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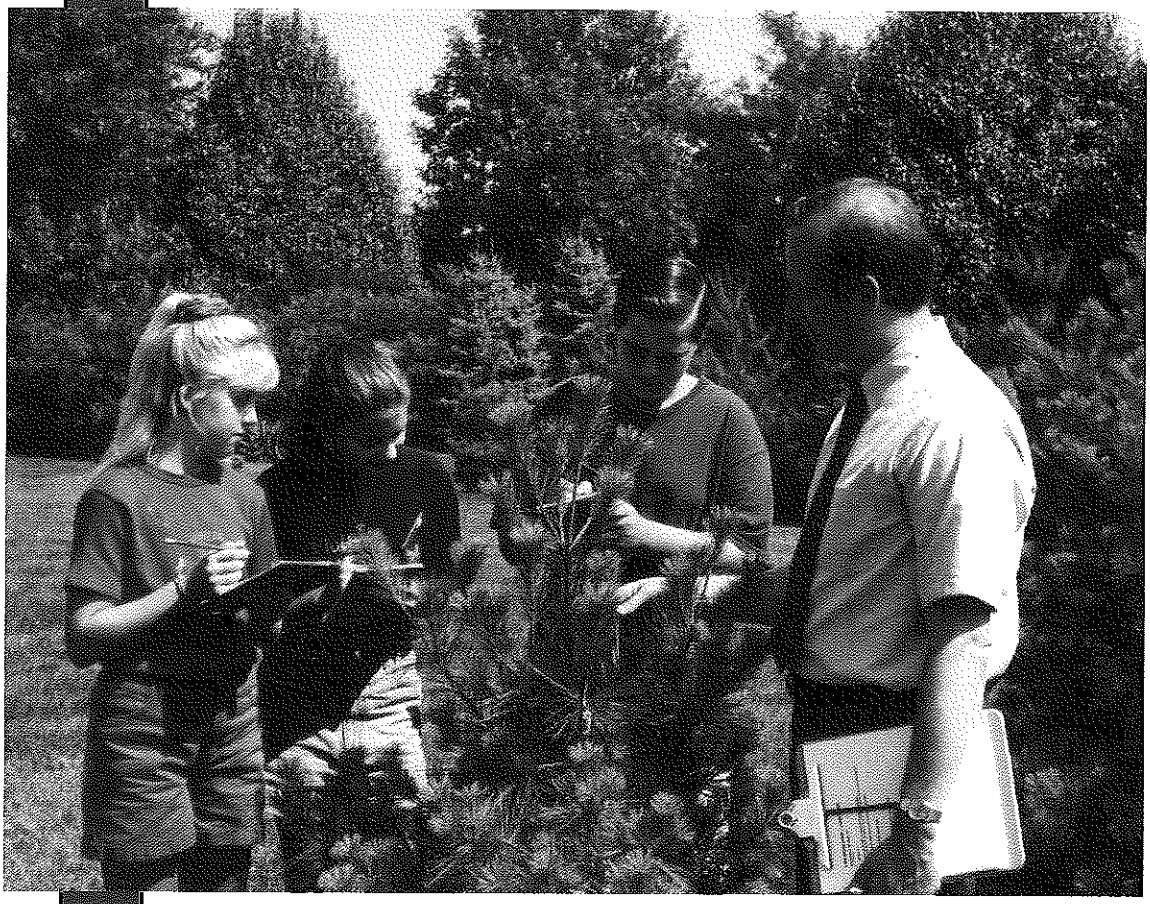

Junior High and Middle School Programs

Curriculum Goals and Activities
Resources for Teachers
Building the Case for Program Expansion

THE
AGRICULTURAL EDUCATION
MAGAZINE

Today's Science Tomorrow's Agriculture

October, 1994 Volume 67 Number 4

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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 the article unless one is on file with the Editor. Articles in The Magazine may be reproduced without permission.

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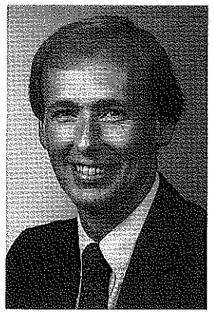
Working on a New Look



BY ED OSBORNE
Dr. Osborne is associate professor and program chair of agricultural education at the University of Illinois at Urbana-Champaign.

Notice anything different about this issue of *The Agricultural Education Magazine*? Thanks to the support of Interstate Publishers, Inc., for the first time ever, an issue of *The Magazine* has been printed with a four-color, slick copy cover. While this new look is temporary, the Editing-Managing Board is working to make this a permanent feature of our professional journal. The immediate goal is to obtain sponsorship for selected issues and eventually (as soon as financially feasible) use this cover design on a permanent basis.

Why a new look? Although a more attractive, contemporary cover design has been introduced in the past year, our journal is still out of step with other professional journals in education and most other fields. Many research-based journals, like the *Journal of Agricultural Education*, use a two-color format, much like the current look of *The Magazine*. But most journals aimed at practitioners in the field have a much more professional and colorful look. A four-color, slick cover will boost perceptions of our journal by all who see it, both those in agricultural education and those in other fields.

The other primary reason for seeking this new look is to boost the pride and interest of agricultural educators in *The Magazine*. With an annual subscription rate of about 4,200, *The Agricultural Education Magazine* is received by less than half of all middle school and high school agriculture teachers in the country. We can do better. The subscription rate was raised from $7 to $10 this past June to cover the increasing costs of publication. In fact, *The Magazine* has been operating at a slight loss each of the past two years, and an increase was needed to bring income and expenses back in balance. At the last Editing-Managing Board meeting in December, members considered several options for upgrading the quality of our journal in hopes of attracting more subscriptions from teachers. Improving/updating the appearance of *The Magazine* was generally accepted as one important strategy. The long-term goal is to move to a four-color cover, with enamel paper used throughout. But this type of improvement means a significant increase in publishing costs. Subscription rates would need to be raised to about $15 per year to cover these costs (still a bargain, compared to most other journals).

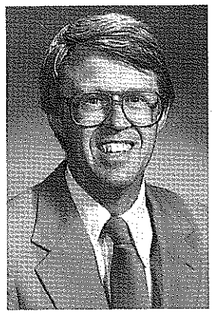
Your editor conducted a small-scale, non-random study of readership of *The Magazine* last year. Questionnaires were sent to secondary teachers in six states. Several useful findings were obtained: (1) slightly less than half of the subscribers favored increasing subscription rates to about $15 to cover the cost of upgrading the appearance of *The Magazine*; (2) a large majority of those who received *The Magazine* read it and rated it highly; (3) a significant percentage of non-subscribers had received *The Magazine* in the past; and (4) a surprising number of teachers reported that they were not aware of *The Magazine* and did not know how to subscribe. In this writer's opinion, these results suggest that the potential for significant increase in readership is good.

There appear to be only four avenues for bringing about a new look in our journal on a permanent basis. These include (1) raising subscription rates; (2) increasing the number of subscriptions; (3) obtaining outside support via advertisements; and (4) a combination of these strategies. The combination approach seems to hold the most merit and will likely be pursued by the Board in the next several years. There is real potential for significantly increasing the number of subscriptions. Chances are that if non-subscribers can be convinced to take *The Magazine* for one year, they will continue their subscription thereafter.

Another way to improve subscription interest in *The Magazine* is to include more articles written by teachers. After serving as editor for nearly three years, I am convinced that the best way to achieve this goal is to ask teacher educators or state supervisors to contact teachers in their states and ask them to prepare manuscripts for selected issues. Since the year's upcoming themes are published in the July issue each year, there is plenty of time to target an issue and prepare an article.

Unlike most other journals, *The Magazine* does not have paid staff in editorial, advertising, marketing, layout, design, art, and photography. The current quality of *The Magazine* is amazing, given the comparatively few dollars that are available to support its cost. *The Agricultural Education Magazine* has undergone some dramatic changes in the past few years. Agricultural educators at all levels need to work together to continue to improve our professional journal, doing what is necessary to make it more appealing to its readers, more professional in appearance, and more popular and desired by agricultural educators and others. ■

Why Middle School/ Junior High Programs?



BY JOHN HILLISON,
THEME EDITOR
Dr. Hillison is professor and coordinator of agricultural and extension education at Virginia Tech, Blacksburg, VA.

While high school and adult agricultural education programs have been around for a long time, even pre-dating the 1917 Smith-Hughes Act, middle/junior high school programs are relatively new to our profession. In recent years, the middle/junior high school program has become a popular one and represents the fastest growing area of agricultural education.

For example, Rossetti and McCaslin report that 30 states have over 50,000 middle/junior high school students enrolled in agricultural education programs. With such a large enrollment, agricultural educators have a wonderful opportunity to influence and begin the process of preparing more students than we ever have before for the field of agriculture. Such students will have the opportunity to have SAE experiences (both entrepreneurial and experiential) and to be members of the FFA. The complete program of agricultural education will be available to them.

It is important to keep in mind that the middle/junior high school program is not simply a smaller version of the high school program. It is equally true that middle/junior high school students are not simply smaller versions of high school students. Luft and Armenta give helpful suggestions on how to teach and work best with students who are in early adolescence. Such students bring several attributes to our programs. They have a natural curiosity, a lot of energy, are generally still excited about school, and interested in learning what is presented to them. On the other hand, agricultural educators must be cautious to continue the development of self-concept in students, who have just barely developed confidence in themselves.

Obviously, the middle/junior high school student must be taught something. That something comes from the curriculum which has been developed and is being developed for this level of the program. As a relatively new curriculum, we have much that can be done. We have few pre-conceived notions about what should be taught. With a clean slate to start with, we have the opportunity to integrate more science concepts into the middle/junior high school curriculum and to make it very contemporary. Rudd reminds us that teachers must believe the curriculum to be beneficial, must be knowledgeable of the curriculum, and must have a positive attitude about it in order for the curriculum to be adopted successfully. The results of his study have significant implications not only for teachers, but also for teacher educators and state supervisors. It behooves all agricultural educators to learn as much as possible about the middle/junior high school curriculum.

Once the curriculum has been adopted, it should be taught to accomplish its purpose.

> *"In recent years, the middle/junior high school program has become a popular one and represents the fastest growing area of agricultural education."*

Keeping the age and maturity level of the student in mind is always important. Middle/junior high school students need to have interest approaches and teaching methods that are appropriate for them. This age level of student is neither an elementary student, nor a high school student. They are something in between and have their own unique characteristics. Miller tells us that both teaching methods and instructional materials used with such students need to be carefully thought out, examined, and used appropriately. There are numerous instructional materials available, and more are being developed every day.

The FFA is an integral part of agricultural education and has been since 1928. This fact is equally true for senior high school programs and for middle/junior high school programs. Weaver and Cupp remind us that middle/junior high school FFA members should have an opportunity to participate in contests and other activities that are intended for them. Simply modifying senior level contests and activities does not always create the right situation. The middle/junior high school contests need to be curriculum driven and appropriate for early adolescents. Success for all is more important than winning for a few. The new middle/junior high school contests have provided an excellent opportunity to emphasize applied science.

The future for middle/junior high school programs looks very bright. We have the opportunity to add a most important clientele group to

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Developing Self-Concept Through Middle Level Agricultural Education

BY VERNON D. LUFT &
TONY ARMENTA
Dr. Luft is professor of occupational teacher education and Dr. Armenta is director of laboratory experiences in the College of Education at the University of Nevada, Reno.

Agricultural education programs are expanding to the middle or junior high school levels. With that expansion should come an understanding on the part of agriculture teachers of the child and current educational trends at the middle level. How many agriculture teachers are in tune with the physical and emotional needs of the middle level child, programs of the middle or junior high school, and current educational trends at that level?

Middle level children are going through drastic changes in terms of physical and intellectual development, which causes them to experience dramatic changes in self-concept. In fact, it has been suggested that the development of a positive self-concept may be the most important need for early adolescents (Van Hoose and Strahan, 1988). Agriculture teachers need to pay particular attention to helping build self-concept among their students at the middle level. The design of agricultural education programs provides an excellent means of building self-concept.

Middle School Structure

One of the most influential reports of the 1980s, *Turning Points: Preparing American Youth for the 21st Century*, gained national attention with its recommendations for middle level school reform (Allen, Splittgerber, & Manning; 1993). The report made a powerful impact because it not only addressed the school needs of young adolescents, but it evinced concern for their total lives—their health, welfare, self-esteem, and sense of purpose.

Agricultural education programs can contribute to each of these concerns. Let's look at some of the recommendations of *Turning Points* (1989) as outlined by Allen, et al. (1993), and discuss how agricultural education can contribute to accomplishing them.

Create small communities for learning. The organizational patterns to accomplish this are schools-within-schools, interdisciplinary team organization, and small group advising teams that ensure that each student is known well by at least one adult. In schools structured using the *Turning Points* recommendations, agriculture teachers can be a part of an interdisciplinary team and assure that students enrolled in agriculture are assigned together on a team. Teams consist of four or five core teachers (i.e., mathematics, science, language arts, social studies, and agriculture) working with about 100 students. Units in academic subjects could center around themes relating to agriculture and be of interest to agriculture students. Advising groups consist of about 25 students assigned to a teacher. The middle level agriculture/FFA members could be the agriculture teacher's advising group. Using interdisciplinary instruction and serving as an advisor of a group of students can be accomplished in traditional middle level structures as well.

Teach a core academic program. This involves emphasizing studies resulting in students who are literate, can think critically, lead healthy lives, behave ethically, and assume roles and responsibilities of citizenship. Agricultural education and FFA promote each of these attributes through various classroom, laboratory, or community activities. Instruction about agriculture helps students to become agriculturally literate. Learning activities which require problem solving and critical thinking can easily be worked into agriculture instruction. The FFA certainly promotes ethical behavior and citizenship.

Ensure success for all students. The middle level school should be a success-oriented school by eliminating tracking based on achievement testing, by establishing cooperative learning, and by stressing flexibility in instruction, organization, and schedules.

> *"Agriculture teachers need to pay particular attention to helping build self-concept among their students at the middle level. The design of agricultural education programs provides an excellent means of building self-concept."*

Agricultural education can contribute to the success of students by addressing the needs of all students through individualized projects and activities, using small group and cooperative learning techniques, engaging students in a variety of activities to address the varied learning styles of students, and providing learning activities that ensure success. Success builds confidence and self-esteem! →

"This involves emphasizing studies resulting in students who are literate, can think critically, lead healthy lives, behave ethically, and assume roles and responsibilities of citizenship. Agricultural education and FFA promote each of these attributes through various classroom, laboratory, or community activities."

Re-engage families in the education of young adolescents. Schools should seek to promote parental involvement in the school and support of the child's learning at home and at school. Parents can get involved in agricultural education programs by assisting with field trips, serving as guest speakers, and assisting with FFA activities. Agriculture teachers can seek and encourage parental support and involvement while making home visits, something that is not new to our program.

Connect schools with communities. Middle level schools must build relationships with the total community to provide students with opportunities for community service and to allow students to interact with businesses and community agencies. Because most middle level students are too young for employment, agricultural education can help schools connect with the business community through job exploration and shadowing programs. Students can get involved in community service projects through the FFA. Community agriculturalists should be invited to speak to classes about their businesses and careers.

Developing Self-Concept

As noted previously, developing self-concept is important to students in the middle level grades. This section will explain a few ways to develop self-concept through agricultural education.

A person's level of self-esteem is a product of the individual's sense of self-worth and their sense of efficacy, that is, their level of confidence to handle life's challenges (Branden, 1987). Agricultural educators have unique opportunities to help students develop their sense of self-worth and increase their level of efficacy. Students can become involved in school, home, and community agricultural projects that help them recognize their worthiness. A sense of accomplishing something for the school, FFA organization, and the individual leads to gaining self-worth. Reinforcement of students' worth on the part of teachers is also helpful.

One of the ways to build self-esteem is to take risks. If middle school agricultural educators were to borrow activities from high school FFA programs, they could be catalysts for building self-esteem. For example, speeches and demonstrations are important activities in the FFA. Middle level teachers could structure class activities in ways that foster verbal expression. It might be scary for the adolescent at first, but the simple act of risking to speak in front of others, regardless of how proficient, builds on the efficacy of the individual. What is first deemed to be risky will become routine for some as experience is gained. When that happens, self-esteem is developed.

Giving students responsibility is another way of building their self-concept, sending the message that they are trustworthy and competent. Every effort should be made to put students into situations in which they are given responsibility. Examples might include serving as a committee chair or member, leading a small group class activity, or giving responsibility through the supervised agricultural experience program.

Another way to build a sense of self-concept is for people to pay attention to that part of a person's life called the area of contribution (Jeffers, 1987). The area of contribution encompasses the times when people give something back to society, usually through some type of volunteerism. It could involve volunteer activities, such as serving meals to the homeless, helping rebuild a house for a family who has lost everything due to a natural disaster, or perhaps reading to a blind person.

When students are actively involved in helping others less fortunate than themselves, they not only learn that they don't have it so bad, but it also boosts their self-esteem. When students are helping others, they realize that they really are important in the larger scheme of things, particularly to those being helped. Middle level agriculture students have opportunities to make a difference, not only in the lives of others, but in their own sense of self-worth. Agricultural educators need to look for ways to foster the "contribution" part of students' lives.

Integrity is another key component, perhaps the key, in one's sense of self-concept. If individuals are not true to their own value system, they lessen the view of themselves in their own eyes. This is the essence of low self-esteem. Instead, individuals must be diligent in living up to high levels of integrity. One of the best ways to influence young people to live lives of integrity is to be a role model for them. An agricultural educator who has high integrity will provide the type of model students need to experience to develop their own high standards. This, in turn, will result in a higher level of self-concept for the student.

When agricultural educators design programs for middle level students, they should not only consider the subject matter, but also the student's physical and mental development.

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What's in the Bag of Tricks?

BY DARLA L. MILLER

Ms. Miller is a graduate student in agricultural education at Virginia Tech, Blacksburg, VA.

It is imperative for middle school agriculture teachers, by the very nature of the students they teach, to have access to an extensive and diverse "bag of tricks" from which to pull teaching and curriculum materials. As teachers scan through the varied sources of instructional materials catalogs available in the field, they must ask themselves, "Will this be appropriate for the age level of the students I am teaching?" Those of us with middle school experience know that sometimes deciding what to teach is often not as hard as finding the appropriate materials with which to teach.

In the past five years, the middle school agriscience program has slowly caught the attention of many publishing companies, and as a result, new materials appropriate for the middle school level are becoming available.

Before discussing available materials on the market, it is important to take time to highlight some important characteristics and requirements of quality middle school curriculum materials. *A Program Planning Guide for Agriscience and Technology Education* (1994) proposes the following criteria be adhered to when selecting materials: (a) possesses technically accurate content; (b) shows and uses current technology; (c) is validly supported by site field testing; (d) is prepared by credible writers in or associated with the profession; (e) uses appropriate instructional methods; and, (f) provides supporting materials for activities or references. Additionally, the curriculum materials should be well-organized and readable for the appropriate grade level. And most importantly, the materials should promote the practical application of content by providing integration of subjects with varied hands-on activities.

Probably the most well-known middle school curriculum materials presently available on a commercial basis are *Exploring Agriculture in America*, developed by the Instructional Materials Laboratory, and *Farm and Food Bytes*, a computer-enhanced series produced by Agri-Education, Inc. *Exploring Agriculture in America* is a general curriculum that provides a varied content of agriculture for students in seventh and eighth grades. Unit titles include: Agriculture in America, Animals in Society, Plants in the Environment, Products from Agriculture, Environment and Resource Conservation, Pet Care, Lawn and Equipment, and Home Environmental Management. The layout for the lessons is easy to follow, being designed around a question and answer format. Each lesson comes complete with reproducible sheets for transparencies and activities to enhance the lesson. In addition, evaluation materials are provided at the completion of each unit. A student reference book is provided to supplement instruction.

Though the Farm and Food Bytes series is more appropriately designed for elementary level students (4th, 5th, and 6th grades), there are uses for middle school students. Its integration with agriculture and language arts, science, math, and social studies assists with illustrating the importance of agriculture in everyone's life. Besides being computer-driven, a student study manual and teacher's guide provides additional learning opportunities. The series includes the following titles available in both Apple and IBM-compatible software: *Introduction to Agriculture, Soil and Water Conservation,* and *Animal Agriculture.*

In the past year several appropriate textbooks have become available to use for instruction or as references in the classroom. An excellent general agriculture textbook is *Agriscience in Our Lives*. For integration of science concepts, *Introduction to World Agriscience and Technology* provides an excellent, science-based approach to agriculture. The text is supplemented with a workbook designed to incorporate practical applications into the classroom. Several other textbooks, even though geared more for the high school student, also provide excellent reference materials for the middle school teacher. They are *Agriscience Fundamentals and Applications, Agriscience Technology, Managing Our Natural Resources,* and *Agricultural Mechanics: Fundamentals and Applications*. A recently published text titled *Biological Science Applications in Agriculture* provides an excellent section on conducting experiments and summarizing and reporting skills. The bulk of the book provides procedures for hands-on experiments related to biological applications. Hopefully, most middle school teachers have already found these treasures and are using them in the classroom.

To discuss all of the supplemental material available, such as audiovisual, experimental kits, games, software, and so forth would be an enormous task. However, always reliable are distributors such as Carolina Biological and Boreal Science Kit for integrative-type materials. →

Virginia is currently in the final stages of completing instructional units for its middle school agriscience curriculum. Formed around *Agriscience Education for the Middle School*, the competency-based instructional guide provides teaching lessons for the sixth, seventh, and eighth grade agriscience program. Table 1 highlights the unit topics included in Virginia's program.

Table 1

Recommended Topics of Instruction for Virginia's Middle School Agriscience Program

INTRODUCTION TO AGRISCIENCE (8002)
GRADE 6 (18 weeks or less)

DUTY AREAS

Duty Area 0	Becoming Oriented to Agriscience
Duty Area 1	Describing Agriculture
Duty Area 2	Introducing Plant and Animal Life Cycles
Duty Area 3	Communicating with Others
Duty Area 4	Introducing Agricultural Mechanics Technology
Duty Area 5	Introducing Ecology and Conservation
Duty Area 6	Identifying Career Opportunities in Agriculture

AGRISCIENCE EXPLORATION (8003)
GRADE 7 (18 weeks)

DUTY AREAS

Duty Area 0	Becoming Oriented to Agriscience Exploration
Duty Area 1	Recognizing Importance of Agriculture/ Agriscience
Duty Area 2	Conserving Natural Resources
Duty Area 3	Exploring Research in Agriculture
Duty Area 4	Exploring Plant Science
Duty Area 5	Exploring Animal Science
Duty Area 6	Introducing Basic Laboratory Skills
Duty Area 7	Encouraging Personal Development

AGRISCIENCE AND TECHNOLOGY (8004)
GRADE 8 (18 or 36 weeks)

DUTY AREAS

Duty Area 0	Becoming Oriented to Agriscience Technology
Duty Area 1	Identifying New Technologies in Agriculture/Agriscience
Duty Area 2	Understanding International Agriculture
Duty Area 3	Understanding Agricultural Businesses
Duty Area 4	Using Microcomputers in Agriculture
Duty Area 5	Introducing Supervised Agricultural Experiences
Duty Area 6	Using Hand Tools and Agricultural Power Equipment
Duty Area 7	Developing Leadership Skills
Duty Area 8	Experimenting in Agriculture

Each lesson has been field-tested in a middle school setting by members of the curriculum's advisory council. The units lack a student guide, but they do provide an extensive list of reference materials, some of which have already been identified previously in this article. In the development of these materials, the writers found the following sources to be the most beneficial at presenting information on a level understandable to the middle school learner: *Food For America, Ag in the Classroom, Farm Facts by the American Farm Bureau, Virginia 4-H Food and Fiber Systems* curriculum, the *FFA Student Handbook,* the *50 Things You Can Do to Save the Earth series, The Amazing Paper Book, The Amazing Dirt Book, The Amazing Apple Book, The Amazing Egg Book* and *The Amazing Milk Book* series.

Various published and unpublished materials emphasize how American agriculture fits into the global picture. A publication distributed from the Ohio Agricultural Curriculum Materials Service titled *Activities to Enhance Student Understanding of International Agriculture* provides some exciting instructional devices in helping students comprehend the importance of agriculture across the world. The Supervised Agricultural Experience (SAE) program is an anchoring part of the agriscience curriculum. Two innovative middle school teachers have created a "spin-off" from Virginia's SAE record book to help middle school students conduct a science-oriented SAE program. The books are designed to provide students the opportunity to learn record-keeping skills by tracking the progress and expenditures of their agriscience project or activity.

There is an abundant amount of material available for middle school teaching. Knowing where to look to fill your "bag of tricks" is the key. Hopefully, the information provided here will make it easier to gather new and innovative materials for classroom use. However, remember, the best materials are those that yield success for the teacher and the student. As a result, many teachers have developed their own curriculum materials, but without the available resources, they have not been able to distribute them on a wide basis.

In the near future, look for new middle school curriculum materials from Interstate Publishers, Inc., and the National Council for Agricultural Education. And get ready to fill your "bag of tricks." Middle school agriscience has caught the attention of many.

Listed below are the curriculum materials mentioned in the article and source of availability.

Addison-Wesley Publishing Company, Inc.
The Amazing Paper Book
The Amazing Dirt Book
The Amazing Apple Book
The Amazing Egg Book
The Amazing Milk Book

Agri-Education, Inc.
Farm and Food Bytes: Introduction to Agriculture
Farm and Food Bytes: Soil and Water Conservation
Farm and Food Bytes: Animal Agriculture

American Farm Bureau Association
Farm Facts

Delmar Publishers Inc.
Agriscience Fundamentals and Applications
Agriscience Technology
Managing Our Natural Resources
Agricultural Mechanics: Fundamentals and Applications

Interstate Publishers, Inc.
Agriscience in Our Lives
Introduction to World Agriscience and Technology
Biological Science Applications in Agriculture

Instructional Materials Laboratory
Exploring Agriculture in America

National FFA Organization
Food For America
FFA Student Handbook

Ohio Agricultural Education Curriculum Materials Service
Activities to Enhance Student Understanding of International Agriculture

The Earth Works Group
50 Things You Can Do to Save the Earth

Virginia Cooperative Extension Service
Virginia 4-H Food and Fiber Systems

Virginia Farm Bureau
Ag in the Classroom (Distributors vary by state)

Virginia Vocational Curriculum and Resource Center
Agriscience Education for the Middle School

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Lee, J.S. (1994). *Program Planning Guide for Agriscience and Technology Education.* Danville, IL: Interstate Publishers, Inc. ■

Why Middle School . . .

(continued from page 4)

the ones we are presently serving. Considering the total number of students in schools at this level and how many are currently enrolled in the agricultural education program, there is tremendous growth potential. Our profession will have a very strong program for years to come. At the rate the middle/junior high school program is being developed and with its graduates soon attending high school, it is very possible that such students will expect similar, contemporary-based curricula and FFA activities. It is very possible that middle/junior high school agriculture programs will be exerting influence on senior high school programs in the near future through their matriculating students. Middle/junior high school students are here, and they are here to stay. ■

Developing Self-Concept . . .

(continued from page 5)

The middle level of education should concentrate heavily on developing students' self-concept. Agricultural education programs can contribute tremendously in fulfilling this need.

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Carnegie Council on Adolescent Development. (1989). *Turning points: Preparing American youth for the 21st century.* Washington, D.C.: Author.

Jeffers, S. (1987). *Feel the fear and do it anyway.* New York: Ballantine Books.

Van Hoose, J. and Strahan, D. (1988). *Young adolescent development and school practices: Promoting harmony.* Columbus, OH: National Middle School Association. ■

Coming In December . . .
Environmental Education Programs

Agriscience Contests Benefit Middle School FFA Members

BY TONIA CUPP & SALLY WEAVER

Ms. Cupp is an agriculture teacher at North Fork Middle School, Mt. Jackson, VA. Ms. Weaver is an agriculture teacher at Beverly Manor Middle School in Staunton, VA.

What is the lifeline of high school FFA chapters? With the increase in middle school FFA chapters around the nation, the answer to this question is the middle school FFA member. But what are state and national FFA organizations doing to meet the needs of the middle school FFA member? By providing state-level middle school FFA contests, Virginia is leading the way to increased membership, member enthusiasm, and increased involvement.

The development of middle school agriscience courses in Virginia in the early 1990s placed more emphasis on agricultural science, diversity, and literacy. The junior-level FFA competitions were no longer in line with the new instruction being implemented in the middle schools. Therefore, these high school FFA contests were not meeting the needs of middle school FFA members. A group of middle school FFA advisors designed contests which were curriculum driven to meet the needs of these specific members. By studying the newly developed state curriculum, five basic topics were found to be commonly taught to middle school agriscience students. These areas included: FFA, mechanics and technology, plant science, animal science, and agricultural products.

The five contests developed from the curriculum were: Agriscience Technology Mechanics Contest, Companion/Small Animal Contest, FFA Quiz Bowl, Food and Fiber Contest, and the Plant, Seed and Fruit Identification Contest. The sixth event is an Agriscience Fair.

For each contest, general rules include that teams consist of a maximum of four members. The best three individual scores are totaled to determine the team score. All four members are eligible for individual awards. A middle school awards ceremony is held during the state FFA convention. First, second, and third place teams are recognized, with plaques and trophies given to the first place team. Agriscience Fair winners also receive a plaque for the chapter and a trophy for the individual. Ribbons are awarded to all participants. Individual scores are ranked according to a blue, red, and white rating so that every member comes away a winner!

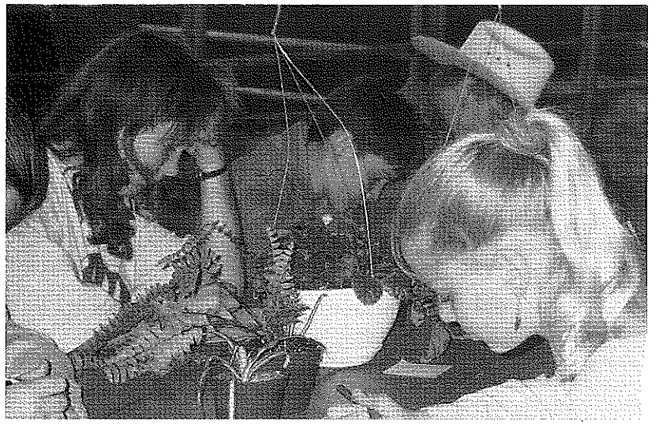
The **Agriscience Technology Mechanics Contest**, a team event, is comprised of five different components. This contest challenges students to explain and demonstrate safety practices, read and interpret directions, identify and use basic woodworking hand tools, select and use measuring devices, and perform measuring skills.

The five components of the test are: written test, tool identification, measuring skills, woodworking skills, and evaluation of a project. The written test is composed of 25 multiple choice questions covering items from general safety to use of hand and portable power equipment. Students are required to identify 25 tools from a list of 57 tools commonly used in a middle school agriscience department. Students also have to perform 10 different measuring skills. Examples include calculating board feet and measuring length, width, and thickness of various pieces of lumber using a variety of measuring devices. To complete the woodworking skill, members are given a simple plan and necessary equipment. Students must demonstrate safety skills and proper usage of tools while performing the skills. In the evaluation section, students are given a plan and four different projects that they must evaluate according to said plan. They must take into consideration correct angles, sanding, finishing, and general appearance of the projects given.

This contest is a challenge and uses skills and information taught at the middle school level. Members enjoy the challenge and type of competition that it allows. Resources used for this contest include *Agriculture Mechanics: Fundamentals and Applications* by Cooper and *Modern Agricultural Mechanics* by Burke and Wakeman.

The **Companion/Small Animal Contest** demonstrates contestants' knowledge about key scientific terms used in the animal industry, new technologies in animal science, ethical →

Tool identification is part of the Agriscience Technology Mechanics Contest.



Students are responsible for identifying common plants in the Plant, Seed, and Fruit Identification Contest.

concerns related to animal welfare, and career opportunities in animal science. Companion/small animals include dogs, cats, fish, game birds, rabbits, and small mammals, such as hamsters and guinea pigs.

The contest consists of two sections: identification of representative samples from three categories—feeds, breeds, and equipment—and a written test containing 50 questions concerning care, nutrition, animal welfare, new technologies, careers, and terminology. Resources used in the contest are *Agriscience Fundamentals and Applications*, Units 12 and 29, and the video "Responsible Pet Ownership," which can be secured through Modern Talking Pictures.

The **FFA Quiz Bowl Contest** is a team event designed to develop an understanding of the FFA. This contest helps students develop oral communication skills, identify effective leadership traits, develop social skills, and identify opportunities for leadership development through participation in FFA activities. Participants need to know all aspects of the FFA. Questions are asked about history, current events, important names, facts about the FFA, FFA officers, symbols, the emblem, membership, medals, and awards. Students also need to be knowledgeable about parliamentary procedure, use of the FFA jacket, conventions, conferences, and items from the New Horizons magazine.

The Quiz Bowl Contest consists of two parts: a written test and oral competition. The written test is made up of 50 multiple choice and true/false questions. The oral competition consists of a round of 25 factual questions. Three to four members per team operate in a head-to-head competition using buzzers in the oral quiz bowl. Team members are not allowed to confer with each other when answering. Correct answers are worth 10 points, while incorrect answers are penalized 5 points.

Students may study for the event by reading the current *FFA Manual* and *Student FFA Handbook, New Horizons* magazine (issues from the current school year), and other state publications.

Due to the number of teams participating, single elimination is required. Teams that did not win their round are allowed to stay and watch the next rounds. At the Virginia FFA convention, the final oral round of competition is slated to be held during the Middle School Awards Ceremony.

The **Food and Fiber Contest** provides students the opportunity to explore the meat animal industry, to identify key scientific terms used in the animal industry, to determine the importance of animals to agriculture, and to determine the economic importance of agricultural crops.

There are five parts to the contest: wood and dairy products identification (10 items each); retail meat identification (10 items); class placement—contestants place one class each of eggs and retail meat cuts; identification of food and fiber product sources (the 20 items presented include paint, leather items, carpeting, heart valves, and others); and a written test based on food and fiber processing, marketing animal products, and food science.

Possible resources used in the contest are *Agriscience Fundamentals and Applications, Food For America Presenters Guide, Farm and Food Bytes*, Ag in the Classroom and "Myths and Facts of Animal Agriculture" from the Animal Industry Foundation.

Egg grading is part of the Food and Fiber Contest.

The **Plant, Seed, and Fruit Identification Contest** introduces FFA members to new technologies in plant science, as well as the many career opportunities. Activities of the contest include identification, planting and transplanting, proper watering, and fertilization of plants.

The contest is divided into four sections: plant, seed, fruit and equipment identification; skill demonstration; written test; and problem solving activities. For identification, the student must identify a total of 30 different specimens

(continued on page 19)

Putting Theory into Practice: Adopting Middle School Agriscience Curricula

BY RICK D. RUDD

Dr. Rudd is an assistant professor in the Department of Agricultural Education and Communications at the University of Florida, Gainesville.

As all teachers quickly learn, time is a valuable commodity. We need time to prepare for class, time to evaluate students, time to teach, and time to update ourselves in our chosen field of expertise. With all of these demands on our time, we are reluctant to add items to our personal agenda. Such is often the case with adopting new curricula for use in our classrooms.

We can all remember our first year of teaching. Many of us do not know exactly how we made it through the intense schedule of learning how the school district operates and balancing classroom teaching with FFA and other activities, as well as having a personal life.

A major part of a beginning teacher's time is spent developing lessons and designing or adopting a curriculum for the program. Once this task is completed, many teachers will rely on this work for a substantial part of their career. How many teachers do you know who still use the lesson plans they developed while student teaching? The problem with this method of curriculum development is that the curriculum quickly becomes outdated.

State of the Middle School Curriculum

In 1988, the National Research Council reported that curricula in agricultural education have not kept up with the agricultural industry. This problem is of particular interest to middle school agricultural educators. Although middle school programs have been in existence since 1925 (Hillison, 1993), only recently have middle school programs shown substantial growth on a national scale.

The appropriate curriculum for middle school agricultural education is still under construction (Hansen & Miller, 1988). In many cases the lack of a middle school curriculum has led to the adjustment of high school curricula to the middle school level. Many problems exist when attempting to make middle school programs fit a pre-existing secondary school model. Frick (1992) asserted that middle school programs are not intended to be small-scale high school programs, but unique educational experiences tailored to the needs of middle school children.

Adopting New Curricula

Given the lack of sufficient curriculum in middle school agricultural education, it is likely that many programs are using a curriculum that does not meet the needs of the students. Fortunately, curriculum development efforts are underway. Unfortunately, convincing teachers to adopt a new curriculum can be difficult.

Virginia middle school agriculture teachers were presented with a new curriculum for their programs in 1990. Work with those teachers has revealed several characteristics that influence a teacher's decision to spend the time and effort necessary to adopt a new curriculum.

As stated earlier, time is a valuable asset for teachers. In order for us to add a new task to our schedules, we must be certain of its merits. A set of circumstances that are conducive to transformation must exist if teachers are to change from their current curriculum to a new curriculum. Three teacher characteristics stand out as being pivotal to the decision to adopt a new curriculum. They are (1) teachers' knowledge of the curriculum, (2) teachers' expectations of the curriculum, and (3) teachers' attitudes toward the curriculum (Rudd, 1994).

Expectations

Teachers are more likely to adopt a new curriculum if they perceive it to be more beneficial to students than the curriculum currently in place. Teachers tend to be concerned about the effects of educational change on their students (Darr, 1985).

If middle school agriculture teachers are expected to adopt a new curriculum that meets the needs of their students, they must be shown the benefits of that new curriculum above and beyond the benefits of the existing curriculum. A selling point for the Virginia middle school curriculum was the tie to agriscience and the perceived benefits of offering an agriscience curriculum over the use of a re-vamped, high school, production agriculture curriculum.

Attitude

If teachers like the curriculum, they will use it. It is difficult to isolate techniques for developing positive attitudes. Since attitudes are developed over time and are complicated constructs, there are no easy solutions to influencing attitude development. However, educational professionals need to be concerned with developing positive attitudes among agricultural educators to facilitate the adoption of →

middle school curricula. Some plausible techniques would include education at the graduate and undergraduate levels for prospective teachers of agriculture, inservice activities in middle school curricula, and leaders in the field exhibiting a positive attitude toward middle school curriculum efforts. Since it is easier to develop an attitude than to change one, the agricultural education profession should be especially concerned with fostering a positive attitude among young professionals in agricultural education.

Knowledge

Teachers must know the curriculum content before they can teach it. House (1981) suggested that teachers tend to teach what they know best.

Teacher knowledge of curriculum is a strong predictor of curriculum adoption. Too often curricular innovations are presented to teachers in the field with little or no preparation for implementation. Professionals in agricultural education and the industry of agriculture need to be concerned with the state of curriculum innovations. If teachers are expected to adopt a curriculum that contains material they were not prepared to teach with no additional training, the curriculum innovations will surely fail. If the field of agriculture desires new professionals that can contribute to the food and fiber industry, it must be willing to support agricultural education in the implementation of curriculum innovations.

The agricultural industry is a vast, relatively untapped resource that can provide agricultural education with support for curriculum development. For example, the Virginia Agricultural Council supported middle school agriscience curriculum development efforts with a $24,000 two-year project. The program provided

> *"The appropriate curriculum for middle school agricultural education is still under construction (Hansen & Miller, 1988). In many cases the lack of a middle school curriculum has led to the adjustment of high school curricula to the middle school level."*

instructional units that are available to middle school agriculture teachers. It is likely that similar support can be found throughout the country for curriculum development, if educators would make the effort to seek it.

Summary and Conclusion

Teachers make the final curriculum decisions in their classrooms. Time is a resource that is often in demand. For middle school curriculum innovations to be effective, they must be adopted and used by teachers.

> *"Given the lack of sufficient curriculum in middle school agricultural education, it is likely that many programs are using a curriculum that does not meet the needs of the students."*

Although middle school agriculture programs have existed for many years, there has been little effort to develop curricula suited for the middle school student. As curriculum development efforts increase, teachers will be faced with a decision to adopt new curricula or continue teaching what they have always taught. Teachers will be more likely to adopt a new curriculum if they perceive it will benefit the students, if they like it, and if they know how to teach it.

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A Status Report of Middle and Junior High Agricultural Education and FFA Programs

BY ROSEMARIE ROSSETTI & N.L. MCCASLIN

Dr. Rossetti is an assistant professor and Dr. McCaslin is an associate professor of agricultural education at The Ohio State University, Columbus, OH.

Middle schools provide an excellent opportunity for agricultural education and FFA to help in the development of early adolescents. McCaslin, Dohner, Hughes and Drier (1993) stated that, "A curriculum designed to assist early adolescents in exploring life's work has much to offer middle school students as they consider potential career and life roles on the road to becoming mature and responsible adults" (p. 35).

A constitutional amendment was passed at the 1988 National FFA Convention that officially allowed middle school membership in the National FFA Organization. Many states had previously been serving these youth in agricultural education and the FFA. In 1992, nearly 20% of the nation's agriculture instructors taught one or more junior high or middle school courses in agriculture (Camp, 1994).

Enrollment in agricultural education programs and membership in the National FFA Organization peaked in the 1976-77 school year with 697,499 students enrolled in secondary programs and 509,735 students as members in the FFA (National Research Council, 1988). From 1977 to 1991, membership in the FFA experienced a continual decline. During this 14-year period, membership dropped 25% (National FFA Organization, 1990-91). Membership started to increase beginning in 1991-92. At that time there were 401,574 members, and in 1992-93 there were 417,462 members (B. Slack, personal communication, October 14, 1993).

With an interest in increasing enrollment in secondary agriculture programs and membership in the National FFA Organization, many agricultural educators turned their attention to exploratory agriculture programs in the middle grades (grades 6,7, and 8). These educators assumed that if enrollment in the middle grades increased, enrollment in the secondary programs would also increase. It was also assumed that increased enrollment in agriculture programs would increase membership in the National FFA Organization.

Rossetti, Padilla, and McCaslin (1992) surveyed all state FFA executive secretaries in the United States, the District of Columbia, Puerto Rico and the Virgin Islands to establish national baseline information concerning middle and junior high school enrollment in agricultural education and membership in the National FFA Organization. This study was funded by the National FFA Organization. Information was received from 52 of the 53 executive secretaries in the spring of 1991.

Thirty states reported having middle or junior high school agriculture programs. Nineteen states reported having FFA members in middle or junior high schools. There were 52,968 middle or junior high school students reported as being enrolled in agriculture programs. Thirty-three percent (17,722) were enrolled in the FFA. Table 1 shows the total enrollment and membership in the sixth, seventh and eighth grades.

The first sixth grade middle school program was reported to have started in Mississippi in 1974. Vermont reported the first seventh grade program as starting in 1930. The first eighth grade program was reported to have started in Virginia in 1926. Students were admitted into the FFA in sixth grade in Mississippi as early as 1974. Louisiana was the first state to accept seventh-graders into the FFA in 1960. Virginia was the first state to admit eighth-graders into the FFA in 1926. →

Table 1

Enrollment in Programs

Grade Level	Schools with Agriculture	Students in Agriculture	Ave. Program Length	Schools with FFA	Students in FFA
6th	21	924	9 wks.	15	124
7th	514	22,056	20 wks.	378	4,730
8th	1,012	29,988	21 wks.	853	12,868
Total	1,547	52,968	17 wks.	1,246	17,722

Fourteen secretaries indicated that their state had a core curriculum for middle and junior high school agriculture programs. Twenty-three topics were listed in the core curricula by the secretaries. The top six topics were: plant science, career exploration, agricultural literacy, animal science, conservation, and mathematics.

Seventeen state FFA executive secretaries (37%) indicated that they provided state level competition for middle and junior high school FFA members. This competition was held in conjunction with the high school FFA events in 14 states. Six states indicated that competition was separate from high school FFA events. Four states indicated that competition included the sixth grade, while 14 states said the competition included the seventh grade, and 17 states said the competition included the eighth grade. The top five competitions included: creed, livestock judging, public speaking, crops, and all contests.

Fourteen secretaries believed there should not be national FFA competition, while seven secretaries encouraged national competition. Four secretaries recommended the following national contests: quiz bowl, essay contests, creed speaking, and tool and material identification.

Twelve secretaries indicated the middle or junior high school FFA chapters were organized separately from the high school chapters. Twenty-four indicated the chapters were joint chapters with the high school FFA. Twenty-seven states required FFA dues for middle or junior high school FFA members. The average dues payment was $3.98, with a range from 50¢ to $8.

Seven secretaries indicated they used federal funds to finance agricultural education programs in middle and junior high schools. Fourteen indicated they used state funds, and 31 indicated they used local funds. Twelve secretaries indicated that they used agricultural education funds to finance programs, while 10 secretaries said that they used secondary education funds, and four secretaries said they used foundation funds.

The major encourager of middle or junior high school enrollment was the agriculture instructor. Other encouragers included: FFA activities and competitions, livestock exhibits in junior shows, and the program itself.

Twenty secretaries cited the school systems and policies as major barriers to enrollment. Examples included no state and/or federal funds, lack of staff to expand programs into the junior high level, lack of available programs, a significant shortage of certified agriculture teachers, and schools that do not want to expand their agriculture staff to accommodate middle school programs.

According to the secretaries, the major student benefit of middle and junior high school agriculture programs is improved agricultural literacy. Others cited increased enrollment at the high school level, participation in FFA activities, leadership development and training, reduced student drop-out rate, increased student self-esteem, and career awareness.

Most secretaries reported there were no disadvantages to having students enroll in middle school programs. A few secretaries cited student burn-out as a disadvantage.

Secretaries reported that the major benefit to the state for having middle and junior high level agriculture programs was increased enrollment. They also indicated that the population was becoming better educated as a result.

This study was the first national baseline study of the enrollment in middle and junior high school agriculture programs and membership in the FFA. Based on the results, the following recommendations were offered:

1. Since the FFA is an intracurricular activity, the National FFA Organization, the U.S. Department of Education, and the U.S. Department of Agriculture should encourage development of a middle and/or junior high school agricultural education core curricula that include its mission, content, goals and objectives, learning strategies, articulation with other agriculture programs, and funding options prior to expanding FFA programs to that level.

2. Agricultural educators at the state and local levels should consider these findings when working with boards of education, administrators, and guidance counselors in establishing policies (e.g., curriculum, funding, scheduling, staffing) that are conducive to middle and junior high school agricultural education and FFA programs.

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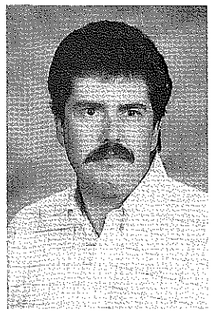
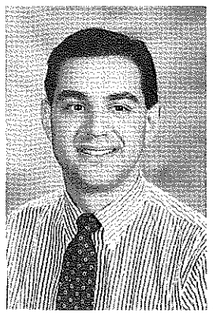
Teaming Science and Agriculture: An Innovative Approach to Teaching Exploratory Agriculture





BY JEFF FOSTER & NEIL KNOBLOCH

Mr. Foster (top) is a science teacher and Mr. Knobloch is an agriculture teacher at Mid-Prairie Junior High School, Kalona, IA.

Agriculture is constantly changing, and we must be ready to change with it. Agricultural education can apply the concepts that the agricultural industry is practicing. For example, conventional farmers worked the soil to prepare the seedbed with several passes across the field. Now, farmers are using no-till, or they are combining technologies to prepare the seedbed, plant the seed, and apply the herbicide in one pass. Agriculture teachers can combine their efforts with science teachers and cultivate the minds of students in one class. Here is an interesting story about how we successfully developed and implemented a new, exciting, agriscience team-teaching concept. We would like to explain the evolution of the new Ag-Life Science course, outline the course, illustrate a day in the class, highlight the benefits of integrating agriculture and science, and share recommendations for team teaching exploratory agriscience.

THE EVOLUTION OF AG-LIFE SCIENCE

The idea of integrating life science and exploratory agriculture into one course developed between the two of us on the trip home from Des Moines after we attended an Agri-Science/Bottle Biology workshop. We discovered answers to achieving our goals by working together as a team in developing a course which integrates science and agricultural concepts.

The 7th grade science curriculum includes three 12-week courses on Earth, Life, and Physical Sciences. We realized that the science concepts taught in the Life Science course could be very easily integrated with agriculture. The three basic parameters of the Life Science course are: plants, cold-blooded animals, and warm-blooded animals. On the agricultural side, there are seven career areas of agriculture that need to be introduced as exploratory agriculture. These seven areas are: production, processing, mechanics, sales and services, horticulture, forestry, and natural resources and conservation.

The challenge was to get both teachers to team teach the goals of both life science and exploratory agriculture. We accomplished this challenge by writing a course guide for the new Ag-Life Science course which directed us to see that our goals could be achieved. The curriculum guide includes the science and agricultural objectives for each week-long unit. In addition, hands-on activities and investigations are listed to apply science and agricultural concepts that are relevant to students' lives.

THE COURSE GUIDE

The course is briefly outlined into 12 week-long units and the agriculture (A) and science (S) objectives that are taught:

I. Course Introduction and Study Skills for Ag-Life Science

- A. Seven career areas of agriculture
- S. Studying skills for science

II. Plants - Seeds

- A. Importance of corn products and co-products
- S. Germination and types of seeds

III. Plants - Seedlings

- A. Importance of soybeans and products made from soybeans
- S. Parts and functions of roots, stems, and leaves. Photosynthesis.

IV. Plants - Reproduction

- A. The horticultural industry and careers
- S. Anatomy and function of the flower

V. Plants - Types of Plants

- A. Careers in forestry
- S. Deciduous and coniferous trees

VI. Cold-Blooded Animals - Earthworms, Spiders, and Insects

- A. Earthworms and Soil Conservation
- S. Parts, functions, and environment

VII. Cold-Blooded Animals - Reptiles and Amphibians

- A. Integrated Pest Management
- S. Parts, functions, life cycles, and adaptations

VIII. Cold-Blooded Animals - Fish, Mollusks, and Crustaceans

- A. Aquaculture
- S. Parts, functions, life cycles, and environments (fresh and saltwater)

IX. Warm-Blooded Animals - Birds

- A. Poultry Production (Egg & Turkey)
- S. Parts, functions, life cycles, adaptations, and identification

X. Warm-Blooded Animals - Vertebrates and Invertebrates

- A. Beef Production/Processing and International Agriculture
- S. Structures and functions of vertebrates and invertebrates

XI. Warm-Blooded Animals - Domestic and Wild Animals

- A. Breeding and genetics of the pork industry
- S. Life cycles, environments, and domestication

XII. Warm-Blooded Animals - Integrated Ecosystems

- A. Future of agriculture and agricultural education
- S. Integration of agriculture and science in the ecosystem

The basic schedule of the Ag-Life Science course is as follows:

- Mondays: Mr. Knobloch and Mr. Foster introduce explanatory agricultural concepts and careers.
- Tuesdays, Wednesdays, and Thursdays: Mr. Foster teaches life science concepts and relates them to agricultural situations.
- Fridays: Mr. Knobloch and Mr. Foster work together in teaching the students to prove the agricultural science concepts valid through activities and investigations.

This is a flexible schedule that enables students to have the best understanding of each principle. This flexibility also allows the instructors to work more effectively in keeping the students interested.

WALKING THE TALK

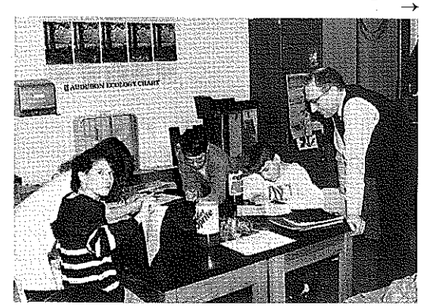
Further, we feel that we are walking the talk of voices in education. Dr. Robert Martin, professor in the Agricultural Education and Studies Department at Iowa State University, visited the Ag-Life Science class and mentioned that "there has been much talk about science and agriculture working together, but very few teachers are doing it. I am impressed to see how well this is working." Therefore, we took a thoroughly discussed concept, and to our knowledge, achieved what very few schools in Iowa have even attempted to do—team teach science and agricultural concepts.

We have adjusted teaching exploratory agriculture and science methods to the FFA motto: "Learning to do, and doing to learn." We have both learned a lot by doing this innovative teaching concept, and we will continue to team teach science and agriculture using creative teaching techniques so that the students learn more about both subjects.

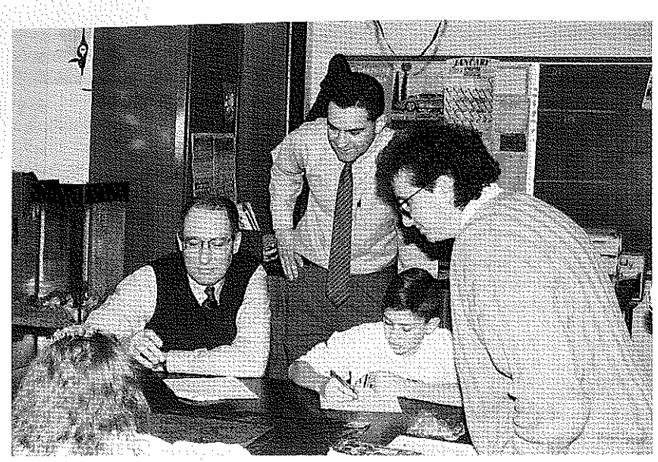
A DAY IN THE AG-LIFE SCIENCE COURSE

Let's spend a day in class. We have selected one day as an example of how the class is taught. Mr. Foster, the science teacher, says, "Good morning, class," and the class responds with an enthusiastic, "Good morning, Mr. Foster." He takes roll and collects the homework assignment. Mr. Knobloch, the agriculture teacher, touches on the lighter side by telling a story as an interest approach about the young son who was told to go disk the corn field. The lad was out in the field about one hour and his dad decided to go check on his progress. Dad noticed a strange thing. His son had made several rounds but not once with the disk in the ground. The dad stopped the son and asked him what he was doing. The son said, "I am waking up the earthworms." Dad said, "Waking up the earthworms?" The son said, "Yeah. My agriculture teacher told me that earthworms do not like disking. I was waking them up so that they had a chance to get away."

Mr. Knobloch continues to discuss the different types of tillage systems and directs the class to show how the science concepts apply to an agricultural situation. He leads to the objective of soil conservation methods, such as leaving residue on the surface by using a no-till system. Mr. Knobloch sets up the investigation by asking the question, "What can farmers and agri-→



Student investigations are a common feature of the new Ag-Life Science course.



Team teaching in the Ag-Life Science course has improved instruction in both agriculture and science.

culturists do to make an environment that earthworms like so that the earthworms till the soil for the farmer?" During Mr. Knobloch's discussion, Mr. Foster sets up the experiment stations. Then, Mr. Foster explains the experiment stations to the students:

1. The Light/Dark Station - The earthworms are placed on a shadow line. One-half of the earthworm is in the shadow under a box and the other half of the earthworm is in the light. The students observe the direction the earthworms will travel.

2. The Wet/Dry Station - The earthworms are placed on a wet and dry paper towel. The students observe the direction the earthworms will travel and answer questions in the study guide.

3. The Hot/Cold Station - The earthworms are placed on a hot, damp cloth towel and a cold, damp cloth towel. The students observe the responses of the earthworms.

4. The Touch Station - The students lightly touch the earthworms on the head, mid-section, and tail with a sharp pencil. They observe the responses of the earthworm.

5. The I.D. Station - The students draw the earthworm and identify the external body parts of the earthworms.

6. The Rollover Station - The students place the earthworm on its back. They observe and record the results of the earthworm's reaction.

7. The Sand & Soil Station - The students place the earthworms on sand and potting soil. They observe the movement of the earthworms.

Mr. Foster clearly establishes that the seven groups of students (each group representing one of the seven areas of agriculture) will rotate from station to station. He directs them to think about the science concepts that he wants them to learn from this activity. The students are given directions and the lab guide. The lab guide has questions about earthworms and their role in agriculture. The guide helps the students apply the science concepts and serves as a study guide and an evaluation of the lab. The students rotate from station to station following the lab procedures and answering the questions, while the teachers move around the room assisting the students and answering their questions. The students close the day by helping with clean-up under the direction of the two teachers. The students hand in their lab guide, and Mr. Foster summarizes the main concepts of the activity.

THE BENEFITS AND CHALLENGES

We feel that this new course is very successful because we see the students learning and applying science and agricultural concepts. Some of the benefits we have experienced in team teaching Ag-Life Science include:

• A simple concept of one area of agriculture can be expanded and explored by the science teacher.

• Science concepts are applied to everyday life, since agriculture literally exists everywhere in everyone's life.

• Community examples are highlighted and incorporated into the instruction because of the unique rural/urban environment of Kalona (2,000 population) and Iowa City (50,000 population).

• Urban, university resources, such as the University of Iowa and Iowa State University, are used in the course, which shows the interconnectiveness of science and agricultural concepts.

• Easier scheduling of exploratory agriculture by the principal and counselor because there is not another class added to the schedule.

• The synergistic effect allows the instructors to cover more material more effectively than if they were teaching two separate courses.

• The instructors motivate each other to be better teachers, and their enthusiasm energizes the entire class.

• The students are highly motivated because more views are presented.

• The "hands-on" activities are easier to conduct because more hands make the work lighter.

• Grading and observations are easier, and there are more ways to evaluate the students.

• Students retain the concepts better because parents have expressed that their children talk about what they learn in Ag-Life Science.

• The agriculture teacher gets to work with seventh-graders and teaches them about agricultural careers; this should help recruit students to take agriculture courses. →

We admit that our team-teaching experience has been very positive; however, we will also admit that there can be frustrations, such as:

• finding time to plan between the two teachers;

• fitting in all the activities;

• adopting a workable grading and evaluation plan that would be agreeable by both instructors;

• reporting the grades of the course to show that it is an agricultural science course on the report card and student record.

RECOMMENDATIONS

We strongly recommend that teachers who are interested in seeing students excited about science and agriculture try the team teaching approach. In summary, we make the following recommendations to teachers who are interested in team teaching agriculture and science:

• The agriculture and science teachers should share their course goals, content, and schedules.

• The teachers should team teach a short unit to compare the compatibility of teachers and course objectives that are to be taught.

• Select a course that the agriculture teacher can apply science concepts to agricultural situations.

• The teachers should be flexible and openly communicate their ideas.

• Develop a course guide that will direct the new course.

• Document everything you teach—successes and failures. Record every idea.

• Review the total course periodically. Revise the course guide using documentation.

• Keep your principal informed about your course. Give him/her a copy of your course guide.

• Publicize the class in the media.

• Allow the students to have ownership of the class.

CONCLUSION

We feel that Ag-Life Science has enriched our teaching and curricula. This new course has bolstered students' enthusiasm and community involvement. Further, it has given our school a sense of place in the community that did not exist before this course was taught. Moreover, the class has brought the agriculture and science departments into a working relationship that gives teachers and students new avenues to explore and integrate agriculture and science in their lives. As agriculture continues to change, agriculture teachers need to look for new ways to teach students with other teachers. ■

Agriscience Contests . . .

(continued from page 11)

from the categories listed. Pictures or actual specimens may be used. A common list of plants, seeds, fruit, and equipment is used to secure specimens. Members also demonstrate one of the following skills: transplanting, taking leaf/stem cuttings, or sowing seeds. The written test consists of 25 multiple choice questions concerning the following topics: plant care, identification of plant parts, methods of reproduction, garden designs, site selection, new technologies, and careers. The problem solving component consists of five activities, such as fertilizer analysis, reading a label, using appropriate horticultural tools, measuring skills, plant care, problems and diagnosis, and pesticide safety.

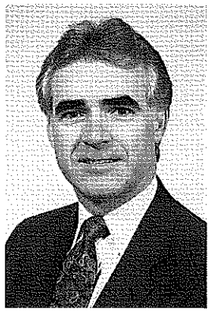
References used for this contest include: *Agriscience Fundamentals and Applications, Introductory Horticulture,* NASCO catalog, various seed catalogs and plant identification charts, and *Reader's Digest Illustrated Guide to Gardening Crop Production.*

The sixth event for middle school FFA members is an Agriscience Fair. Seventh and eighth grades compete in the fair. Each grade level is separated into two divisions: educational and experimental. Chapters may enter one project in each division for a total of four entries. This gives members an opportunity to expand their applications of science in many areas of agriculture. The projects are placed according to their strength in the following areas: agriculture and scientific thought, creativity, understanding, clarity, dramatic value, and technical skill.

References for this fair may include: *The Agricultural Education Magazine* (August 1991), *Scholastic Journal* (Dec. 6, 1991), and Search—*A Research Guide for Science Fairs,* by Connie Wolfe.

These six curriculum-driven competitions are the first steps to motivating and exciting middle school members to participate in FFA activities. They are a much-needed learning opportunity for a group of individuals which has been neglected thus far. Middle school members are the customers we need to serve if our current FFA programs are to continue. This may be the key that opens the door to stronger, more active high school FFA chapters! ■

Building the Case for Middle Grade Agricultural Education



BY MATTHEW HUGHES &
R. KIRBY BARRICK

Dr. Hughes is vocational education supervisor, Ohio Department of Education, Columbus, OH. Dr. Barrick is professor and chair of the Department of Agricultural Education at The Ohio State University, Columbus.

Career education is making a comeback. The entire education community seems to be re-discovering what vocational educators have long known: Students need learning experiences that help them make sound career-related decisions. Information in this article may help teachers and administrators in making decisions for providing these learning experiences at the middle grade (grades six through eight) level.

Interest in agricultural education and other career-oriented programs in the middle grades has increased in recent years, partly due to educational reform efforts and to an expanded knowledge base related to early adolescent education. This article examines aspects of school reform legislation, as well as characteristics of early adolescents (ages 10 to 14 years), which underscore the importance of career-oriented middle grade programs. Because state-level decision makers have an integral part in implementing and maintaining these programs, related perceptions and opinions of state vocational education directors and supervisors are also examined. Included is information on how agricultural education "fills the bill" at the middle grade level.

School Reform Legislation

In many ways, the recently passed School-To-Work Opportunities Act builds the case for career-oriented programs at the middle grade level. By requiring students to elect a "career major" prior to the beginning of the eleventh grade, the act reinforces the notion that students need to begin preparing for their life's work before reaching the high school grades. Certainly, the career major aspect of the act emphasizes the need for career-oriented programs long before the junior year of high school.

In many states, vocational education has played an important role in preparing young students to make career decisions through various courses at the middle grade level. Based on current school-to-work transition legislation, it seems reasonable that vocational education and agricultural education can play an even greater role in the future.

Characteristics of Early Adolescents

Middle grade curricula and student activities should be based on the needs and characteristics of early adolescents. An important task of the middle grade school is to help students develop social skills (Lipsitz, 1984). The curriculum should also provide early adolescents an understanding of various career roles in society (Carnegie Council on Adolescent Development, 1989). However, Sale (1979) emphasized that job training is not an appropriate function of the middle grades. Through the middle grade curriculum, early adolescents should have opportunities to learn through hands-on experiences, acquire commonly-used practical skills, and develop personal values (Kindred, Wolotkiewicz, Mickelson, Copenlin, & Dyson, 1976; Curtiss & Bidwell, 1977; Greenberg & Hunter, 1982.)

> *". . . students need to begin preparing for their life's work before reaching the high school grades."*

Student organizations play important roles in the education of early adolescents. These organizations allow students to explore personal and career interests, as well as develop social and leadership skills (Kindred et al., 1976; Miller, 1988). Because of wide variations in the development levels among early adolescents, it has been recommended that participation in activities take precedence over competition in the middle grades (Brazee & Smalley, 1982). Recognizing potential problems associated with middle grade competitive activities, Rossetti, Padilla, and McCaslin (1992) recommended that the National FFA Organization not develop contests at the national level for its middle grade members.

What Do State-Level Administrators Think?

A recent study examined the perceptions and opinions of state vocational education directors and agricultural education supervisors related to aspects of career-oriented programs in the middle grades (Barrick & Hughes, 1994). The study revealed that middle grade agriculture programs are offered in over two-thirds of the states, with the primary focus being on career exploration.

The following conclusions are based on → results of the study. State vocational directors and supervisors believe that:

1. career-oriented courses can help middle grade students understand the world of work;
2. career-oriented courses can contribute to the intellectual development of middle grade students;
3. career-oriented courses can help middle grade students develop their personal values;
4. career-oriented courses can help students be better prepared to make sound career-related decisions;
5. career-oriented courses can contribute to the social development of middle grade students;
6. the concepts of career-oriented education should be incorporated throughout the middle grade curriculum, as well as taught in courses specific to the career area; and
7. team competition is preferable to individual competition as a part of middle grade vocational student organization activities.

> *"Middle grade curricula and student activities should be based on the needs and characteristics of early adolescents. Through the middle grade curriculum, early adolescents should have opportunities to learn through hands-on experiences, acquire commonly used practical skills, and develop personal values."*

How Can Agricultural Education Fill the Bill in the Middle Grades?

Based on what is known about early adolescents and the opinions of state-level administrators of vocational education, how can agricultural education benefit the middle grade student? Following are ways that agricultural education can help early adolescents make the transition from childhood to adolescence and be better prepared to make career-related decisions, such as those required in school-to-work legislation.

Social Skills and Personal Values

Through FFA activities and community service work, middle grade agricultural students can learn the importance of teamwork and develop social and leadership skills. FFA also allows students to explore various agricultural careers through contests and related activities. While there are certainly beneficial aspects of FFA contests for early adolescents, emphasis should be placed on participation for all students rather than on competition.

Understanding the World of Work

Agricultural education offers middle grade students numerous opportunities, both in and out of the classroom and lab, to explore agricultural careers. Practical, hands-on activities in the school setting expose early adolescents to workplace practices. Through supervised agricultural experience (SAE), students may explore agricultural careers through job shadowing and research or gain actual work experience through entrepreneurship or placement programs. Early exposure to a wide array of career options helps students to be better prepared to make career-related decisions.

Intellectual Development

Many academic competencies and problem-solving skills promoting intellectual development are incorporated into the agricultural education curriculum. These competencies and skills help early adolescents apply knowledge and see the relevancy of school. SAE programs provide excellent opportunities for students to work independently, apply their knowledge, and learn through discovery.

Delivery of Agricultural Concepts and Career Information

There is debate related to the system for delivering occupationally related curricula to middle grade students. At issue is whether related information is best delivered through courses specific to the occupational area or by incorporating the information throughout the curriculum. Agricultural education fits neatly into a variety of delivery systems and strategies. As a stand-alone course, agricultural education provides middle grade students with opportunities for in-depth study of agricultural careers and concepts. Agricultural concepts are also easily incorporated into science, history, social studies, and mathematics curricula. Regardless of the delivery system, the important point is for middle grade students to be exposed to the wide field of agricultural occupations and related concepts.

Summary

Middle school agriculture programs can and do work. State vocational education directors and agricultural education supervisors see the need for and positive benefits of middle school programs. Teachers and school administrators contemplating the fate of agricultural education for middle grade students must consider how well the program addresses educational reform initiatives, educational needs of early adolescents, and the perceptions and desires of state-level decision makers. From social, intellectual, and vocational development to the development of practical skills, agricultural education and other career-oriented programs serve the middle grade student well.

One caution needs to be addressed — simply transferring existing programs of agricultural

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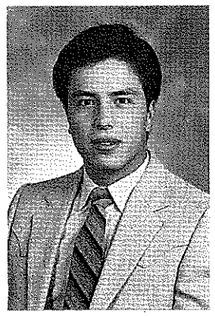
Why Middle School Agriscience?



By Ralph Ramos and Robert M. Torres

Mr. Ramos (top) is an agriculture teacher at Picacho Middle School, Las Cruces, NM. Dr. Torres is an assistant professor of agricultural and extension education at New Mexico State University, Las Cruces.

Over the past decade agricultural education has undergone numerous changes to keep up with the revolution of technology, industry, and the business of agriculture. Seeking advancement with the changing world, agricultural education demands new teaching approaches at an earlier age which will result in new directions for learning. Concerns about the changing workplace and increasing technological requirements have alerted educators, scientists, business leaders, and others of a need to boost student interest and understanding of math, science, and technology. Middle school agriscience serves as a mechanism that can integrate biological, technological, and mathematical concepts by using agricultural topics. Agriscience is the key at the middle school level for beginning a feeder system for high school programs of this type. As appropriate as agriscience would seem at the middle school level, adoption of such a course is easier said than done. Establishing approval, developing sound arguments, and anticipating administrative concerns are only a few keys to opening the opportunity for establishing an agriscience program at the middle school level.

Winning the Approval

As with any new program seeking endorsement, contact with the principal is imperative. One must be able to clearly communicate a need for establishing an agriscience course. The agricultural educator must present the principal with his/her model of instruction and the benefits of the agriscience course to students, the total school program, and to the community. Other key supporters should be sought within the school system by reaching out and sharing the proposal with teachers in the school, advisory groups, administrative staff, school board members, parents, and students. The key to winning approval is to set goals high, be organized, and have long range plans in mind. Key decision makers need to have a clear understanding of the benefits agriculture can play in increasing students' interest in math and science by connecting principles to agriculture.

Promoting an Agriscience Course at Middle School Level

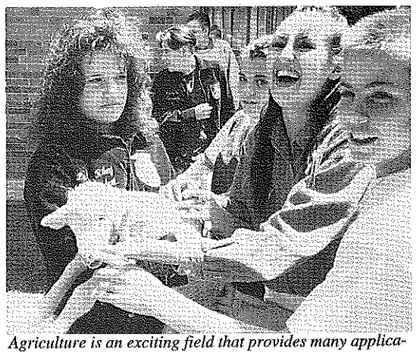
The prevailing middle school concept is one of providing students with exploratory, hands-on experiences. Agriscience can build on basic science skills acquired in elementary school and expand the science curriculum at a higher level. By exposing students in agriscience to subject areas in agriculture, students will not only gain skills in science and math, but also become acquainted with careers in agriculture and develop an appreciation for modern agriculture. Incorporating leadership skills in the agriscience curriculum can develop more self-directed learning at an early age in preparation for high school.

Middle school agriscience can provide a positive learning environment to meet the unique and personal needs of pre- and early adolescents. Agriscience is suitable for integrating curricula to meet the needs of all students, regardless of ability level. With the full inclusion movement in public education, agriscience opens new opportunities for creative teaching and stimulates student interest in the natural science process at all ability levels. Other learning opportunities, such as leadership skill development, may be explored for use with a diverse student population, an area not offered in the regular science curriculum.

With the multitude of agricultural topics, the agriscience curriculum may be designed to maintain student interest throughout the school year, perpetuating student curiosity of what will be learned next. The agriscience curriculum requires consolidation with science courses in existence at the middle school to meet district, state, and national competencies.

Developing Leadership Skills at the Middle School Level

Agricultural education has a standing tradition of providing students with leadership skills and opportunities. Agriscience students at the middle school level would be served well by →



Agriculture is an exciting field that provides many applications of science.

Involving middle school students in the FFA can help develop personal and social skills.

learning basic leadership, building student confidence, and promoting active classroom participation and student activities. Teaching leadership to students will allow agriculture teachers to lay the foundation for students to begin setting personal goals and goals for the FFA chapter.

Incorporating leadership into the agriscience curriculum at the middle school level creates interest in other educational extracurricular activities, such as contests that are provided by FFA involvement. The extracurricular activities at the middle school level unlock opportunities for students to experience academic competition that augments traditional sports competitions. Through the extracurricular experiences offered through FFA involvement, students work doubly hard; FFA involvement also serves to promote students' overall academic performance.

Administrative Concerns

The concern held by most administrators at the middle school level is the operating expenses of this type of course. A plausible reason behind this concern is because most administrators equate agriscience to the old, vocational, hands-on approach in an industrial shop environment and the large cost of this type of program. Costs of maintaining and operating an agriscience course are equal to other science courses offered in a typical middle school. The agriscience teacher needs to envision and plan a budget of all anticipated expenses for carrying out a model instructional program. However, an agriscience course integrating FFA activities may realize travel expenses. These expenses may be met by involving FFA alumni and members in fund-raising activities.

Another concern administrators have is obtaining a qualified agricultural educator. Questions arise whether to hire an additional staff member, which could be expensive, or to fill the position with a current faculty member. It becomes imperative, for a successful agriscience course, that administrators consider persons with an educational background in agriscience and the FFA.

Persons fresh out of an agricultural education program who are seeking employment in teaching agriculture should target middle schools who express interest in hiring science instructors. These science teaching positions could very easily be converted into agriscience courses, even if it requires teaching the traditional science curriculum the first year. However, preservice agriculture teachers must actively pursue a science teaching endorsement for the teaching of science, thus becoming a more versatile graduate. Moreover, preservice teachers in agriculture might expand their knowledge in science areas such as astronomy, meteorology, geology, environmental science, and chemistry, all of which can be related to agriculture in many ways.

Summary

Like most students in secondary agriculture programs, middle school students are challenging to teach. Middle school students need to be motivated to learn the subject matter. Since agriscience is such a powerful and exciting subject, the teacher is able to add variety to teaching with student involvement every day. Variety and involvement spark student motivation for learning. Agriscience at the middle school level offers an alternative approach to the traditional science curriculum by using hands-on learning, activity-based instruction, and an exploratory science model using agricultural topics. Agriscience courses offer students opportunities to discover what is occurring in their native and global environment and why.

These early adolescents face new challenges as society approaches the 21st century. These challenges bring choices that will lead them to a progressive future. It is the responsibility of agricultural educators to be part of the new science turning point to meet the challenging national education goals of becoming first in the world in math and science achievement. Developing agriscience courses at the middle school level serves to strengthen our math and science education and exploration into agricultural topics. Why not agriscience in the middle school? ■

Essential Elements of the Problem-Solving Approach to Teaching

BY BRYAN L. GARTON

Dr. Garton is an assistant professor of agricultural education at the University of Missouri, Columbia.

The agricultural industry is rapidly changing through innovation and the advancement of technology. Future employees in the industry of agriculture (i.e., our students) will be required to use critical thinking skills to make decisions and solve problems. Although not a new concept to agricultural education, the profession recently re-emphasized the teaching of decision-making skills through problem-solving (American Association for Agricultural Education, 1991).

The problem-solving approach has been regarded by many in the profession to be among the most effective teaching strategies (Martin, 1982). A rationale for using the problem-solving approach to teaching was provided by Phipps and Osborne (1988) when they stated that problem-solving ". . . stimulates interest; develops thinking ability; and helps students to evaluate, draw inferences from, and make decisions essential to the solution of a problem" (p. 150).

Crunkilton (1988), in his address to the profession, stressed the importance of problem-solving by stating that ". . . problem solving, both as a method of teaching and a skill that students need, is more critical today than it was years ago" (p. 8). As a profession we have advocated teaching students decision making skills through problem solving. However, are we employing the essential elements of the problem-solving approach in our teaching?

Essential Elements

The first and foremost essential element in teaching using the problem-solving approach is **defining the problem to be solved**. Students must be involved in identifying and developing a clear definition of the problem to be investigated.

Problems to be solved should be true to life, real problems of the students, and/or problems that students could potentially face later in their chosen careers. Teachers should identify and also challenge students to identify occupations that would require the solving of the problem under investigation. By relating the problem to occupations of interest to students, a larger number will see the need in solving the problem and therefore will be more likely to become interested in solving the problem.

Stewart (1959) may have communicated it best when he stated that a "problem must be stated clearly and definitely, it must be appropriate in scope and difficulty; it must involve thinking of quality and quantity; it must be true to life and otherwise interesting to the pupils" (p. 88). After nearly 35 years, Stewart's words are still applicable today.

After students have clearly defined the problem to be solved, they should be guided in **seeking the data and information** necessary to solve the problem. Teachers may choose to use one or more of the many teaching methods available during this, the second essential element of problem-solving. Teaching methods could include demonstrations, experiments, field trips, supervised study, or others that allow students to collect the needed information to solve the problem.

With the data and information collected, students should be ready to **formulate possible solutions and/or recommendations** to the problem. During this, the third essential element of problem-solving, students should be encouraged to use their critical thinking skills to analyze and evaluate the data and information in developing a potential solution and/or recommendation. Again, teachers may use one or more methods of teaching to guide students in formulating possible solutions or recommendations to the problem under investigation.

The fourth essential element of teaching using problem-solving is **the application of the concepts, principles, and/or skills learned**. This element of the problem-solving approach provides students the opportunity to try out their proposed solutions or recommendations to the problem. It is often during this element of the problem-solving approach that students receive "hands-on" learning and practice.

Once students have had the opportunity to apply their proposed solutions and/or recommendations they should be led through the final essential element of problem-solving, **the evaluation**. It is during this element that students should be encouraged to think at their highest cognitive level and determine if and how well their solution or recommendation solved the problem. This element may also be utilized by the teacher to evaluate students' learning.

Teaching students using the problem-solving approach can be a rewarding, yet challenging

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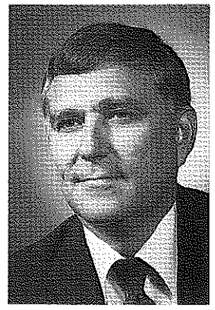
Ignorance Is Not Bliss!



BY GARY MOORE

Dr. Moore is professor of Agricultural and Extension Education at North Carolina State University, Raleigh.

"Ignorance is bliss." Thomas Gray's time-worn phrase may be cute, but it does not help promote diversity in agricultural education. Diversity in agricultural education means that all students from all cultures and backgrounds are in agriculture classes and the FFA. When we understand and teach about other cultures, our classes become more attractive to students of all cultures. For example, African-American students could be more interested in the FFA if they were aware of their heritage as it relates to the FFA.

In the early days of agricultural education, schools in the South were segregated with a separate youth organization for black students—the New Farmers of America (NFA). The NFA is an important part of our heritage. On the occasion of the NFA and FFA merger, Adolphus Pinson, the NFA president, stated, "Please be reminded that the spirit of the New Farmers of America does not die here today. Rather we awake to the dawn of a new day. Together we walk into the dawn as Future Farmers and toward a fuller realization of our educational aim and purposes." Remembering the spirit of the NFA can help agricultural education in its quest for greater diversity.

How much do you know about the NFA? To help you learn more about the NFA, the following quiz has been developed (the answers are found at the end of the quiz). You may want to use this quiz with your students.

The NFA

___ 1. The student organization for African-American agricultural students prior to school integration was the:

A. National Farmers of America
B. Nubian Farmers of America
C. Negro Farmers of America
D. New Farmers of America

___ 2. The national NFA organization was started in:

A. 1928
B. 1929
C. 1932
D. 1935

___ 3. The NFA was divided into:

A. Two sections
B. Three sections
C. Four sections
D. No sections were needed because the organization was limited to the South

___ 4. The NFA degrees were:

A. Farm Hand, Improved Farmer, Modern Farmer, Superior Farmer
B. Tenant Farmer, Farm Owner, Landlord
C. Greenhand, Chapter Farmer, State Farmer, Dixie Farmer
D. There were no degrees in the NFA

___ 5. The "Father" of the NFA was:

A. Booker T. Washington
B. George Washington Carver
C. George Washington Owens
D. Fred McClure

___ 6. The NFA colors were:

A. National Blue and Corn Gold
B. Black and Cotton White
C. Black and Old Gold
D. Forest Green and Cotton White

___ 7. The NFA emblem differed from the FFA emblem in that it had:

A. A cross section of a cotton boll
B. A mule pulling the plow
C. The sun high in the sky
D. No eagle at the top

___ 8. National NFA week was during the week of April 5. This was because:

A. It marked the start of spring
B. The NFA was incorporated on April 5
C. The Emancipation Proclamation was signed on April 5
D. Booker T. Washington was born on April 5

___ 9. The NFA conventions were generally held in:

A. Nashville, Tennessee
B. Atlanta, Georgia
C. Charlotte, North Carolina
D. Petersburg, Virginia

___ 10. The NFA merged with the FFA in:

A. 1945
B. 1963
C. 1965
D. 1969
E. 1976 →

The NFA Quiz - Answers

1. (D) New Farmers of America. The organization had its roots in the New Farmers of Virginia which was started in 1927.

2. (D) The NFA organization held regional meetings as early as 1928. In 1935, the organizational meeting for an official national association was held at Tuskegee Institute.

3. (B) The NFA was divided into three sections. The Washington section (named for Booker T. Washington) consisted of North Carolina, South Carolina, Virginia, Maryland, Delaware, West Virginia and New Jersey. The Almmot section was composed of Arkansas, Louisiana, Mississippi, Missouri, Oklahoma and Texas. The section name comes from the first letter of each state in the section. The third section was the Sargent section and was comprised of Alabama, Georgia, Florida, Tennessee and Kentucky. This section was named after Dr. H.O. Sargent, a white federal agricultural education official responsible for supervising Negro agricultural education programs in the South.

4. (A) There were 4 degrees in the NFA; Farm hand, Improved Farmer, Modern Farmer, and Superior Farmer.

5. (C) George Washington Owens, an agricultural professor at Virginia State College, is considered the founder of the NFA. He was instrumental in starting the Future Farmers of Virginia and was active in establishing the NFA.

6. (C) Black and Old Gold were the NFA colors.

7. (A) The NFA emblem was exactly like the FFA emblem except it was black and gold and contained a cross section of a cotton boll instead of the ear of corn.

8. (D) NFA week was held during the week in which Booker T. Washington was born, April 5. The NFA treasurer was stationed at the picture of Booker T. Washington.

9. (B) Atlanta, Georgia, was the home of NFA conventions from 1949 to 1965. Prior to that, the convention was rotated among the states.

10. (C) The last NFA convention was held in Atlanta in October of 1965. The convention adjourned and the NFA officers and choir headed immediately for Kansas City for the FFA convention. An impressive ceremony was conducted in which the NFA merged with the FFA.

Conclusion

While addressing the FFA convention in 1965, Adolphus Pinson, the last NFA president, said, "There is an established philosophy that in unity, there is strength." We can strive for unity in agricultural education by remembering the NFA. This can help African-American students feel a stronger bond with agricultural education and the FFA. As teachers, we should include the history of the NFA in our curriculum. Ignorance is not bliss. ■

Essential Elements of . . .

(continued from page 24)

experience. It takes hard work and creative thinking on the teacher's part to develop problems to teach the subject content and still relate to as many students as possible

No one has proposed that teachers of agriculture teach all their subject content through the problem-solving approach. However, if we are going to prepare our students for a rapidly changing agricultural industry, we must teach them how to make decisions through problem-solving skills. After all, there is no better way to learn problem-solving skills than through participating in problem-solving.

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Building the Case for . . .

(continued from page 21)

education from the high school level to the middle school level is not appropriate. The temptation to duplicate classes and activities must be avoided. Middle school-aged students are different from high school students, and those differences must be addressed in agriculture programs, if those programs are to be successful.

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NEW

The EARTH and AGRISCIENCE

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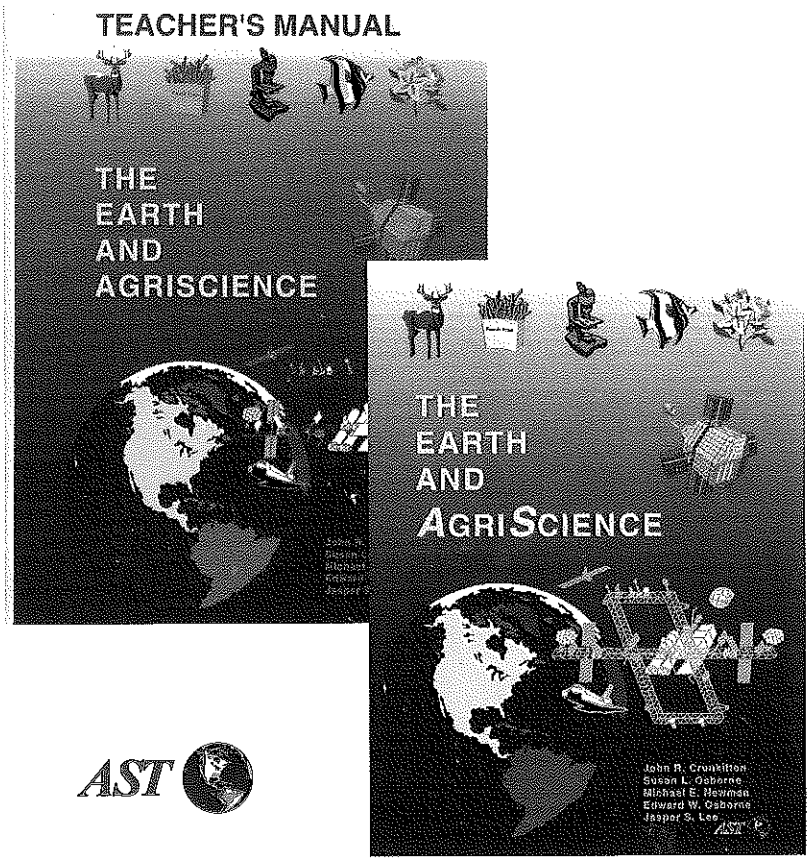
The Earth and AgriScience is an introductory agriscience book for grades six and seven, with application in the fifth and eighth grades. it is written at the sixth grade reading level. Numerous color photographs, color line art, and color text will enhance the use of the book for the student. *The Earth and AgriScience is in full-color, cover to cover.* It will be used in 9-week, semester, or year-long courses. Each part (unit) of ***The Earth and AgriScience*** may be used as a stand-alone short course where courses are not semester or year-long.



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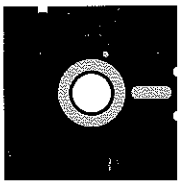
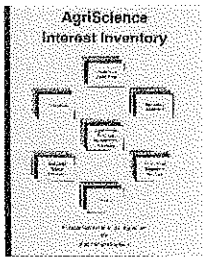


AGRISCIENCE INTEREST INVENTORY

by Mary Beth Bennett, Samuel M. Curtis, Robert A. Martin, and Paul A. Schlotfeldt



The ***AgriScience Interest Inventory*** focuses on determining the level of interest of middle school students in the following seven occupational areas of agriculture: 1.) Production Agriculture, 2.) Horticulture, 3.) Agricultural Mechanics, 4.) Agricultural Products, Processing & Marketing, 5.) Renewable Natural Resources, 6.) Agricultural Supplies & Services, and 7.) Forestry.

The interest inventory packet is totally self contained. Each packet includes a disk containing the inventory as well as a 16-page user's manual. The information is organized so that it may be operated by students wanting their information profiled. The instrument is self-scored and generates a profile of the students' score for each occupational area as well as a total score for the inventory.

The ***AgriScience Interest Inventory*** is not a test of ability or knowledge, but is an assessment of current interest in various aspects of agriculture. It is concerned solely with a student's expression of a degree of like or dislike for each of the 100 activities.

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