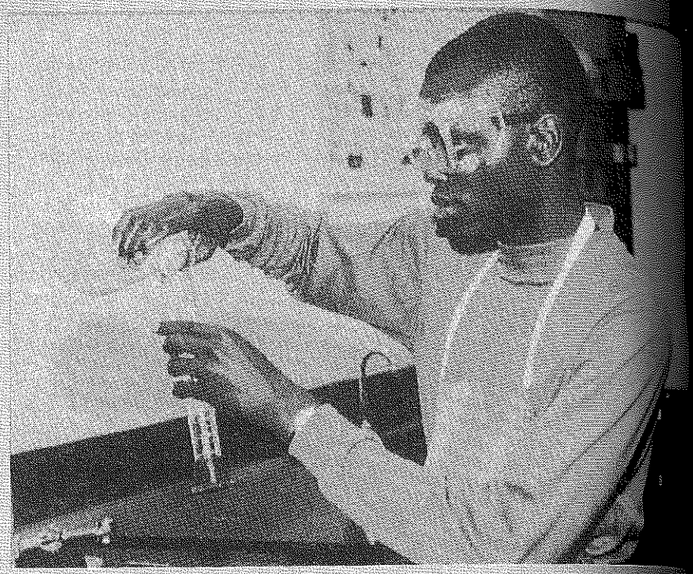
# STORIES IN PICTURES

FFA contests, fairs, and other programs serve to reinforce learning and motivate students to participate in SAE programs. (Photo courtesy of Jay Eudy, Austin, TX)



School-based SAE programs can be developed in indoor and outdoor lab settings.

## *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 the profession via *The Magazine*. Original copy should be two to three double-spaced typewritten pages forwarded to the Editor. Any aspect of agricultural education at all levels is appropriate for the ***Success Stories*** feature.

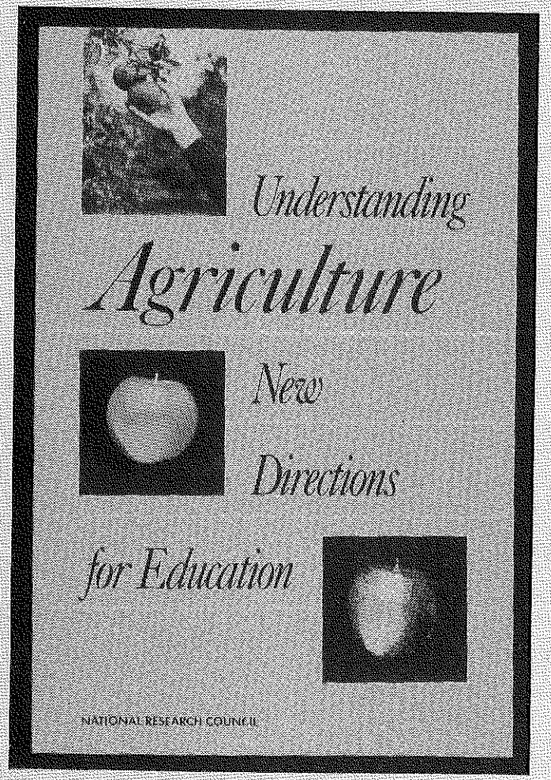
Also new for 1993, agricultural educators are invited to share their views on specific aspects of agricultural education through a new ***Forum*** feature column. This column will allow members both within and outside the profession to debate specific issues in agricultural education. Original copy should 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

ry, 1993
ne 65
er 7

1988




1993

## The NAS Report — Five Years Later

THE
AGRICULTURAL EDUCATION
MAGAZINE

January, 1993 Volume 65 Number 7



## Table of Contents



**ARTICLE SUBMISSION**

Articles and photographs should be submitted to the Editor, Regional Editors, or Special Editors. Items to be considered for publication should be submitted at least 90 days prior to the date of issue intended for the article or photograph. All submissions will be acknowledged by the Editor. No items are returned unless accompanied by a written request. Articles should be typed, double-spaced, and include information about the author(s). Two copies of articles should be submitted. A recent photograph should accompany an article unless one is on file with the Editor. Articles in THE MAGAZINE may be reproduced without permission.

**PUBLICATION INFORMATION**

THE AGRICULTURAL EDUCATION MAGAZINE (ISSN 7324677) is the monthly professional journal of agricultural education. The journal is published by THE AGRICULTURAL EDUCATION MAGAZINE, INC., and is printed at M & D Printing Co., 6[illegible] cond Street, Henry, IL 61537.

Second-class postage paid at Mechanicsville, [illegible] 23111; additional entry at Henry, IL 61537.

POSTMASTERS: Send Form 3579 to Glenn A. Anderson, Business Manager, 2441 Suzanne [illegible] Mechanicsville, Virginia 23111.

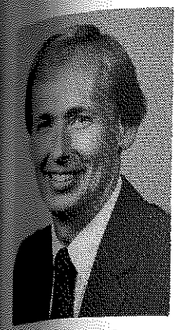
**SUBSCRIPTIONS**

Subscription prices for THE AGRICULTURAL EDUCATION MAGAZINE are $7 per year. Foreign subscriptions are $20 (U.S. Currency) per year for surface mail, and $40 (U.S. Currency) foreign airmail (except Canada). Subscriptions in groups (one address) are $4 for eight issues. Single copies and back issues less than ten years old are available at $1 each ($2.00 for foreign mail). All back issues are available on microfilm from Xerox University Microfilms, 300 North Zeeb Road, Ann Arbor, MI 48106. In submitting subscriptions, designate new renewal and address including ZIP code. Send all subscriptions and requests for hardcopy back issues to Business Manager: Glenn A. Anderson, Business Manager, 2441 Suzanne Rd., Mechanicsville, VA 23111. Publication No. 73246





# Going to Extremes



By ED OSBORNE
*Dr. Osborne is associate professor and program leader of agricultural education at the University of Illinois, Urbana-Champaign.*

The committee on Agricultural Education in Secondary Schools forwarded two major findings in its 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's 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 enrollments, 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. Somehow 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 have developed and disseminated 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 national use in agriscience, agrimarketing, and international agriculture, 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.

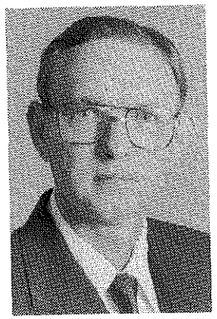
What can be done about uneven program quality? In addition to administrative and resource factors, a teacher difference clearly exists. Just as in any other profession, there are those who excel beyond imagination, and there are those who are unimaginative. In response to this given, we must continue to seek a larger share of imaginative agriculture teachers, but dramtic 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 inservice programs and new materials. The challenge for preservice and inservice teacher improvement rests primarily with teacher education programs.

The Committee on Agricultural Education in Secondary Schools also recommended that teachers 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 one 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, if not exclusively, for vocational purposes. These systems tend to preserve the status quo" (p. 4). With the legislative basis for vocational education funding now 75 years old, to 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 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



By Dr. BOB R. STEWART

*Dr. Stewart is professor of agricultural education at the University of Missouri-Columbia.*

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 in agricultural education. The intent of this issue of *The Agricultural Education Magazine* is to examine progress from the viewpoint of selected leaders in the field and to examine national issues and directions which have an impact on the delivery of agricultural education in this country. However helpful this review may be, the important focus must continue to be on the activities which result in state and local implementation of changes in agricultural education.

The national committee's finding pointed to two basic challenges (National Research Council, 1988):

> First, agricultural education must become more than vocational agriculture. Second, major revisions are needed within vocational agriculture. In working toward both goals, educators should borrow from the best current programs, while creating new ways to deliver to more students educational opportunities in the agricultural sciences, agri-business, nutrition, and land resource stewardship. (p. 1)

Adjustments and innovative program activities have addressed these challenges. Perhaps the article on agricultural literacy focuses most directly on a major change in thinking and application for the agricultural education profession in addressing programs for education about agriculture, for a wide range of students K-12 (some would include adults as well). Another change involves the integration of science into the agriculture curriculum by taking advantage of an applied science approach in the teaching of agriculture and in seeking cooperation from science teachers to integrate the concepts of agriculture into the teaching of science. The concept of experiential learning has been reinforced and promises to continue to play an increased emphasis in education in this country. Oregon, Wisconsin, and Maine have recognized programs which call for apprenticeships and internships. Other schools are stressing career exploration and some type of workplace experience for all students at the developmental level in grades 7-9.

***... 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 educational programming viewed as strengths of agricultural education by the national committee. However, there is danger in only talking among ourselves. 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 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 those students interested in working in the broad area of agriculture, and 4) to work with the educational community to encourage the development of programs about 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. Questions about accountability of programs; the need to improve education for all students; and emphases 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 worksite skills, including responsibility, integrity, and perseverance. Agricultural education can also play a role in helping school do more to develop problem solving and critical thinking skills. On the other hand, agricultural education is being challenged at all levels by new academic standards, course requirements for graduation, and the overarching question of identifying and relating to general education developments such as outcome-based education. There is no question that agricultural education as a profession and local programs with positive leadership can build on our strengths and adapt to the changing educational environment, just as there have been positive responses to the national report. However, if this is to happen, we must be full participating partners in the local and state efforts which will shape the focus of education during the next five years.

**Reference**

National Research Council. (1988). **Understanding agriculture: New directions for education.** Washington, D.C.: National Academy Press. ■

## Going to Extremes

*(continued from page 3)*

issued 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 revolutionary. We have begun to revitalize agricultural education in the public shools, but 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 agriculture will the first shots be fired. Not many would label agricultural educators as radical, but if there was ever a time for 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 (nonvocational) 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 Home, Agriculture and the Environment,* and *Ethics in Agriculture.* Only when we add these types of courses to the menu will we see dramatic increases in female, minority, and total enrollments. SAE and FFA could continue to play an important role in these agricultural literacy courses, but probably in a more redesigned and selective way.

Much progress has been made in revitalizing agricultural education in the past five years, and the 1988 National Research Council report deserves full credit for motivating and inspiring us to be better. However, up until this point we have failed to see the golden egg - agricultural literacy courses at the secondary level. Not until we discover this gem will agricultural education undergo a true revolution. We are on the right course, but we can be so much more. ■

# Secondary Agricultural Education Five Years Hence

By
PHILLIP ZURBRICK
*Dr. Zurbrick is professor of agricultural education at the University of Arizona, Tucson.*

September 1988 is a time of infamy for agricultural education in the minds of some and a glorious mandate for change to 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 final impact of the national report, it is appropriate to put in perspective the changes made to date and attempt to identify unfulfilled challenges.

The Natioanl Research Council report contained two basic challenges. First, agricultural education must become more than vocational agriculture at the secondary school 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 vision 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 nation's need for education in agriculture at the secondary school level.

## Changes:

The author has recently completed a six month sabbatical planned to assess the status of agricultural education and to identify innovative and creative programs in agricultural education. This odyssey involved over 10,000 miles of automobile travel through 11 western states. This opportunity to gather data on changes occurring in agricultural education at the secondary level provided an ideal research base for this article.

A realistic summation of progress in implementing the Strategic Plan and meeting the challenges of the National Research Council report might best be described as somewhat of a "mixed bag." Dr. Orville Thompson, Professor Emeritus and active agricultural teacher educator at the University of California, Davis, recently observed that there has been more change in agricultural education in the past five years than in all of the prior years of his professional experience. He commented that the changes have in fact been revolutionary and not evolutionary in nature!

Enrollment in agricultural education in the State of Idaho has more than doubled in the past five years. Dr. Lou Riesenberg, Head, Department of Agricultural and Extension Education at the University of Idaho cites: 1) a revised and expanded curriculum utilizing semester courses and 2) the acceptance of agricultural education credit by the State Board for meeting both high school graduation and college admission standards as two of the primary reasons for the increased enrollment.

***Enrollment in agricultural education in the State of Idaho has more than doubled in the past five years.***

Dr. C. Van Shelhamer, teacher educator 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 on change and the adoption process indicate that if 20% or more of a population accept an idea it will become widely adopted. Other innovative ideas included development of aquaculture laboratories on school sites and biotechnology and computer laboratories as secondary school agricultural 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. Some 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.

***. . . 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 1) the development of strategic, and in some cases, tactical plans in support of *The National Strategic Plan for Agricultural Education,* 2) widespread adoption of name changes for programs and courses, and 3) the elimination of agricultural mechanization in institutions of higher education engaged in the preparation of teachers of agriculture.

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 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.

The loss of courses in agricultural mechanization at the university level is primarily the result of shortsightedness on the part of administrators in times of stressed resources. Occupational analysis indicates that no occupational preparation program in agriculture offered at the secondary school level is complete without some instruction in agricultural mechanics. Future teachers are not going to be able to effectively provide such instruction if the present trends continue and become widespread.

## 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 level is offered. Perhaps the most encouraging change occurring in the past five years has been the revolutiionary change in the philosophy of what is agricultural education at the secondary school level. Dr. Thompson's comments seems 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 agriculture 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!***

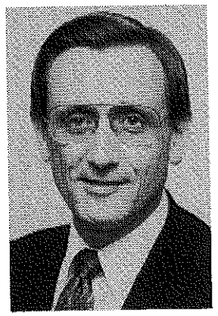
In terms of the two challenges in the National Research Council Report, they might be assessed as follows:

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 revision 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 a few glorious exceptions. The profession must recognize the National Research Council Report was

*(continued on page 23)*

# From Then Until Now



By LARRY D. CASE
*Dr. Case is Coordinator, Agricultural and Rural Education, USDA, Washington, D.C.*

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 1988, 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 positive strengths 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 1988. During this gathering, national level agricultural education leaders closely examined how we were dealing with change.

From that self examination, a new attitude emerged about the future of agricultural education. The value-based national 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 addtion, the seven national goals defined our direction. The Strategic Plan was officially released in December of 1989, during a National Council meeting in Orlando, Florida. Leaders of all agricultural education organizations participated in an official signing 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 now combined with the focus of the Strategic Plan. The agricultural education community responded by harnessing the forces of change to address the future, rather than expending energy to resist that change.

The key to this lies in the identification of the uppermost values of individuals and organizations within agricultural education. As changes in agriculture and education occur, those values clarify what is important to the educational process of agricultural education, thus enabling program operators to broaden the content and context of instruction. Agricultural educators 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 team 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 FFA Foundation.

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

Other new program thrusts have resulted. Among them are *Infusing International Agriculture into the Curriculum, Supervised Agricultural Experience Handbook* and video, middle school programs, Project PALS mentoring program, the Agriscience Institute and Outreach program, *Water Quality Indicators Guide: A Teachers Handbook,* and a nationwide conference on aquacultural education curriculum materials.

Projects under development include instructional materials in Agricultural Issues, Financial Records, No-Till Agriculture, Maximum Economic Yield, and species-specific aquaculture.

## Processes in Agricultural Education Change

### Together We Can

New materials are not important unless they are used by local instructors. With increasingly limited resources for inservicing local instructors, processes for working together have also been modified. A national Together We Can System of inservicing professionals in agricultural education has been developed. State leaders are asked to identify inservice instructors to receive training on the new materials. In turn, these trained individuals are expected to deliver the materials through inservice workshops on the state, substate and local levels. As new teaching materials are developed, this sytem provides teachers and others an opportunity to receive 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 agricultural 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 of the NVATA Board to move its 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 nationwide program improvement.

## Name Changes and Reorganization

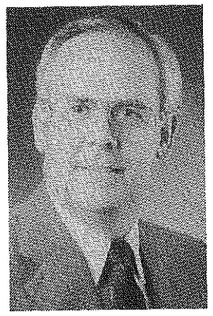
The program name has officially changed to agricultural education to be more reflective of instruction *in* and *about* agriculture. Likewise, The Council changed its named to *The National Council for Agricultural Education.* The National FFA Organization uses the letters FFA as its name. Supervised 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

*(continued on page 23)*

**The mission** of agricultural education is to provide a total dynamic educational system. **We aspire** to excellence as we recruit, prepare and support individuals in agricultural careers. **We serve** the people and inform them about agriculture, its needs, opportunities and challenges. **We value** *providing* instruction in and about agriculture; *serving* all populations; *developing* the whole person; *responding* to the needs of the marketplace; *advocating* free enterprise and entrepreneruship education; *functioning* as a part of the total educational system; *utilizing* a proven educational process which includes formal instruction, experiential learning, leadership and personal development.

# A Reflection of Change in Teacher Education



By GLEN C. SHINN
*Dr. Shinn is Past-President of the American Association for Agricultural Education and professor and head of the Department of Agricultural Education at Clemson University.*

Happy New Year! Now that the party's over, it is time to get on with 1993 resolutions — no easy task. A good filing system allows one to go back and find last year's resolutions. The disadvantage is that last year's list was a computer edited 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 Fall 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 agreed 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, agribusiness 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.***

As a professional family, we bought into the new venture and proceeded with national and state strategic planning coupled to tactical plans. The language of change filled our professional literature, contributing to the expectation of a revolution in agricultural education.

## Agriculture in the Secondary School

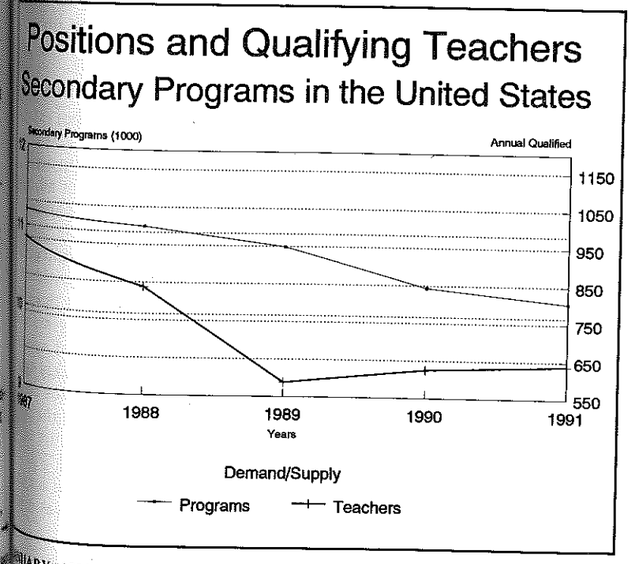
There have been some dramatic changes in secondary schools. Changes in the number of credits for high school graduation, the international nature of the curriculum, scheduling and delivery strategies, and an emphasis on Tech Prep are common across the United States. At the same time, there have been economic and social changes in the agricultural industry, a shift in the sequence of instruction, and a dramatic change in the experiences of the learner. The recommendations proposed by NAS resulted in a major shift in secondary agriculture programs; agricultural education is more than vocational agriculture, and vocational agriculture is more than farming and ranching. We may debate the rate of change, but we cannot argue the direction.

## Agricultural Teacher Education

*The Chronicle of Higher Education* continously describes the turbulent times that colleges and universities are experiencing. In an attempt to better understand and analyze the changes which have occurred that affect agricultural teacher education, a review was made of the national supply and demand of agriculture teachers (Camp & Oliver, 1988-1991), and eight universities with agricultural teacher education were interviewed regarding program change.

**Nature of Teacher Supply and Demand.** 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 1987. The number of students who qualified to teach fell to 638, while the number of secondary agriculture programs declined to 10,176 in 1991. 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 enters 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 51.4% 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 = 33.03). However, the percentage of agricultural education graduates who entered agribusiness rose from 7.5% in 1975 to 23% 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 professors assigned to the department and a significant number of departmental name changes. Most names now reflect a broad mission through the title, either directly or indirectly. The workload analysis indicated a substantial decrease in the time faculty 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 inservice activities for agriculture teachers. The nature of work in the department has changed significantly over the past five years to include more non-teacher education activities. This is largely due to changes in funding, student enrollment, and departmental reorganization.

***The NAS Committee recognized that only a portion of the graduates enters 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 changes. 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- →

tors. Instructors generally make up a very small portion of the university faculty.

**Nature of Curriculum.** There were few changes made within 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 by 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 initial certification process coupled with a decrease in the authority of accrediting agencies.

***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 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 ". . . created 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

*Many university programs have added an agricultural literacy dimension to the curriculum. Vonne Baker, a South Carolina elementary teacher, examines a bovine egg and prepares it for in vitro fertilization during the Agriculture in the Classroom Summer Institute held at Clemson University.*

. . . which will be reflected in the next catalog." This professor also reported that there has been a recognition in the role *about* agriculture as a part of the agricultural education philosophy within undergraduate courses.

Among the group, there was a general consensus that the NAS Report has had little direct impact upon the teacher education component. 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.

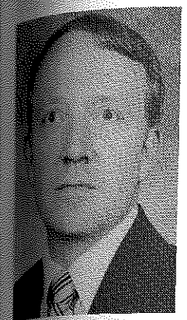
## Futuring Agricultural Education

Joel A. Barker (1992) describes examples of how our experiences cause us to ". . . see best what we are supposed to see . . . and to . . . see poorly, or not at all, that data that does not fit into our paradigm" (p. 91). Peter Drucker (1980) concluded that significant competitive advantage lies with those organizations and individuals who anticipate well in turbulent times. We can conclude that the past five years were a turbulent time in the history of agricultural education. We can also safely conclude that turbulence will continue to occur. The questions remain. Will the profession proactively shape the future or will the future shape the profession? Will Rogers warned that "even if you are on the right track, you'll get run over if you just sit there."





# Measuring The Magnitude and Impact of Change



By LARRY E. MILLER

*Dr. Miller is professor of agricultural education at The Ohio State University, Columbus.*

Interventions intrigue and invite the curious. The changes occurring in agricultural education pose some unique opportunities for evaluators and researchers to document and examine whether or not changes have an impact upon students and programs. Ultimately, questions will begin to come from policy makers and administrators: "So what?" "What differences have the changes made?"

## 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 commence around the interventions. One could also conceive 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, then cooperative, problem solving 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 article is not meant to present a list of what to research. Teachers, with applied research, and teacher educators, with more basic research, need to cooperately conceptualize the questions to ask in light of the research problems and work together. Thinking beyond our usual cadre of colleagues in comprising 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* agriculture expand, studies should be conducted to look at the effects of classroom instruction, laboratory instruction, the practice (SAE) 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 technological →

*(continued from page 12)*

**Selected References**

AAAE Directory (1992-93).

Barker, Joel A. (1992). **Future edge: discovering the new paradigms of success.** New York: William Morrow & Company, Inc.

Drucker, Peter (1980). **Managing in turbulent times.** New York: Harper & Row.

National Academy of Science, Committee on Agricultural Education in the Secondary Schools. (1988). **Understanding Agriculture: New directions for education.** Washington, D.C.: National Academy Press.

Oliver, J. Dale and Camp, William G. (1992). **A National Study of the Supply and Demand for Teachers of Agricultural Education in 1991** (Draft). Blacksburg: Virginia Polytechnic Institute and State University.

Oliver, J. Dale (1991). **A National Study of the Supply and Demand for Teachers of Agricultural Education in 1990.** Blacksburg: Virginia Polytechnic Institute and State University.

Camp, William G. and Oliver, J. Dale (1990). **A National Study of the Supply and Demand for Teachers of Agricultural Education in 1989.** Blacksburg: Virginia Polytechnic Institute and State University.

Camp, William G. and Esheverria, Roy A. (1989). **A National Study of the Supply and Demand for Teachers of Vocational Agriculture in 1988.** Blacksburg: Virginia Polytechnic Institute and State University. ■

systems to share instructional materials and software?

What should be the state administrative staffing patterns for education *in* and *about* agriculture?

What should be the models for delivering education *in* agriculture?

What preservice and inservice personnel development programs should be used for education *in* and *about* agriculture?

What achievement/competencies in science subject matter are actually developed through instruction in agriculture?

What systems should we establish to develop relationships with other professional groups such as science teachers, elementary teachers, administrators, and guidance counselors?

What roles should colleges of agriculture play in program improvement and staff development?

What linkages should we establish with the Cooperative Extension Service? 4-H? Volunteer organizations?

Why do some school districts offer vocational agriculture and others not?

Why does the level of success of programs vary so widely?

What can we do to integrate sciences into agricultural instruction?

How can agricultural concepts be incorporated into other school subjects?

How should we apply new technology?

What will be the effect of school reform movements on electives, extra-curricular activities, and co-curricular activities?

What responsibilities should Colleges of Agriculture have for the education *in* and *about* agriculture outside higher education?

As administrative and supervisory leadership diminishes at the federal and state level, from where should the leadership emerge for "total quality management" of the program?

## How Do We Do It?

These questions are only a sample of what might be posed. For those interested in research and evaluation, they pose some interesting areas of inquiry. To investigate many of them will call for the profession to invigorate its research programs and bring others into our research community.

Who will do the research and evaluation? Almost every college and university in the nation is experiencing financial cutbacks. Vacant positions in agricultural teacher education go unfilled. The state supervisory staffs are being decimated by cutbacks and restructuring. Monies for research are virtually nonexistent. Who, then, will conduct such studies, and how can they be financed and conducted?

The faculty in teacher education programs in most colleges and universities are so buried in teaching and service activities that the prospect of conducting investigations such as those proposed borders on the unrealistic. Teachers surely do not need additional duties, and the same can be said for state supervisors. Research proposed under federal legislation is earmarked for special populations and not documenting performance of ongoing efforts. The knowledge of agricultural education by most of those doing the research by "centers" is minimal, if not minuscule. So few universities have enough critical mass of faculty able to conduct inquiry that we would be well advised to concentrate research and evaluation in those that have such capability.

***The knowledge of agricultural education by most of those doing the research by "centers" is minimal, if not minuscule.***

Let us not fool ourselves. The policy makers and administrators will still want answers to questions about program impact, even if no specific persons are conducting such investigations. The only way it can be successfully achieved is through the the formation of coalitions among state supervisors, teacher educators, and teachers. Coalitions will call for strategic planning of the agenda and action planning for the investigations.

Scholarship, from a holistic view that research is just a small part of overall scholarship, also has an important role to play. Not all research has to be experimental inquiry. Teachers who are willing to write and document their successful experiences will contribute to the advancement of the profession by sharing with others and the literature base of the profession. The profession needs good thinkers as well as good researchers.

The profession must be innovative in seeking support for research. Most will come from outside vocational education. We must begin to promote the position that Colleges of Agriculture, and thus agricultural experiment stations, have in the future of agriculture. The total agribusiness industry has a vital stake in the

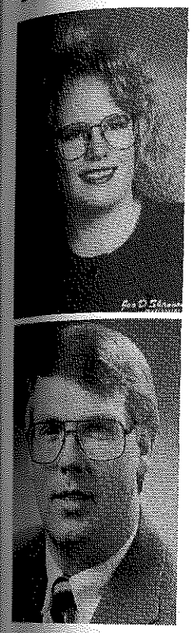
*(continued on page 18)*







# Agricultural Literacy: Where Do We Stand?



By Jennifer Lichte and Robert J. Birkenholz

*Ms. Lichte is a graduate student and Dr. Birkenholz is an associate professor of agricultural education at the University of Missouri-Columbia.*

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 our 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 recognizes that state and national representatives, who are elected by a 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:

> They must accept the fact that the public policy which governs and controls agriculture is policy they make, not policy which farmers make. They must be sufficiently aware of the revoluion in agriculture and its implication to approve policies which will sustain and improve agriculture and be fair to the people who engage in it, recognizing that in their blindness they could "kill the goose that laid the golden egg." (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, special interest 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 diagnostic laboratories and university research facilities 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 agriculture. According to Marian Pancoast (1992), an animal technician at Washington University in St. Louis:

> 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 little product labels that say, 'Saved through animal research.' Frequently they don't even know the role played by animals. (**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 →

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 1.516 trillion dollars. The total amount appropriated for the USDA was $59.4 billion (Budget for the United States Government, Fiscal Year 93, Part One, p. 29). Of the $59.4 billion budgeted for the USDA, $23.362 billion was directed toward the Food Stamp program. This figure represents 39% of the total budget appropriated for the USDA in fiscal year 1993. In contract, the Extension Service, ASCS, and the Farmers Home Administration (FmHA) combined, were appropriated only $1.860 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, pp. 269-303).

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 proper animal care.

## Where Do We Want To Be?

There is a need to make a conscientious 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 AMERICA 2000 plan, we must produce a "nation of learners." All learners, young and old, should be able to communicate and demonstrate competency in all areas of subject matter, including a basic knowledge of agriculture, food, and food production.

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 1991). Education about agriculture should begin in kindergarten and continue through high school graduation and beyond. We must also educate adult residents of this country to keep them informed of changes and expectations of agriculture in our nation. 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 educators in secondary schools have done an excellent job in teaching secondary school students. However, additional work is needed to teach elementary students and adults about agriculture.

Currently Food for America programs and Ag 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 used in areas already predominantly agriculturally based.

Commodity groups and general farm organizations should become involved in the education of students and adults. Specially designed programs can be presented to inform younger students about the use of farm products and the ethical treatment of animals. 4-H groups provide an excellent opportunity to teach young people about agriculture and animal care. Animal projects for many young people provide an opportunity to raise and properly care for animals.

State Departments of Agriculture should become involved by sponsoring "Agriculture Days" at urban schools. For example, the Missouri Department of Agriculture has started a program to increase awareness of agriculture among inner city youths. This program was held in October 1992 in St. Louis and focused on educating metropolitan students in the third and fourth grades. Commodity groups and the Missouri Farm Bureau presented short workshops on farm products and opportunities in agriculture.

University Extension centers should also play a role in educating adults in rural and urban areas through workshops, newsletters, and newspaper articles to help keep citizens aware of changes in agriculture and agricultural policies.

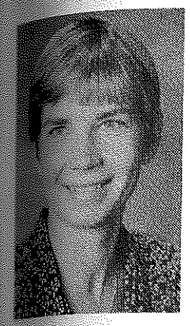
## Summary

Many changes are occurring in agriculture and education. Agricultural educators must keep the public informed of these changes and seek to achieve a level of



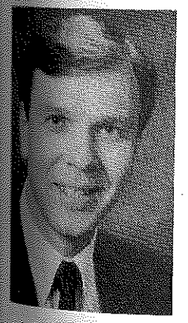


# Integrating Agriculture Into The Science Curriculum



By PAMELA M. EMERY and MARK P. LINDER

*Ms. Emery is a middle school science teacher at Fairfield-Suisun Unified School District and Science and Agriculture Project Coordinator for the California Foundation for Agriculture in the Classroom (CFAITC). Mr. Linder is Executive Director of CFAITC and Program Director for the California Farm Bureau Federation's agricultural education program.*



Pretending to reward my students for their commendable work the previous day, I handed each a Fig Newton. "Go ahead and eat," I said. "Then we'll begin our lesson." As the students munched, I explained we were continuing our lessons on mutualism — a relationship between organisms where both species benefit — using figs as an example.

The story of how figs grow unfolded as the students used paper props of figs and tiny wasps to act out the fig facts I shared:

- Because fig trees do not produce visible blooms like most fruit trees, pollination is unique.
- Speck-sized wasps mate inside the already growing fruit, where the flowers are, and pollinate the fruit.
- After mating, the female wasps leave the fig and enter other figs, trying to find appropriate places to lay their eggs.
- Meanwhile, the male wasps die, leaving their tiny carcasses inside the fig.

As the students listened to the story, they began to believe that with each bite of a fig, they were swallowing dead wasps. I had captured their attention! Now, for the rest of the story . . . Figs used in Fig Newtons nowadays are made from varieties that do not contain wasps. But, after hearing the story, the students will never forget what mutualism is and how genetic diversity, mutation, and biotechnology have made it possible to eat figs that do not contain the tiny insects!!

As a middle school science teacher in Fairfield, California, I constantly look for ways to capture my students' attention so they want to learn. In 1988 I attended the Summer Agricultural Institute for educators, which is sponsored by the California Foundation for Agriculture in the Classroom (CFAITC). This program gave me a whole new way to motivate my students. I could teach them about what rapidly growing children relate to — FOOD and CLOTHING! My enthusiasm for agricultural education is contagious, and this excitement is shared by my students.

## Changes in Science Education

Studies show that the key to a top-notch science program is allowing students to "construct" their own thoughts on a subject, test those thoughts through experimentation, then either confirm or alter their conceptions. Actually, this is a natural process for youngsters. Encouraging this process in the primary grades helps students learn to think for themselves as they mature.

In reponse to such findings, California's Board of Education redesigned its Science Framework, endorsing the concept of →

*(continued from page 16)*

agricultural literacy in the general public which will help them make wise decisions. Agricultural literacy is vital for the survival of the agricultural industry in this nation. Agricultural education must begin at an early age and continue throughout life. A strong and vibrant agricultural industry is equally dependent upon those who consume agricultural products, and the farmers who produce agricultural products. Agricultural educators should place as much emphasis on consumer education in the future as they have on vocational education in the past.

**References**

Congress of the United States of America. (1992). **Budget for the United States Government, Fiscal Year 1993.** Washington, DC, p. 29; 269-303.

United States Congress. (1991). **Educational Excellence Act of 1991.**

Hamlin, H.M. (1962). **Public school education in agriculture.** Danville, IL: The Interstate Printers and Publishers, Inc.

Mawby, R.G. (May, 1984). Agriculture colleges must take the lead in ending ignorance about farming, **The Chronicle of Higher Education,** p. 72.

Pancoast, Marian (1992). Article on animal research. **Columbia Tribune,** May, 1992.

Russell, E.B., McCracken, J.D., and Miller, W.W. (1990, March). Position statement on agricultural literacy. **The Agricultural Education Magazine, 62** (9), 13-14, 23. ■

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;
- incorporate critical thinking, cooperative learning, writing, literature, and other subject matter such as mathematics, social science, and health into their science curricula; and
- use a thematic approach to teaching science so that the knowledge gained by students is a smooth, continuous process from year to year.

I feel strongly that educators can easily and creatively achieve the goals of the Science Framework simply by incorporating agriculture into science education.

### 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 education and to meet the goals of the California Science Framework. Working with the SACP Advisory Committee and the Fairfield-Suisun Unified School District, I developed 13 pilot science units. Each "constructivist" unit contains a series of ready-to-use, hands-on lessons. The unique aspect of these units is that they add an agricultural twist to scientific topics already taught in the classroom. 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 scientific process as students identify a "mystery" seed, build soil models, read literature, and plant seeds;
- BASEBALL BATS - WHERE DO THEY COME FROM? — uses trees and bats to teach students about lumber production.

The idea of incorporating agricultural education 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 nutrient requirements of plants. The Foundation continues to develop lessons as funding becomes available.

What is so exciting about the Foundation's programs is that there are numerous resources available to make students think, question, experiment, and discover as they learn about America's #1 Industry — AGRICULTURE!

### Closing Comments From the Executive Director of CFAITC

Pam'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. Our AITC efforts began in 1980 when programs like *Farm Days,* with support from 4-H and FFA, brought farm animals to city schools. In 1986, the California Foundation for Agriculture in the Classroom was formed to generate additional financial support for expanding Ag in the Classroom activities. The Foundation's mission is to foster a greater public knowledge of the agricultural industry through public education activities and classroom incorporation of agricultural information. It seeks to enlighten students, educators and leaders in the public and private sectors about agriculture's vital, yet sometimes forgotten, role in American society and the effect all citizens have on agriculture's well-being. ■

## *Measuring the Magnitude . . .*

*(continued from page 14)*

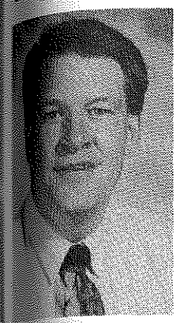
future of education *in* or *about* agriculture. A plethora of foundations and other agencies is interested in environmental and rural development issues. We must begin to embed our study in their agendas.

The impact of our programs upon the learners and ultimately upon the economy and quality of life of the people and communities we serve must be documented. Agriculture is a living and dynamic field that poses an exciting and invigorating medium to help people learn. Strategies must be developed to successfully document its effectiveness and contributions. ■





# Aquaculture — The Council Wins In Six



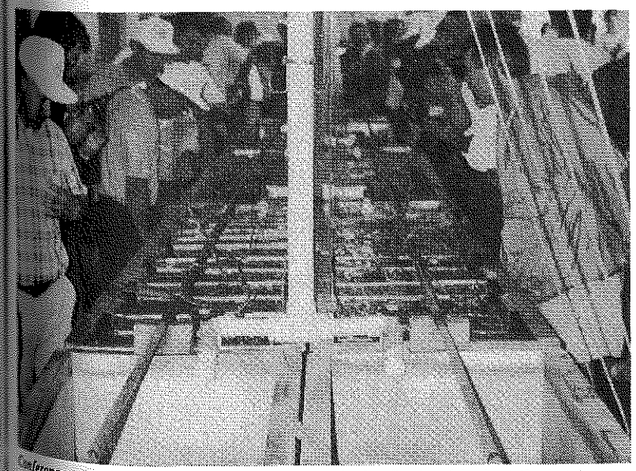
By MICHAEL WALSH
*Mr. Walsh is an agriculture teacher at Rochelle High School, Rochelle, IL.*

I 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 50 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 in order to get an aquaculture curriculum in each school. The Council provided most of the meals, transportation, and lodging costs for the bulk of the participants. In return, The Council expected each of the aquaculture teams to go back to their respective states and provide aquaculture inservice to the teachers in their state.

By the time the week concluded, state inservice 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.



*Conference participants on the warm water tour had a firsthand look at the hatchery building where hundreds of thousands of catfish eggs were hatching.*

### The Speeches

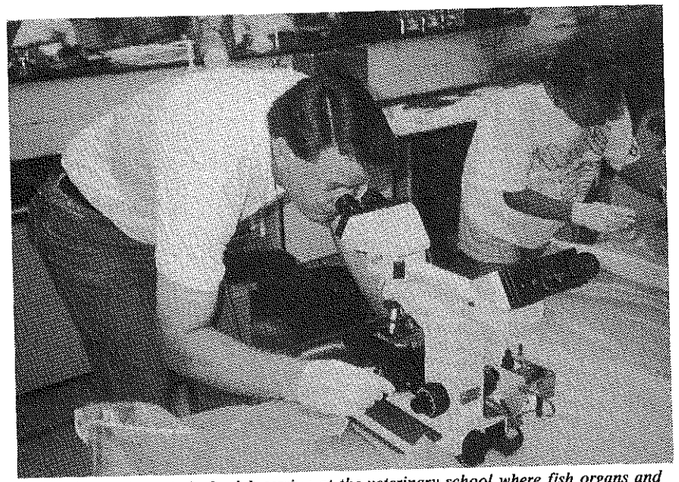
Among the dignitaries was the National FFA Advisor and Council Chairman, Dr. Larry Case. Dr. Case addressed the conference on several occasions. Ron Buckhalt and John Pope of The Council served as moderators, hosts, and masters of ceremonies. Key speakers were authors Dr. Jasper Lee of Mississippi State University and Dr. Wade Miller of Iowa State. These two gentlemen were responsible for writing most of the curriculum materials in Module I. They attempted to take the participants through a page by page preview of the Module I 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, he is in his late 60s and is currently running for re-election. His was one of the most down to earth, interesting and entertaining speeches of the conference; he told it like it is.

A speaker that handled the topic of feeds and feeding was Dr. Tom Ziegler, President of Zeigler Brothers Feeds. In a short period of time much information was disseminated on feeding in aquaculture. 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. Moss had several "volunteers" from the audience performing 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 Hinshaw, an extension aquaculturist at 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, recirulating 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 closer 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 in Greenville, 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 Greenville, 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 how the hatchery was a vital part of the farm ponds' success. Everyone was able to tour the fish barn on the campus of North Carolina State University. On the low-tech 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 curriculum materials was a detailed plan and 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 a lab 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 exercise. The second session at the veterinary school was a lecture and slide presentation of what is being done on a commercial scale in aquaculture.

One entire afternoon was devoted to specie specific technical sessions. Each participant selected two sessions to attend from among catfish and crawfish, salmonids, tilapia, striped bass, shrimp and redfish, clams and oysters, and tropicals and baitfish. There was a great deal of technical information and cultural data dispersed at these sessions. Slides, handouts, lectures and question and answer sessions were all a part of these specie specific topics.

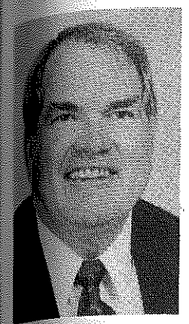
## The Council Pulled It Off

Without a doubt the National Aquaculture inservice training to infuse aquaculture into agricultural education was a tremendous success. As a classroom teacher I was first thrilled to be chosen to represent my state, and second overwhelmed at times with the great volumes of materials and tangibles that were given to us. The Council should be commended on a job well done. The conference has been over for less than two months, and I am already referring to the materials that I had received. This national workshop has almost guaranteed that there will be 50 state inservices held within in the next twelve months. Outstanding effort, thanks.





# SAE Programs



BY TOM HEFFERNAN
*Mr. Heffernan is an agriculture teacher at Pleasanton High School, Pleasanton, TX.*

SOE, SAE, SOEP, SAEP, 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 SAE because they assume financial responsibility. Students own the materials and are responsible for financing in everything that goes into the business. As they plan, implement, and manage the program it is essential that accurate records be kept so it can be determined 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 inclined toward livestock production. Beef cattle, peanuts, watermelons, coastal bermuda hay, and vegetables are the primary agricultural commodities grown in Atascosa County. Being located close to San Antonio also gives students an opportunity for entrepreneurial activities in sales and service, marketing, processing, and agricultural mechanics.

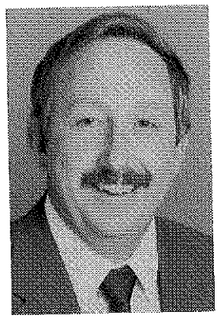
Many students are second and third generation FFA members and the entrepreneurship SAE fits very well. A very large percentage of the members come from rural backgrounds. Some live in town but still have rural ties. Many will not go back to the farm or ranch but still want to be involved with an SAE that will earn them a degree or award because their dad or grandad earned one. Tradition is on our side. And, yes, there is emphasis on the awards and degrees as 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 sell 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 and management can make. By experimenting with different situations, students have the opportunity to weigh their situation against one that is similar. Students will begin preparation for an SAE that will give them a sound 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 American 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.



By RAY V. HERREN
*Dr. Herren is associate professor of agricultural education at the University of Georgia, Athens.*

*Please address requests to:*
*Ray V. Herren*
*Associate Professor*
*Agricultural Education*
*629 Aderhold Hall*
*The University of Georgia,*
*Athens, GA 30602-7162*

The cornerstone of most instructional programs is a high quality, student-oriented text. Almost as important is the availability of good reference materials for the teacher. Traditionally, several publishing companies have provided us with student texts and teacher reference materials. In the past two to three years, several new texts have been published that are seeing widespread use in our classrooms. Also some of the older tried and tested references and texts have been updated to reflect the changes in our programs and agricultural industry.

Periodically *The Agricultural Education Magazine* will present a column on the review of new books. The reviews will hopefully be done by teachers who are currently in the profession. I currently have several texts and reference materials that are available for review. If you would like to review one of the books, send me your name and address and I will send the book. In return you will be asked to send back a short review of the book. The book will be yours to keep. The list of currently available books is as follows:

*Modern Agricultural Mechanics* (2nd Edition) 1990 by Burke and Wakeman
*Agricultural Mechanics: Fundamentals and Applications* (2nd Edition) 1992 by Cooper
*Mechanics in Agriculture* by Phipps and Reynolds 1990
*Modern Livestock and Poultry Production* (4th Edition) 1992 by Gillespie
*The Healthy Indoor Plant,* 1992 by Powell and Rossetti
*Careers in Agribusiness and Industry* (4th Edition) 1991 by Smith, Underwood, and Bultmann
*The Farm Management Handbook* (7th Edition) 1991 by Leuing, Klemme, and Mortenson
*Producing Farm Crops* (4th Edition) 1991 by Boone
*Poultry Science* (3rd Edition) 1992 by Ensminger
*The Stockman's Handbook* (7th Edition) by Ensminger
*Stockman's Handbook Digest,* 1992 by Ensminger

## *Agriscience & Technology*

Burton, L. DeVere. (1991). Albany, NY: Delmar Publishers.

Reviewed by:
Anglia Webb
Agriculture Teacher
Hahira
Middle School
Hahira, Georgia

This textbook delivers what it promises; it is packed with the latest agriscience and technological innovations. Chapter one is a brief historical look at our agricultural roots. The rest of the book is divided into 5 sections (17 chapters): Biotechnology, Technology, Food and Fiber, Energy and Power Technology, Computer Aided Management and Environmental Technology. Each chapter includes a list of objectives, vocabulary terms, career options, looking back section, and chapter review and learning activities.

The book has 326 pages, has a hard cover, and is compact. Mid-level and advanced level 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 graphs, pictures, 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 salt tolerance are all topics covered along with much, much more. Each chapter review has 8-10 thought-provoking questions. Most questions ask the student to describe, discuss, explain or assess a particular situation. There are no true-false, matching, or fill-in-the-blank questions. Also, each chapter has two learning activities, such as conducting a feed trial, conducting a mock trial, conducting tours/interviews, and making projects.

The questions and learning activities are structured to encourage students to use planning, organization, and thought. 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 to introduce your students to a wide variety of areas in the agriscience field. It covers a wide range of new technologies, many of which are currently on the cutting edge in the new era of agriculture.



## *From Then . . .*

*(continued from page 9)*

changed. The National FFA Organization operation 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 $1,930,528 in 1984 to $4,424,958 in 1991.

The Council's annual budget has grown from $53,000 in 1984 to $765,369 in 1992. In addition, the Council has currently approved $1,920,000 worth of projects for which funding is being sought through the National FFA Foundation. Currently, the Foundation has found $570,000 to partly fund several proposals. These figures do not include all of the funding which has been used to develop the aquacultural 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 industry. These agricultural issues relate to instruction in the development of the whole person. It is a sound educational approach that has served students and agriculture very well and represents our value-based approach stated in the Strategic Plan.

### What Does The Future Hold?

Without a doubt, more and faster 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 to refine and update its vision and the related processes for focusing energy and resources for accomplishing its mission. Priority issue identification in a fast-changing environment and the ability to respond to opportunities in a timely fashion while maintaining harmony in the agricultural education community are major challenges for the future. In short, how do we develop manageable and effective tactical 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. ■

## *Secondary Agricultural . . .*

*(continued from page 7)*

directed at secondary level agricultural education and stop attempting to satisfy the challenge by offering agriculture programs at the elementary and/or adult levels. Further, such programs must be different from the "in agriculture" offering in terms of content, expectations, and experiences utilized.

### Achieving the Challenges

What is required to move beyond the current status and achieve the challenges of the National Research Council Report? Perhaps the two biggest roadblocks to achievement are "tradition" and "convenience." It is essential that individuals with vision broad enough to make agricultural education at the secondary school level more than vocational agriculture be identified and given a leadership role. Such individuals must rise above tradition and possess a "why not" attitude. Further, such leaders need to reject the "cookie cutter" program mentality and recognize as equally legitimate programs those that deal with "about agriculture," those that deal with "in agriculture," and those that provide some aspects of each.

Teachers and leaders are needed who are not willing to reduce agricultural education to its lowest denominator, but who will raise it to its highest numerator, thus allowing agricultural education to serve an expanded clientele in an appropriate and challenging manner. The future of agricultural education is now and the challenges remain five years hence!

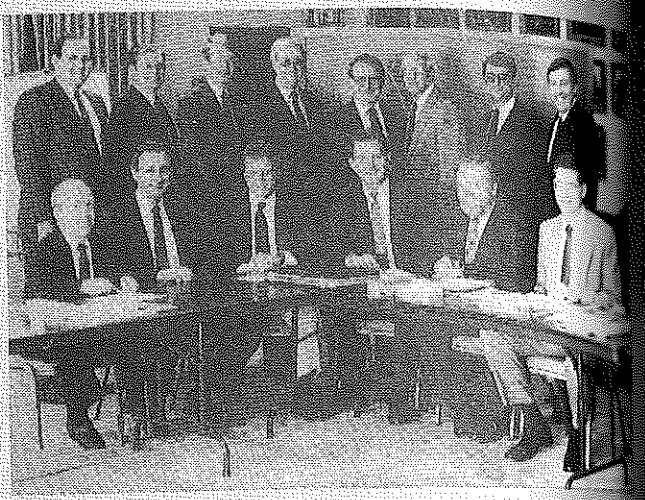
**References**

National Council for Agricultural Education (1990). **The stratetic plan for agricultural education: a national mobilization plan for revolutionary change in agricultural education.** Alexandria, VA: Author.

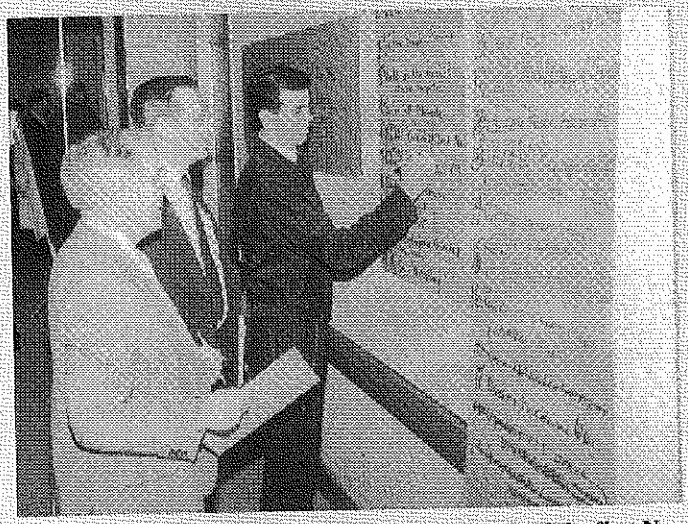
National Research Council. (1988). **Understanding agriculture: new directions for education.** Washington, DC: National Academy Press. ■

# 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 1989 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*

Lee, Jasper S. & Newman, Michael E., (1992) Interstate Publishers, Inc., Danville, IL

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, baitfish, 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 to be considered before you begin. Many inexpensive ways are described that could be used for SAE programs. Other plans are for the more production-oriented person who wishes to begin a business.

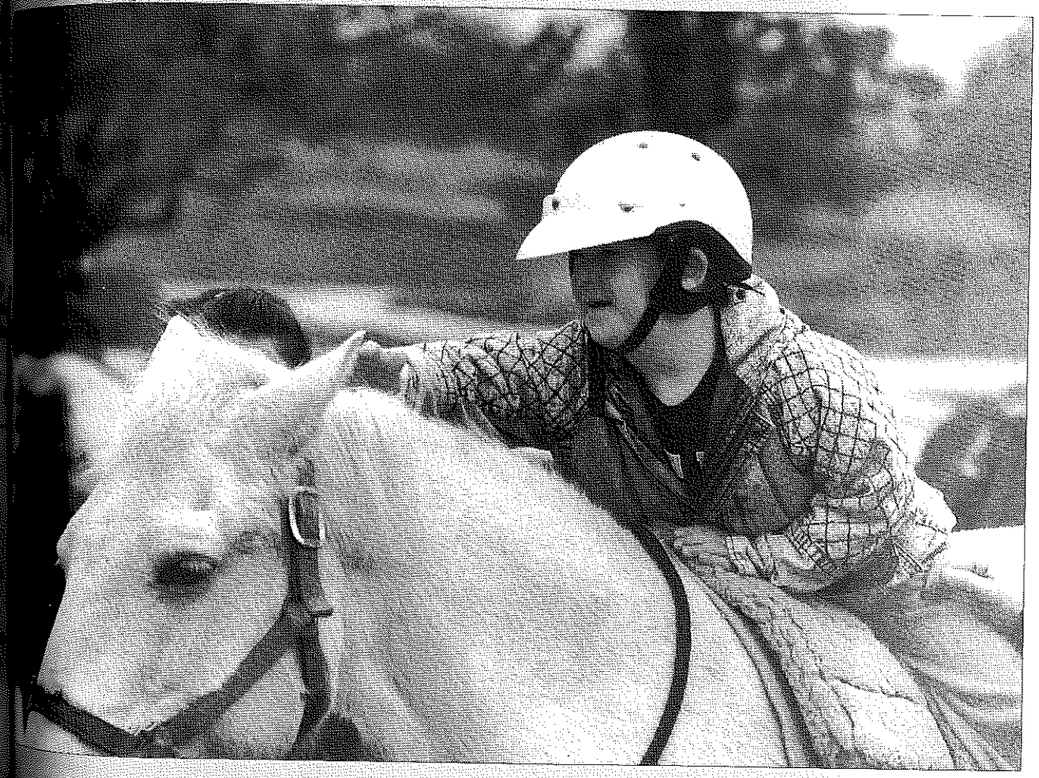
The only weak point of the book is the lack of detail in some parts. This vagueness is due to the immense amount of material that the book covers, however, and the authors do give specific examples to enable the reader to go beyond the book and ask questions to clarify the subjects. Since much of the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

Overall, this is an excellent book in my opinion. My plans are to include much of the new information I have gathered from the book in my classes. I also hope to employ some of the smaller, inexpensive 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 causes for problems observed. A diagram such as this helps to lay out the possibilities and makes it easier for teachers to develop a plan of attack (solution plan). For the sample problem 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.

Agricultural Education Magazine



Serving Individuals with Disabilities