Agriculture has become a vast and complex industry, employing many persons in agriculturally related occupations at skilled, technical, and professional levels. Glenn Murch (right), dairy science student at Clemson University, is shown with his instructor discussing the control and operation of high temperature pasteurization equipment. (Photo by Wilbur McCullough, State Department of Education, South Carolina.)

The Golden Anniversary exhibit of vocational agriculture was developed by the Mobile County Vocational Agriculture Department in Alabama. The development of the past 60 years as shown in this exhibit attracted much attention. (Photo by Oliver Faye, Vocational Teacher, Alabama.)
EDITORIALS

From the Editor...

Today learning throughout life is as much a necessity as it is a prerogative; in the future learning throughout life will be imperative. Traditionally adult education—education for persons who have completed or left full-time schooling—has been a vital part of public school education in agriculture. Considering the meager time, effort, and money devoted to adult education, the fact that over 40 percent of the persons served by agricultural education are adults is noteworthy, and in a real sense, evidence of the profession's dedication to and support of adult education.

Some Relevant Issues

Educational programs of the National Agricultural Education Association are organized and taught by high school teachers of agriculture in addition to their duties as teachers of high school students. With the new programs of vocational education in agriculture—broadened purposes, new programs, new clientele—such an arrangement is not likely to produce educational programs appropriate for all adults whose vocational or avocational interests involve knowledge and skills in agricultural subjects. The following issues are relevant to broadened and improved programs of adult education are developed.

Is the high school the appropriate public school agency for adult education? Generally, high schools have not accepted adult education, including adult education in agriculture, as a major function. Relatively few high school teachers of agriculture have contractual responsibilities for teaching adults. Many teachers who conduct adult programs do so because of their commitment to the belief that adult education is part of a complete program of vocational education in agriculture. Experience indicates, however, that high school administrators and boards of education in agriculture will support in principle, and to some extent financially, successful programs of adult education in agriculture. But on the other hand, many of the emerging institutions that place a high priority on occupational education—

(Continued on next page)

Guest Editorial...

Continuing Education in Agriculture

Agriculture is more than farming! Therefore, adult education in agriculture is more than young farmer and adult farmer education. Patterns of operations in agriculture in production have changed drastically in recent years. With the broad tasks given us under the Vocational Educational Act of 1965, it is mandatory that continuing education be provided for those adults who are employed in all agricultural occupations. In past years, our primary objective has been to provide education for farm owners and operators and for those preparing to become owners and operators. This will continue to be an important phase of our educational programs for adults. However, in large farm operations of the future, the skilled and technical workers should be our primary concern.

As farms become more industrialized, the key word for instructional programs for the farm owner and operator will be management. It has been said that we are witnessing a dramatic new revolution in agriculture which many have termed a "management revolution." If educational programs for young farmers and adult farmer are to be successful and have real meaning, we must concentrate our efforts on "management strategies" rather than the traditional "farm management."

If we are to accept the responsibility of continuing education for all persons in agriculture, we must provide for those who are employed or who are preparing for employment in the off-farm agricultural occupations as well as for those workers in production agriculture. It has been stated that as many as one-third of our labor force can be categorized in one of these areas. At the present time, we are meeting the need for a very small percentage of agricultural workers. We must think in terms of education in agriculture being a continuous process and should gear our educational system for adult education on a large scale with flexibility to accommodate all types of situations. We must not let ourselves be "boxed in" by traditional thinking concerning organizational patterns for instruction.

Agriculture is big business! The demand for adult education in agriculture at all levels—training and retraining for specific skills as well as avocational education—will be big business in the 1970's. It is our responsibility to think big in terms of our planning for future programs of continuing education in agriculture for all adults.

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Adult Education in Agricultural Supplies

FRED D. DILLNER
Teacher of Agriculture
Shippenburg, Pennsylvania

When teachers of agriculture are asked to prepare programs for adults, they are faced with the challenge of preparing programs that are relevant to the needs of adults. However, they must also ensure that these programs are aligned with the overall educational goals of the school. The following are some of the key considerations:

- Pre-service and in-service teacher education programs should be developed with the needs of adults in mind. This means that the programs should be designed to meet the specific needs of adult learners, taking into account their prior knowledge and experiences.
- Adult education programs should be flexible and adaptable, allowing for different learning styles and preferences.
- Adult educators should be trained in the principles of adult learning, including how to create a supportive and inclusive learning environment.
- Adult education programs should be evaluated regularly to ensure that they are meeting the needs of adult learners.

The Early Concept

The early concept of vocational education in agriculture held that it was a form of training to prepare students for careers in agronomy or related fields. However, this concept has evolved over time, and today's agricultural education programs are designed to meet the needs of a diverse range of learners.

The Importance of Adult Education

Adult education programs are important because they provide opportunities for lifelong learning. For many adults, these programs offer the chance to acquire new skills, update existing ones, or simply continue to stay engaged with the field of agriculture.

Instructor in Agricultural Supplies

The purpose of this article is to share with you some of the experiences and results of a program of adult education in agricultural supplies. In 1967, courses were planned in cooperation with the Pennsylvania State University, which provided the necessary guidance and support.

The First Course

The first course I taught at Shippenburg High School was titled "Human Factors in Management." The course was designed to provide students with an understanding of the role of human factors in the management of agricultural businesses.

The Importance of Leadership

My experience with men in these areas of responsibility has shown that this is not an easy task. Many of these leadership positions want to improve themselves.

(Continued on next page)
A New Approach...

Dr. Robert Pielke, Jr., local veterinarians and members of the course, Dairy Cattle, evaluate, discuss the effect of feed onudder health with Fred Dilbua, course instructor.

and welcome the opportunity to join others in such an educational venture.

It is true that leadership conferences and business seminars are held for some of the top men employed by cooperative and privately owned businesses and that field men and sales representatives regularly attend conferences. Many managers, department managers, and supervisory personnel seldom have the opportunity to "rub elbows" with other business and related agriculture firms. The classroom atmosphere, with the interchange of a few good questions by a teacher, may quickly place the men in a frame of mind where they are eager to respond and share their reactions to the questions at hand.

Course Content

The course on "Human Factors in Management" consisted of the following five following problem areas:

What are the functions involved in managing an agricultural supply business?

What is a successful business?

What factors contribute most to success?

What factors most frequently cause business failure?

How can problems encountered in an agricultural supply business be identified and simplified?

What human factors are most important in managing and operating an agricultural supply business?

Worksheets consisting of management evaluations and sample problems involving decision making were used as part of the teaching procedure. Discussion was developed from the worksheets, and time was provided for the learner to ask questions and develop his own thought patterns. The program materials attempted to define, develop, and improve the attitudes, values, and skills necessary for managing employees, other personnel, and the trade or business. The course emphasized that the most important part of good management is "man"—man's ability to cope successfully with the many decisions or adjustments that must be made in today's business activities.

Evaluation

At the completion of the course the men were given an evaluation sheet and asked if they might be interested in taking another course. A large number indicated an interest in feed nutrition. A program was then developed by the teacher with the men advising as to what problem areas would be of most value. A second course, "Dairy Cattle Nutrition," was designed and taught to the group in the winter of 1969. Eighty percent of the class consisted of persons enrolled for the second year. Another evaluation was taken and again the majority indicated they would like to enroll in a course on credit management. This will probably be the topic for next year's class.

Experience has shown that there are needs and that an education gap does exist with those employed in the agricultural supply industry. These men are aware of these needs for information. They have indicated that the local high school is an excellent place to meet and that the teacher of agriculture can provide the educational experiences they need.

Courses involving agriculture have tremendous latitude. They develop a working relationship which can benefit the farmer, the businessman, and the teacher. The teacher, through his association with the businessmen gains greater insight into business and production knowledge. The men requested and received individual instruction visits at their places of business throughout the year.

A Complete Program

Is it not just as important to provide training for persons in agricultural supply businesses as it is to provide instruction for farmers? Is our professional competence and our experience in leadership so limited that we can not expand our vision to include these adults? We already have achieved across the nation excellent results in teaching some of the new instructional areas to high school students. Is this where we drew the line? Will we give no further assistance?

Do you want to see what a complete program of agriculture can do for your area? Organize and teach a class of adults in agricultural supply business and you will find it extremely interesting, challenging, and rewarding.

The AGRICULTURAL EDUCATION MAGAZINE

J. R. Boone

Adult Farmer Education by Television

North Carolina Department of Public Instruction

Dr. Robert Pielke, Jr., local veterinarians and members of the course, Dairy Cattle Training, discuss the effect of feed on udder health with Fred Dilbua, course instructor.

Technological advances in the field of agriculture have made it imperative that teachers of agriculture offer more depth, scope, and competence in teaching adult farmers. Adult farmer instruction have become more specialized, therefore more specific instruction is needed.

Special Instructors

Agricultural educators in North Carolina have recognized for many years the need for resource people to aid the teacher of agriculture in dealing with specific problems. Since 1962 the State Board of Education has allocated funds to pay salaries and travel expenses for special instructors of adult short courses.

Early in the Adult Farmer Specialized Instructor Program a shortage of capable resource people was recognized. The few available could not possibly fill the need. After a year of trying to relieve the shortage, it was decided to try a pilot program using one special instructor and the medium of television to carry the information to several adult farmer classrooms simultaneously.

Special Instructors

Since the beginning of instruction by television in North Carolina, teachers of agriculture have been involved in selecting courses to be taught, determining course content, responding to evaluative questionnaires, and conducting evaluative group discussions at the end of each series of lessons. Teachers using the television lessons for the first time are brought in for an orientation at which time suggestions are given for materials to be used to follow-up each lesson, local resources to utilize, and methods of on-farm instruction.

Methods of using television in adult farmer instruction vary from school to school. Generally teachers assemble the class 30 minutes prior to a telenest lesson. This period is spent checking the roll, reviewing previous lessons, and raising questions concerning the lesson to follow. Teachers receive an outline of each lesson several days prior to a telenest. After the telenest, the teacher spends from one to one-half hours localizing the information, reviewing the material presented on television, and assisting with individual interpretations.

How Teachers Use Television

Evaluation

Evaluation...
A Key to Effective Adult Education
ELOD E. WITT, Agricultural Occupations Instructor
Roanoke, Illinois

Have farmers in your area plowed you with questions such as: How much fertilizer should I apply to corn? or What is the best way to control weeds? How about fertility? What source of information do I use for answering such questions or should I even attempt to answer these questions? Experimental trials are conducted by universities and commercial concerns, but if the experimentation is not conducted in the local area, just how accurate is the information for local farmers?

The Beginning
Five years ago I conducted an adult farmer course on fertilizers. During the course many questions similar to those indicated above were asked. It concluded that the best answer was to conduct trials on local farms experimenting with varying levels of fertility and aid in locating the economic level of fertility for corn. Fifteen farmers agreed to enroll in a five-year course on the economics of corn production. At that time we were only two weeks away from planting and slow-down fertilizer had already been applied to the previous fall. We organized the class immediately. A president, vice-president, and secretary were elected. A constitution and by-laws were developed. We received approval from the board as an adult farmer course.

Experimental Plots
The fertility program, rate of population, variety, and other pertinent management decisions for each farmer were written on the chalkboard. From this information we selected five relatively homogeneous groups to begin our first fertility experiment. We were attempting to eliminate as many extraneous variables as possible and base the experiments on one variety, population, and fertility. Class tours to each member's experimental plots were made in July, August, and September. During these tours we made tissue tests, population counts, corn counts, stansability checkings on tassels looked for fertilizer deficiency symptoms and insect and disease damage. The winter meetings were the first real surprise. For years these farmers had been growing continuous corn, heavily fertilized, using the latest approved practices. But for the first time we began to realize that growing corn involves more than planting, cultivation, and harvesting. On our tours we learned that corn plants differ within a field as well as between farms. We learned there are differences in varieties other than differences in yield. As we analyzed the results of the first year of experimentation, we found that it was necessary that many variables be controlled in our experiment. For example, we decided that the planting of different varieties had to be eliminated for many reasons. It would not be answered because of differences in varieties. As an outgrowth of these discussions, we developed the following requirements for the next year's fertility trials conducted by each farmer. All corn must be planted to one corn variety, a black seed, weighed on the same scale, and tested with the same moisture tester. All test plots must be still tested yearly during the week of Labor Day. All farmers must plant the same variety on their experimental plots.

A rain gauge must be placed at each plot. All farmers must use the correct soil test procedure by sending samples to the State Soil Testing Laboratory. Any more experimental plots must be conducted to provide additional information for the fertility plots.

Cooperation from Commercial Companies
Since variety is such an important factor in corn production, we began to realize shortcomings in our knowledge of corn production. Each class member purchased a copy of the book Modern Corn Production. As instructor, I wrote weekly assignments and prepared tests on the reading assignments. We studied corn production in earnest! This series of classes was interest and informative. The farmers were eager to study and the grading of test papers proved to be most competitive. I highly recommend this procedure in adult classes. I have used it in many of my other courses.

We have resource persons in this course, but we find our own studying and testing to be most beneficial. Resource persons from a university or another group outside the class may help if they know when they found our work and come to the class session prepared to discuss only one phase of corn production. During these class sessions, the agriculture occupations instructor or the class president serves as moderator and the resource person sits with the class and enters into the discussions.

The Results
We are now in our fifth year of operations. Approximately 150 experimental plots were planted this year by the farmers in the classes. This year sixty-four plots will test insecticides for control of corn rootworm. Some of the insecticides have not been released commercially so we are attracting attention from other agencies. It has been difficult for us to locate the economical bushel of corn. Each class member believes the course has been of benefit to him in this good, however, it seems to us that we have long enough placed emphasis on fertilizer selection and now we must turn our attention to corn production. In reality we have been building our courses. We have increased production with Market of the Year. The fact that our corn yield increased, placing corn above other classes on the market, decreased the advantage of our efficient management and actually gave us a lower cost per bushel and a higher cost per bushel.

As Table 1 indicates, in four years we have gained our average yield from 116 to 157 bushels per acre—a 35 percent increase. Yet during this same period, net income per acre has increased from $7.48 to $22.86 per bushel or corn increased 19 cents. We realize that large increases in figures are due to increased use of herbicides and insecticides as well as an increase in land values and taxes. These and other factors are reflected in the present situation. If we can obtain the same net profit with 140 bushels of corn per acre as we can with 150 bushels per acre, we have removed 10 bushels of corn per acre from the market (a 6.6 percent reduction) thus stimulating price. Unless the need for more corn is present, this should be one of our goals rather than achieving high yields with no regard to production costs. When we speak of the economics of corn production, let's be aware of volume of production and price relationships.

What Next?
Upon the completion of the fifth year, the farmers are planning to reorganize for another five years. We will probably test these levels of fertility on each farm instead of one. We are convinced that we can produce corn according to the demands of our nation. We want to develop a quality product and provide a market for that product.

We have been involved with testing laboratories in plant analysis. We now want to work with laboratories on analyzing grain. We think that we should encourage a product that will demand a premium on the market. Also, we want to begin a new course on soybean production structured in the same manner.

We are convinced of one thing: A study of the records for the past years clearly shows the need for meaningful and accurate analysis of yields, costs, and market prices in relation to the desired net profit.

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<th>Yield</th>
<th>Seed, Fertilizer, and Herbicide Cost</th>
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<tr>
<td>Per Acre</td>
<td>Per Acre</td>
<td>Per Bushel</td>
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<td>1962</td>
<td>124.2</td>
<td>42.22</td>
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<tr>
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<td>141.7</td>
<td>66.25</td>
</tr>
<tr>
<td>1964</td>
<td>156.8</td>
<td>30.96</td>
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Table 1
Summary of Results of Roanoke-Benton Corn Economics Class

Eden E. Witt is one of two teachers of agricultural occupations at Roanoke-Benton High School. In addition to a high school program with 140 students enrolled in 1962-63, Mr. Witt and his fellow teacher conducted an adult education program involving more than 100 farmers, businessmen, and women. In addition to the Corn Economics class described in this article, adult courses were held on Truck Maintenance and Repair, Futures Markets, Electrical Controls and Motors, and Oleyus-olczyakas Walting, and a series of informational meetings on corn production. Mr. Witt currently serves as President of the Illinois Association of Vocational Agriculture Teachers.
Adult Farmer Instruction in Farm Business Planning and Analysis

HOMER E. BROWN, Teacher of Agriculture
Sugarcreek, Ohio

JOHN T. STARLING, Teacher Education
The Ohio State University

Paramount in any educational endeavor is the need for the continuous search for new and better methods and procedures. Agriculture, like the rest of the economy, is undergoing rapid and accelerating changes due to technological and scientific developments and improved methods of organization and management.

If we take a look at what happened on Ohio farms between 1955 and 1965, we find that the total value of farm land and buildings increased by more than $25,500 per farm with a total increase of almost two billion dollars for the state. During the same period, the average size of farms increased from 113 acres to 146 acres while the number of farm operators decreased from 177,058 to 120,381. An analysis of the records of 250 dairy farms listed in the 1966 Farm Business Analysis Report shows that the total capital investment for the high 25 per cent of these farms was $123,000, while the median total capital investment was $85,483. Crop farmers in the top 25 per cent reported $29,000 invested in machinery and equipment alone.

Need for Systematic Instruction

These facts show that farming is big business. Large investments coupled with eloser margins between cost of production and selling price make it necessary for the farmers to know more about his business if he is to allocate resources in order to get optimum returns to the capital and labor involved.

Adult education in agriculture in the past has emphasized approved practices as they apply to a variety of enterprises organized by what is termed the "shoestring" approach. With the number of instructions in each of a series of ten to twenty meetings dealt with a different topic and frequently has only minor significance to the real needs of farm operators. Some farm operators are interested in and attend only one meeting, while others may attend several meetings. Because of the variety of topics and the variation in attendance, it is difficult for the teacher of vocational agriculture to become familiar enough with each farm operation to make worthwhile on-farm instruction. In these cases, on-farm instruction usually deals with approved practices with little or no relationship to the entire farming operation.

Need for Record Analysis

Every teacher of vocational agriculture has, at one time or another, been asked questions similar to these: "Should I buy the 80-acre farm adjoining my farm or should I just buy the plot in my old tractor and get a larger one?" These, among many other, cannot be answered unless many other questions have been asked and answered. The teacher of vocational agriculture should be thinking, though not asking directly, "Are you a good crop farmer?"

This question would be just as "shoestring" as the first because the farmer would have to ask himself many other questions before he could provide the answer. Even if he could be reasonably certain that he was a good crop farmer, his values with respect to his farm would be confronted with a mass of other related questions. Obviously, the need for records and an analysis of these records are of major importance. Through an analysis of his farm business, a farmer might find that his machinery investment and costs per crop acre are too high. He might also find that his crop yields, as compared to other farmers in the area, are above average. This is only a limited amount of information but it puts him in a better position to make major decisions.

Recognizing this need to help farmers in the area of farm business management, sixty-five Ohio teachers of vocational agriculture are conducting farm business analysis programs as part of their instructional program for young and adult farmers. The results of these programs have been extremely gratifying as indicated by the program at Garaway High School.

The Program at Garaway High School

A Farm Business Planning and Analysis Program was initiated by the Garaway Vocational Agriculture Department during the 1946-65 school year. This systematic program replaced the "shoestring" type program that had been offered in previous years. In order to secure enrollment, the Farm Business Planning and Analysis Program was explained to all full-time farmers that had been members of the previous adult program. Enrollment was taken on the first day of classes, the first served basis and was limited to eight farmers.

Since the initiation of this program it has grown into a four-year program. The first year the program of instruction is the second year, Record Summary and Analysis; the third year, Adjustments in the Farm Business; and the fourth year, Technical Agriculture Based on the needs as determined by the farm business analysis records. The enrollment has increased each year the program has been in operation. Presently, there are 38 farms enrolled in four different groups, one group for each year of the program.

Operation of the Program

Classroom instruction consists of two meetings per month for each group with each meeting averaging about three hours in length. The meetings begin in October and continue through April. On the farm instruction is provided through the months and the hours spent range from twenty to forty hours per farm operation per year.

During the first two years this program was in operation, the teacher of vocational agriculture also had a full unit of high school vocational agriculture. The young and adult farmers in this community responded to the farm business analysis program to the extent that more time was needed to conduct this activity. This year, too, had the full support of the school administration, so an additional teacher was hired and the enrolled one teacher to spend full-time on the farm business planning and analysis program.

In financing this program, the local Board of Education pays 50 per cent of the teacher's salary, the 25 per cent of the travel, all expenses, personnel, and provides classroom and other equipment needed.

Record Analysis

After a farmer has kept complete farm records for one year, it is reasonable to expect a better understanding of vocational agriculture can identify specific areas in which instruction is needed for the group and for individual farmers. The analysis of the farm businesses of those enrolled in the program at Garaway High School revealed that special emphasis should be placed on reducing overhead ratio, increasing pounds of milk produced per cow and reducing the cost of producing one pound of milk.

After a farmer has some records completed for one or two years he is more acceptable in making adjustment in his business. In order to assist the farmer to eliminate his weaknesses, the Garaway Instructional Farm Business Planning and Analysis Program has organized a Dairy Teen Club, a Corn Club for young farmers, and conducted a forage plot demonstration.

The purpose of the Dairy Teen Club is to increase herd average per farm by a ton of milk during the year. Nine farms are enrolled in this program. The Garaway Instructional Farm (chose and raise) is given to these members on dairy testing, feeding, breeding, health and management problems. The program was first organized in February, 1960, and already five members have changed or started a testing program and six have improved their feeding programs. Some have already indicated that their production has increased and other improvements will be tried as the year progresses. If the Dairy Teen Club is successful, it will be expanded and other avenues will be tried to improve farming operations.

Homer S. Brown (right), co-author of this article, reviews the analysis records with an adult farmer. Interpretation of the analysis data is an important part of the instructional program.
Instructional Program

Silvicultural practices are taught on their watershed acres thereby allowing students to gain experience by actually participating in field projects. The instructional program emphasizes cutting practices that allow forest water resource utilization with multiple land use. Students not only learn how to alter different forest stands, they understand the basic principles by which these cuttings are justified. Equipment used in weekly training classes is borrowed from local school funds. Some equipment is donated by local dealers and manufacturers. Students are taught how to use a variety of hand and power tools. Emphasis is placed on maintenance and repair of gasoline powered chain saws and brush cutters. In most cases, students learn to use and maintain many of the tools encountered by a forest worker.

Employment Opportunities

The employment potential for technically trained forest personnel seems unlimited. The majority of graduates in this training usually seeks employment in a field largely controlled by state and federal agencies. Schools offering vocational agriculture must become aware of the problems in forest watershed management. Schools should evaluate their programs to produce forest technicians who are better prepared to meet the demands of an already expanding field.

FARM MANAGEMENT INSTRUCTION VIA EDUCATIONAL TELEVISION

LLOYD M. JEWELL, JR., Supervision Virginia Department of Education and J. D. OLIVER, Teacher Education Virginia Polytechnic Institute

One of the most pressing needs of young farmer and adult farmer programs is greater emphasis on farm management instruction. With the continuing increase in the cost of production and a carouse margin of net profit, the necessity for making wise decisions constitutes the most critical aspect of the successful operation of a farm.

This problem has been foremost in the planning of the Virginia supervisory and teacher education staffs for a number of years. To update vocational agriculture teachers for providing instruction in this area, a farm management specialist was added to the teacher education staff and an active in-service training program was initiated. Approximately 50 per cent of Virginia teachers have participated in the training program to date. To promote further instruction in farm management for young and adult farmers, the joint supervisory and teacher education staffs endorsed a proposal in March, 1967, to conduct farm management instruction via educational television.

Teachers Express Interest

A member of the supervisory staff met with groups of teachers throughout the state to explain the project and its program. Later a questionnaire was prepared and sent to all teachers. One hundred and eighty-five of the 340 teachers in Virginia indicated interest and agreed to participate if a course in farm management instruction was offered. Teachers preferred that the course begin the second week in January and that the course consist of ten weekly lessons.

Arrangements for Instruction

A series of ten weekly lessons was prepared by educational television bureau in January, 1968. This course was the first of its kind to be offered statewide on educational television in Virginia. The course was sponsored by the Agricultural Education Service of the Virginia State Department of Education in cooperation with the Agricultural Education Department at Virginia Polytechnic Institute. The cost of the course was paid by the State Department of Education.

In the local schools the program was conducted under the supervision of teachers of vocational agriculture. The 30-minute telecast lesson, presented at 8:00 p.m. weekly, was supplemented by the local teacher to make it more meaningful to the members enrolled. Classes assembled at 7:30 p.m. During the 30 minutes prior to the telecast, the teacher gave an introduction to the lesson and distributed charts, forms, and other materials needed by the students. Following the telecast, an additional hour was used for reviewing the lesson, explaining practices or procedures not fully understood, applying the practices to the local farm conditions, and making plans to assist class members with individual on-farm instruction.

A brief description of each of the ten telecasts follows:

Lesson one: The Nature of Farm Management. What farm management is, why it is a complex task, the importance of management to financial success, and the quality of good managers, and the decision-making process.

Lesson two: Economics of Fertilizer Use. Making decisions about buying and using fertilizers; using economic principles in making decisions regarding production decisions in general.

Lesson three and four: Estimating Farm Machinery Cost. Estimating the (Continued on page 41)
ADULT EDUCATION — DOES IT PAY?

EDGAR A. PERSONS, Teacher Education
University of Minnesota

The idea of a business management emphasis for adult instruction in agriculture in Minnesota was first, by the success of the Institutional-Ontario Farm training program following World War II. Adult education based upon farm business records and a total farm management approach is now the basic method of fulfilling the requirements for adult education under the Minnesota State Plan for Vocational Agricultural Education.

The Minnesota Program

During the 1967-68 school year, seventy-six vocational agriculture departments employed more than one instructor. In almost all cases, at least one of the additional men in each department was responsible for conducting organized classes in farm business management education. Enrollment in these courses exceeded 3,000 farm families with over 1,200 enrolling in farm business analysis. Rapid growth has just begun. If adequately prepared for, the farmers who were obtained there will have over ninety vocational agriculture departments with instructors each year for the next four years, which may be regarded as the minimum requirements for farm business management education in about twenty-five to sixty-five farm operators.

A business management education program is organized to satisfy the following criteria:

Audit of farm business education was accomplished by examining 3,018 farm records of farmers who had been enrolled in farm business management education from 1959 to 1965. Measures of farm income as well as twenty-one other measures of business attributes, personal, biographical, and educational characteristics were examined to determine their relationships. Income measures were reduced to standard indices to eliminate the growth effects that might naturally occur as a result of price changes, economic growth of the agricultural sector, general inflation, and farm business firm growth that occurred irrespective of enrollment in an education program. Income measures examined were labor earnings, farm earnings, and family labor and total farm sales.

A correlation coefficient technique was employed to determine the curve that best described the relationship of each of the indexed measures of earnings to inputs of farm management instruction. Marginal returns to educational investment were determined by reference to the curves.

Income rose sharply during the first three years of instruction, declined during the fourth, and then began a sharp rise in the seventh year which continued through the thirteenth year. Instruction of the average instructor and providing auxiliary services and supplies necessary for persistence in the undertaking are estimated to cost $1,500.

The additional cost would need to provide about $700 to amortize the cost of capital outlay for office space, conference room, and office equipment.

Taking into account the marginal community benefits and accounting for the future opportunity and social improvement of the level of living of farming families, those two individual participants and the school, the benefit-cost ratio for farm business management education of the community can be expected to generate nine dollars in increased farm business activity.

Summary

While the reported benefit-cost ratios for individual and community investments in agricultural education for adults are very high, the implications of the research are of even greater interest. The performance curves which describe the relationships of education to farm incomes may also describe educators who have commonly called the learning curve. Response in marginal earnings may be another way of assessing the behavioral changes that occur in reaction to the variables. In this case, then the learning curve should be manageable. Agricultural educators may use this information and test alternative educational programs for better farm business management education that will accelerate the rate of learning and reduce the time span over which learning is maximized.

Likewise, instruction in management for farm entrepreneurs may be applied to other business firms. Proof of the economic efficiency of management education for farmers should prompt examination of similar programs for operators of other kinds of private and public business enterprises.

One fact is clear: The farm business management education program as taught in Minnesota public schools offers a high return on investment to both individuals who enroll and the sponsoring community. Rural communities who are searching for ways to develop economically, improve the level of living of farming families, should recognize the potential of expanding vocational agriculture instruction in the local school to include intensive adult instruction in farm business management education.

BOOK REVIEW


Successful farm financial management requires knowing how to use capital successfully, including credit. This text, especially designed for the continuing growth of farms and the greater use of purchased inputs combining to create the capital required for operation, presents many applications for other business firms. The economic efficiency of management education for farmers should prompt examination of similar programs for operators of other kinds of private and public business enterprises.

Another feature of the book is the analysis of lending institutions and a portrayal of their loan policies and procedures. A concluding summary chapter, leaders are compared and their performance is analyzed in terms of country, state, and national data. This section of the book could serve as well as a text for university students and as a reference guide by knowledgeable economists, farmers, and bankers.

Mr. Nelson is an agricultural economist at the University of Nebraska. Mr. Murray is professor of economics at Iowa State University.

Guy E. Timmons, Professor, Michigan State University
Multiplying the Teacher's Efforts in Adult Education

JAMES ALBRACH, Teacher Education
Kansas State University

In a comprehensive study of adult education in the United States in 1966, the following conclusions were made: upper and middle class adults participate in adult education programs; adult education is not costly of vocational education; faculty members generally give adult education low priority; adult education programs are not geared to meet the problems of today; and the climate has never been better for a creative explosion of adult education.

In agricultural education the traditional adult class member is a person who has a larger than average farm operation in both capital investment and acreage. He has a higher than average educational attainment, and he has a thirst for additional information. His average class member is usually interested in the social and leadership development which can be attained by membership in a young farmer or adult farmer class. Both young farmer and adult farmer classes will referred to as adult classes, because age alone is not an adequate way to differentiate between the two types of classes.

Additional Teachers

The findings that "faculty generally give adult education low priority," "adult education is not costly of vocational education," "class has never been better for a creative explosion of adult education" imply that more needs to be done to improve present programs of adult education. In some cases it may be possible to hire another teacher to conduct the program of adult education. This would be desirable, especially if the present teacher of vocational agriculture has a sufficient number of vocational agriculture students to be considered full-time. A great deal of growth in adult education could be obtained through employment of additional teachers for adult programs.

If an additional teacher is not possible, then the present teacher might have to take a look at the priority which he has given to adult education. He may have to evaluate the economic impact which the adult program is making in the community. Perhaps a much greater impact could be accomplished in the financial realm by working through the farmers in the community to take an active part in the adult program. Perhaps the teacher has failed to see the carry-over benefits an adult program could provide for his regular vocational agriculture program, or he may not consider that the involvement with an adult program of vocational agriculture is a great in-service educational device for the teacher. Other benefits which the teacher may have overlooked is that his regular lessons could be enriched with the experiences obtained and that his judgmental decisions could be tempered and enhanced by associations with the leading producers in his community.

Using Additional Resources

When additional adult education services are offered by the vocational agriculture instructor, time required for the service is not necessarily increased. Additional resources are often found for these services. This can be done by either discouraging some of the present services which are being offered or by becoming more efficient in the performance of the services which are to be continued. Both alternatives should be considered, but the alternative which offers the most promise is that of becoming more efficient. Perhaps a goal would be to have the teacher's present services multiplied by other persons and by resources which are available. Some of the most promising ways in which the teacher's efforts could be multiplied are as follows.

Class members and class officers. Members and class officers can help the vocational agriculture teacher in both the administrative and instructional phases of the adult class operation. Members and class officers can help secure enrollment, plan social and recreational functions, secure resource persons, serve on special committees, help identify the short and long range objectives of the program, help select the trips, help plan and conduct field trips, and serve on class panels.

Young farmer associations. Associations are helpful in the development of the social and leadership skills of class members. They can be helpful in furnishing technical agricultural skills by providing a list of available resource persons to chapters and planning state tours and conventions. Local young farmer chapter members develop pride in their membership and their community. Waits' organizations do much to keep up the interest of the husbands who belong to their classes.

Resource persons. Specialists usually make good speakers at adult class meetings if adequate preparations have been made. Specialists in livestock, crops, economics, engineering, and other fields are often chosen. Neighboring vocational agriculture teachers. Neighboring teachers can do much to help generate enthusiasm for adult classes in their respective communities. Perhaps a few joint meetings between classes could be held, especially if outstanding resource persons can be secured by holding joint class meetings. Another possibility is the sharing between classes of the specialties or experiences which each instructor has available.

Future Farmers of America. Traditionally a field trip can provide instruction which could not be obtained in any other way. Good examples are regional machinery shows and field trips to observe outstanding farming operations in the particular area or region. Tours to the farms of class members are usually successful. Class meetings can be held in conjunction with the field trips to the homes of class members.

Panels. Panels are a successful means of teaching. The teacher will often be the panel moderator. Leading livestock and crop producers make good panel members along with class members who have special competencies in the areas discussed. Certain class discussions seem to be handled better by a panel discussion than by any other method of instruction.

Farm organizations. Farm organizations are traditionally promoted adult education for their members. Officers of farm organizations are pleased to speak to adult classes on topics of special interest. Topics involving legislation are often discussed by members of farm organizations. Such topics as water pollution, corporate farming, and other topics of a policy nature can be handled quite effectively by farm organization speakers.

The teacher will need to be a good administrator or he might be better coordinating all of his teaching resources. Teachers are available to him than he was before. However, in order to receive the maximum benefit of these teachers, the teacher will need to cooperate with them. The amount of cooperation which is needed depends upon the individuals involved in the particular activity. The teacher will need to be the analyst, the catalyst, and the psychologist as he decides if he should use any or all of the resources which are commonly available to him. The individual teacher decides which of the resources, methods, and materials will thereby increase his efficiency, and which of the resources do not.

August, 1968

NATIONAL FFA ARCHIVES

The following materials are needed for the National FFA Archives.

Agricultural Education Magazine

To complete the film from Volume 1 (1929) through 1957, the following issues of The Agricultural Education Magazine are needed: January 1952; May and July 1954; May, July, September, and October 1955. All issues beginning with January 1958 are needed.

American Farm Youth Magazine

The American Farm Youth Magazine preceded the National Future Farmer. It was not an official FFA publication but had wide circulation among FFA members prior to 1952. All issues of The American Farm Youth Magazine are sought.

Future Farmers of America Manual

The FFA Manual was first printed in 1930 by Farm Journal. The Archives has one copy of the first edition which is badly worn. Another copy of the first edition as well as other early editions are needed.

National Congress of Vocational Agricultural Students

The national judging contests for vocational agriculture students were first held in Kansas City in 1926. For ten years the judging contests were referred to in annual pamphlets as "National Congress of Vocational Agriculture Students." The Archives has a copy of "Announcement of the Second Annual National Congress of Vocational Agricultural Students" which was for the national contest and meeting event held in Kansas City in November, 1927. The Archives also has a copy of the annual announcement for 1930. Annual announcements for the National Congress are needed for the following years: 1926, 1928, 1929, 1931, 1932, 1933, 1934, and 1935.

Address of National Archives

Teachers of vocational agriculture, teacher educators, and state supervisors—especially those with many years of service and those retired—are asked for assistance in obtaining the needed items. Send materials and suggestions to:

R. J. Johnson
FFA Consultant and Archives Chairman
Future Farmers Supply Service
Alexandria, Virginia 22310

The Teacher's Task

Regardless of the amount of resources which are available to the teacher, he must continue to plan, make his farm visits, analyze his program, and decide which of the resources are the most valuable to him. Perhaps the climate has never been better for a creative explosion for adult education" is an accurate prophecy.
The present staff at the University of Nebraska School of Technical Agriculture numbers sixteen. Two have master's degrees, eight have bachelor's degrees, and the remaining six have technical-vocational training. This range in educational background creates a need for a program of in-service education. Here again the parent college has been of real value. The Department of Agricultural Education has set up an off-campus course for the staff at Curtis. We envision that this type of support will continue and that a variety of courses will be offered over the coming years. That department also provides guidance and coordination in research and overall program development.

Some Advantages

Without question, some schools that attempt to provide both degree and vocational-technical programs on the same campus have discovered the student who is not satisfied with either the "academic" or transfer courses. Some recent research indicates that large numbers of students are not satisfied with their academic courses and are not satisfied with the "academic" or transfer courses. Some recent research indicates that large numbers of students are not satisfied with their academic courses and are not satisfied with the "academic" or transfer courses.

The_Agricultural_Education_Magazine (Left) A technical agriculture instructor discusses some of his successes in teaching with a new educator at a Nebraska farm.

The current staff at the University School of Technical Agriculture includes sixteen. Two have master's degrees, eight have bachelor's degrees, and the remaining six have technical-vocational training. This range in educational background creates a need for a program of in-service education. Here again the parent college has been of real value. The Department of Agricultural Education has set up an off-campus course for the staff at Curtis. We envision that this type of support will continue and that a variety of courses will be offered over the coming years. That department also provides guidance and coordination in research and program development.

James T. Horner is Chairman and Professor, Department of Agricultural Education, University of Nebraska, Lincoln. Stanley A. Matzke, Jr., is Superintendent of the University School of Technical Agriculture located at Curtis, Nebraska.

Agricultural education is most advantageous for the student who understands the objective of the vocational-technical school and is most willing to contribute both his program of knowledge and experience. The instructor at the Technical School of Agriculture gains his knowledge and background because he is associated with a Land-Grant University. The instructor knows college transfer is in the school's aims, so he does not have to "make the course tough" so the graduates will transfer successfully.

We also enjoy the benefits of the accounting system of the University, the legislative support of the University in gaining a budget, the savings of the University's central purchasing, and the counsel of the Chancellor and all other key staff members at the University of Nebraska.

The certificate the graduate receives is signed by the Chancellor, the Dean, and the President of the Board of Regents.

In the three years we have been part of the College of Agriculture of the University of Nebraska, it has become apparent that it is a mature institution, willing to give the guidance, assistance, and support while allowing the flexibility needed to achieve the goals of preparing young people for agricultural occupations. It still holds firmly to the Land-Grant philosophy of expanding agricultural education and meeting the needs of the people of the State.
What would a nuclear disaster mean to farmers in your community? Radiation from fallout produced by a nuclear attack could be expected to affect 75 percent of the land area and 85 percent of the unprotected population. If proper protection measures against radiation from fallout are not taken, the farmer and his family will be seriously affected.

Although livestock can absorb larger doses of radiation than people, they will be affected. Crops may be contaminated by fallout or by the uptake of radioactive isotopes by plants from contaminated soils. The population of this nation would depend almost entirely on farmers in your community for food and fiber following a nuclear attack. Would they be able to respond?

The answer is “yes,” if his life can be spared. If he can protect his livestock from contamination and exposure, and if he knows how to farm contaminated soils.

**Safety Education**

As a vocational agriculture teacher, you are responsible for a variety of educational programs that contribute to the development of youth and adults in your area or school district. You are expected to provide them with a curriculum which fulfills their needs.

**Instruction on Nuclear Radiation**

Have you considered enlisting safety education with information on protection from nuclear radiation and how it relates to survival in the home and other rural areas? The problems of survival on the farm are more complex in many ways than those faced by urban residents. The urban dweller is able to rely heavily on local government resources. Farmers and their families are, necessarily, responsible for a much larger portion of their own protection and for that of their crops and livestock.

As a vocational agriculture instructor you may feel inadequately prepared to teach this unit. Terms such as radioactivity, fallout, gamma rays, decay, Strontium 90, thyroid, neutrons, and dose, may be unfamiliar.

These terms were new to the authors, too, until they completed a workshop in Personal and Family Survival offered by the Wisconsin Board of Vocational, Technical and Adult Education. After completing this workshop, both instructors and adults and high school agriculture students in a unit oriented to the farm and rural people.

Personal and family survival is a family affair. Safe use of foodstuffs temporarily contaminated is possible if the housewife knows how to decontaminate them. Also, the farmer knows that he will be a decontamination center for everyone who passes through his home. He should have in his mind what he will do should his home become the only safe haven for his family.

**Importance of Planning**

During the next few years I have taught vocational agriculture I have learned that proper planning is perhaps the basic requirement of a functional instructional program. Proper planning will give the desired results on the farm and in the classroom. Adequate planning in the classroom and proper planning in the home farm conditions of the student will be the key to successful planning.

**Suggested Guidelines**

- The instruction should be planned by the teacher and the young farmer with the teacher accepting major responsibility and providing leadership.
- The overall objective should be discovering and solving major problems of young farmer enrolled.
- Planning should be systematic and conducted throughout the year; on-farm instruction should be provided; and the instruction should be practical and interesting.

**Planning for Young Farmer Programs**

One of the greatest challenges I have encountered in conducting young farmer programs has been that of stimulating interest. In most communities there is always a small group of farmers who are anxious to attend classes. Although this may be slowly improving, the statistics reveal that only a small percentage of the adults who could profit from organized instruction are being reached. Thus, one of the greatest challenges in planning and conducting the instructional program is to discover and use ways which will stimulate more young farmers to participate.

What results do we expect from our instructional programs? We must know what we are striving to achieve — our goals. Planning and conducting the programs will be of little value unless it results in the young farmers making intelligent decisions and applying approved practices in their farming operations. Our efforts will be of little significance if we do not assist young farmers in solving problems effectively as well as economically.

Because of unlimited demands for the time and talents of teachers in agriculture, it is essential that we plan well those things we should be doing in agricultural education. Too many classes are taught with little thought about the topic to be discussed and the end result is that the students are left counting the minutes and thinking about the problems they face in the farm.
A New Program in Vocational Agriculture

ALBERT LEE

Teacher of Agriculture

Williamsburg, Kentucky

For many years teachers of vocational agriculture have advocated provision of programs in order to meet the changing needs of today's students. The need of farming has changed through the years and students needs have become more varied and complicated. Therefore, programs of vocational agriculture must change.

A New Program

Our school, Whitley County High School in Williamsburg, Kentucky, has a natural advantage to move in the direction of providing instruction in horticulture. We have 1,100 students in a consolidated system. The school grounds consist of 160 acres of level to rolling land. We have a two-teacher department of vocational agriculture with 112 boys enrolled. My co-teacher provides instruction in production agriculture (farming). I have started a new program in horticulture. The program was developed in consultation with agricultural education specialists in the State Department of Vocational Education at the University of Kentucky.

The course of study is designed to help students develop basic understanding and skills which will lead to further training in ornamental horticulture or to employment as operators of greenhouses, nursery workers, lawn and garden maintenance workers, or landscape aides. The primary units of instruction include:

- Greenhouse management
- Bedding plant production
- Polling and transplanting soft stem fertilizers
- Plant growing media
- Insect control
- Ventilating and heating greenhouses
- Plant identification
- Landscape design
- Turf maintenance

Laboratory Facilities

The program of instruction necessitates the construction of a greenhouse indicated in the picture. The first year we produced over 500 geranium cuttings, 150 daisy petunias, 750 carnations, 50 scarlet sage, and 70 daisy geraniums as well as other bedding plants. The market value of the flowers raised was over $1,200.00. We sold enough flowers to make the program self-supporting for an additional cost. We also sell flowers at a healthy price for a good deal of the school grounds at a profit. In addition, we designed and constructed a fish pond for the school grounds (see picture).

The best practices carried out on the school grounds have greatly enhanced the opportunity for students to practice what is taught. Students also receive much more supervision than they could possibly be given with a home-farm program.

Program of Instruction

Many exercises taught in the raising of flowers and bedding plants can be used in raising field crops. There are many related lessons in soils, insecticides, fertilizers, light and temperature requirements, length of growing season, and related topics. The program provides an excellent opportunity to stress the basic principles of plant science. Our greenhouse serves our program like a laboratory does for a good science teacher.

We offer a complete course in small engines for much of the equipment used in horticulture has to be repaired from time to time. We feel this saves both time and money for the students. Students also have the opportunity to learn the practical agricultural mechanics related to ornamental horticulture.

An Effective Program

We think this adaptation of our program is very effective. We feel there is a good production agriculture program. But now we are helping many boys who were unable to profit from a more narrow program of former years. We are doing a better job of teaching principles of plant science. We also feel that many of the boys will be able to enter successfully careers in ornamental horticulture. The motivation and practical values of the program is great. In short, it has been and continues to be a most satisfying experience.

The publication is well adapted as a reference for high school and college courses in agricultural occupations. Its best use would be as an orientation to cooperative in agriculture. Additional resources would be needed for a comprehensive study in the field.

John D. Todd
University of Tennessee

BOOK REVIEW

Cooperatives in Agriculture

Charles C. Drasbaugh, Associate Professor of Education, Rutgers—The State University, New Jersey, has been appointed Special Editor for The Agricultural Education Magazine for Region II (Delaware, New Jersey, New York, and Pennsylvania). Dr. Drasbaugh taught vocational agriculture for fourteen years in Hugueno and Dover, Pennsylvania. He holds B.S., M.S., and D. Ed. degrees in agricultural education from the Pennsylvania State University. He has been a member of the faculty of the Graduate School of Education at Rutgers since 1964.

Dr. Drasbaugh has had articles published in The Agricultural Education Magazine, American Vocational Journal, and the Pennsylvania Agricultural Education Magazine. Dr. Drasbaugh has served as a researcher and presenter at several research projects. He is currently secretary of the American Association of Teachers of Education in Agriculture.

Mr. Walker has been a teacher of vocational agriculture for four years, the last two years at Norman Park High School, Norman Park, Georgia. At Normann Park High he developed a program serving approximately 100 high school students and 300 adults. An advisory council was used in planning this extensive program which emphasized a marketing and processing program for the community.

Mr. Walker holds life membership in the American Vocational Association and the National Vocational Agricultural Teachers' Association.

Shubel D. Owen, Professor of Agricutural Biology, North Dakota State University, was honored as "908 Faculty Lecturer" at North Dakota State University. Professor Owen was selected for this honor by a faculty committee of previous lecture ship recipients after considering nominations from all departments in the University.

Professor Owen's lecture, "To Teach," was delivered to faculty and students at NDSU. A digest of his lecture appeared in the Minnesota Agricultural Education, April, 1968, issue of The finalists published by the Department of Agricultural Education, University of Minnesota.

Professor Owen received the B.S. degree in 1927 and the M.S. degree in 1936, both from Iowa State University. Prior to coming to North Dakota State University, he taught agriculture and science in Iowa and served as Assistant State Supervisor of Agricultural Education.
There is no substitute for a summer home visit if the teacher wants to make his teaching relevant to the home situation. (Photo by Bill Wimmer, Kansas.)

D. B. Sheffield (right), teacher of agriculture at Rock Ridge High School, Wilson, North Carolina, supervises a class of adult farmers during a course on Small Engine Repair. Charles Barnes (left) is the special instructor for the course.

Boyswinie of 30 Minute Club awards in Montana in 1968. (Left to right) Boyd Aubuch, State Supervisor; Dan Wynn, John VanDzemier, Frank Weinhall, and Luther Lehen, Teachers of Agriculture; Max Amberson, Teacher Educator. (Photo by Max Amberson)

Featuring —

AGRICULTURAL EDUCATION FOR PERSONS WITH SPECIAL NEEDS