the impact of the national report, Understanding Agriculture - New Directions for Education, at the end of five years and to consider the need for future changes. The report was released in 1988 after deliberation of almost three years by a blue-ribbon panel appointed by the Secretary of Education and the Secretary of Agriculture. The panel was an independent group, and the study was conducted by the National Academy of Sciences. While this independence was somewhat threatening at times to the profession, it created a new level of credibility in research and emphasis for the program. The group was able to identify strengths and weaknesses in the program and make significant recommendations for change. However, implementation of change was and is left to the professionals.

Going to Extremes

(continued from page 3)
i ssued by the committee. What agricultural literacy accomplishments can be cited for secondary level agricultural education?

Some have called the National Strategic Plan for Agricultural Education revolutional. Whether one has begun to revitalize agricultural education in the public schools, a revolution has not yet begun. Only when we allow ourselves to openly and completely envision agricultural education in the secondary schools as more than vocational education will we be free. Not many would label agricultural educators as radicals, but if there was ever a time going to extremes, it is now.

We cannot accomplish our potential in the secondary schools by only improving vocational course offerings in agriculture. We must envision secondary agricultural education as encompassing well-defined and distinct vocational and literacy (non-vocational) components. That is, every secondary program should be able to list a general sequence of courses designed for those considering some degree of occupational or professional affiliation with agriculture. In addition, every secondary agriculture program should be offering one or more agricultural literacy courses designed for any student in the school, regardless of grade, background, or career interests. Examples of these literacy courses include Consumer Choices in Agriculture, Science Applications in Agriculture, Agriculture Around the World, Agriculture and the Environment.

We only ask these types of courses to the mind's eye and see dramatic increases in enrollment. State and federal agencies could continue to play an important role in these agricultural literacy courses, but probably in a more redesigned and realistic way.

Much progress has been made in revitalizing agricultural education in the past five years, and the 1988 National Report Council report deserves full credit for motivating us to be there. However, up until this point, we have been driven by those who are skilled and experienced in the secondary level. As we develop this vision in agriculture education, we should consider a true revolution in what we do on the right course, but we cannot do much more.

The important focus must continue to be on the activities which result in state and local implementation of changes in agricultural education.

We in agricultural education take pride in recognizing that many of the calls for educational reform capture the basic concepts of agricultural education. Programming viewed as strength of agricultural education by the national committee. However, there is danger in talking among ourselves. It does not seem to be widely recognized by the educational community that our programs must be competency based and emphasize problem solving, critical thinking, experiential learning, and the development of the whole person by stressing communications, responsibility, and integrity.

While we have been somewhat successful in convincing people that the program is more than agriculture, we may not have been as successful in communicating program strengths. Our continuing challenge is: 1) to capitalize on these strengths, 2) to utilize resources now available through the National Council for Agricultural Education, 3) to communicate the role of agricultural education to students interested in working in the broader area of agriculture, and 4) to work with the educational community to encourage the development of programs in agriculture for the broader school population.

It is equally important to project to the future: What do the next five years hold? I believe each of us would recognize that we are living in a time of accelerated change. Programs in agricultural education will be impacted by the national focus on the need to upgrade the workforce and to improve public education and to enhance accountability of programs; the need to improve education for all students; and emphasizes developed as a result of new Perkins Act initiatives such as tech prep, integration of academics, and teaching for all aspects of the industry have forced all educators to examine the need for change.

It does not seem to be widely recognized by the educational community that our programs are competency based and emphasize problem solving, critical thinking, experiential learning, and the development of the whole person . . .

On the one hand agricultural education can contribute to the call for increasing students' communications and workforce skills, including responsibility, integrity, and perseverance. Agricultural education can also play a role in helping students to develop more develop problem-solving and critical thinking skills. On the other hand, agricultural education is being challenged at all levels by new academic standards and course requirements for graduation, and the overarching question of identifying and relating to general education goals such as outcome-based education. There is no question that agricultural education at a profession and local programs with positive leadership can build on our strengths and adapt to the changing educational environment, just as we have been positive responses to the national report. However, if this is to happen, we must be full participants partnering in the local and state efforts which will shape the focus of education during the next five years.
Secondary Agricultural Education
Five Years Hence

September 1988 is a time of infamy for agricultural education in the minds of some and a glorious mandate for others. The long-awaited National Research Council report on agricultural education in secondary schools was finally released, much to the chagrin of some and joy of others. The report has spawned a number of actions and reactions in agricultural education from the day of its release that continue five years hence. While it is perhaps too early to assess the impact of the national report, it is appropriate to put in perspective the changes made to date and attempt to identify unfulfilled challenges.

The National Research Council report contained two basic challenges. First, agricultural education must become more than a required course at the secondary level. Second, major revisions are needed within vocational agriculture programs at the secondary level.

Perhaps the most encouraging change occurring in the past five years has been the revolutionary change in the philosophy of what is agricultural education at the secondary school level.

One of the initial actions spawned by the report was the National Strategic Planning effort in 1989. As a member of the national writing team that assembled in St. Louis in September of that year to draft The Strategic Plan for Agricultural Education, I cannot adequately describe the euphoria generated by this vission of an expanded mission for agricultural education. The writing team was so ecstatic over the vision that the term "revolutionary" was suggested as descriptive of its potential impact. The members of the writing team were literally jumping up and down with excitement in describing how agricultural education programs would change to meet the needs of the student for education in agriculture at the secondary school level.

Changes:

- Enrollment in agricultural education in the State of Idaho has more than doubled in the past five years.
- The widespread adoption of state strategic plans is encouraging and is one indication of a change in philosophy. However, there is need for the development and adoption of tactical plans on the local level describing how the strategic plans are to be achieved in every school. There is great danger in simply using state strategic plans as a public relations tool and not as a tool for establishing and maintaining program direction.

Assessment of the Current Status:

Based upon the above noted changes and in light of the National Research Council Report, an assessment of the current status of agricultural education at the secondary school level is offered. Perhaps the most encouraging change occurring in the past five years has been the revolutionary change in the philosophy of what is agricultural education at the secondary school level. Dr. Thompson's comments seem most appropriate when considering this change in philosophy. However, in many cases the nature of agriculture programs offered at the secondary school level is somewhat like people in the former Soviet Union — the revolutionary changes have not "soaked in," and one notices little difference in agricultural programs. Most certainly, this change in philosophy has opened the gates for new and innovative programming at the secondary school level. The climate is right for bold new program thrusts in agricultural education at the secondary school level.

There is great danger in simply using strategic plans as a public relations tool and not as a tool for establishing and maintaining program direction.

The widespread change in names must likewise be followed with substantive change in content and direction. A popular change in name has been "Agricultural Science," which in many cases has not been followed by any change in curriculum content.

In terms of the two challenges in the National Research Council report, they might be assessed as follows:

1. Good progress has been made in most states in meeting the second challenge — revision of vocational agriculture programs. Success is indicated by enrollment increases and the establishment of new programs. Continued review must be made, and those states that have not revised curricula must do so immediately or risk erosion of programs.
2. Action on the first challenge — making agricultural education more than vocational agriculture, has been given primarily "lip service" with few new curriculum exceptions. The profession must recognize the National Research Council Report was

...slightly over 20% of the secondary programs in Montana have made significant changes in their agriculture programs during the past five years.

Additional changes observed include:

- The development of strategic, and in some cases critical plans in support of the National Strategic Plan for Agricultural Education.
- Widespread adoption of name changes for programs and courses.
- The elimination of agricultural mechanization in institutions of higher education engaged in the preparation of teachers of agriculture.

Dr. C. Van Shafer, teacher in agriculture at Montana State University, estimates that slightly over 20% of the secondary programs in Montana have made significant changes in their agriculture programs during the past five years. Experts change on the adoption process indicate that if 20% of the population accept an idea it will become widely adopted. Other innovative ideas included development of agriculture laboratory on school sites and biotechnology and computer laboratories as secondary school agriculture education facilities. Additional changes cited include close collaboration among agriculture teachers, science teachers, and non-school personnel providing enhanced educational opportunities for students. Some agriculture programs have become recognized and utilized within their school systems for providing the practical application to academic instruction in biology and physics. Teachers of agriculture are even providing non-occupational courses in biotechnology for academically talented students taught on an independent study/research basis. Several schools have changed graduation requirements to include a non-vocational course in agriculture, thus recognizing the need for students to become agriculturally literate citizens.
From Then Until Now

It has been said that if you want to feel good, you should examine your past accomplishments. If you want to feel challenged you should examine what needs to be done. To do both, one needs only to review the achievements of agricultural education since 1984 and consider a future built on that foundation.

Looking Back
April of 1984 was a milestone for agricultural education. It was the first meeting of the National Council for Vocational and Technical Education in Agriculture (The Council). This unique group was formed to provide leadership for program renewal. Two of the first issues faced by The Council were the declining enrollment in secondary agricultural education and the influence of a national education report entitled A Nation at Risk.

What resulted from that meeting was a national study on Agricultural Education in the Secondary School. The National Research Council-Board on Agriculture was commissioned to conduct the study. During an unprecedented singing ceremony, Secretary of Agriculture John Block, Secretary of Education Terrell Bell, and President of the National Academy of Sciences, Frank Press, officially agreed to cooperate in the conduct of the study. In 1986, the study report entitled Understanding Agriculture, New Directions for Education was released.

Both the process and the product of the study had a positive impact on the program. The process of conducting a national study on agricultural education by an independent group was new and sometimes threatening to the agricultural community. However, the experience caused the community to examine itself in an objective fashion. The report acknowledged many strengths and terminated the funding of the agricultural education program, and as with any good report, it also challenged the status quo.

National Summit on Agricultural Education and The Plan
Agricultural educators accepted the challenge. In another unprecedented move, a national summit of agricultural education leaders and organizational staff planned and conducted a national summit on agricultural education in 1989. During this gathering, agricultural education leaders closely examined how they were dealing with change.

From that self-examination, a new attitude emerged about the future of agricultural education. The value-based mission statement that was adopted broadened the focus of agricultural education to include more than instruction in agriculture. It acknowledged the need for instruction about agriculture. This was a major move that can be traced back to recommendations in the national study report.

The report acknowledged many positive strengths of the agricultural education program, and as with any good report, it also challenged the status quo.

In addition, the seven national goals defined our direction. The Strategic Plan was officially released in December 1989, during a National Council meeting in Orlando, Florida. Leaders of all agricultural education organizations participated in an annual singing ceremony. Through the Strategic Plan, individuals and organizations were empowered to address change and modernize the agricultural education program.

Agricultural Education Leaders Empowered
The dynamics of the national study were combined with the focus of the Strategic Plan. The agricultural education community responded by harnessing the forces of change to address the future through expanding energy to realize the change.

The key to this lies in the identification of the uppermost values of individuals in organizations within agricultural education. As changes in agriculture and instruction occur, those values clarify what is important to the educational process of agricultural education, thus enabling the operators to broaden the content and context of instruction. Agricultural education leaders can more easily choose to be interdependent with others on the basis of strengthening their own core values.

Collaboration Occurs
Examples of collaboration include ongoing efforts with science teachers and agriculture teachers have worked together in developing new methods of teaching agriculture and biology. Materials are being distributed to teachers across the nation through inservice workshops taught jointly by agriculture and biology teachers. The project is being supported by the Kellogg Foundation through the National Farmer Training Program.

Another example is the Food Science and Safety instructional materials being developed in collaboration with the Future Homemakers of America/ Home Economics Related Occupations (PH/AERO) organization. Science, math, computer teachers, and others are involved in agricultural education. This program is being developed through The Council using public funds administered by the United States Department of Agriculture.

New other programs thrives have resulted. Among them are Instructing International Agriculture into the Curriculum, Supervised Agricultural Experience Handbook and video, middle school programs, Project PAL, and a monitoring program, the Agricience Institute and Outreach program, Water Quality Indicators Guide: A Teachers Handbook, and a national conference on aquaculture education curriculum materials.


Processes in Agricultural Education Change
Together We Can
New materials are not important unless they are used by local instructors. With increasing limited resources for inservice local instructors, processes for working together have also been modified. A national Together We Can System of inservice professionals in agricultural education has been developed. State leaders are asked to identify inservice instructors to receive training on the agricultural curriculum. In turn, these trained individuals are expected to deliver the materials through inservice workshops on the state and local levels. As new teaching materials are developed, this system provides teachers and others an opportunity to teach them along with instruction on their use.

During the inservice activity, participants can provide feedback on issues and concerns. This information will be summarized and used by the appropriate persons at the state and national levels. As the system is refined, the information will become critical in identifying needs and focusing effective strategies for addressing issues and problems.

Joint Board Meetings
One group which will make use of the information will be the participants in the joint meeting of the agriculture education organization boards. The first joint meeting was held in July, 1992. This activity was declared a success by those participating. One very visible effect of the joint meeting was the decision by the NVATA Board to establish an executive office into the National FFA Center as a part of the National Headquarters operations.

There will be more joint meetings in the future with the obvious purpose of working closer together to maximize the use of resources by the agricultural education community for statewide project improvement.

Name Changes and Reorganization
The program name has officially changed to agricultural education to be more reflective of instruction in and about agriculture. Likewise, The Council changed its name to The National Council for Agricultural Education. The National FFA Organization uses the letters FFA as its name. Supervised Agricultural Experience now represents the experiential portion of the program, and the American Association for Agricultural Education includes a broader audience of agricultural educators at the collegiate level. Again, the new names attempt to communicate the broadened mission of agricultural education.

Organizational structures have also

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A Reflection of Change in Teacher Education

HAPPY NEW YEAR! Now that the party's over, it is time to get on with 1993's resolutions - no easy task. A great deal of the January column allows one to go back and find last year's resolutions. The disadvantage is that last year's list was a computerized version carried forward ... from 1988. (That's called electronic technology.)

1988 was a good year! I remember it as a year filled with change and challenge and success. (That's called selective memory.) Among the positive experiences was a National Science Foundation National Satellite Video Conference which announced the findings of the National Academy of Science/Committee on Agricultural Education in Secondary Schools. There was a downlink at our university and we made it into a gala by holding the conference in the President's Box in the stadium. "Death Valley" was filled with expectations and anticipation. (That's usually reserved for football.) There were students, teachers, teacher educators, administrators, advisory members, and friends. Like the new year's eve party, each participant came with visible expectations of change and new opportunities for the agricultural education enterprise.

Expectation is a powerful phenomenon. The NAS Committee on Agricultural Education (1988) boldly wrote that "agricultural education must become more than vocational agriculture ... and major revisions are needed within vocational agriculture" (p. 1). The committee urged that agricultural education must change to include education about agriculture and education in agriculture. The NAS Committee also made six bold recommendations for teacher education: 1) stress applied learning but strengthen science, technology, economics, agriculture marketing and management, international agriculture, and public policy; 2) improve technology transfer and develop methods to teach the strength areas; 3) develop partnerships to deliver in-service programs; 4) establish centers for curriculum design and counselor training; 5) develop linkages with science, business, and educational technology; and 6) establish a network to recruit talented students into the teaching profession.

A comparison of the agriculture teacher supply and demand data indicated a significant decline of 33% in the number of students qualifying to teach agriculture and a general decline of nine percent in the number of secondary agriculture programs during the five year period. There were 952 students who qualified to teach agriculture and 11,204 secondary agriculture programs in 1983. The number of students who qualified to teach fell to 638, while the number of secondary agriculture programs declined to 10,176 in 1993. The figure below compares the number of secondary positions and the number of students qualifying for secondary positions in the United States.

The NAS Committee recognized that only a portion of the graduates enter teaching and encouraged the profession to increase the number of talented students recruited into the teaching profession. In 1965, 64.6% of the graduates entered teaching. Oliver and Camp (1992) reported that 51.8% of the majors entered teaching in 1991. A Chi Square analysis documented a significant decline in the percentage of majors who entered teaching between 1985 and 1991 (Chi = 33.00). However, the percentage of agricultural education graduates who entered agriculture rose from 7.3% in 1973 to 23.6% in 1991.

The five year summary data indicated nine percent fewer positions over the five year period and 33% fewer numbers of secondary teachers qualifying to teach.

Nature of Department/Unit. Most of the changes have occurred in the departmental unit housing agricultural teacher education. There has been a general increase in the number of positions assigned to the department and a significant number of departmental name changes. Most names now reflect a broader mission through the title, either directory or staff-directed. The workload analysis indicated a substantial decrease in the number of people dedicated to the function of teaching. There has been a shift to increased research and development activities, accompanied by a general decline in the time dedicated to service activities for agriculture teachers. The nature of work in the department has changed significantly over the past five years to include more non-traditional education. This is largely due to changes in funding, student enrollment, and departmental reorganization.

The NAS Committee recognized that only a portion of the graduates enter teaching and encouraged the profession to increase the number of talented students recruited into the teaching profession.

A small general increase in the number of undergraduate students in the departmental unit was reported over the five year period, while the number of graduate students declined slightly. This shift was not corroborated in the analysis of teacher supply and demand. General comments by the respondents suggest that a shift has occurred in the focus of the mission and roles, as well as the internal organization within departments.

Nature of University Faculty. There were mixed changes reported in the number of faculty with three or more years of secondary teaching experience. The prerequisite of three years of secondary experience as a condition of employment appears to be declining.

The distribution of professional ranks was also reported with mixed results. There was a slight decline in the number of professors, while the number of associate and assistant professors increased slightly. At the same time, there was a slight decline in the number of instruc-
Of the six NAS recommendations for agricultural teacher education, there was little evidence among the limited sample of universities that any substantive changes have occurred. The only exception was the emphasis on agricultural literacy.

General Impact Analysis. When asked to describe the impact of the NAS report upon agricultural teacher education, one professor estimated little impact on agricultural teacher education. "The report has not been used as a resource to make minor changes in the form of agriscience and junior high programs. These changes have not yet impacted agricultural teacher education." Another university faculty member observed that the report "caused a lot of fanfare but little action...although we now have a strong agricultural literacy program underway." A more optimistic professor concluded that the report "brought about changes, especially in the required biological/physical sciences curriculum. Instructors generally make up a very small portion of the university faculty."

Nature of Curriculum. There were few changes made in the teacher education curriculum which were documented in undergraduate course catalogs. The total number of hours required for graduation increased slightly, from 130 to 132, while the number of free electives decreased slightly. There were also few changes in the number of required agricultural education courses, with an average 25 semester hours reported. A general feeling was expressed that some changes had occurred within courses, including a much broader definition of the mission and roles of the agricultural education program. This shift could not be documented in the catalog descriptions.

Nature of Certification. Evidence of change in teacher certification was documented in a small increase in the number of programs which now offer concurrent certification with general science or biology. However, there were few changes in the course requirements for certification within agricultural education. When asked to estimate the extent of changes in the nature of certification for agricultural teacher education, the general agreement among respondents was "little to some" change had occurred. There appears to be more university responsibility for the initiation of the professional process coupled with a decrease in the authority of accrediting agencies.

The Right Time

Given that the essence of science is comparison, practitioners must begin to conceptualize that which they wish to study in order that any pre and post measurements can be effective around the interventions. One could also conclude that opportunities will present themselves to extend inquiry beyond our usual disciplinary research and encompass problem solving research, which calls for interdisciplinary or multidisciplinary teams to address the problems. For example, if agricultural literacy programs were extended into the elementary schools, they could be a cooperative problem solving research, research might call for teams of elementary, science, and agricultural researchers. Many other such teams might be constituted to address research agendas beyond the usual disciplinary inquiry conducted just by agricultural educators.

This report is not meant to present a list of what to research. Teachers, with applied research, and teacher educators, with more basic research, need to cooperate to conceptualize the questions to ask in light of the research processes and work together. Thinking beyond our usual cadre of colleagues in comparing teams to investigate problems should be a consideration. Many universities today are beginning to develop the infrastructures necessary to encourage and facilitate interdisciplinary inquiry.

Some Questions to Consider

Agricultural educators can begin by preparing to do policy research on the implications of the program changes. What are the best implementation strategies? Some other questions we may wish to address are:

What is the current level of agricultural literacy among students and the adults of this nation?

As implementation occurs, what formative and summative evaluation strategies should be utilized?

As programs about agricultural expand, studies should be conducted to look at the effectiveness of classroom instruction, laboratory instruction, the practice (SAD) component, and the youth organization.

How will we attract and serve diverse audiences?

How should program upgrading, consolidating and phasing-out occur, and what policies are needed to facilitate transitions?

What will be the effect upon preparation for postsecondary instruction?

How can we develop technology?
Agricultural Literacy: Where Do We Stand?

The history of our country is deeply rooted in agriculture. The primary aim of farmers during the 1800s was to produce enough food to feed the immediate family. Slowly, however, the industry of agriculture began to change. During the late 1800s and early 1900s the industrial, mechanical, and chemical revolutions prompted a rapid decline in the number of people directly involved in production agriculture. Today, three percent of the United States workforce (i.e., 3% of the world's farmers) produce 20% of the world food supply. So, what about the other 97% of our population? Should they care about agriculture? Absolutely!

According to Mawby (1984) “many bad decisions affecting food production can be traced to a lack of understanding about agriculture on the part of the 97 percent of people who don't live on farms” (p. 72). In order for citizens to make reasoned decisions about policies and issues affecting agriculture, there is a need for all citizens to develop a minimum level of understanding about agriculture, food, and food production (Russell, McCracken, and Miller, 1990). It is also important that the non-farm majority in our population recognize that state and national representatives, who are elected by the consumer-oriented electorate, must be agriculturally literate. Recent trends indicate that people have become more interested in issues related to agriculture, food, and the conservation of our precious natural resources. However, their beliefs, attitudes, and actions are often misinformed or misguided. Agricultural educators share the responsibility to inform the people of this nation about agriculture so that public policies affecting agriculture will be developed to preserve the industry which produces the food needed to satisfy the most basic of human needs. Hamlin (1962) outlined the problem most clearly when he wrote:

“People must accept the fact that the public policy which governs and controls agriculture is policy they make, not policy which others make. They must be sufficiently aware of the role and its implications to approve policies which will sustain and improve agriculture and be fair to people who engage in it, recognizing that in their blindness they could “kill the goose that laid the golden eggs.” (p. 58)"

Where Are We Now?

U.S. society has evolved with each passing generation to the point where residents are becoming further removed from their roots in production agriculture. Public impressions of agriculture have been tainted by the actions of special interest groups and information provided through the media. For example, animal rights groups such as the Animal Liberation Front (ALF) and People for the Ethical Treatment of Animals (PETA) have engaged in destruction and thefts at animal treatment centers across the country.

Recent trends indicate that people have become more interested in issues related to agriculture, food, and the conservation of our precious natural resources. These groups often lead the public to only a superficial understanding of the role of animal experimentation in scientific research or modern agricultural production. According to Marian Pancoast (1992), an animal technician at Washington University in St. Louis:

“While we don't see the scars of people saved through animal research techniques, we are simply happy to have them around. Survivors don't come with life-size protest labels that say, 'Saved through animal research.' Frequently they don't even know the role they played in animal research.”

(Columbia Tribune, May 1992)

This statement further substantiates the need for people to become more literate about the contributions which animal research has made to enhance the quality of life in this and other countries.

Another major misconception is the view that many people have expressed with regard to funding appropriations for the →

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United States Department of Agriculture (USDA). Articles which have appeared in many national newspapers and news magazines would lead people to believe that the USDA spends most of its money to subsidize farmers, when, in fact, the biggest proportion of USDA funding is used to support the Food Stamp program in the Division of Food and Nutrition Services.

The United States Congress recently approved the federal budget for fiscal year 1993 in the amount of $61.6 billion, of which 5.3% of the total amount appropriated for the USDA was $35.4 billion (Budget for the United States Government, Fiscal Year 1993, Part One, p. 299). Of the $35.4 billion allocated for the USDA, $23.6 billion was directed toward the Food Stamp program. This figure represents 36% of the total budget appropriated for the USDA in fiscal year 1993. In contrast, the Extension Service, ASCS, and the Farmers Home Administration (FHFA) combined, were appropriated only $1.86 billion for fiscal year 1993. This figure accounts for only 3% of the total budget appropriated to the USDA (Budget for the U.S. Govt, FY93, Appendix One, p. 269-263).

Other national issues which have been portrayed negatively to the public are water quality, soil erosion, and animal care. In all three cases farmers have frequently been blamed for abusing the environment, natural resources, and "animal rights." Most citizens of this country are not aware of the efforts of farmers to protect water quality, control soil erosion, and provide for proper animal care.

**Where Do You Want To Be?**

There is a need to make a consequential effort to increase the agricultural literacy of the residents of this country. Educated and well-informed citizens are needed to make more accurate and proper decisions about the care of our land, animals, and food. According to President Bush in his 1990 State of the Union address, "Too many Americans do not understand that agriculture is the foundation of our nation's economy." This message seems to be echoed by many educators and citizens who are concerned about the future of agriculture. A lack of understanding about the importance of agriculture can have serious consequences for our society.

To meet the goals of Bush's plan, every adult resident of this country should possess the knowledge and skills needed to compete in a global economy and exercise the rights and responsibilities of citizenship (Educational Excellence Act of 1993). Education about agriculture should begin in kindergarten and continue through high school graduation and beyond. We must also educate adult residents of the country to keep them informed of changes in agriculture in our lives. They must be informed so they can make intelligent decisions concerning agriculture, food, and food production.

**How Are We Going To Get There?**

As a profession, agricultural education in secondary schools have done an excellent job in teaching secondary school students. However, additional ways are needed to teach elementary school students about agriculture.

Currently Food for America program and FF in the Classroom programs are making efforts to increase awareness of agriculture at an earlier age; however, these programs are not implemented in every state and are many times only not in areas already predominantly agriculturally based.

Commodity groups and general farm organizations should be involved in the education of students and adults. Specially designed programs can be presented to inform younger students that the use of farm products and the ethical treatment of animals are important. Education programs can also be used to teach young people about agriculture and animal care. Animal projects for the young provide an opportunity to raise and properly care for animals.

State Department of Agriculture and have become involved in "Day of Service" at urban schools. For example, the Missouri Department of Agriculture has started a program to increase awareness of agriculture among inner city youth. This program was held in June 1992 in St. Louis and included educating metropolitan students in the first and fourth grades. Commodity groups of the Missouri Farm Bureau presented farm products and opportunities in agriculture.

University Extension centers should play a role in educating adults to use agriculture through workshops, newsletters, and newspaper articles to build citizen awareness of changes in agricultural and policy issues.

**Summary**

Many changes are occurring in agriculture and education. Agricultural education must keep the public informed of changes and seek to achieve goals of...
making science education more meaningful to K-12 students. The framework now emphasizes that teachers and/or educators should:

- use hands-on activities when teaching science;
- be facilitators of their students' learning rather than teachers of facts;
- integrate all disciplines of science in their lessons rather than keep the earth, physical, and life sciences as separate subjects.

CFAITC's Science and Agriculture Curriculum Project

The Science and Agriculture Curriculum Project (SACP) was formed in 1990 to respond to the changing needs of science educators and to meet the goals of the California Science Framework. Working with the SACP Advisory Committee and the School-Surplus School District, 1 developed 13 pilot science units. Each "constructivist" unit contains a set of hands-on, hands-on, hands-on resources.

The unique aspect of these units is that they add a natural rural-to-science teaching and learning in the curriculum. Along with the lessons on mutualism in figs, some other units currently available are:

- ENERGY AND PEANUTS - studies the unique life cycle of the peanut and peanut production as students perform standard energy experiments;
- THE MYSTERY OF PUMPKINS - teaches the process of scientific process as students identify a "mystery" seed, build cone models, read literature, and plant it.

- BASEBALL BATS - WHERE DO THEY COME FROM? - uses trees and bats to teach students about baseball production.

The idea of incorporating agriculture into various curricula is catching on. Over 3,000 science units have been distributed to California educators for grades K-12. Through a grant from the California Department of Food and Agriculture's Fertilizer Research and Education Program, three new units are being written on the nutrients required for plants. The California Department of Agriculture continues to develop lessons as funding becomes available.

The most exciting about the Foundation's programs is that there are numerous resources available to make science interesting, exciting, and enjoyable for all students. The Foundation's programs began in 1980 when programs like Fruit Tours, with support from 4-H and 4-H began. In partnership with 4-H and 4-H, the California Foundation for Agriculture began in the Classroom. The Classroom is a place for students to meet other students and to study agriculture. The Classroom is a place for students to meet other students and to study agriculture. The Classroom is a place for students to meet other students and to study agriculture. The Classroom is a place for students to meet other students and to study agriculture. The Classroom is a place for students to meet other students and to study agriculture.

Closing Comments From the Executive Director of CFAITC

Paul's efforts to integrate agriculture into K-12 science education exemplify the Foundation's philosophy of making agriculture easy to understand and enjoyable for all students. Since 1980, the California Foundation for Agriculture in the Classroom has been a tremendous educational resource for teachers across the state. The Classroom is a place for students to meet other students and to study agriculture. The Classroom is a place for students to meet other students and to study agriculture. The Classroom is a place for students to meet other students and to study agriculture. The Classroom is a place for students to meet other students and to study agriculture. The Classroom is a place for students to meet other students and to study agriculture.

Measuring the Magnitude...continued from page 16

...future of education in or about agriculture. A plethora of foundations and other agencies is interested in environmental education and rural development issues. We must begin to embed our study in their agendas.

The impact of our programs upon the learners and ultimately upon the economic and quality of life of the people and communities we serve must be documented. Agriculture is an exciting, dynamic field that poses an exciting, dynamic medium to help people learn. Strategic developmental plans must be developed to document its effectiveness and contributions.

Aquaculture — The Council Wins In Six

Recently had the pleasure of being one of the participants in the National Aquaculture Inservice Workshop held at the Crabtree Sheraton Hotel in Raleigh, North Carolina, on August 11-16, 1992. The meeting was sponsored in part by the National Council For Agricultural Education.

Over the six-day gathering participants were given five modules of curriculum materials that were developed by The Council and pilot tested by the six aquaculture test sites. Participants were also instructed on ways to get aquaculture into the curricula of their respective departments. Each state and territory of the United States was invited to bring up to five individuals, including classroom teachers, state supervisors, teacher educators, and other high level agricultural education officials. As it turned out, each of the 40 states and territories was represented, with over 300 program participants.

There were speeches, presentations, lectures, tours, field trips, and question and answer sessions. Each day would start early in the morning and finish up by early evening. It was also a chance to meet the experts in the field of aquaculture, talk with classroom teachers, and exchange ideas.

By the time the week concluded, state in-service plans were submitted to Council officials from each state supervisor. Also available to workshop participants was a media room which was filled with a wide range of pamphlets, booklets, brochures, catalogs, and other handouts that were available as resource materials.

The Speeches

Among the dignitaries was the National FFA Advisor and Council Chairman, Dr. Larry Case. Dr. Case addressed the conference on several occasions. Ron Buckholt and John Pope of The Council served as moderators, hosts, and masters of ceremonies. Key speakers were authors Dr. Jasper Lee of Mississippi State University and Dr. Wade Miller of Iowa State. Three of the two gentlemen were responsible for writing most of the curriculum materials in Module 1. They attempted to take the participants through a page by page preview of the Module 1 curriculum. Most of the other authors of the aquaculture curriculum did not attempt this feat.

At our first evening banquet of the conference, we had the pleasure of hearing James Graham, North Carolina Commissioner of Agriculture. This man has been in political life for over 25 years, and in his late 60s and is currently running for reelection. His was one of the most down to earth, interesting and entertaining speeches of the conference, and he told it like it is.

A speaker who handled the topic of feed and feeding was Dr. Tom Ziegler, President of Zeigler Brothers Feeds. In a short period of time much information was disseminated on feeding and raising feed. From the University of Illinois, Dr. Jeff Moss presented one of the few hands-on speeches that dealt with water →
quality as it related to aquaculture. Dr. Most had several "volunteers" from the audience participate in various water quality tests while he spoke on related topics.

The "fish barn," as it was called, received a lot of talk during the week. Dr. Jeff Hinders, an extension aquaculturist from North Carolina State University, is partially responsible for its development and operation. During his presentation, participants saw through slides what they would later visit in person. The entire fish barn concept was one of the more interesting parts of the conference. The fish barn was a two-building aquaculture complex. One building was a low technology recirculating intensive aquaculture operation, something any classroom teacher could incorporate. The second larger building was an extremely high technology, commercial intensive, recirculating aquaculture operation complete with all of the bells, buzzers, and alarms.

All of the participants had a lab session at the veterinary school where fish organs and tissues were removed and placed under the microscope for close examination.

The Tours

The Council provided various tours to aquaculture locations throughout the state of North Carolina for the participants. Tour #1 was a cold water tour facility in Asheville, North Carolina; tour #2 was the warm water tour facility in Greensboro, North Carolina; and tour #3 was the classroom recirculating laboratory. A fourth tour was for agricultural educators other than teachers and it focused on SAE programs.

I selected and attended the warm water tour. Our group of about 50 teachers toured the Southern States Feed Mill in Greensboro, and then the Carolina Classics Farm in Ayden. The farm was a complex of catfish ponds. The farm also had its own catfish hatchery in a separate building. During August when we were there, only a small portion of the building was in production, but participants could see the hatchery was a vital part of the fish ponds' success. Everyone was able to see the fish farm on the campus of North Carolina State University. On the west side of the fish barn it was explained that a recirculating aquaculture system could be put together for any agriculture program in the country. Included in the correct materials was a detailed step by step procedure on how to make it happen for you. Another tour for the participants was a session at the Veterinary School. The first session was for participants to get hands-on experience in handling fish in this situation. Two fish were laid out for us to dissect. We were instructed on how to remove organs, and then they were examined under the microscope. This was a very involved and interesting lab lecture. The second session at the veterinary school was a lecture and slide presentation on what is being done on a commercial scale in aquaculture.

One entire afternoon was devoted to a specific technical session. Each participant selected two sessions to attend from among catfish and crawfish, shrimp, tilapia, striped bass, redfish, clams and oysters, and tropical and saltfish. There was a great deal of technical information and a cultural dispersion at these sessions. Slides, handouts, lectures and questions were all a part of these specific topics.

The Council Pulled It Off

Without doubt the National Aquaculture Inservice training to infuse aquaculture into agricultural education was tremendous success. An educator was first thrilled to observe how representative my state, and second overjoyed at times with the testing of technical materials and tangibles that were placed on us. The Council should be commended for a job well done. The conference was very well covered and over for less than two months, and of course, the material that had received. This national workshop is almost guaranteed that there will be state inservices held in the next two months. Outstanding efforts, thanks.

SAE Programs

S
OE, SSOE, SSEP, PROJECT PROGRAM! Where does it lead and what does it mean? For years it meant that a student enrolled in agriculture was required to have some type of production project (plant or animal) to enhance his/her classroom instruction. The enhancement is still an integral part of the program, but the "plows and cows" stereotype is certainly changing.

Now, as before, a well planned and supervised SAE leads to an exciting and rewarding part of the Agricultural Science and Technology program. This supplement to classroom instruction presents an opportunity for students to enhance the knowledge they acquire in the classroom with additional activities.

Entrepreneurship is still one of the favorite SAE programs. Regardless of what many think, if students want to improve their skills in an area, they certainly want to have the opportunity to earn money. Students are taking more risks with this type of project because they assume some financial responsibility. Students own the materials and are responsible for financing everything that goes into the business. As they plan, implement, and manage the program, it is essential that accurate records be kept and managed to determine if this was a profitable venture.

For 18 years my second week lesson plan has been to sell SAE — its importance and value. Not everyone enrolled will have an opportunity for an entrepreneurship SAE, but each student is exposed to the possibilities that are available. Locally there is a strong county show with a good premium sale for those who are involved in livestock production. Beef cattle, peanuts, watermelons, coastal Bermuda hay, and vegetables are the primary agriculture commodities grown in Brunswick County. Being located close to San Antonio also gives students an opportunity for environmental activities in sales and service, marketing, processing, and agricultural mechanics.

Many students are second and third generation FFA members and the entrepreneurship SAE fits very well. A very large percentage of the members come from rural backgrounds. Some live in town but still have rural ties. Many will not go back to the farm or ranch but still want to be involved with an SAE that will earn them a degree or award because it is easier than the granddad earned one. Tradition is our side. And, yes, there is emphasis on the awards and degrees. Students select an SAE as part of their requirement for the Greenhand Degree.

The methods used to teach this are not anything earth shattering. Many of you do them now. An attempt is made to give every beginning student on the idea of developing competencies necessary to own and/or manage a business. This is accomplished by relating success stories of former students who live in the community.

The value of financial records is taught and then students are given record keeping activities that stress all of the above entrepreneurship areas. These activities are conducted using the Texas FFA Record Book and other SAE program materials available from instructional Materials Service at Texas A&M. "What if" situations prepared using a spreadsheet are invaluable in teaching students the difference a small decrease or increase in marketing expenses or management can make. By experimenting with different situations, students have the opportunity to weigh the results of one situation against one that is similar. Students will begin preparation for an SAE that will give them a round background in business or help them gain employment.

Not all students will have the resources to begin an entrepreneurship SAE, (about 65% of Pleasanton students do) but every student entering class as a first year FFA member at Pleasanton will prepare a complete set of financial records on some type of entrepreneurial program. Many students with entrepreneurship SAE programs will increase the size and scope of their SAE and apply for advanced awards and degrees. An average of 15 State FFA Degrees and two to three National FFA Degrees is received each year.

Of course, as teachers we are still going to encourage the type of program that is our favorite. We will continue to stress the awards and degrees aspect of the SAE. Is this bad? I don't think it is. The program fits many students and if they learn management and how to keep financial records they are preparing for life after high school.
Agriscience & Technology

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his textbook delivers what it prom-
ises; it is packed with the latest agriscience and technology innov-
ation. What makes this text unique is that it is a brief history book at our agricultural roots. The text is divided into 5 sections (17 chapters): Biotechnology in Agriculture, Food and Fiber, Energy and Power Technology, Computer Aided Management, and Environmental Stewardship. Each chapter includes a list of objectives, vocabulary terms, career options, looking back sections, and chapter review and learning activities.

The book has 326 pages, has a hard cover, and is compact. Mid-level and advanced students will find the book easy to understand and appealing in appearance. The print is large and easy to read. Important terms are italicized within the chapters, as well as found in the glossary in the back of the book. Also, many of the facts and drawings are found within each chapter to support the text.

Topics such as genetics, gene splicing, animal health, hormones, recycled animal waste, artificial insemination, embryo transfer, growth regulators, and soil science are covered along with much, much more. Each chapter text has 8-10 thought-provoking questions. Most of these questions ask the student to discuss, explain or use a particular situation. There are no true-false, fill-in-the-blank questions. Each chapter has two learning activities, such as conducting a field trial, collecting a mock trial, conducting tours/externships and making projects.

The questions and learning activities are structured to encourage students to present their findings to the class. However, this book is not a how-to book and is not generous with hands-on activities.

Agriscience and Technology will be a valuable tool to use in the introduction of agriculture to a variety of students, from the 8th grade to college. It covers a wide range of new technologies, many of which are currently on the cutting edge in the field of agriculture.

From Then... (continued from page 9) changed. The National FFA Organization program represents one of the most significant changes at the national level. The FFA Center is now being managed through a customer-based approach with a Chief Operating Officer in charge of day-to-day operations. The same Chief Operating Officer is also responsible for FFA Foundation operations. A more efficient utilization of resources is being achieved.

What Have Been The Results? Efforts to modify the program over the past few years are working. Evidence can be found in the 1991-92 FFA membership of 401,574 compared with 382,748 in 1990-91. Membership potential is also on the increase for the National Young Farmer Educational Association and the National Postsecondary Agricultural Education Association. Another indicator is the amount of financial resources being focused on agricultural education. The National FFA Foundation has grown from $1,950,528 in 1984 to $4,424,958 in 1991.

The Council's annual budget has grown from $53,000 in 1984 to $765,460 in 1992. In addition, the Council has currently approved $2,000,000 worth of projects for the FFA's 1,250,000 members. These figures do not include all of the funding which has been used to develop the agricultural education program.

More important than the money is the nature of the projects. The funding comes because we are addressing the issues that are important to the public and to the industry. These agricultural issues relate to the instruction in the development of the whole person. It is a student-focused approach that has served students and agriculture well and represents our value-based approach stated in the Strategic Plan.

What Does The Future Hold? Without a doubt, more and more change is in store. The future belongs to those who can respond to change and meet the needs which it creates. Agricultural education has demonstrated that it can respond.

The challenge for agricultural education is to continue in its role as the leader in the development of education and the related processes for focusing energy and resources for accomplishing its mission. Priority issue identification and the fast-changing environment and the ability to respond to opportunities in a time frame while maintaining high standards are major challenges for the future. In short, how do we develop manageable, and effective and efficient plans within and between agricultural education organizations?

The best is yet to come, if we continue to focus on the needs of our customers, respond to meet their needs, and manage ourselves in alignment with our values.
STORIES IN PICTURES

Members of the Committee on Agricultural Education in Secondary Schools outline their recommendations during a press conference for release of the report *Understanding Agriculture — New Directions for Education.*

Members of the National Summit Planning Group, whose efforts led to two National Summits in Agricultural Education held in 1988 and 1990.

The Strategic Plan under construction - As a result of the first National Summit, The Strategic Plan for Agricultural Education was developed in 1990.

A national videoconference was held in 1990 for release of the National Strategic Plan for Agricultural Education.
Aquaculture - An Introduction

Reviewed by:
Lynne M. Cook
Agriculture Teacher
Tift County High School
Tifton, Georgia

One of the hottest subjects in the agricultural industry today is aquaculture. Producers along with other landowners have found this business to be an added way to make profit on the land taken up by previously unused ponds. As an agricultural educator, I must make sure that my curriculum fits the interests and endeavors of the agricultural community which will surround my students when they leave high school or college and seek a career. It is with this thought in mind that many agricultural educators have introduced the study of aquaculture into their curriculum. Until recently, very little literature was available to the teacher for help in the classroom. However, now with Lee and Newman’s book, I believe that the agricultural educator has an outstanding tool for use in the classroom.

The most outstanding feature of Aquaculture - An Introduction is that it covers the total industry of aquaculture. The basics of the science of aquaculture (fish, pest, and water biology) are covered with enough information to allow the reader to understand the fundamentals without getting bogged down in the particulars. A chapter on the aquaculture industry today is included, which tells the reader of the increased use, history of, and need for the industry. This chapter also has a good section describing current careers. Not only are catfish and trout production discussed in the book, but crayfish, ornamental, bivalve, plant aquacultural production, and recreational aquaculture are also covered.

Another strong point of the book is the directions given to those who wish to begin a small aquaculture enterprise. The authors indicate the materials needed to use the setup, and the factors that should be considered before you begin. Many precautionary ways are described that can be used for SAE programs. Other plans for the more production-oriented aquaculture who wishes to begin a business.

The only weak point of the book is the lack of detail in some parts. The weakness is due to the immense amount of material that the book covers, because the authors do give specific steps to enable the reader to go beyond the book and ask questions to clarify the concepts. Since much of the technology in aquaculture is new or just being developed, much of the equipment is too new and thoroughly as could be expected.

Overall, this is an excellent book and my opinion. My plans are to include most of the new information I have gathered from the book in my classes. I also hope to employ some of the smaller, indoor aquaculture setups for my students.

About the Front Cover:
Being able to effectively solve problems encountered in teaching requires teachers to reflectively think about possible cases for problems encountered. A diagram such as this helps to outline the possibilities and makes it easier for teachers to develop a plan of study (isolation plan). For the case of lack of student motivation, teachers should determine if the problem is a whole class problem or one that is limited to a few students in the class. Solution strategies must vary accordingly.