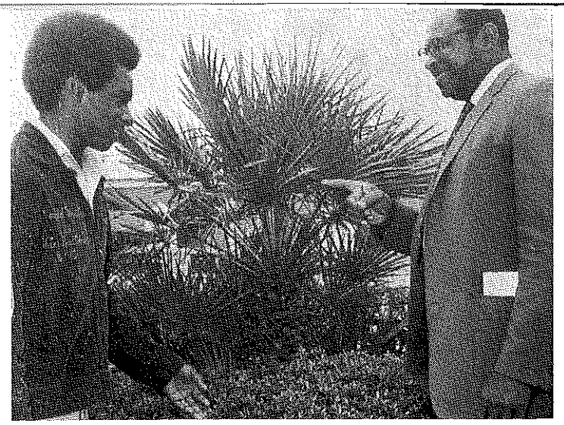
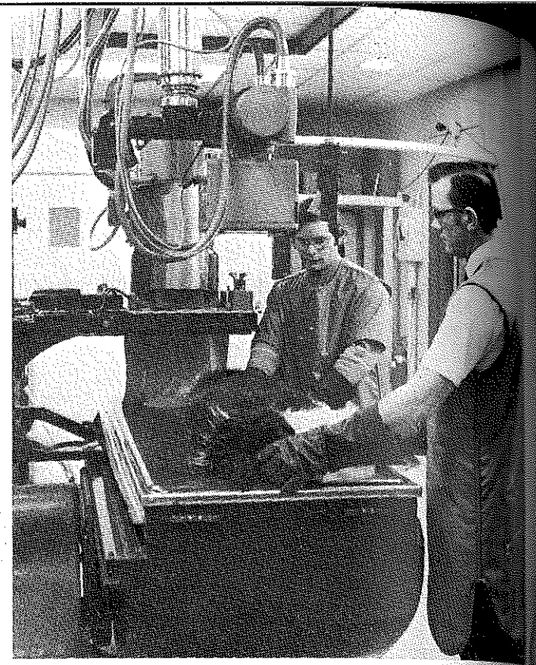


ON-JOB-TRAINING — Students enrolled in urban Agricultural Education programs derive considerable benefit from supervised occupational experiences. Here Benny Campbell, a student at Booker T. Washington High School, New Orleans, Louisiana, is receiving on-the-job supervision from his agriculture teacher, Sidney Jordan. Benny is receiving training in ornamental horticulture at The Royal Orleans Hotel. (Photo by J. C. Simmons, Louisiana State Department of Education)

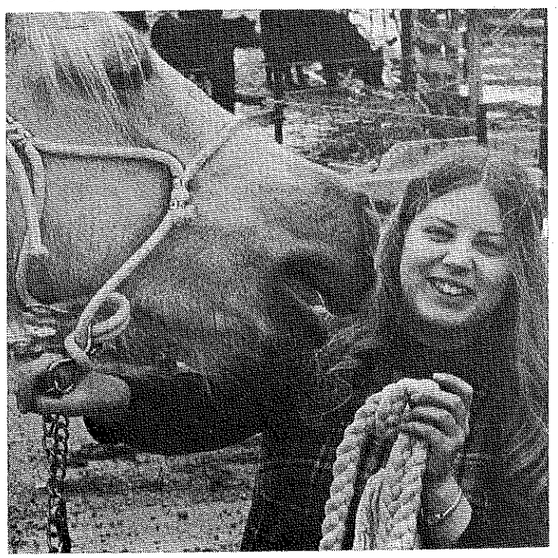


PET CARE IS BOOMING—Small animal care is a popular activity in urban agriculture. Millions of pets require medical treatment each year in the United States. In this photograph a sedated Collie is being positioned for an x-ray examination. (Photo from Eastman Kodak Company)

Stories in Pictures

by Jasper S. Lee

HORSES ARE FAVORITES—Large animals are popular with many urban students. Jane Cleveland, a student at Wilmington College, Wilmington, Ohio, is shown with one of her favorite animals. In addition to her personal enthusiasm for horses, she is planning a career in animal science. (Photo from Wilmington College)



AGRICULTURAL MECHANICS IS POPULAR—Many students like the hands-on activities of agricultural mechanics instruction. In this photograph, Sidney Crockett, agriculture teacher at Pulaski County (Virginia) High School, is demonstrating the use of engine analysis equipment. (Photo by Robert Veltri, Photo Lab, VPI & SU)

Agricultural Education

February 1975 Number 8

Volume 47

Theme—PROGRAMS IN NATURAL RESOURCES

The
Agricultural Education
Magazine

EDPRESS Vol. 47 February 1975 No. 8

TABLE OF CONTENTS

THEME—PROGRAMS IN NATURAL RESOURCES

Editorials

Natural Resource Education—Problems and Potential ..... Rodney W. Tulloch 171

Environmental Protection—Addition or Division? ..... Howard I. Downer 172

Education for Work and Leisure ..... Thomas Marron 173

Letters 174

Natural Resources and Environmental Careers in Our Vo-Ag Program ..... Jewell Colliver 175

Planning a Natural Resource Program for a Local Ag Department ..... Lee Wilmot and Rodney Tulloch 176

The Natural Resources Management Option in Virginia ..... Glenn Anderson 178

Important Competencies in Agricultural Resource Workers ..... Douglas Bishop and Max L. Amberson 179

A Paradise for Natural Resource Education ..... Norman J. Sadler 181

Effective Occupational Experiences for Students Enhance Learning ..... J. David McCracken 182

A Natural Resources Management Program ..... Daniel D. DeJarnette 184

Internships in Nonfarm Agriculture for Prospective Teachers ..... Charles W. Smith 186

The Neglect of Vocational Agriculture in Eastern Nigeria ..... John U. Okorie 188

Assistantships and Fellowships in Agricultural Education, 1975-76 ..... Paul Peterson 190

Book Reviews 191

Stories in Pictures 192

This publication is the monthly professional journal of agricultural education. The journal is published by THE AGRICULTURAL EDUCATION MAGAZINE, INC., and is printed at the Lawhead Press, Inc., 900 East State Street, Athens, Ohio 45701.

SUBSCRIPTION PRICE: $5 per year. Foreign subscriptions $6. Student subscriptions in groups (one address), $2 for October-May. Single copies and back issues 50 cents. In submitting subscriptions, designate **new** or **renewal** and address including ZIP code. Send all subscriptions and requests for back issues to Harlan E. Ridenour, Business Manager, AGRICULTURAL EDUCATION MAGAZINE, Box 14343, Columbus, Ohio 43214.

Second-class postage paid at Athens, Ohio.

Send articles and pictures to the Editor or to the appropriate Special Editor.

COVER PHOTO:

The maintenance of wildlife areas, as shown in the cover photograph, is an important area of natural resources and popular with sportsmen. Many instructional programs contain specific units on wildlife and the required habitats. (Photo from Rodney Tulloch, University of Kentucky)

Editorials

Guest Editorial . . .

NATURAL RESOURCE EDUCATION -- PROBLEMS AND POTENTIAL

Rodney W. Tulloch
Teacher Education
University of Kentucky

Rod Tulloch

"Natural resources," "conservation," "environment," and related terms are not new to teachers of agriculture. Teachers of agriculture have taught the major principles and the related basic science of natural resources for years. Much of what they taught is relevant today. However, recent emphasis on the environment, the "energy crisis," increased use of recreational areas, and shortages of fertilizer and other agricultural inputs have greatly increased the emphasis on conservation and natural resources. The increased emphasis and the resultant effect force the profession to a comprehensive analysis of present offerings and what should be offered in vocational agriculture in the area of natural resources education.

Problems

The impact of modern agriculture on our natural resources is significant. Fertilizer consumption for the fiscal year ending June 30, 1973 was: nitrogen, 8.2 million short tons (2,000 lbs. = one short ton); P_2O_5, 5.0 million short tons; and K_2O, 4.6 million short tons. The demand for fertilizer is in excess of the supply and is taxing the natural resources of the United States. Of the estimated 339 billion gallons of water used daily in the United States about 35 percent is used for irrigation.[1] Water is increasingly difficult to obtain for irrigation purposes. About 950 million acres of farmland in the United States are in grass, pasture, and cropland plus farmsteads and roads. About 387 million acres or 40.7 percent are in cropland.[1] With present food shortages, the importance and value of productive cropland is evident.

An enormous problem is that of erosion and sediment deposits. Sediment resulting from soil erosion is the number one water polluter that affects water quality. Total erosion is estimated in excess of 4 billion tons per year in the United States. The sediment from this is a serious problem made worse by the fact that it carries quantities of salts, nutrients, pesticides, organic materials, and pathogens.

Other serious problems in agriculture include: disposal of animal wastes, plant residues, forest trash; reclamation of strip mines; control of animal and plant disease agents and allergens; proper use of agricultural chemicals; proper natural resource planning and management; and, most importantly, improving attitudes toward natural resources.

Present Situation

Most individuals in the agricultural education profession do not have a comprehensive background in natural resources. This is caused by the lack of course offerings that are appropriate for teachers of vocational agriculture and those preparing for the profession. However, within the past five years many colleges and universities have added both pre-service and in-service courses in natural resources, environmental education, and conservation which better meet the needs of teachers. The author is familiar with twenty new programs and has read about many others.

Until recent years there has been a lack of appropriate materials for classroom use. Several books and publications on careers in and related to natural resources have been published in recent years. There are also numerous books and materials on the quality and quantity of the Nation's natural resources. In addition, many states have prepared outstanding materials for teacher use. An excellent source of materials is the Superintendent of Public Documents, Washington, D.C.

Many teachers who indicate a willingness to do something about natural resources education are having difficulty, for one or more of the following reasons: (1) too few students to justify a program, (2) too many students to handle in a new program, (3) lack of adequate time to work on a new curriculum, (4) lack of financial support and/or resources to establish a new program, and (5) insufficient personal subject matter background or experience.

Considering all these problems, it is evident why change is slow. A positive attitude is necessary in planning for new and emerging programs if progress is to be made. What are some positive steps that can be taken?

A Plan for Progress

The following suggestions will help in planning and developing a worthwhile emphasis on natural resources education.

1. Understand the aim of natural resources education.
2. See the need for natural resources education.
3. Know the agricultural resources available in the community for training students in natural resources.
4. Develop and implement a curriculum in natural resources.
5. Develop training stations and training plans in natural resources.
6. Organize and use an advisory committee.
7. Develop experience programs including selecting appropriate experience programs, planning the program, keeping records, and summary and evaluation.
8. Supervise the experience program by the teacher.
9. Secure and effectively use equipment and materials.
10. Develop a public relations program and keep everyone informed.

(Concluded on page 174)

Guest Editorial . . .

ENVIRONMENTAL PROTECTION - - ADDITION OR DIVISION?

Howard I. Downer
Teacher Education
University of Tennessee at Martin

H. I. Downer

During the hurry and scurry of developing new programs for Vocational Agriculture following the passage of P.L. 88-210 in 1963, it became evident that standard terminology must be developed for occupational areas related to agriculture. A National Ad Hoc Committee was appointed to tackle this very difficult task. The deliberations of the committee were brought to focus when a conference was held at the U.S. Office of Education in February, 1966, and resulted in the recognition of eight occupational areas. These eight areas were further codified and defined by Putnam and Chesemore and were included in the fourth draft, Volume II of the *Standard Terminology for Curriculum and Instruction in Local and State School Systems.**

Environmental Protection is a new agricultural occupational area recently recognized by the Division of Vocational and Technical Education of the U.S. Office of Education. As yet we have seen few, if any, guidelines as to what occupational activities are to be included in this area. I rather suspect that when they are developed they will duplicate or at least closely parallel those activities now attributed to the occupational area of Agricultural Resources. This will tend to dilute or divert subject matter related to environmental protection that has been included in curriculum guides for the resources area by many states.

If we can assume that conservation, protection and regulation, and recreational utilization are still viable occupational activities of the Agricultural Resources area, then we would be hard pressed to delineate occupational activities for the Environmental Protection area that would not duplicate those activities except at the professional level of preparation.

Having had a small part in the deliberations which led to the establishment of Agricultural Resources as one of the original eight occupational areas for Vocational Agriculture and in the establishment of the subject matter and planned learning activities for this area, I question the practicality of separating Environmental Protection from the occupational activities of Agricultural Resources (i.e. conservation, protection and regulation, and recreational utilization). They are so interrelated as to be inseparable and the duplication of the activities in more than one occupational area will be confusing, to say the least.

Present curriculum guides developed for Agricultural Resources incorporate a significant proportion of environmental protection concepts and practices needed to enter agriculturally related occupations in this area at less than the para-professional or professional level. These guides emphasize conservation and management of the resources which is considered by the professional environmentalists as being the most practical approach to environmental protection.

In reviewing the available occupational titles most closely associated with environmental protection, I have found few that do not require a minimum of a Bachelor's degree in engineering, chemistry, or biological science. This would indicate that occupational preparation in this area is beyond the level of vocational-technical programs in agriculture as established by federal and state policies and regulations. As yet there have been few, if any, justifications set forth to substantiate the separation of environmental protection occupations from those in the agricultural resources area and still be able to classify them as being of less than professional level.

We in agricultural education at local, state, and national levels must guard against the dilution of established agricultural occupations programs by the addition of occupational areas which duplicate or closely parallel these existing programs and for which there are few identifiable job openings not requiring a four-year degree. We must realize that environmental protection should be an integral part of the occupational preparation of each student for agricultural occupations and not a separate occupational area. ♦♦♦

*U.S. Office of Education, *Standard Terminology for Curriculum and Instruction in Local and State School Systems*, State Educational Records and Report Series: Handbook VI, Washington, 1969.

Themes For Future Issues

March —	Utilizing Resources in Teaching	July —	The FFA
April —	Informing the Public	August —	Serving Out-of-School Groups
May —	Teaching the Disadvantaged and Handicapped	September —	Guidance, Counseling and Placement
June —	Women in Agricultural Education	October —	International Agricultural Education

Education for Work and Leisure

Thomas Marron
Teacher of Natural Resources
Coventry, Rhode Island

Tom Marron

"An educational cop out! Merely an escape from real education! A lot of fun but that's about all! Really, how can you justify outdoor recreation activities in your vocational-technical Natural Resources Program?" These were some typical responses to the Outdoor Recreation component of the Coventry Natural Resources Program.

> Learning to be a consumer of outdoor recreation is a prerequisite to learning to be employed in outdoor recreation.

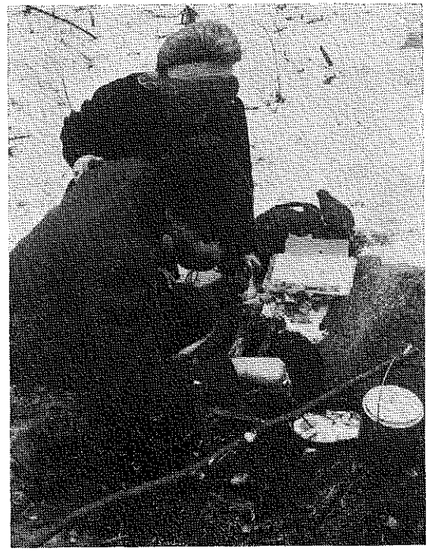
For several pressing reasons, I simply could not omit this subject from the educational experience of our students. First, outdoor recreation skills are often vocational-technical skills of Natural Resources occupations. Second, as I prepare students to move into the post-industrial society of three-day weekends, I find it mandatory to find a place for education for the world of leisure alongside education for the world of work. Perhaps most of all, outdoor recreation provides a tremendous vehicle for learning things that could not be learned any other way and that must be learned by students preparing for a natural resources career. And, finally, because recreational uses of our natural resources are now so demanding and so rapidly growing, management of resources for recreational use is fast becoming an environmental priority.

Outdoor Recreation is a major area of study in the Coventry Natural Resources Program along with Forestry, Wildlife, Environmental Horticulture, and Environmental Control. Of all these areas, Outdoor Recreation has been most easily and most often misunderstood. At the same time, it has proven to be the most valuable for many students.

While working for the State Department of Natural Resources during the summer, several of our students learned that their canoeing skills were more than recreation skills. During an intensive Canadian Goose survey, the students were canoeing daily and found their canoeing skills absolutely essential to carry out their work assignment. The Natural Resources students develop canoeing skills during a two-week training program conducted during school time. And they apply these skills on canoeing field experiences that are conducted during the three-year Natural Resources Program.

Freeze-dried ice cream, a two-pound tent, a nine-ounce stove, and a host of other backpacking gear is just part of the "Backpacking for Work . . . and Fun!" unit that is offered. Fire making, backpacking equipment, outdoor cooking, survival, and first aid are some of the subjects which tie into this outdoor recreation topic. According to proposed plans, students will utilize all of these skills to conduct field studies during full day and overnight experiences in and out of Rhode Island. But students are often making their own plans for the next three-day weekend or the summer long before the school plans are implemented.

One morning around 7:15, two horses participated in the Natural Resources Program to the delight and enthusiastic involvement of the students and to the bewilderment of onlookers. I am sure if you want to learn to ride a horse, you should do just that.



Students at Coventry, Rhode Island test outdoor cooking skills in the cool of winter as part of the Outdoor Recreation Component of the Natural Resources Program.

If you want to learn to read about them or watch slides of them, then you should do that. Our students wanted to learn to ride. And they did. But they also gained insight into complex problems of trail management as well as human interest in horses and horseback riding. These insights are critically important to the effective and wise management of our resources for recreational uses.

Orienteering "is played on vast acres of God's tapestries, among great boulders and brown pine glades, beneath the melting gold of maple trees and over streaming fields of russet weeds, past crumpled stone walls and along cold, tumbling brooks" according to Bill Johnson of *Sports Illustrated*. Orienteering is a sport, a skill, a game, a method of learning, and a vocational-

(Concluded on page 177)

LETTERS

Dear Editor:

Once again, Professor Cayce Scarborough has "hit the nail on the head" in discussing professional organization(s) memberships. Being a teacher educator in Ag. Ed. myself, (as much as one can be these days), my own experience may help explain some key points in Professor Scarborough's case.

First, I'm a "joiner." That is. I join my local and state teacher's organization, state and national vocational association, and A.A.T.E.A. These are all organizations for Agricultural Educators. As the Professor points out, being "active" in all is most difficult.

Part of the problem in becoming "active" is that teacher educators have a self-identity only at the national level. There is no state organization for vocational teacher educators in Agriculture where I work. With only six persons in the State in this capacity, there isn't likely to be such an organization. Attempts to organize all vocational teacher educators in the State has proven to be most difficult, but is now progressing.

Secondly, years ago I noticed that while the problems confronted by teachers are very similar to those confronting teacher educators, working on the other guy's problems will not necessarily solve your own problems. Teacher educators have their own unique problems to resolve, for which much work is needed.

This situation encouraged me to become involved a few years ago in the state and national association of teacher educators (A.T.E.) an organization mentioned by Scarborough in his editorial. I was "active" enough to be State President and attend the national meeting last year.

My experience was most gratifying in that all teacher educators in all fields are eligible for membership. However, I noted that very few vocational and/or agricultural teacher educators were members of either the state or national organization. For what it is worth, it appeared to me that the real war in teacher education is being fought by A.T.E. Whatever we do for teacher education in A.A.T.E.A. or other vocational education organizations are but battles in this war.

While I am not sure of the course agricultural teacher educators should take in caring for themselves professionally, I am sure that being "active" in whatever one belongs to is a key to being professional. And this, I believe, is what Professor Scarborough had in mind in his timely editorial.

C. Douglas Bryant
Agricultural Education Department
N. C. State University
Raleigh, North Carolina

Natural Resource Education—Problems and Potential

(Tulloch—from page 171)

Many teachers in schools where natural resources should be taught do not have the competency or the resources to initiate an instructional emphasis, whether it be a comprehensive module or unit of instruction or establish a program. They should look to universities and colleges offering extension courses, short courses, and workshops which will help implement the ten suggestions. If such courses or workshops are not offered, teachers should make their desires known. Certainly a greater allocation of time and money at both the state and local level needs to be used on natural resources education.

While developing such an instructional thrust, do not forget adults. Classes in natural resources could effectively serve adults in agriculture, including both farm and off-farm clientele. Courses for adults could include forestry, recreation, conservation, wildlife, and a broad range of other subjects. The need outdistances the present level of offerings.

Conclusions

Not every teacher or every department should offer a specialized program in natural resources. If a survey and analysis of the community indicates to the teacher and his advisory committee that natural resources is an area to be included in the instructional program, there are three possible approaches that may be used to meet local needs.

First, regular instructional programs can incorporate modules dealing with natural resources, thus, educating all the students in the most important and basic areas of natural resources. Soil and water conservation, forestry, wildlife and recreation are examples of such modules.

Secondly, where lack of training stations or other problems prohibit a specialized program in natural resources a Diversified Agricultural Occupations (DAO) Program may be established. Using this approach a class of students might spend 50-60 percent of their time on a Core Course of Study. The remaining 40-50 percent of the time could be spent on individual study. Interested students placed in natural resource training stations would study an Individual-Student Study Guide dealing with natural resources. For more information on Diversified Agricultural Occupations, see Dr. Harold Binkley's article in the November 1972 issue of *The Agricultural Education Magazine*.[2]

A third approach has a possibility in a few situations. And, this is when the need exists and the training stations and other resources are available for a specialized program in natural resources. This approach provides for more specialized, indepth, and intensive education in natural resources. Many of the students taking such a program can find rewarding careers in many communities.

If the teacher decides to provide an instructional emphasis on natural resource education, he should use all the resources available; work with his advisory committee, local school officials, state staff members; and inform the community about what he is doing.

Only through a unified aggressive effort can the instructional emphasis be developed to meet the need for natural resources throughout the country. ◆◆◆

[1] *Methods for Identifying and Evaluating the Nature and Extent of Non-Point Sources of Pollutants.* U.S. Environmental Protection Agency, Washington, D.C., October, 1973, p. 35.

[2] Harold R. Binkley, "Diversified Agricultural Occupations (DAO) — Instructional Programs to Meet the Challenge in Agribusiness Education," *The Agricultural Education Magazine*, 45:5 (November, 1972), p. 114 & 115.

Natural Resources and Environmental Careers in Our Vo-Ag Program

Jewell Colliver
Teacher of Agriculture
Barren County High School
Glasgow, Kentucky

Jewell Colliver

For many years we have been trying to make Vocational Agriculture relevant to the needs of our community. This year consolidation presented an opportunity for an expanded program of vo-ag in our school. Consolidation gave us an opportunity to offer more specialized courses than had been possible in the smaller community high schools. We now have 318 students enrolled in vo-ag in our school system and are served by six teachers.

In order to explain the curriculum offered, we need to look at the location of Barren County. We are located in the south central area of Kentucky, ninety miles south of Louisville on I-65. This highway has three interchanges in Barren County and had an average daily traffic volume of 12,033 in 1971 or 4.4 million vehicles for the year. I-65 extends in a north-south direction and is a major highway for the central United States.

The natural resources of the county are diversified. Mammoth Cave National Park touches the northern part of the county, and Barren River Reservoir and State Park are located on the southern side of the county. Mammoth Cave National Park, with the world's most extensive underground caverns, occupies 51,000 acres and is one of the world's outstanding geologic attractions. In addition Barren River Reservoir occupies 10,050 acres, and a 1,500 acre state park has been developed into another major attraction in our community. Kentucky is located within one day's drive of 60% of the people of the United States now, thanks to our improved highway system.

Barren County is a prime agricultural county ranking second in the State in burley tobacco, dairying, beef, and hay production. The economy of the county is diversified, with agriculture, manufacturing, and tourism each playing an important role. In 1970, 20.7 percent of the employment was in agriculture, 24.3 percent in manufacturing, and 10.1 percent in government service. While agriculture is still undisputedly vital to the region, the nature of agricultural activity is changing in accordance with national trends. The number of people employed in production agriculture decreased by 46.4 percent from 1960 to 1970. In 1973 two million people visited Mammoth Cave. Tourism (the hospitality industry, as it is more correctly called) was Kentucky's second largest industry in 1973. The income from goods and services provided in tourism was 701 million dollars. Our school community is located in a prime tourist center in Kentucky, and this creates many job opportunities which fit in well with part-time farming in the area.

Our staff felt the need of providing training in the area of natural resources and environmental careers. I was selected to teach it because of my interest and background. That background included serving the past twenty years on the Conservation District Board of Supervisors, presently being chairman of the city-county Planning Commission, and having 28 years of experience as a teacher of agriculture in the county.

After the decision was made last spring to offer the course in Natural Resources, and with a pre-enrollment of fifteen students in the class, I secured a suggested curriculum guide from Dr. Rodney Tulloch, Assistant Professor of Agricultural Education at the University of Kentucky, and wrote some 85 letters to sources suggested in the guide. I had a very gratifying response and received a wealth of reference material, all free. Also, I received information as to where other material could be purchased that would be helpful. So far, we have put relatively little cash outlay into the program.

Neil Connell, Manager of Barren River Reservoir—U.S. Army Corps of Engineers, makes presentation to Natural Resources Class while Ranger Crabbe (left) and Ranger Furlong wait their turn.

Our Natural Resources course is set up as a two-year program offered to juniors and seniors meeting two hours a day, which permits field trips and use of resources that otherwise are not practical for a one-hour period. Occupational experience programs are being developed largely as summer employment. A few students, however, are employed part-time during the school year.

I have been teaching the course only since the beginning of the present school year. The students, however, have shown excellent interest. We take a field trip about twice a month during favorable weather. So far we have visited the city water plant, Barren River Dam control center, a privately owned fishing pay-lake, city sewage treatment plant, and sanitary landfill. Resource people who have visited the class include the city water plant manager, chamber of commerce executive secretary, and the president of National Park Concessions, Inc., that employs over 600 people. Others scheduled include superintendents of National and State parks, and the Manager of Resources for the U.S. Corps of Engineers.

(Concluded on page 180)

Planning a Natural Resource Program for a Local Ag Department

Lee Wilmot

Lee Wilmot
Vo-Ag Teacher
McCreary County High School
Whitley City, Kentucky

Rodney Tulloch
Teacher Education
University of Kentucky
Lexington, Kentucky

Rod Tulloch

In this day of rapidly changing agriculture, McCreary County, Kentucky is faced with a decline in production agriculture both in terms of people engaged in farming and total sales of farm products. To make the high school program of vocational agriculture viable, it becomes necessary to make a serious analysis of the situation to determine what the future role of the department should be. In Kentucky, a major emphasis in program planning has been to meet the needs of the community and the training needs of the students.

During the summer of 1974, teachers who were enrolled in a class at the University of Kentucky conducted local surveys to determine: 1) training station possibilities, 2) resources that can be used for field trips, demonstrations, and in other instructional situations, and 3) employment opportunities in agriculture for high school graduates.

Facts From the County Survey

The survey for McCreary County revealed that there are numerous training station possibilities in both forestry and recreation with governmental agencies and in the private sector. Several governmental agency personnel and private employers indicated interest in developing training stations for students. There are many resource persons available to serve on the advisory committee and speak to and conduct demonstrations for the classes.

Resources of the county that need to be understood in implementing an instructional program are: a) A large part of the county is government owned. The county is made up of 267,520 acres of land in south central Kentucky, with the Forest Service (United States Department of Agriculture) controlling 67 percent of the land, most of it in the Daniel Boone National Forest, and the Corps of Engineers controlling 3.73 percent making up the Lake Cumberland District. b) Much of the total area is in forest and woodlands. Looking at the total land mass of McCreary County, it was found to be made up of 95 percent of mixed hardwood and softwood forests. c) The area is ideally located for recreational uses. McCreary County is readily accessible to several large population centers. It is within a day's travel (300 miles) of urban centers with a total population of nearly 14 million people. The 1980 projected population for these centers is approximately 19 million. A new recreational area is in the planning stages which will encompass 18,750 acres of private and public lands.

3) Job opportunities are changing but look bright in natural resources. Mining is declining while other employment areas are opening up. Employment opportunities in the mining industry of the county have declined by 82.9 percent, while other employment opportunities have increased: manufacturing, a 212 percent increase; transportation, a 48 percent increase; wholesale and retail, a 196 percent increase; finance, a 300 percent increase; and services, a 95 percent increase.

Forestry represents a large and growing job market. Private industrial employment in forestry-related business is up 16.5 percent. The Federal Government is a large employer in the county, with a majority of its personnel employed in forestry work.

Rationale for a New Curriculum

The predominant use of land in McCreary County for forestry and recreation enterprises indicates a strong potential for training possibilities and employment opportunities in the years immediately ahead. Three major areas of emphasis for training are identified by the U.S. Forest Service: water shed protection, recreation, and lumber production. The advisory committee concurs that this information indicates that McCreary County High School can best serve its agriculture students by the development of an intensive course of study in the area of forestry and conservation of natural resources.

The employment picture for forestry and wood utilization jobs is bright in both the government and private sector. Numerous opportunities exist for the establishment of and employment in recreational and related businesses. Persons with good training in natural resources will be in demand for many years.

A Competency Based Curriculum

Working with teacher educators at the University of Kentucky, a two part "plan of action" was devised to: 1) develop a more relevant course of study, and 2) to provide the teacher with up-to-date technical and central training to teach the course. After preliminary planning and making use of present competency-based forestry materials, the teacher of agriculture from the county spent many hours with government and private industry employers. His purpose was to determine what attitudes, knowledge, and skills would need to be developed by high school students in order to prepare them for job entry in the employment opportunities of the area.

After competencies were identified the wording was refined and they were checked by several persons who were knowledgeable about the job. After these competencies were cataloged and all the competencies for a job area were substantually completed, a review of teaching materials, equipment, and

(Concluded on next page)

(Wilmot—from previous page)

reference materials available was made to determine what could be used in the implementation of the program. After developing a list of items needed to implement the program, a rationale was developed for the major items. The list and the rational were presented to the principal, superintendent, and the board of education.

Developing Teacher Competency

The "plan of action" provided on-the-job training for the teacher so that he could acquire, firsthand, the competencies required of students. After preliminary planning with University personnel, arrangements were made with the U.S. Forest Service for the teacher to receive on-the-job training with the Forest Service. The teacher spent approximately fifty hours in on-the-job training with the U.S. Forest Service. Activities of shorter duration were planned in private business.

The teacher developed basic skills in or related to plane surveying; forest measurement by both direct and indirect measurement and volume computation; applied silviculture including artificial reforestation, natural forestation, weeding, thinning, pruning and cutting techniques; forest soils; timber harvesting; and forest protection. Other areas in which the on-the-job training was essential included outdoor recreation and wildlife ecology.

Implementation Procedures

The McCreary County School Board is planning a new high school to be completed in 1976. The plan is to include facilities for a two-year, two-hour period, intensive course of study in forestry.

The aim of the specialized course in forestry is understood by the teacher, administrators, and the forestry businessmen and industry personnel of the area. The need for the program has been shown by the survey. A rationale for the course has been prepared. Lists of facilities, materials, equipment, and reference materials needed for the program being prepared and presented to the board of education. The early and thorough planning for this course should maximize the program development and support. A ten-acre demonstration plot and laboratory near the school is being planned with the U.S. Forest Service. Prospective training stations are being contacted. Local news media will soon be given information about the course in forestry to increase interest and to better inform the public. Continual help in all areas is received from the advisory committee. A PERT chart is being prepared to assure that everything possible is done on time to be ready for the first day of class in 1976.

Summary

The philosophy underlying the plan for a specialized course in forestry is sound, the determination of need is valid, and the method of development of the programs is sound and well suited to the situation in McCreary County. The program is building on knowledge and accomplishments of the past, while incorporating new ideas and subject matter. The course of study being developed will allow greater numbers of students to be more specifically prepared for entry level jobs and advancement in the occupational area in which there will be job opportunities. This course should be interesting to the students and of vital worth to the community. ◆◆◆

Education for Work and Leisure

(Marron—from page 173)

technical skill. Perhaps most of all, it is fun and education can legitimately be that too.

The orienteering skills developed in Natural Resources include such things as topographic map interpretation, use of a compass, use of topographic maps in the field, and a host of related skills. All of these skills can be used by the students on their next hunting or camping trip. And that would be ideal so that those skills will remain ready for use in a Natural Resources occupation after graduation.

After our students have studied salt water sportfishing, they have a background of understanding and interest which paves the way to an effective study of salt water resources management for recreation and for commercial use. A fishing trip, a class in fish preparation, and a field study of these resources all tie together to make learning interesting, exciting, and unforgettable. Perhaps best of all, the students complete this outdoor recreation unit eager to learn more and to make these resources more a part of their lives.

These are some of the forms the outdoor recreation component of the Coventry Natural Resources Program has taken. There are many others we have become involved in such as flytieing, spincasting, archery, wood carving, hunter safety, and hiking. There are many more outdoor recreation activities we have not yet become involved in. And, there must be a host of valuable outdoor recreation activities possible for any Natural Resources program.

The other side of the outdoor recreation component that is probably more easily understood than the activities themselves is managing resources for recreational uses. The two facets of outdoor recreation are complementary to one another.

In the area of resource management for recreational uses, we do focus on the forest, wildlife, parks and campgrounds, law enforcement, fresh water resources, and people. A problems approach is often taken. And field studies of facilities obtain firsthand information and experiences in management processes. The students also depend upon the people in recreation management positions in their studies. All of our work with resource management for recreation use has greater meaning and purpose with our background of outdoor recreation experiences.

Outdoor Recreation is a vitally important part of the educational experience received by the Coventry Natural Resources students. Not only does it prepare them for the world of work but it also prepares them for the world of leisure. Both of these worlds will challenge our students, the generation of 2000 A.D., more than they have challenged any generation before them. ◆◆◆

THE NATURAL RESOURCES MANAGEMENT OPTION IN VIRGINIA

Glenn Anderson
Supervision
Richmond, Virginia

History

The need for instruction in conservation and forestry was recognized early by the state leaders of agricultural education in Virginia. As early as 1938, special courses were offered to keep the instructors of agriculture up-to-date on new developments in conservation and forestry.

During the "forties," programs in farm forestry, wildlife conservation and soil and water conservation education received their greatest boost. In 1943 the State Forestry Education Committee (Advisory Committee) was formed. This committee was composed of representatives from forest related industries and various educational agencies.

In 1965, a survey of conservation and forest related industries and agencies revealed a substantial need for employees with concentrated instruction in these areas. A committee was appointed and a curriculum guide was prepared for an optional cluster course.

The curriculum guide has been reviewed and revised by representatives of prospective employers, agricultural education instructors, and by members of the state staff.[1]

Following the publication and distribution of the guides, the major emphasis was placed on assisting instructors in their total Natural Resources Management program. The remainder of this article is devoted to a discussion of the Natural Resources Management Advisory Committee, the development of teaching material and the workshops planned for instructors of the Natural Resources Management Option.

Using Natural Resources Management Advisory Groups

All leaders in agricultural education have recognized the value of an advisory committee in planning an instructional program. The advisory committee for this option has representatives from all areas of natural resources. Approximately thirty members are present at the annual meeting, and members of certain sub-committees usually meet additional times during the year. The various sub-committees include:

1. Forestry Committee
2. Outdoor Recreation
3. Air, Soil and Water Conservation
4. Wildlife Conservation

This committee has provided the impetus for many outstanding advancements in this option. Members have participated in workshops and assisted in preparing various publications and teaching aids for the agricultural education instructors.

Developing Curriculum Material

A concentrated effort has been made by the state staff to provide teachers with the necessary aids to improve the instruction in the Natural Resources Management program. As early as 1945, a publication entitled "Forestry in Vocational Agriculture," by the late Professor Henry C. Groseclose of VPI & SU was prepared for distribution.

Following the recommendation of the State Natural Resources Management Advisory Committee a new publication in forestry was developed in 1962. "Forestry in Vocational Agricultural in Virginia" was prepared and published by the Agricultural Education Division, State Department of Education, with the assistance of representatives from the Virginia Division of Forestry, the Forestry and Wildlife Department at VPI and SU, and instructors of Agricultural Education in the State. This publication received a major revision in 1970 and the title was changed to "Forestry in Agricultural Education in Virginia." Filmstrips were also prepared to complement the publication. Teachers have used these teaching aids most successfully.

Today similar teaching aids are being developed in Wildlife Management by the Commission of Game and Inland Fisheries in cooperation with the Agricultural Education state staff. This material will include a publication and complementary filmstrips, and masters for transparencies will be developed.

The close coordination of teaching materials by the Advisory Committee has assured the production of quality and useful teaching aids.

Workshops

In our Natural Resources Management Option, a special effort has been made to provide teachers with in-service education which would enable them to accomplish their objectives in their total instructional program. From 1969-74, a total of eleven workshops were held for this purpose. These workshops included most areas covered in the Natural Resource Management Curriculum Guide.

Some of the areas covered include the following:

1. Tour and Discussion of Recreational Enterprises
2. Tour and Discussion of Wildlife Management Areas
3. Use and Discussion of Equipment in Forestry
4. Tour and Discussion of Virginia Division Forestry Nursery

(Concluded on page 180)

[1]Natural Resources Management, A Curriculum Guide for Agricultural Education, Agricultural Education Service, Division of Vocational Education, State Department of Education, Richmond, Virginia 1972.

Important Competencies in Agricultural Resource Workers

Doug Bishop

Max Amberson

Douglas Bishop and Max L. Amberson
Teacher Education
Montana State University
Bozeman, Montana

The identification of specific competencies needed by workers in agricultural occupations is the first step that must be taken by agricultural educators as an attempt to improve their training program. The study being reported was conducted to provide information relative to the knowledge, skills and attitudinal competencies needed by entry level employees in selected job titles in agricultural resource occupations.[1] Agricultural resources occupations are defined as those occupations involved in the development, maintenance, protection and recreational utilization of natural resources including plant life, non-human animal, air, water, soil minerals and mineral fuels, and space on land and ocean surfaces.

Three criteria were considered in the selection of the job titles to be included in the investigation. First, the researchers were interested in those job titles in which specific kinds of training were necessary in preparation for entry-level employment. However, this training should not necessarily require a baccalaureate degree. Second, the job titles selected had to be unique to the employment needs of Montana. Third, consideration was given to the number of positions comprising the job title.

Method

The agencies, organizations and businesses that were considered when selecting the population included the Soil Conservation Service, Montana Meat and Poultry Inspection Program, Stockmen's Organizations, Agriculture Finance Organizations, The Bureau of Land Management, and federal and private crop insurance agencies.

Job titles included in this study were identified with the help of persons in agricultural resources agencies which hired graduates of the State's agricultural training programs. The initial investigation revealed that agricultural resources occupations, as defined for the study, were generally characterized by the need for a professional degree. However, several technician positions existed among the selected agricultural resources agencies. The final list of job titles included the technician level positions of Civil Engineering and Soil Conservation Technicians, Lay Food Inspectors, and Dairy Herd Improvement Supervisors. These technical level positions were studied in detail in an effort to identify competencies needed by employees in these four positions.

The initial list of competency statements was synthesized from the job descriptions found in the Dictionary of Occupational Titles and job descriptions and training manuals available from federal and state government agencies. Additional competencies were obtained by interviewing persons employed in the selected job titles. When the competency lists were prepared, directors and work supervisors reviewed the competencies for each job title included in the study. Following the validation process, 120 employees were asked to react to the competencies on a rating scale from 1 to 4 denoting "not important" to "essential." The data received from 92 employees in the various job titles were used to arrange the competencies from the most important to the least important on the basis of a mean rating.

Results

Because of the large number of competencies identified for each job title, only some significant findings are being reported. A complete copy of the report is available upon request from the Department of Agricultural and Industrial Education, Montana State University, Bozeman, Montana 59715.

Soil Conservation Technician Competencies

Personal qualities received the highest mean rating among the 182 competencies rated. The competency, "Demonstrate the ability to get along with others," received the highest mean rating.

Other competencies included in the upper 25 percent of competencies dealt with the actual handling and use of survey equipment. Competencies requiring a detailed knowledge of specific conservation practices and crop cultural practices seemed somewhat less important to this group of employees.

Civil Engineering Technician

The Civil Engineering Technicians who were surveyed felt that "Recording survey data" was the most important competency. Employees in this job title placed more importance on the use of the survey equipment and recording the survey data and less importance on personal competencies than did the Soil Conservation Technicians.

An understanding of agricultural practices was considered of less importance by the respondents. The bulk of the competencies related to production practices was in the lower 25 percent of all competencies rated.

Competencies calling for the employees to make recommendations about use of certain conservation practices were given lower priority. This might indicate that Civil Engineering Technicians generally perform assigned tasks given them by a supervisor re-

(Concluded on next page)

[1] Bishop, Amberson and Agocs, *A Study to Determine Competencies Needed in Selected Job Titles in Agricultural Resources Occupations*, Staff Study, Agricultural and Industrial Education Department, Montana State University, June 1974.

(Bishop—from previous page)

sponsible for planning conservation practices.

Probability Values of Duplicate Competencies

Competencies for the job titles, Soil Conservation Technician and Civil Engineering Technician appeared to be similar since the final instruments contained 74 duplicate competencies.

Using a Chi square test, the p-values established for 74 competencies indicated that only one of the 74 duplicate competencies received a significant probability value below the .05 level.

Food Inspector Competencies

A total of 337 specific competencies were identified as being valid for a person employed as a federal food inspector. The large number of competencies made it necessary to divide the list into 39 separate categories.

Competencies ranked in the upper 25 percent related to the maintenance of clean, sanitary conditions within the plant. Maintaining personal cleanliness among the employees was quite important with five such competencies appearing in the upper 25 percent. Seven of the 13 competencies relating to personal work traits appeared in the upper 25 percent.

Dairy Herd Improvement Supervisor

Seventy-four specific competencies were identified as being directly related to the Dairy Herd Improvement Supervisor job title. Six competencies received the highest mean rating possible. With the exception of operating an automobile, each of these competencies related to collecting, weighing and recording milk samples.

A knowledge of animal health care was not considered to be extremely important to the performance of the supervisor's job. Those competencies relating to dairy herd management were also in the lower 25 percent.

Discussion and Conclusions

Even though the research dealt with only four job titles, the results obtained are interpreted as showing a divergence among the competencies required in the various Agricultural Resources job titles. There are definite professional and vocational competencies related to agriculture required by employees in agricultural resources job titles. Competencies that relate to personal qualities are considered to be very important.

Competencies requiring an in-depth understanding of agricultural practices were not rated as high as those competencies related to the specialty skills. It appears that many of the competencies needed would be obtained in a post-secondary education program.

A more detailed task analysis is needed to provide a breakdown of all competencies into their respective tasks. Additional research of this nature would provide data needed to determine the most effective and efficient way of assuring articulation at all educational levels in the preparation of prospective employees in the Agricultural Resources area. ◆◆◆

(Anderson—from page 178)

5. Workshop on Curriculum Material Development and Dissemination

Evaluations of the workshops have been favorable and the participants have made the selection for the major areas to be covered. These workshops have been held in all parts of the State. Some of the facilities that have been used for our workshops include:

1. VPI & SU
2. Dabney Lancaster Community College, Clifton Forge
3. Mount Rogers Recreational Park in Southwest, Virginia
4. Kerr Dam Recreational Area at Clarksville
5. Virginia Division of Forestry Nursery at New Kent
6. State high schools with model programs in Natural Resource Management.

The Natural Resources Management Option has continued to increase in popularity. In Virginia today, 47 schools offer instructions in this area and a projected 66 will offer Natural Resources Management by the school year 1977-78. The success of this program can be attributed to many factors.

The factors which should receive the most credit for the success of the program include:

1. Careful planning by state staff
2. The guidance received by the Advisory Committee on Natural Resources Management
3. The coordination of program ideas from Agricultural Education Instructors
4. The provisions for the production of teaching materials which are articulated with the teacher's guide, "Forestry in Agricultural Education in Virginia."
5. Qualified instructors
6. The workshops which enable instructors to stay up-to-date

One of the most successful options offered in agricultural education in Virginia is Natural Resources Management. The reasons for its success have been outlined and discussed. Other options have been introduced and have been successful. The format of careful planning used in the Natural Resources Management Option was followed in organizing these new options.

The total involvement of representatives from educational agencies, related industries, agricultural education instructors, and state staff has created a successful program.

(Colliver—from page 175)

Beginning with their junior year, students are given a choice of courses which permit greater competence in the special area they select. A total of six high school credits may be received in agriculture. Smaller numbers of upperclassmen are due somewhat to consolidation and a much larger curriculum offered in many other departments.

While our natural resources class is new and we have only one class, many of the opportunities in our area for education in natural resources are now being used to at least a limited extent. The enthusiasm of the students, government and industry, and interested people in the community are convincing proof of the need for this program.

There are many jobs available in our area and it is our desire that our students be properly educated to fill these jobs. ◆◆◆

A Paradise for Natural Resource Education

Norman J. Sadler
Vo-Ag Instructor and Voc. Director
Randle, Washington

Norman Sadler

White Pass School District, covering the eastern one-third of Lewis County in the great forest State of Washington, is indeed a paradise for natural resources education. In this area of unspoiled beauty, one finds majestic Mt. Rainer which rises 15,280 feet and is snow covered all year. To the south 25 miles is a wilderness area containing Mt. Adams, with its peak some 12,320 feet and its snow-covered beauty which is generally hidden to most viewers other than those located in Randle, Wa., the home of the White Pass Chapter of the Future Farmers of America.

Our high school indeed is unique, as Lewis County has one of the largest timber reserves in the continental United States. We find heavy, complex machinery moving nature's giants through the trail roads of the forest to the seaports of Washington and around the world.

When I first came to White Pass High School as a Vocational-Agriculture Instructor, a forestry program was not offered. It seemed logical to assume that in terms of the environment and the natural resources of our community, a forestry and natural resources program should be offered to the agricultural students in our school. This matter was discussed with our superintendent, Mr. Marvin F. Hanson, the school board, and members of the community. Advice was given and incorporated into the forestry program from these sources.

One of the key questions to be answered was, "Where are our high school graduates going?" Many went on for further schooling, but a good number followed in their father's footsteps and went directly into forest industries. All kinds of jobs were taken by both boys and girls.

Forestry students at Randal, Washington during a logging equipment orientation sponsored by Latimer and Sons Logging Co.

The boys were employed as logging truck drivers, saw mill workers, choker setters, buckers, fallers, maintenance personnel, U. S. Forest Service staff, and heavy equipment operators.

The girls were employed in clerical positions, workers in forest industries, or for the U. S. Forest Service. Over the years knowledge of our community and the advice offered by the Vocational-Agricultural Advisory Committee has helped to create a two-year alternate program in forestry for our students.

Agriculture IV, Forest Industries, is taught one year and the following year Agriculture V, Forestry and Natural Resources, is offered.

Our Forest Industries Course covers tree identification (dendrology), all the local forest industries, safety as related to the State of Washington Forest Industry Handbook, logging equipment, Industrial First Aid, maps and compass reading, chain saw operation, wildlife, ecology, and timber cruising. Time is allowed for group and individual projects. The Forestry and Natural Resources Course duplicates timber identification, timber cruising, and map reading, because of the difficulty and need for this knowledge in forestry occupations. New units for this year are forest insects and disease, fire fighting, Christmas tree culture, raising seedlings, reforestation, management of the forest, forest laws, scaling timber, and and elementary transit and survey unit. Time is also provided for individual and class projects. In both years, local field trips are numerous.

The community is a real supporting force for the forestry program. The towns of Packwood, Randle and Glenoma, which are within the school district, provide for many field trip experiences for our Forestry students. Timber fallers, truck drivers, heavy equipment operators, and many other

(Concluded on page 183)

Effective Occupational Experiences for Students Enhance Learning

Dave McCracken

J. David McCracken
Teacher Education
Ohio State University

In the long history of education we have noted how skills and knowledges that were originally learned in and around the home have moved into the schoolhouse. Parents and employers and fellow workers, under modern industrial conditions, have found it more efficient, more economical, and less troublesome, to hand these tasks over to people called teachers. Yet in the search for good education we have tried more and more, to recapture the natural learning situation. So, the most effective teaching in agriculture is done on supervised programs where a boy stakes out a project on his father's farm and takes full responsibility for it under supervision of an agricultural teacher. This takes education right back to where it started, with, of course, the very important added factor—the well-trained teacher.[1]

Teachers who develop applications of instruction through occupational experiences are increasing the probability that their students will learn more effectively. "The teacher of a vocation should have participation in all the areas in which he hopes to secure learning."[2] A combination of classroom instruction and supervision of student experiences is essential. Neither instruction without practice nor practice without instruction is desirable. Teachers who develop applications of instruction through occupational experiences are increasing the probability that their students will learn more effectively.

Classroom instruction in vocational agriculture can normally be applied in three different settings: 1) School laboratory experiences, 2) Cooperative education placement in a farm, business, or industry, and 3) Supervised experience programs utilizing farm, home, or community resources. As experiences are provided in more diverse occupational areas and to more urban-based students, the challenge to the teacher is to be more creative than ever before in designing such experiences and utilizing them to enhance learning.

Teachers of vocational agriculture will find below a list of questions designed to challenge their thinking concerning the occupational experiences they provide for their students. The success or failure of an occupational experience program for a student depends, to a large degree, upon the effectiveness of the supervision by the teacher. Effective supervision requires planned programs, instruction so each student can succeed, and effective evaluation to insure the plan has been accomplished.

Question 1. Is your curriculum planned in sufficient detail so you know what job skills students should learn through their occupational experience programs?

Question 2. Do you require a training plan, job plan, budget and/or other advanced planning concerning skills to be gained through occupational experience programs?

Question 3. Do you require a daily or weekly work report so you may evaluate a student's progress in accordance with his training plan?

Question 4. Do you as an instructor suggest and/or require specific job skills your students must demonstrate?

Question 5. Do you have the full support of your administration concerning objectives, policies, and procedures for conducting occupational experience programs?

Question 6. Do you effectively utilize an advisory committee to assist in providing occupational experiences for students?

Question 7. Are your students fully informed concerning the wide range of occupational experiences in which they might participate?

Question 8. Do you regularly visit the occupational experience site to determine if experiences are appropriate?

Question 9. Do you feel free to suggest changes in experience programs when needed?

Question 10. Do all occupational experiences provided by your department meet relevant legal and safety requirements?

Question 11. Are employers of your graduates satisfied with the job skills of your former students?

Question 12. Do you seek to have students apply all learning in practical settings, not just those areas where they have "projects?"

Question 13. Do your students feel the occupational experience program is an integral, important part of the curriculum or just a requirement?

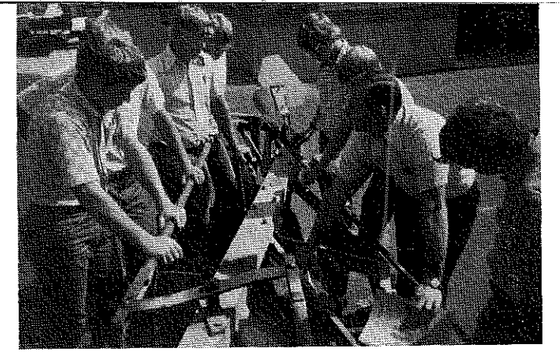
Question 14. Do your employers view the program as "providing training" or "providing jobs"?

Question 15. Are you continually searching for additional occupational experiences which can be accomplished within the environment of each of your students?

There can be no adequate training in agricultural occupations that does not have its foundation in experience (participation) in the tasks for which the abilities are needed. Individuals in every group taught should have experience programs. What one practices, what he experiences, what he participates in, he learns.[3]

I trust these questions have challenged your thinking. Seek ways to build more effective experiences for students into your curriculum plan. Then provide them for your students. Students have a way of living up to your expectations of them. Expect them to apply their classroom learning through planned occupational experience programs.

1 Keller, Franklin J. *Principles of Vocational Education: The Primacy of the Person*. Boston: D. C. Heath and Company, 1948 p. 197.
2 Lamar, Carl F. "Occupational Experience for the Individual in Vocational Education" p. 214-226 in Krebs, Alfred H., ed. *The Individual and His Education*, the Second Yearbook of the American Vocational Association. Washington, D. C.: American Vocational Association, 1972 p. 219.
3 Binkley, Harold "Supervised Experience Program in Career Education: A Must in Agribusiness Education", *The Agricultural Education Magazine*. December 1973, p. 129.



Application of classroom instruction in laboratory settings can provide effective learning experiences. Richard Tangeman (second from right) is shown demonstrating the adjustment of a moldboard plow to some of his students at Marion Local High School, Mercer County, Ohio.

(Sadler—from page 181)

workers in the logging industry have given of their time and equipment for our class use.

All of the forest industries are visited; these include lumber companies, saw mills, and cedar shake mills (which make cedar roofing). The U.S. Forest Service in Randle is the scene of annual timber sales where tracts of Government timber are bid for by large and small companys. Sales may bring as much as $250,000.00 in a bidding period of 15 minutes. Forestry students are always impressed by these sales.

Game management field officers have visited the class to discuss game management in our natural setting. Students have made individual field trips into the forest to study a selected animal, and presentations are made to the class. Teachers can learn more from these kinds of activities than from many esteemed books on the same subject.

Field trips to Webster State Nursery near Olympia, Washington revealed methods of propragation forest trees and their culture until salable age.

Trips to Christmas tree plantations allowed students to observe planting, culture and harvesting techniques.

Trips to the helicopter and high-lead logging sites create keen interest and motivated the students further in the classroom.

Real live forest problems that exist in our community are used in the best, relevant way for our students. This past spring and summer there developed a massive infestation of Douglas Fir bark beetles, causing an estimated damage to over 50 million board feet of timber from Randle to Packwood. The U.S. Forest Service surveyed the scene. To reduce the spread of the bark beetle the timber must be surveyed, sold, cut and logged before the temperature reaches the 70's in the spring. Packwood Forest Service Ranger, William M. Truitt, was invited to the forestry class to discuss the bark beetle and its impact to our community. Field trips related to this problem will be taken later this spring.

Looking back at our beginning in light of where we are today in Natural Resources Education at White Pass our progress is impressive. The future looks even brighter. Some of the things presently in the winds of change and progress are to expand the offerings in Forestry and Natural Resources.

Such areas under consideration are: propragating native species of forest plants for commercial use, starting a life saving unit for Forest Search and Rescue, developing a water testing class to determine amounts of pollution in our river systems, evaluating the recreational value of the area, experimenting in crossbreeding of trees, and searching out sub-species and trees with special resistances for forest tree improvement.

These are a few of the paths one might follow. Many more will open up as each agriculture teacher looks at the environment where he teaches and lives.

Our very own land, water, wildlife, natural forests, or prairies are unique. We must create the awareness within our students of the natural resources around us, and how they can be used, restored, and best maintained for our future needs. ◆◆◆

Mel Hickle, a school board member at White Pass High School, demonstrates the operation of a Cedar shake mill to forestry students.

A NATURAL RESOURCES MANAGEMENT PROGRAM

Daniel D. DeJarnette
Agricultural Education Instructor
William Campbell High School
Naruna, Virginia

Dan DeJarnette

Agriculture instructors must remain alert to make changes in program offerings, if needed, to meet the current agricultural education needs of the school, community and area. Every opportunity should be taken to improve the instructional program. Have you ever thought about using the school grounds as a land laboratory for Natural Resources Management? The teachers in the William Campbell High School Agricultural Education Department not only thought about it, but did something about it.

The high school is located in the southeastern part of Campbell County in a rural setting. Campbell County, located in South Central Virginia, consists of general crop and livestock farms. Tobacco is the chief cash crop in the area, followed by small grain, corn, and forest products. The forest products industries in the county, up until recently, have experienced a tremendous growth.

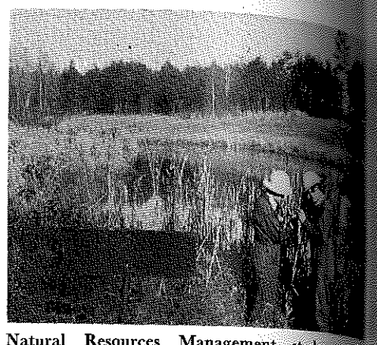
During the 1960's, Agricultural Education instructors across the State reevaluated their program offerings to see if community and area needs were being met. Prior to the 1960's, William Campbell offered Basic Agricultural Science and Mechanics I and II, General Mechanics and Agricultural Production. The additional school land, which is now used as a land laboratory for Natural Resources Management, was originally purchased with the idea of providing agricultural students "at school experience" in agricultural production.

A concentrated effort was made in 1964 and 1965 to evaluate the local program offerings to see if an additional option course or two was needed. A community survey conducted by the Agricultural Education Department revealed a large opportunity for placement and prospective employment in Natural Resources Management, as opposed to other options. Eleven businesses, employing a total of 37 workers, created a demand for students with experience in natural resources management.

During the summer of 1965, a conference with the Principal, guidance personnel, and agricultural instructors was held to discuss the possible addition of the Natural Resources Management Option to the program. After receiving a favorable reaction at the conference, a meeting was held with prospective students to determine their interest. High student interest and readily available prospective employment opportunities in the community and area indicated the need for the addition of a program in natural resources at William Campbell H.S.

Once it was decided that the addition of the Option would enhance the effectiveness of the total Agricultural Education Program, final plans began to take shape. A decision to expand the program offering was made at a joint meeting of the Superintendent of Schools, Area Supervisor of Agricultural Education, the Principal and the three Agricultural Education instructors. The School Board further designated the additional land as a land laboratory for the Natural Resources Management Option. The land laboratory, consisting of approximately 80 acres of land is one of the Department's most important assets. Naturally, it is managed by the members of the William Campbell FFA Chapter and the Agricultural Education instructors. The Option was conducted on an experimental basis in 1966 and implemented in 1967. Program offerings today include: Basic Agricultural Science and Mechanics I (8th grade level), Basic Agricultural Science and Mechanics II (9th Grade level), Agricultural Production III, IV, and V, and Natural Resources Management III and IV.

The Natural Resources Management



Natural Resources Management students examine growth of cattails at one end of the pond and discuss ways of controlling them.

Option provides many opportunities for high school youth to develop skills and abilities in forestry and wildlife management, outdoor recreation, and soil, air, and water conservation. The Option is designed for 720 to 1,080 hours of in-school instruction using 110-minute class periods. Due to the large number of students enrolling in Basic Agricultural Science and Mechanics, only one 55-minute period for Natural Resources Management III and one 55-minute period for Natural Resources Management IV is provided. Future plans call for the addition of another full-time instructor to expand the program to 110-minute periods and the addition of the fifth year of the Option.

The school is located near a State game fish hatchery in Brookneal (known for its Striped Bass) and is close enough to Smith Mountain Lake, Staunton River State Park, Buggs Island Lake, and Leesville Lake for field trips. Along with the school land laboratory, this outdoor laboratory provides ideal opportunities for Natural Resources Management educational activities.

Initial contacts with prospective students of the Option are made in Basic Agricultural Science and Mechanics I. Emphasis is placed on topics of general conservation, forestry, wildlife and study of soil characteristics.

The author has responsibility for teaching Agricultural Science and Mechanics II and continuing with part of the Agricultural Production Option. Students in Agricultural Science and Mechanics II are taught tree indentification, woodland management practices, measuring and marketing timber, and soil and water conservation practices.

Prospective students of the Natural Resources Management Option are identified through study of personal records, farm and home visitations, and general observation by the instructors. Individual conferences are held with prospective students early in the year so that student schedules can be completed accurately. Care is taken to see that all students in the 2nd year, basic course know and understand the various options courses available to them. Students in both basic courses are provided with varied related experiences in Natural Resources Management to help them decide which option to enter. The students assist in maintaining a 1½ mile long nature trail established by Natural Resources Management students. Arline's Nature Trail named in honor of Mrs. Arline Whitlow, biology teacher at William Campbell, consists of over 25 identified species of trees native to the area and many plants too numerous to mention, both wild and domesticated along with numerous bulb plantings. Some of the stops on the trail include Dogwood Lane, a moss and fern study area, a picnic area, Nature's Dell (through which a meandering stream runs), wildlife feed patches and plantings, a farm pond, and a Christmas tree plot.

Basic Agricultural Science and Mechanics students have planted trees, shrubs, flowers, bulbs, wildlife shrubs (Autumn Olive, Amur Honeysuckle, Rugosa Rose, etc.) built crosstie foot bridges, and constructed and placed numerous bird houses and feeders as part of their extended class activities. Students not only have the opportunity to learn and apply basic natural resources management principles on the land laboratory, but also apply them on home improvement projects.

Sophomore, junior and senior high school students, upon completion of the two basic courses, have the choice of entering either Agricultural Production or Natural Resources Management programs. Three Agricultural Production and two Natural Resources Management programs are offered. James D. Puckett, Head Teacher, is in charge of the Natural Resources Management Option and the Advanced Courses in Agricultural Production.

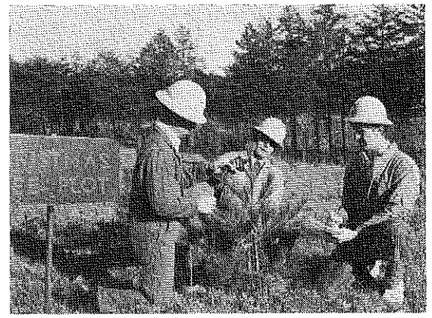
Some of the major learning areas in Natural Resources Management include: Exploring Career Opportunities, Understanding the Economic Importance of Renewable Natural Resources, Identification of Tree Species, Clear Cutting, Thinning, Removing Diseased or Insect Infested Timber, Prescribed Burning, Hardwood Suppression and Control, Hand and Machine Planting, and Proper Harvesting Techniques. Students harvest ½ acre or more of timber each year on the land laboratory. The logs are traded to a local timber buyer for lumber to construct FFA picnic tables. Money obtained through sale of the tables is used to purchase some of the supplies and small equipment needed for the Option. Our two FFA chapter chain saws were purchased this way. Other major learning areas include: Growing and Marketing Christmas Trees, Soil Testing, Surveying and Leveling for Conservation, Fish Pond Ecology and Management, Identification of Important Wildlife Species, Using Maps and Aerial Photographs in Environmental Planning, Protecting the Forest, Planning and Developing a Soil and Water Conservation Program, Preparing and Using Records and Reports and Leadership Training.

A wise philosopher once stated, "A chain is no stronger than its weakest link." This is certainly true in Natural Resources Management. "Related activities carried out on the school land laboratory and in the surrounding community provide the link between theory and practices, reinforcing classroom concepts."[1]

Some of the related activities that have helped to increase the effectiveness of the Natural Resources Management Option include:

1. Establishing and improving sod on the cleared portion of the land laboratory.
2. Construction and improvement of a picnic and recreation area on the land laboratory.
3. Establishing and improving a moss and fern study area on the land laboratory.
4. Planning and stocking a wildlife and recreation farm pond.
5. Establishing and improving Arline's Nature Trail on the land laboratory.
6. Providing guided tours for interested school and community groups.
7. Establishing and maintaining Nature's Dell.
8. Establishing Dogwood Lane on the land laboratory.
9. Seeding and observing wildlife patches on the land laboratory.
10. Planting approximately 20,000 Shortleaf, Loblolly, and White Pine Seedlings.
11. Building a lathe house and raising tree seedlings for the Christtree plot.
12. Constructing and installing bird houses and feeders on the land laboratory and homesteads.
13. Establishing, maintaining, and improving a Christmas tree plot on the land laboratory.
14. Inviting conservation and forestry specialists to speak to FFA members and serve as resource persons.
15. Identifying and labeling trees on the land laboratory.
16. Crusing and tallying timber on the land laboratory.
17. Visiting the State Fish Hatchery at Brookneal.
18. Field trips to nearby parks and recreation areas.
19. Harvesting timber on the land laboratory.
20. Participation in the Keep Virginia Green (KVG) Fire Fight-

(Concluded on page 189)



J. D. Puckett, agriculture teacher, and two Natural Resources Management students examine the growth rate of White Pines in the Christmas tree plot.

1 Grubough, Richard; Hefty, Ronald; and Stump, Ned; "Environmental Management and Vocational Agriculture, The Agricultural Education Magazine, Volume 43, Number 9, March 1971, page 223.

INTERNSHIPS IN NONFARM AGRICULTURE FOR PROSPECTIVE TEACHERS

Charles W. Smith
Teacher Education
Louisiana State University

Supervised experience programs for students of vocational agriculture in secondary schools have been a basic component of the total vocational agriculture program from its inception in 1917. For several decades, major emphasis was placed on providing supervised experiences on the student's home farm, with little or no attention being given to other types of experience programs.

The National Vocational Education Act of 1963 brought about major changes in program objectives moving from a program that emphasized careers primarily in production agriculture to one that was concerned with preparing youngsters for careers in the total agricultural complex including nonfarm agricultural occupations.

Numerous research studies were conducted in the mid 1960's to determine the scope of nonfarm agricultural employment in the respective states. Resulting state summaries revealed many opportunities for developing training programs for specific areas of the nonfarm agriculture. As states attempted to redirect their programs, cooperative work experience programs in agriculture (C.A.E.) became a part of the state plan for vocational and technical education in agriculture in most states.

With these new developments, it was evident that teacher educators had to adjust the pre-service training of teachers to meet these changing and emerging needs.

Too often teacher educators have talked about program development in a philosophical setting rather than providing a basis of real life experiences from which a young teacher may later draw when implementing a particular aspect of the program.

Persons preparing to become teachers of vocational agriculture usually have left teacher education programs with a limited experience base, obtained primarily during several weeks of student teaching which culminated their professional training at the undergraduate level. Teacher educators have recognized the limitations of pre-professional instructional programs, but have often failed to find solutions to this perplexing problem.

In an effort to provide pre-service experiences of both a philosophical and practical nature in organizing and conducting cooperative work experience programs in agriculture, the Department of Agricultural Education at Louisiana State University developed an undergraduate course, *Internship in Nonfarm Agricultural Occupations.* The course is open to students completing their junior year who are preparing to teach vocational agriculture in secondary schools. Six semester hours credit is granted upon completion of the course.

The purposes of the course are to (1) familiarize students with the operation of agriculturally related businesses through observation, instruction and work in nonfarm agricultural businesses and to (2) familiarize students with the cooperative agricultural education program as conducted in Louisiana through related classroom instruction.

Student Internship

Since an internship denotes a training period of actual service as an employee in a business, each student enrolled is placed in three different nonfarm agricultural businesses for a period of forty hours in each establishment. Normally students work four hours a day, two days a week, for five weeks and obtain a total of 120 hours of work experience during the semester in the three businesses.

Cooperating businesses utilized in the internship program normally represent the area of Farm Machinery Sales and Service, Farm Supplies and Equipment, and Ornamental Horticulture. Businesses selected for training centers are of sufficient size to employ persons in a number of job titles which are representative of some of the nonfarm agricultural job titles found in the state.

An agreement which details the responsibilities of the student, manager, and instructor, is signed by all three parties prior to the beginning of the internship. The working agreement includes the following:

. . . The student will receive no pay.

. . . The student's work schedule will be worked out between the student and manager, subject to approval of the instructor.

. . . The student will observe all policies and regulations of the business.

. . . The student will participate in the activities of each department to which he is assigned but is expected to be rotated to several areas of the business during his internship.

. . . The student will be assigned to a variety of departments, including selling and non-selling.

. . . The student will complete a final report of intern activities.

. . . The manager will report to the instructor periodically on the progress of the student.

. . . The instructor will visit the business periodically to confer with the manager and the student.

Such an agreement outlines what is expected of each party and reduces misunderstandings that might normally arise.

Students are expected to conduct themselves as employees of the business to which they are assigned, work the required number of hours on specified days, be punctual, dress appropriately for the work, and actively participate in all work assigned to them by their supervisors.

While on the job, students are expected to acquire an insight into the operation of the business through work, observation, and conferences with their supervisor and others in the business. Suggested observations to be made include the following:

. . . Public's image of the business

. . . Ownership organization

. . . General layout of the business

. . . Employment applications

. . . Training programs for employees

. . . Personnel policies

. . . Sales forms

. . . Customer services and conveniences (credit, delivery & others)

. . . Receiving (method of shipment, records—orders, invoices, etc.—returns to vendors, and exchanges with other businesses)

. . . Market information supplied to employers

. . . Resident buying office (name, location, services provided, fees charged, etc.)

. . . Contributions of each department to the total operation

. . . Approximate sales volume and mark-up of merchandise

. . . Methods of keeping and taking inventory

. . . Selling (psychological principles involved in persuasive and suggestive selling)

. . . Advertising and promotion schemes

. . . Merchandise presentation

. . . Store protection

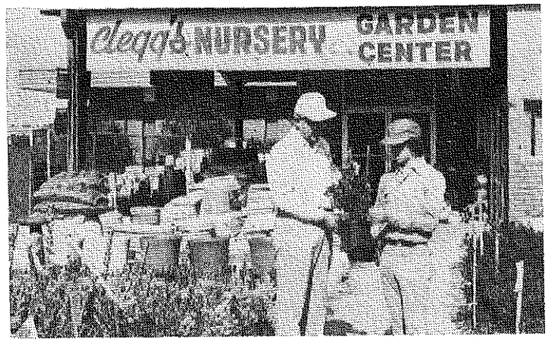
. . . Merchant and community relations

. . . Relationships of employee to fellow-employees, employers, customers, salesmen, and others.

At the completion of the internship, the student is required to submit a written report to the instructor that describes in detail the observations made in each business, an account of his work experiences, and a detailed job description of each job title found in the businesses which includes the following: (1) Job title, (2) Nature of the work, (3) Training and background needed, (4) Salary and benefits, (5) Opportunities for advancement.

Related Classroom Instruction

Concurrently with the internship, students attend class for two hours a week for related classroom instruction. The instruction is focused around the cooperative agricultural education program as an important aspect of the total supervised experience program in vocational agriculture.



Robert Manuel, a Louisiana State Ag. Ed. major, receives some pointers from his internship supervisor.

The major objectives of the related classroom instruction are to familiarize students with (1) the basic and advanced program in vocational agriculture; (2) cooperative work experience programs in general; (3) problems of youth in employment; (4) the nonfarm argicultural complex in Louisiana—occupational opportunities and training needs; (5) procedures used in identifying occupational opportunities at the community level; (6) the guidance function of the teacher of vocational agriculture; (7) the vocational development process of students; (8) methods of using occupational information in teaching and counseling; (9) vocational guidance activities of teachers; (10) the cooperative agricultural education program in Louisiana; (11) policies related to student participation in a C.A.E. program; (12) teacher responsibilities in conducting a C.A.E. program; (13) responsibilities of the training center in a C.A.E. program; (14) steps in implementing a C.A.E. program, and (15) labor laws relating to a C.A.E. program.

Summary

The internship has been in operation for four years. Graduates in agricultural education who have completed the internship have been successful in initiating and administering agricultural education programs in secondary schools and have expressed satisfaction with the contribution of the internship to their professional training in agricultural education.

Since the successful development of the internship in nonfarm agriculture in the Department of Agricultural Education, other areas of vocational teacher education at Louisiana State University have developed an internship as a part of their curriculum.

The internship combines both the theoretical and practical and provides the prospective teacher with authentic preservice educational experiences. It focuses on the area of agricultural employment that will provide the greatest number of employment opportunities in the future for students having occupational objectives in agriculture.

◆◆◆

The Neglect of Vocational Agriculture in Eastern Nigeria

*John U. Okorie**
Iowa State University


John Okorie

Vocational Education in agriculture in the East Central State of Nigeria appears to be losing its slim grip especially with the youth. Many of the people still fail to rightfully conceptualize the essence of studying agriculture in the secondary schools. Unfortunately, the government as well as the University of Nigeria does not seem to take an active role to rectify this perplexing trend. The agricultural education section of the Department of Vocational Education, University of Nigeria, occupies virtually a nominal role. It is disheartening to state that the agricultural education section has been in existence in the university for about ten years with only one instructor. This demonstrates a keen neglect of vocational education in agriculture, and an apparent effort to stymie the advancement of agriculture in this area.

Prior to the Civil War which ended in 1970, students in secondary schools as well as a number of unemployed youth were developing some awareness about choosing a career in agriculture, in spite of its tremendous physical exertions. Remarkably, there has been a considerable absence of interest in agriculture by the youth recently. The students look for direction either from the government, the university, or from their teachers without finding any. More importantly, there is the absence of a guiding principle and philosophy in the school curriculum aimed at instilling in the students the usefulness and importance of agriculture to the economy of the country. An outstanding characteristic of farming in this area is the lack of recognition of farmers as well as those preparing to farm. Usually, the educated youth are very reluctant to associate themselves with farming whereas many adults who have been farming all their lives feel unprepared to undertake any formal studies for improving their agricultural practices.

Parent's Views About Vocational Education

To many parents being a good farmer does not require further agricultural training in the secondary school. The parents' convictions stem from their personal experiences since none of them actually underwent any form of training before entering farming. In addition they have been farming all their lives without much desire for education to improve their farming practices. Realistically speaking, many parents have not seen any gainful remuneration from their long years of farming and are therefore hesitant to encourage their children to prepare themselves for farming. However, it should be understood that parents are not presently involved in the agricultural programs in secondary schools. For this reason, they are not aware of the types of agricultural occupations available other than farming.

Nevertheless, some farmers do want their children to become farmers. More specifically, in a recent study conducted by the author, 60 percent of the farmers saw nothing bad about their children choosing farming as a profession provided that the system of farming of the children would appreciably be less tedious than the type of farming of the parents. Forty percent expressed total disapproval of their children becoming farmers.

Farming Patterns

More than 80 percent of the farmers in the region operate a mixed type of farming. Under this system, each farmer is engaged in the production of crops as well as livestock. The farmer cultivates different types of crops such as yams, cassana, maize, beans and vegetables, usually in one piece of land. Likewise, he may have a few chickens, goats and sheep. These traditional practices of farming in addition to several other factors are responsible for the lag in farm production. The fact that farming in this part of the world entails tremendous physical exertions coupled with poor pricing systems tend to make farming unattractive to many parents as well as their children.

Evidently, farming is devoid of adequate financial rewards. The information gathered from the study revealed that a majority of the farmers in Eastern Nigeria earned an annual income of between $150 and $450. On the basis of this income, most farmers are unable to meet the basic needs of educating their children or provide them with other essential family necessities. More encouraging facts are required to convince the youth to choose farming as a career. With the cost of living soaring and the youth desiring to have a better way of life, it would be expected for them to reject agriculture as a career because of such a low income. Undoubtedly, farming in this area needs revitalization in all its ramifications in order to make it appealing to a large segment of the people.

Government Roles

Out of a total of about 130 secondary schools in the East Central State, only a list of 33 secondary schools was obtained from the Ministry of Education. This number represented all schools in the region offering agriculture up to high school level. It is the government's responsibility to encourage the study of agriculture in secondary schools. Apparently, the indication is that not much is being done at the secondary school level to resuscitate the dying interest in agriculture. Besides, many of the schools offering agriculture lacked textbooks, laboratory equipment, money to purchase seeds, fertilizers and insecticides. There was also an absence of irrigation water, current agricultural journals, and visual aids or films on modern farming. The teeming population coupled with the present food situation demand that the government render adequate encouragement to the study of agriculture in secondary schools.

Concerns of Agriculture Teachers

It was an attempt to probe into the factors inhibiting the progress of agricultural science in secondary schools that necessitated the inclusion of teachers in the study. The teachers were very much concerned about agriculture as a subject in the school system. In demonstration of their concern, 97.8 percent were of the opinion that agriculture should be taught in all classes in the secondary school system, since agriculture is the basic industry of the people. Slightly over 54 percent of the teachers believed that agriculture was the most neglected course of all secondary school subjects. A majority of the teachers were in agreement with the statement that students have no chance to apply their agricultural knowledge outside of the classroom. To many teachers, the problem of securing employment by agricultural students upon graduation was considered a major concern in the region. Agriculture itself, could offer but a few opportunities under the umbrella of government, as individual enterprises in agriculture are still very limited. The principal reason for the neglect of agriculture in secondary schools was attributed to the indifference of the government. It was reported that 87 percent of the teachers indicated that efforts of the government in supporting agricultural programs in secondary schools were poor or very poor. On the other hand, all the teachers interviewed express willingness to develop a one-to-three hour day or evening classes for the local farmers if there was sufficient encouragement from the government for such a program.

Views of Secondary Students

An incredible 99.5 percent of the secondary school students blamed the government for lack of encouragement in the study of agriculture, especially as there was no emphasis being placed upon the vocational aspects of agriculture. It was comforting to find that 96 percent of the students agreed with the statement that farming is a good occupation, but maintained that farming in Nigeria needed improvements in all sectors.

The study showed that 98 percent of the students agreed that better trained teachers were needed to teach agriculture in secondary schools. Approximately 64 percent expressed the need for individual farm projects which are not required of the students according to the school curriculum, whereas 84.5 percent maintained that students could both learn and make money through the study of agriculture. The persistent usage of the hoe and matchete for the school farm was an anathema to the students. For this reason, 92.5 percent would like the introduction of modern farm machinery and equipment for use on the school farm.

Changing the Agricultural Image

Among the many problems which tend to diminish the importance of agriculture is a lack of adequate and relevant information for the farmers. The farmers actually lust for identification with more positive aspects of agriculture. For this reason, new instructional media should be involved in their teaching program. The use of audio visual materials for instructional purposes should be highly encouraged. Instructional programs should be structured in such a way as to meet the needs of a large segment of the farm population.

An important aspect of meeting teachers needs involves training. More than a third of the teacher population is inadequately qualified to teach agriculture in secondary schools. Therefore, in-service training programs are needed for agricultural teachers in order to keep them current on agricultural technology. There should be sufficient emphasis on farm practical experience, student teaching, use of teaching aids and dedication to the teaching of agriculture during such training programs. In the future, vocational agriculture teachers should be graduates from the Vocational Education Department of the University of Nigeria or its equivalent.

With respect to the various concerns expressed by the students, the core of the problem lies in the improvement of agricultural education programs in secondary schools. Whatever program is designed for the students should include farm projects. The farm implements have been characterized by students as outdated. Therefore, an agricultural program which minimizes manual labor, unquestionably, will appeal to most of the students. Parents should be encouraged to participate in various agricultural programs involving their children. Teacher visitations to parent's homes and student farm projects should also be encouraged. An introduction of audio visual materials on modern agriculture, current farm journals, and textbooks will enhance the image of agriculture in the secondary schools. Above all, there is a great need for the government to redress itself toward the realization of improving vocational agriculture in secondary schools. ◆◆◆

* This article is largely based upon John U. Okorie's Ph.D. dissertation: *The Impact of Agricultural Education on Farm Production in Eastern Nigeria.* The author earned the B.S. and M.S. degrees from Colorado State University. He is due back in Nigeria to teach in one of the Nigerian Universities.

(DeJarnette—from page 185)

ing Program.

21. Surveying and laying off water drainage area on the land laboratory.
22. Thinning ½ acre or more of timber on the land laboratory each year.
23. Conducting active Building Our American Communities (BOAC) Projects for the school and community each year. (William Campbell FFA Chapter was named the Southern Regional Winner in the National BOAC Awards Program (1973) and received a Bronze Award on the National Level in 1974)
24. Cooperating and working with community citizens and groups.

All successful programs have one thing in common—support on a community, an area, and a state-wide basis. The William Campbell Agricultural Education Department has been fortunate to have had such support.

ASSISTANTSHIPS AND FELLOWSHIPS IN AGRICULTURAL EDUCATION, 1975-76

Paul Peterson
Coordinator, Agricultural Education
California State Polytechnic
University, Pomona

The 1975-76 survey of the Publications Committee of the American Association of Teacher Educators in Agriculture reveals a continuing availability of assistantships.

Key to Understanding:

Data provided are in the following order: Nature of assistantships (number available); number of months available during year; beginning month of employment; amount of work expected; monthly remuneration and other considerations such as remission of fees; whether aid is for master's, advanced graduate program, or doctoral students; source of funds; the 1975 deadline for application, and the person to be contacted. Slight variations in this pattern are due to the nature of the data provided by reporting institutions.

Alabama A & M University
Research Assistant (1) 12 month; Immediately; 20 hrs./wk.; masters; 300./mo. Research Assistant (1) 9 month; Sept. 1, 1975; 20 hrs./wk.; masters; 255./mo. Contact Dr. Taylor Byrd, Agribusiness Education, Normal, Alabama 35762.

University of Arizona
Research assistantships (2); 9 or 12 months; June or September; one-half time, $360; out-of-state tuition waived; master's; department budget; March 1 or 6 months prior to enrollment; Dr. Floyd G. McCormick, Professor and Head, Department of Agricultural Education.

Arkansas State University
Assistantships (3); 9 months (two semesters) from August to May; stipend for the 9 months is $2,400 from University funds to work toward a master's degree; deadline for applications is May 1, 1975; contact Dr. Olen P. Nail, Dean, College of Agriculture, Drawer YY, State University, Arkansas 72467.

Auburn University
Description: assistantships are awarded to students at the master's and doctoral levels of study and the recipients are selected from candidates representing all the program specializations in vocational and adult education; monthly stipends are approximately $300.00 per month for masters degree candidates and $400.00 a month for doctoral candidates; source of these assistantships is the State Department of Education; applications may be forwarded to Dr. R. W. Montgomery, Head Dept. Voc. & Adult Education. Five assistantships are available for nine months each, beginning in September and ending in June; Ten assistantships are awarded on a 12 month basis and may be initiated in any quarter of the year; students may schedule a full academic load of 16 hours per quarter and are expected to work 13 hours per week; an academic load of 12 quarter hours may be scheduled along with a two-thirds work load and this will permit an increase in the stipend awarded. Auburn University has been designated an EPDA approved institution; applications for these grants should be made through the State Director of Vocational Education of the candidates home of record; A. U. is also an "equal opportunity employer."

Clemson University
Research assistantship (1); 12 mos., August; 20 hours work; $260/mo.; reduction in fees; master's; university funds; April 1 application deadline; Earl T. Carpenter, Head, Agricultural Education.

Cornell
Graduate Assistants (?) 10 and 12 month; July or September 1; masters or doctorate; $3,000 or $3,700 with exempt fees and tuition; 15 hours/week. Apply by March 15 to William Drake, Stone Hall, Cornell University, Ithaca, New York 14850.

University of Illinois at Urbana-Champaign
Teaching assistant (1); one-half time; $438.88; tuition and fees waived; Ed.D. or Ph.D. level.
Research assistants (3-4); one-fourth or one-half time; $186-$197 for ¼ time and $372-$394 for ½ time; tuition and fees waived; masters and doctoral. Paul E. Hemp, Chairman, Division of Agricultural Education; March 15.

Iowa State University
Research assistantships (2); 12 mo.; one-half time; $320; reduced fees; master's or doctoral program in Agricultural Education; Agricultural Experiment Station; March 1; Harold R. Crawford, Head, Department of Agricultural Education. Other assistantships (4) or instructorships pending upon project funding.

Kansas State University
Teaching assistantship (1); 9 mo.; June or September; one-half time; $333; reduced tuition; masters or doctoral; March 1 to Dr. James J. Albracht, Coordinator, Agricultural Education.
Research assistantship (1); 9 mo.; June or September; one-half time; $333; reduced tuition; masters or doctoral; March 1 to Dr. James J. Albracht, Coordinator, Agricultural Education.

Louisiana State University
Nine (9) assistantships (Some are instructional and some are research & service); available for 9 months; work 20 hours per week; M.S. candidates $270 per month; Ph.D. candidates $324 per month; tuition and fees are waived; application deadline—March 1975; contact Charlie M. Curtis, Director, School of Vocational Education, 208 Stubbs Hall, Louisiana State University, Baton Rouge, LA 70803.

University of Missouri-Columbia
Assistantships available for the 1975-76 academic year—two teaching and two research; available for 9 to 12 months, $355 mo., plus remission of out-of-state fees; either masters or doctoral students; contact Gene Love, 435 GCB, Agricultural Education, University of Missouri, Columbia Missouri 65201.

Montana State University
Assistantship (1); 9 months, September 15-June 15; Teach one 3 quarter hour course—each of 3 quarters; $3,600; remission of fees; one-half of regular fees; may work on Masters while teaching; Experiment Station Funds; contact Dr. Max L. Amberson, Head, Agricultural & Industrial Education, 126 Architecture Bldg.—Creative Arts Complex, Montana State University, Bozeman, Montana 59715.

New Mexico State University
Graduate assistantships (2) for each academic year; assistantships start and end with the academic school year; this is approximately from the last week in August until the second week in May; both are teaching assistantships which require 20 hours of participation per week; one assistant is assigned to agricultural engineering and works with the service courses for agricultural education majors; the other assistant works with the department of Agricultural and Extension Education; remuneration for the assistant's work is $2,700 with tuition paid for by New Mexico State University; assistantships are available at the M.A. level only.

Ohio State University
Teaching associate (1); 9-12 months; July 1 or later; one-half time; $450/month; master's and doctoral with preference for doctoral; apply by April 1; Ralph E. Bender, Chairman, Department of Agricultural Education. Research associates (3-5) (Some of these assistantships provide experience in the development of curriculum materials with Dr. Harlan E. Ridenour); 9-12 months; July 1 or later; one-half time; $450/month; master's and doctoral with preference for doctoral; apply by April 1; Ralph E. Bender, Chairman, Department of Agricultural Education.
Other assistantships are available through the Center for Vocational Education. Contact Dr. Robert E. Taylor, Director.

Oklahoma State University
Graduate teaching assistantships (2) 9 months; September 1975; one-half time (20 hours per week); doctoral candidates; $375.00 per month plus remission of out-of-state fees.
One (1) graduate research assistantship—9 months; September 1975; one-half time (20 hours per week); doctoral candidates; $375.00 per month plus remission of out-of-state fees.
Application deadline for all assistantships is March 15, 1975; contact Dr. Robert Terry, 235 Agricultural Hall, Oklahoma State University, Stillwater, OK 74074.

Pennsylvania State University
Assistantships (8); 12 months; June 10, September 1, December 5 and March 12 (Beginning month of employment); 20 hours per week; $450.00 per month plus remission of fees; available for either master's or doctor's degree; source of funds—state, vocational and industry; deadline for application—anytime but prefer April 1. The above are all half-time assistantships.

Purdue University
Teaching instructorship; 12 months starting January 1975; one-half time; $300-366/month for 20 hours per week; fees remitted except $60; master's or doctoral candidates applications accepted. Send to William B. Richardson, Acting Coordinator, Agricultural Education, South Campus Courts G-10.

Tennessee State University
Five teaching and research assistantships; ¼ teaching and research; 9 and 12 months; beginning September 1, 1975; 20 hours per week; $250-$300 a month; no other considerations; M.S. in Agricultural Science with emphasis on Agricultural Education & Agricultural Economics; source of funds—state and Federal; deadline—student must be admitted to the graduate programs; contact Dr. Gul M. Telwar, Head, Department of Rural Development, Tennessee State University, Nashville, Tennessee 37203.

Texas A&M University
Beginning month of employment is September 1; amount of work expected is 20 hours per week; monthly remuneration of $375-400 depending on number of hours graduate work completed; out-of-state fees are waived; available to either master's or doctoral students; teaching and non-teaching assistantships funded through Graduate College; research assistantships are funded through the Texas Agricultural Experiment Station; deadline for application is June 30, 1975; applications should be made to Dr. Earl H. Knebel, Department of Agricultural Education; 5 teaching and non-teaching assistantships — 9 months; 3 research assistantships — 12 months.

Utah State University
A graduate assistantship is offered to someone working towards his master's degree in Agricultural Education funded by the College of Agriculture at Utah State University; the contract is for the school year October 1975-May 1976 (9 months); the amount is $3,000, (tuition and fees are not included); work expected is for assistance in teaching agricultural mechanics lab sections each weekday afternoon; application deadline July 30, 1975; contact Dr. Gilbert A. Long, Head, Department of Ag. Education, UMC 48, Utah State University, Logan, Utah 84322.

Virginia Polytechnic Institute and State University
Graduate teaching assistants (2) 9 month; September; 20 hrs/week; masters; $390./month. Graduate research assistant (1) 12 month; July; 20 hrs/week; masters; $390./month. Apply by March 15 to Dr. James P. Clouse, Agricultural Education.

University of Wisconsin
Approximately 5 graduate assistantships available for candidates for Master of Science in Agricultural Education degree; $2,400 per 10 mos., 12-15 hrs. per week assigned in professional activities.
Contact Dept. of Agricultural Education, University of Wisconsin, River Falls, Wisconsin 54022. ◆◆◆

This list of assistantships and fellowships in Agricultural Education is prepared annually by the Publications Committee of the American Association of Teacher Educators in Agriculture. Paul Peterson is Coordinator of Agricultural Education at California State Polytechnic University, Pomona.

Paul Peterson

BOOK REVIEWS

ENVIRONMENTAL CONSERVATION EDUCATION by The Conservation Education Association. Danville, Illinois: Interstate Printers & Publishers, Inc. 1974, 70 pp. $2.50

This publication is an annotated bibliography of many current environmental books. It includes both hardbound and paperbound books which are published in the United States. It also excludes publications of governmental agencies, organizations not primarily publishers, magazines, pamphlets, reprints, and conference reports.

The bibliography is divided into six levels. One can easily find books according to topic areas in levels of (a) primary (b) upper elementary (c) junior high (c) senior high (e) college (f) general reading. It is by no means a complete list, but it does include many texts that are outstanding references for the environmental areas.

The Conservation Education Association selected several members to compile and review all the books that are included. The people on the committee are well known and are well qualified in the environmental education field.

The bibliography is intended primarily for teachers but could also be used by youth leaders of environmental groups or school librarians. It, in my opinion, succeeds in providing anyone interested in environmental education with a sound listing of reference material.

Gary Bambauer,
Environmental Science
Instructor for Agriculture
Clayton, Ohio

HOW TO EAT BETTER AND SPEND LESS, A COMPLETE GUIDE TO VEGETABLE GARDENING, by Eddy Rice. Reston, Virginia: Reston Publishing Company, Inc., 1974, $7.95 Cloth

This book is an easy-to-read teaching device for the uninitiated gardener and a reinforcing tool for the gardener who does a good job. It gives every gardener or would-be gardener tips on how to design the garden; what kind of seed to buy; when to plant; planting basic vegetables and herbs; how to transplant, water, and use insect spray; when to use top dressing and fertilizer; how to test soil, make a garden mulch and compost pile; how to protect your garden from moles, mice, birds and other animals;. when and how to harvest; and organic gardening.

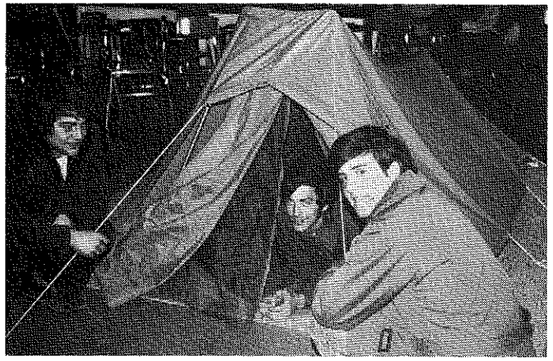
It takes each vegetable or group of vegetables and explains the what and why of each.

Mr. Rice gives confidence to the beginner and explains some of the myths of gardening to the experienced. The book is useful as a reference and as a progressive step-by-step guide. You can pick the book up and read from cover to cover, or a paragraph at a time. The contents include: preliminary planning, preparing the garden plot, planting and care, basic and additional vegetables, herbs, and thirty-two hints. Also included are: weights and measures, fertilizers, vegetable garden guide, mail order sources, animal and bird control, and a glossary.

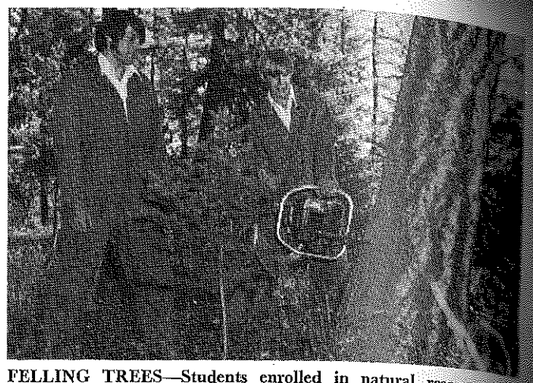
Eddy Rice is a retired Lieutenant Commander in the United States Navy. Mr. Rice has won prizes for his efforts as a gardener. The information about fifty vegetables and herbs that he shares with the reader are a result of his extensive knowledge and experience of gardening. His wife helped on the book, and it includes a bit on canning and preserving (drying, cooking, and pickling). Much of the book is written in reference to Virginia, but he takes pains to explain how to adjust for other locations.

The book is invaluable as a reference for anyone interested in gardening. It answers questions that are hard to find in reference books, and is very practical. For that reason, it is a good resource for adult education classes. The Extension worker and Vocational Agriculture teacher will find it can explain concepts in layman's terms, as well as helping him in advising students, farmers, and neighbors on their gardens.

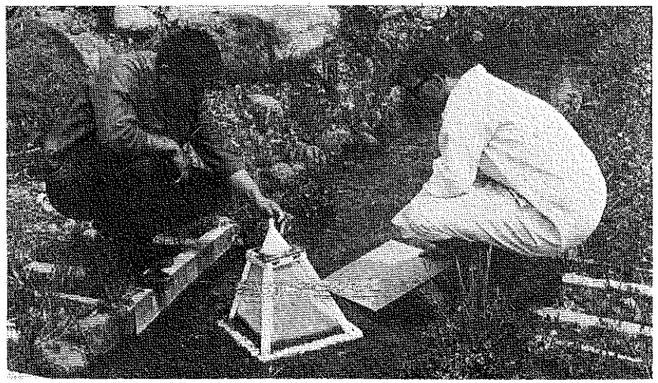
Roger Engstrom
Farm Veterans Co-op Coordinator
Iowa Lakes Community College
Emmetsburg, Iowa



STUDYING TENTS—Setting up a light-weight tent, in this case in the classroom, is a first step in studying camping tents for vocational or avocational purposes. (Photo by Thomas Marron, Coventry, Rhode Island)

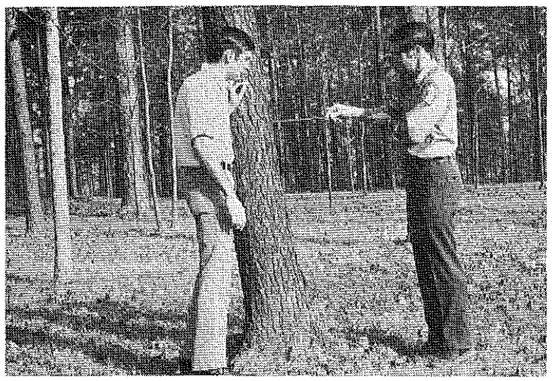


FELLING TREES—Students enrolled in natural resources learn how to fell trees. These students have a forestry laboratory area near their school. (Photo from Max Amberson, Montana State University)



STUDYING WATER—The area of natural resources includes maintaining and improving water supplies. Here technicians conduct tests at a tree farm in Washington. (Photo from Rodney Tulloch, University of Kentucky, and courtesy of the Weyerhaeuser Company)

Stories in Pictures by Jasper S. Lee



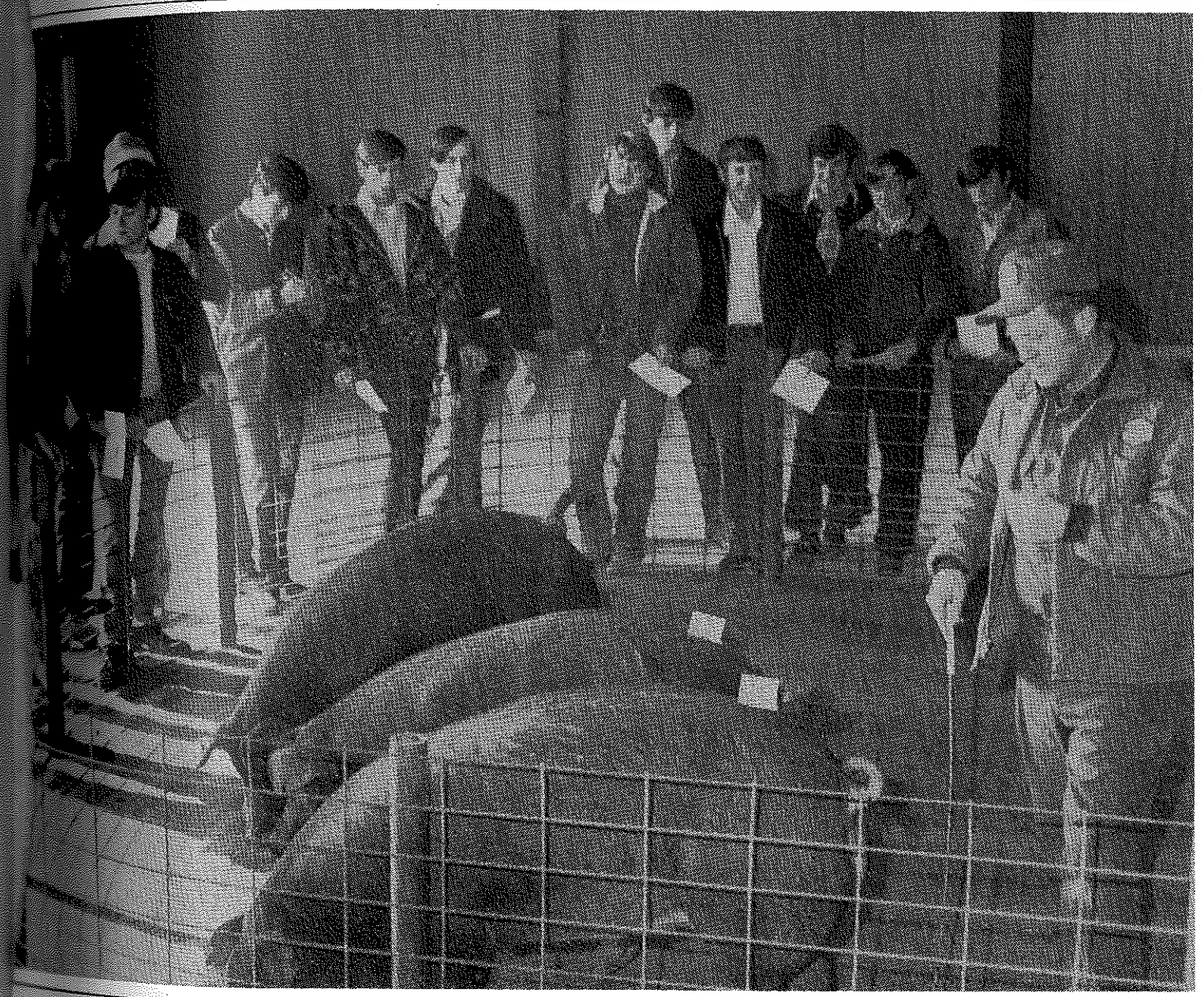
USING INCREMENT BORER—Glen Kile of the U.S. Forest Service demonstrates the use of an increment borer in determining the age of a tree to Lee Wilmot, agriculture teacher at McCreary County (Kentucky) High School. (Photo from Rodney Tulloch, University of Kentucky, and by Lass and Ladd Studio, Whitley City, Kentucky)

DITCHING—Improving and maintaining the soil is an integral part of the instruction in natural resources. Here a ditcher is observed operating on the E. V. King Ranch, Silverton, Oregon. (Photo from Rodney Tulloch, University of Kentucky, and U. S. Department of Agriculture)

Agricultural Education

March 1975 Number 9

Volume 47



Theme—UTILIZING RESOURCES IN TEACHING