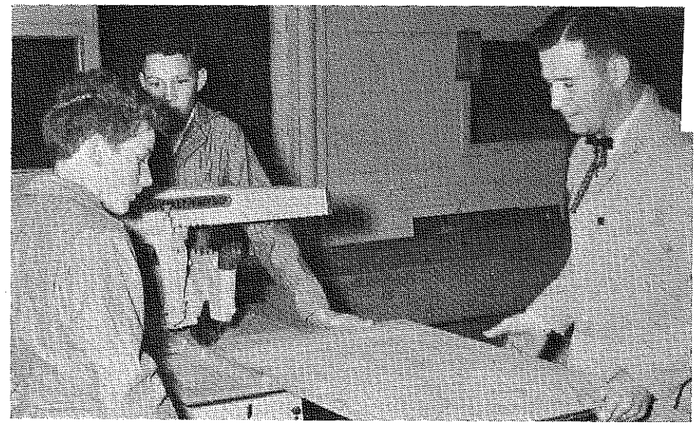

Don Monosmith, vocational agriculture teacher at Burlington, Colorado, provides small group instruction on the safe use of the radial arm saw. (Photo by Irving Cross, Colorado State University)

Stories in Pictures

ROBERT W. WALKER
University of Illinois

Boys and girls in a vocational agriculture class at Jackson (Michigan) High School learn to operate semi-auomatic baggers for potted plants. (Photo by Walter McCarley, Michigan State University)

Vocational agriculture students apply the results of research in agriculture. Plow, plant, and press both before and after is being done in one trip through the field by Richard Lee of Clark, South Dakota. (Photo by H. E. Urton, South Dakota)

AGRICULTURAL EDUCATION

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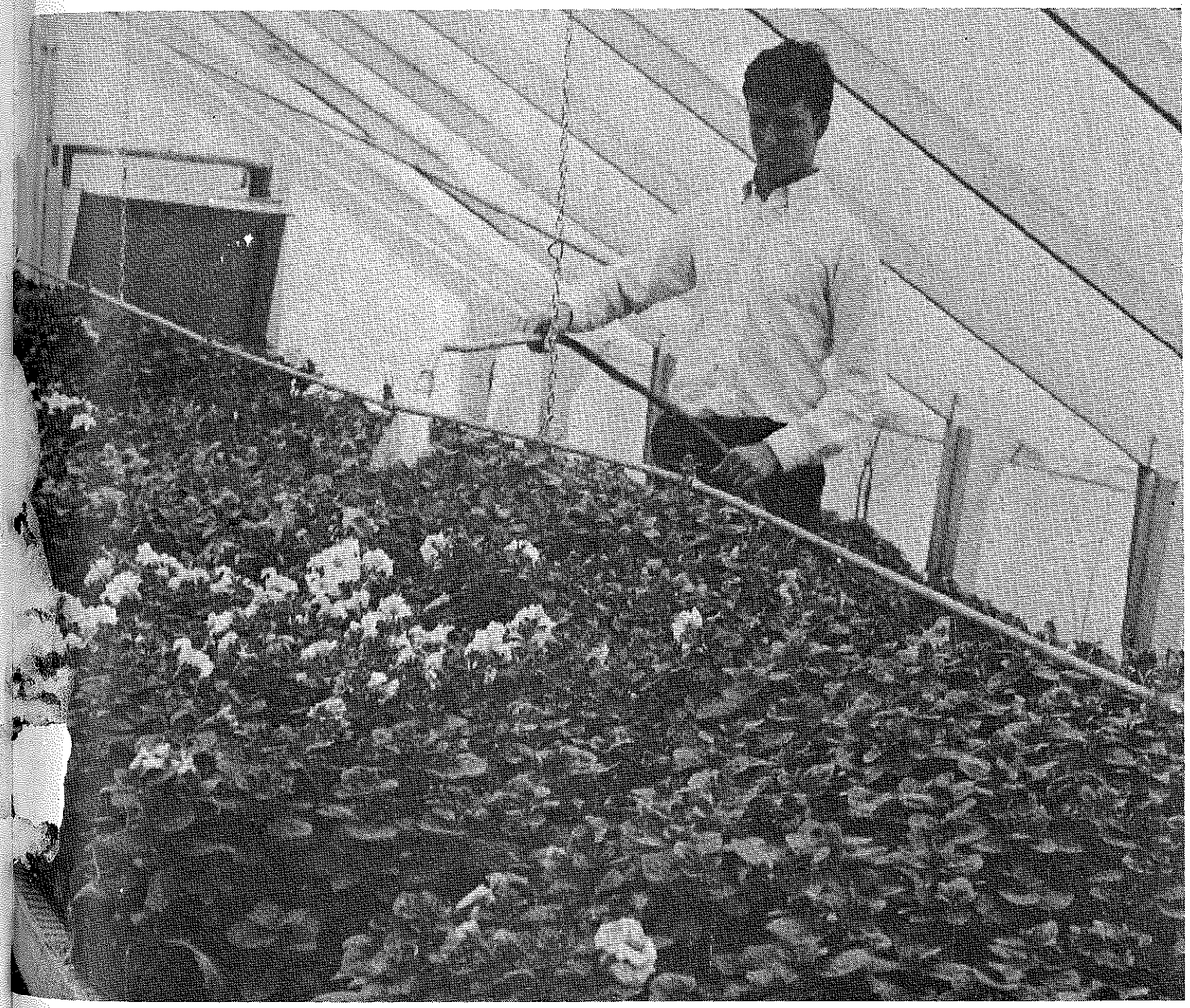

Featuring —

INSTRUCTIONAL PROGRAMS IN ORNAMENTAL HORTICULTURE

THE
AGricultural EDucation
MAGAZINE

Vol. 42 October, 1969 No. 4

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Editorials

Guest Editorial . . .

The Challenge for Change


James Durkee

Who is challenging teachers of vocational agriculture to change? Why are so many folks both within and outside vocational agriculture capitalizing the word "change"? When and how do we change? What changes should be made if we are to meet the charge—challenge for change in agricultural education?

Persons making the challenge for change need to be identified. Their position needs to be assessed in terms of their understanding of what is being done in local programs of vocational agriculture to provide students opportunities to learn the how and why of agriculture. During nineteen years as a teacher of vocational agriculture, I have not been given a charge to change by boys, parents, board members, principals, or superintendents. However, I have received many good ideas that have given direction to change in teaching vocational agriculture from these groups as well as from fellow teachers, state supervisors, teacher educators, farmers, and men in agricultural business.

What changes at the local level should be made in teaching vocational agriculture? I believe that you and I are in a position to best determine the need for change—change not based on the percentage of the population who are farmers and ranchers or employed in agriculture but change based on the Jims and Johns and, in some cases, the Marys and Sues who enter our classroom each day. What education and experience will be most beneficial to these individuals to prepare them for careers in agriculture as well as for living and making a contribution to society?

Why is the word "change" capitalized by so many people today while the same groups want to put a lower case "a" on agriculture and drop "farmers" from the Future Farmers of America organization? You and I are somewhat

(Continued on next page)

James Durkee is Teacher of Vocational Agriculture, Laramie, Wyoming, and Teacher Educator in Agriculture at the University of Wyoming.

Guest Editorial . . .

In Tune with Reality


J. C. Atherton

The time has arrived when it is essential that verbalization of the educational program in agriculture take a back seat to doing and being. The speaking must support what is being done.

Acceptance or rejection of the program by the lay public will be predicted more upon what the program is and what it does than by what is expounds. It is a must that education in agriculture evidence interest in contemporary life by its involvement in the vital issues of employment. If this is not done, the public will pass us by and we shall become increasingly ineffective.

The choice must be a deliberate one in which vocational agriculture elects to act and to be a force in the education of individuals for employment. For without this it is highly unlikely that it will have the right or the privilege to present its message in such a manner that it will be a dynamic force in the lives of individuals, or of the community, or in the broad field of education.

Possibly the phase of our professional lives that needs most attention as we enter into the seventies is that of implementation or of making ourselves and our endeavors more relevant and in tune with reality. We should be honest with ourselves and with those we serve. In the recent past a portion of our teaching failed to be job oriented. Too often I'm afraid this was the case of a majority of the instruction. If we don't know occupational opportunities and the places where our students find employment, how can we truly point the way? It seems that too often there is a credibility gap between our saying and doing. By our fruits we are known and it seems senseless to pretend to be doing something that we are really not doing nor even have it as a major objective.

There was a time when our vocation was a vital force

(Continued on next page)

J. C. Atherton is Professor of Agricultural Education, School of Vocational Education, Louisiana State University, Baton Rouge.

The Challenge for Change

(Continued from page 83)

to blame. We have been responsible for a changing vocational agricultural program from the first day we walked into our schools whether five or twenty years ago. Constant change in our educational program has been brought about by many factors. I go back to the Johns and Jims in the program to see the changes. The young men whom we work with each day are not the same as those students we had fifteen, five, or even one year ago. They too have been influenced by what they see and do each day.

Agriculture has changed, is changing, and will continue to change as demands of society increase for more and higher quality food and fiber and as more services are required by farmers and ranchers. At the same time educational processes are changing. Devices are being used in the classroom to replace the chalk and slate. Audio visual equipment supplemented by field trips and supervised agricultural experience programs are providing students with a better understanding of American agriculture. Modern agricultural mechanics and land laboratories are providing better opportunities to learn by doing. More workshops, seminars, and conventions are being conducted to keep teachers abreast of advances in agriculture and education.

When do changes in agricultural education take place? Continuously is the best answer I can give. Change is evident by our accomplishments—less than 1 per cent of the vocational agriculture graduates unemployed, the success of vocational agriculture students in college, increased enrollment in vocational agriculture programs, and the development of new vocational agriculture programs. Are these not measures of change? We do not advertise too much change in vocational agriculture. But change has and is taking place in some 10,000 departments of vocational agriculture across the country. For example, changes in supervised experience programs were not placed in the headlines as teachers of agriculture continue to serve the needs of students through various experience programs. Most of the changes in teaching vocational agriculture have not been as dramatic as the new math but have been improvements in the instructional program brought about by revising what is taught so students are up to date with modern methods, techniques, and management practices used in American agriculture. Changes occur at all times stemming from either the individual students' needs or from the community or agricultural practices involved.

These remarks are not meant to be interpreted as we are good enough or that no changes are needed. Rather they are meant to recognize the fact that we, teachers of vocational agriculture, have changed teaching methods, subject matter content, and service to our students and the community.

What does the challenge for change mean to teachers of vocational agriculture? The real challenge is to let people know what we are doing, to continue to devise and adopt new practices in teaching vocational agriculture, to continue to support the efforts of supervisors, teacher educators, and professional organizations, and to continue to improve our understanding of agriculture. Change will occur and vocational education in agriculture will continue to be a leader in the field of education.

In Tune with Reality

(Continued from page 83)

in the life of the school and the community. Various aspects of education pioneered by this group have received near universal acceptance. The vocational agriculture department was relevant in the life of its students and the community by what it was and what it did. The quality of the program was such that it demanded recognition from those engaged in secondary education. Unfortunately, the spirit of youth waned and it seemed easier to live on past laurels than to keep abreast of change. Only as we are truly committed to occupational training and implement this goal fully will we be able to look our fellowman in the face and say sincerely that we are preparing persons for life's work in the broad field of agriculture.

Themes for Future Issues

November	***Instructional Programs in Agricultural Supplies***
December	***Instructional Programs in Agricultural Resources***
January	***Teacher Education and Supervision***
February	***Instructional Programs in Agricultural Products (Processing)***
March	***Instructional Programs in Forestry***
April	***Instructional Programs in Agricultural Production***
May	***General and Practical Arts Education in Agriculture***

THE COVER PICTURE

Vaughn McCabe, a student at the Shelbyville (Delaware) High School, waters plants in a plastic greenhouse. Four greenhouses, each measuring 21 x 60 feet, are used at the school. Two additional houses are under construction. Cost of the plastic greenhouse, which was designed at Cornell University, is less than $1,000. (Photo by Fredric Myer, Department of Public Instruction, Dover, Delaware)

Realistic Instruction in Ornamental Horticulture

NATHAN H. CLARK
Ornamental Horticulture Instructor
Hathorne, Massachusetts

The principles and objectives of vocational education should not be abandoned; they need only to be applied to our present situation. Basically we should plan to meet the needs of students and the community, keeping in mind that the current interpretation of the community is much broader than previously.

The Need

The aim of instructional programs in ornamental horticulture should be to provide as much training and experience as possible in the various branches of ornamental horticulture where employment opportunities actually exist. If we do this effectively, students will be able to fulfill the requirements of the community regardless of size or location.

The need at the present time is for more highly trained and skilled workers to maintain park systems, private grounds, golf courses, cemeteries, industrial grounds and public as well as private shade trees. In addition, nurserymen, garden center operators, and landscape contractors all are searching desperately for good employees. To accomplish this, changes should be made by up-dating courses and improving programs. There is more study material available now than ever before; but because classtime is limited, students should be expected to devote more of their own time to study if they wish to progress.

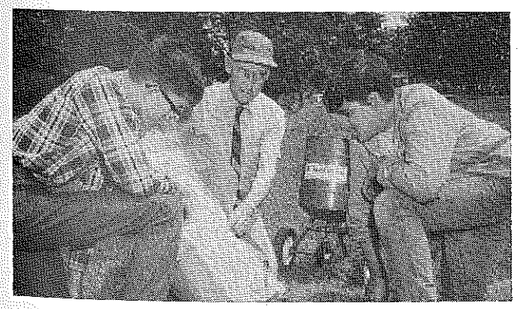
The Program

At Essex Agricultural and Technical Institute we have developed programs that have aims to teach basic horticultural skills, to develop skilled workers, to develop managerial abilities, and to prepare students for further education in horticulture. The instructional program begins with the orientation of students who are about to be promoted to the ninth grade. During April, May, and June they are taught skills on a half-day basis and given an opportunity to decide whether or not they want to study horticulture. During the freshman year, several survey courses are provided which extend their knowledge and abilities.

The opportunity to specialize begins in the sophomore year. The program includes studies and practices having to do with lawns, herbaceous perennials, deciduous shrubs, evergreen shrubs, deciduous trees, evergreen trees, plant propagation, and landscape design. During the junior year, more advanced training is given in turf management and design. The program for seniors includes studies and practices in arboriculture, plant identification, and advanced landscape design.

The job analysis method of teaching is used throughout all courses. Although sufficient time is devoted to the presentation of necessary technical information, as much time as possible is spent actually doing each job. The school has a large, well-landscaped campus and nursery which serve as ideal laboratories for carrying out approved practices.

All programs include five months of supervised work experience each year. This type of experience provides for the further development of skills and abilities. Experience employment must be approved by the school and supervised by instructors throughout the period, April to September. Students apply the knowledge and skills learned during the winter and also learn additional techniques from their employers during this part of the year-round program. It is while on these summer projects that students develop into skilled workers. As juniors many students begin to show managerial potentials, hence they are encouraged to assume responsibilities and develop such abilities. As a result senior students are often employed as crew foremen.



Nathan H. Clark (center) instructs students in the proper use of chemicals in ornamental horticulture.

Knowledge and Attitude

Along with knowledge, skills, and good work habits, there is the ever-present need for a proper attitude. We use every opportunity to emphasize this. Students are frequently reminded that they must be willing to devote more time than forty hours a week to their work if they are to progress and succeed. Also they must be productive, otherwise employers cannot afford to hire them. If they are not successful as an employee, they certainly cannot establish a successful business of their own.

Not all but much horticultural work is heavy and tiresome. Students need to be aware of this and be prepared to accept it.

When students have gained a knowledge of horticulture, developed the abilities to perform skills, formed good work habits, and acquired a proper attitude, they are ready to meet the challenges of the community, further education, or both.

A Useful Facility in Initiating Ornamental Horticulture Programs

EARL B. RUSSELL, Agricultural Occupations Instructor
New Lenox, Illinois
and
JAMES W. HANLIN, Agricultural Occupations Instructor
Atwood, Illinois

Earl B. Russell

When this article was written, Earl B. Russell was an Agricultural Occupations Instructor and James W. Hanlin was a student teacher at Lincoln-Way High School, New Lenox, Illinois. Currently Mr. Russell is a Ph.D. candidate in agricultural education at The Ohio State University.

James W. Hanlin

Enthusiasm by teachers of agriculture toward developing meaningful and comprehensive programs of instruction has made agricultural education one of the most dynamic areas in education. Recently, ornamental horticulture has emerged as one of the instructional areas in agriculture needing immediate initiation and expansion in schools in order to meet the tremendous need for competent persons in horticultural careers.

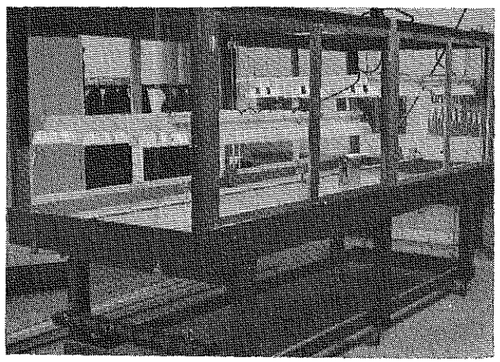
Temporary Facilities

Since some school administrators are hesitant to invest large sums of money in a greenhouse facility for a new instructional program in horticulture, teachers may find it desirable to construct a growth table to use on a temporary basis while the program is being developed. The Agricultural Occupations Department at Lincoln-Way High School (New Lenox, Illinois) is utilizing a growth table featuring automatic misting, self-contained drainage, automatic lighting, and instantly adjustable lights. This facility works quite effectively for plant propagation from seeds, cuttings, and layerage and for small-scale production of a wide variety of horticultural plants. Although this growth table is less effective than a greenhouse for instructional purposes, it provides the opportunity for students to put theory into practice in a simulated setting.

Decay-resistant redwood is used in areas of the growth table exposed to water. The table legs consist of 4 x 4's which support a floor of 2 x 12's, with a 2½-inch space through the center allowing space for a drainage trough. The growth area of the table is enclosed along the sides by 1 x 8's and the upper framing is built of 2 x 4's. Tempered masonite, sloped toward the center of the table to facilitate drainage, is supported on wedge-shaped strips nailed to the floor. Caulking compound is used around the outer edges of the masonite to provide a water-tight seal. The drainage trough through the center of the table is constructed of sheet aluminum creased with a v-shaped groove sloping two inches. The trough is covered with quarter-inch mesh hardware cloth and nylon cloth in order to hold back sand and other propagating media. Consequently, drainage is simply a matter of allowing water to drip into the trough and then into a container beneath the table.

The six-foot openings on each side of the table are enclosed by double doors. These doors and each end of the table are covered with transparent six-mil polyethylene. The polyethylene and the hover-like fluorescent light reflectors assure a relatively constant humidity which is essential for adequate growth of most greenhouse plants, especially during their propagation. The top of the table is left open to permit ventilation.

The automatic misting system, connected to a water line by a common garden hose, consists of a strainer, solenoid valve, and a Mist-A-Matic control which is available from several greenhouse supply firms. This control works on the principle of evaporation. The system has three common greenhouse sprinkler nozzles activated regularly by the Mist-A-Matic as water evaporates from a small, counterbalanced screen on the control which simulates the surface of a plant leaf.



Horticultural growth table showing arrangement of Mist-A-Matic control system, fluorescent lights, cabling, and counterweights made of old corn picker husking rolls.

During propagation, when a uniformly high humidity is required, the misting nozzles perform perfectly since the fluorescent lights are kept at a maximum height during the stress of propagation. As plants become rooted and are ready for vegetative growth, manual watering is then needed and lights should be closer to the plants to stimulate growth.

Bill of Materials

Number	Description
	Lumber
2	4″x4″x8′ (legs)
4	2″x12″x14′ (floor)
3	2″x6″x12′ (bracing)
6	2″x4″x14′ (framing and bracing)
1	2″x4″x8′ (framing)
2	1″x8″x14′ (box sides)
1	1″x8″x10′ (box ends)
8	1″x4″x14′ (door frames and facings)
2	4′x8′ sheets tempered masonite (floor)
84 ft.	¾″ moulding (to secure polyethylene)
	Hardware
132 sq. ft.	six-mil polyethylene
1 pc.	10″x12′6″ sheet aluminum (trough)
1 pc.	6″x12′6″ quarter-inch hardware cloth
1 pc.	6″x12′6″ nylon cloth
1	Mist-A-Matic control w/solenoid valve and strainer
1	3/4″ I.D.x12′6″ water pipe w/cap
3	2½″ brass greenhouse sprinkler nozzles
6	4′ two lamp reflector units, rapid start
6	2′ two lamp reflector units, rapid start
2	Cartons 4′ Gro-Lux lamps, rapid start
2	Cartons 2′ Gro-Lux lamps, rapid start
42 ft.	3/4″ angle iron (for light frames)
4	3/8″x36″ threaded rods (through light frames to prevent sway)
70 ft.	1/8″ steel cable (light suspension)
12	1/8″ cable clamps
4	1½″ single tackle pulleys
4	1½″ double tackle pulleys
8	1″ double tackle pulleys
4	3/8″x3″ eye bolts
4	corn picker husking or snapping rolls (counterweights for lights)
64	1¼″ corner braces (for doors)
16	2″ butt hinges
16	1¾″ turn buttons
8	1″ door knobs
6	4″ rubber truck casters

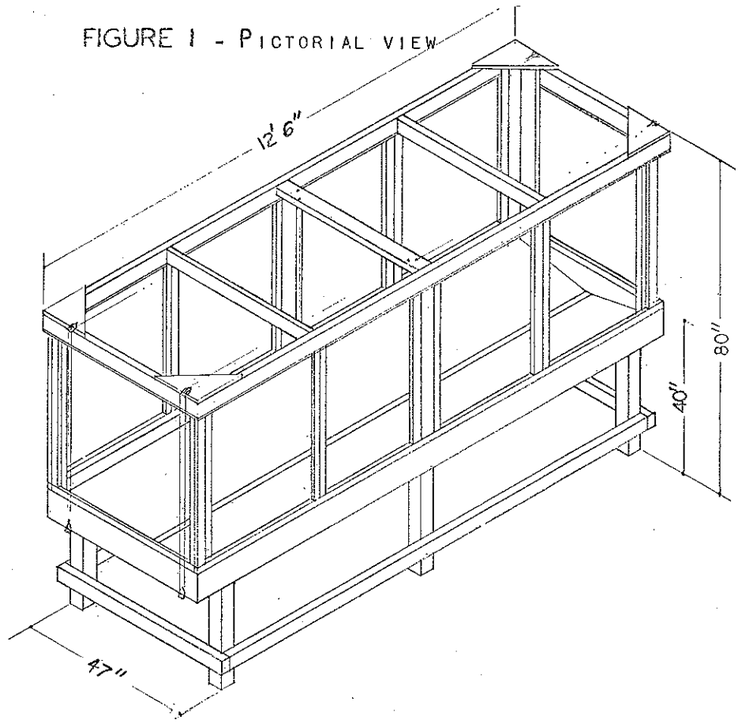


FIGURE 1 - PICTORIAL VIEW

Miscellaneous materials such as bolts and screws were not included in the bill of materials. The cost of the growth table is approximately $360. By omitting the automatic misting system, the table could be built for approximately $280.

Using the Growth Table

The design of the table easily lends itself to designing growth experiments. For example, one half of the table may contain sand as a propagating medium and the other half may contain other media such as peat moss and perlite. Innumerable combinations of rooting media, lighting, fertilizing, and watering practices could be set up easily for student's experimentation.

At Lincoln-Way High School the table is easily rolled on the 4-inch truck casters from the end of the shop nearest the classroom to the opposite end to get direct morning sunlight through a large glass door. Besides natural sunlight for regular plant production, natural versus artificial lighting can be used for experimentation. We find the growth table an excellent facility for initiating an ornamental horticulture program.

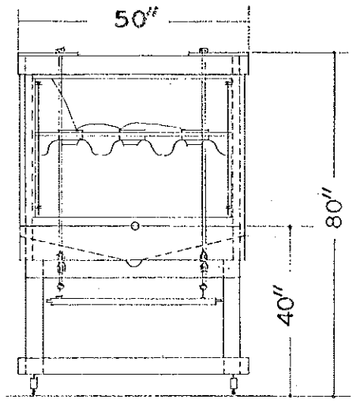


FIGURE 2 - END VIEW

AGRICULTURAL EDUCATION IN SIERRA LEONE, AFRICA

KEITH E. FISCUS, Teacher Education
Washington State University

Agricultural education in Sierra Leone, West Africa, began in 1964 with the establishment of Njala University which was patterned after the philosophy and principles of the Land-Grant institutions of the United States. The basic conditions (social, agricultural, economic, and natural) are quite different from conditions in the United States, however the need for a Land-Grant institution is great in Sierra Leone as it was in the United States in 1861.

Sierra Leone is a tropical country located on the west coast of Africa just north of the equator. It is a country that is slightly smaller than the state of Maine and has a population similar to the state of Kansas.

THE CHALLENGE

The greatest current economic problem in Sierra Leone is the inability of the agricultural clientele to produce ample food, clothing, and shelter. Although approximately 88 per cent of the adult population are farming, there is insufficient agricultural production to meet the needs of the country.

The abundant rainfall, of which 85 per cent falls in a three-month period, washes the lateritic soil free of most of its fertility. The temperature, having a comfortable range from the low in the seventies to the high in the nineties, encourages the rampant growth of agricultural insects and disease.

There are many complexities to the problems of agricultural scarcities. The farmers produce at sub-subsistence levels. Their farms are small, averaging approximately one and one-half acres per farm. Labor requirements are high and of a most strenuous type since the only labor source is human labor. There are no beasts of burden in Sierra Leone. The farmers' nutritional level is low. They simply do not have the strength to put in a "good day's work." Illiteracy is prevalent among farmers. Many have not attended school at all. Characteristically, the farmers have little capital, large families and accept improved methods and practices slowly.

The schools of Sierra Leone have a "classical" educational structure of which the main objective is college preparation with little or no attention given to vocational competency and guidance in agriculture. The existing educational programs are not meaningful to students. This is evidenced by the large number of school-leavers.

Sierra Leone has additional problems with inadequacy in health and sanitation. Nutrition deficiencies are common. The mortality rate is especially high in children between the ages of two and six. Transportation and communication systems are underdeveloped. There is an underdeveloped organization of agricultural markets.

Sierra Leone has many problems; however, the Sierra Leoneans are hopeful people. They are enthusiastic about their country. They express faith that the "new" kind of schooling that is being developed at Njala University will aid in the task of greater agricultural production.

THE PROGRAM

Prior to 1965, there were very few attempts at teaching vocational agriculture in the secondary schools in Sierra Leone. There were some schools teaching village gardening. One school had a farm on which to teach students how to farm.

The primary objectives of the Agricultural Education Department of Njala University established in 1965 were to assist the Ministry of Education in the establishment of vocational training schools (farm schools) and vocational agriculture departments in secondary schools, to prepare teachers of agriculture for the vocational training schools and secondary schools, and to conduct research necessary for curriculum development, occupational guidance and placement.

Teacher Education

Several meetings were held with the Ministry of Education to discuss teacher education in agriculture for vocational training schools and secondary schools. As a result of those meetings, teacher education programs were established to meet the following needs for teachers of vocational agriculture: 28 teachers over a three-year period who will receive an intensive one-year course in agricultural education; 229 teachers over an eight-year period who will enter a three-year agricultural education course; and 80 teachers over an eight year period who will enter a four-year agricultural education course leading to the B.S. in Education.

Keith E. Fiscus was Adviser in Agricultural Education and Head of the Agricultural Education Department at Njala University, Sierra Leone, West Africa, from June 1965 to June 1967. During that period of time he was a member of the staff of the Agricultural Education Division, University of Illinois, and was assigned to the Njala University Project. In this article, Dr. Fiscus describes his activities and experiences in planning and establishing the agricultural education program at Njala University.

Keith E. Fiscus

Dr. Fiscus demonstrates the use of hand tools in clearing a swamp for a village vegetable producing project.

Pilot Centers

The pilot center for the development of vocational training schools was initiated in January 1967. In this pilot center students were enrolled for an intensive two-year program of agricultural training. It was designed as post-primary, terminal schooling. Students were trained to be farmers. They were taught how to maximize agricultural production. The teaching of profitable farming was proposed as the most effective way to inculcate social status and respectability for agricultural pursuits.

The pilot center for the study of agricultural education in secondary schools and rural communities was established in cooperation with a near-by secondary school on November 1965. The objectives of the pilot center were to learn the needs of agricultural education in secondary schools and rural communities, to develop teaching materials and methods of teaching based upon local educational and agricultural conditions, to adapt existing teaching materials and methods to local and regional use, to develop a department of vocational agriculture in a secondary school that will serve as a demonstration for the community, other secondary schools, and education officials in the country, and to provide a center for student teachers to learn teaching skills.

Land Laboratory

The Agricultural Education Department initially was allocated seven acres of land on which to develop a land laboratory. An additional eight acres of "bush" and swamp land were cleared and added to the land laboratory. There were several functions of the land laboratory. It was the physical facility for supervised agricultural experience programs. Students gained much practical experience in the land laboratory. It was a demonstration farm. Crop rotations, variety and fertilizer trials and cropping systems were demonstrated. Adapted varieties were grown for seed, livestock feed, and human food. Modern methods of teaching were applied to the land laboratory. Some very effective teaching innovations were developed. It was a controlled replication of the school farm that was so vital to secondary schools.

The land laboratory became a very valuable part of the agricultural education program. Students of agricultural education were taught the production of all crops grown in the land laboratory. More than 400 varieties of crops were planted. Records were kept of the production and adaptability of each crop. Seeds were obtained from the temperate and tropical regions from four continents. Seeds from adapted varieties of crops were made available to the pilot centers, other secondary schools with an interest in vocational agriculture, other agricultural departments of Njala University and many farmers. Some 200 farmers received seeds during the period of operation. Cropping systems were tried, especially with reference to their adaptability to seasonal climatic variations. A commercial farming unit was established. Teaching innovations which stimulated student interest and motivations were developed.

Extension Activities

Every school that offered an instructional program in agriculture or those that wanted to establish a school farm or garden was contacted. Assistance was offered these schools in curriculum development, program planning and the acquisition of agricultural and educational materials. Seedlings of permanent crops and seeds of adapted varieties of vegetables and annual crops were distributed to these schools.

Community programs were established in three nearby villages to develop techniques and methods for teaching adults. In one program the entire village population was involved in a vegetable growing project.

Several farmers in the vicinity adjacent to the Njala area were assisted with agricultural problems. These farmers were furnished seeds, fertilizer, chemicals, advice and guidance as needed. The object of this service was to determine the effectiveness of assistance to farmers in their own environment.

CONCLUSION

Sierra Leone students are eager learners. They have a sincere and earnest hunger for knowledge about agriculture. They express the same glowing pride of their accomplishment as those expressed by students elsewhere.

There are many principles of learning that worked especially well in Sierra Leone. The students learned more readily when teachers "showed" them how to perform agricultural skills than when the teacher "told" them about agricultural skills.

The problem solving technique was a very successful teaching method, especially when the technique included the application of manipulative skills. The transfer of learning from the classroom to the student's farms and gardens was more readily accomplished when the concepts and principles also involved application and practice in the land laboratory.

The establishment of the agricultural education program in Sierra Leone tends to support the position that it is possible for teaching personnel from a completely different form of society and social structure to become effective teachers in a foreign country.

Special Education Includes Instruction in Ornamental Horticulture

HAROLD McDONALD, Teacher of Horticulture
and
GLENN BRONSON, Vocational Education Director
Mount Anthony Union High School
Bennington, Vermont

A program for integrating special education students into the main stream of life at a comprehensive high school was begun at Mount Anthony Union High School (Bennington, Vermont) during the 1967-68 school year. A part of this program is instruction in ornamental horticulture for the boys and girls participating in the program. Students participating in the special education program in ornamental horticulture range in age from sixteen to twenty. The students generally have limited or less gifted ability than other students enrolled in the vocational education programs.

The Beginning

During the first year of the program, students in the special program in ornamental horticulture worked with other students in developing facilities for ornamental horticulture in the newly constructed high school. Construction of the agricultural facilities in the new school had not been completed when the school year began. During the weeks and months that followed, students developed outdoor plots for annuals, perennials, and nursery stock and helped construct a commercial type, polyethylene covered greenhouse. The special education students lent willing hands to these projects.

Outfitting the land for production required training in the use of an assortment of hand tools and small power driven garden equipment. With varying degrees of success, the special education students tried their hands at operating a garden tractor with rotary tiller, a heavy-duty garden rotary tiller, and a heavy-duty garden shredder. The group also added suitable soil practices and today this plot is ablaze with the colors of ageratum, marigold, salvia, snapdragon, and aster grown as bedding plants in the greenhouse by the special education students.

Proper Attitudes

Certain qualities of these mentally handicapped boys and girls become evident through these and other projects—the desire to work as a team, a desire to help each other out, a willingness to accept one's limitations and to do his best, and a deep rewarding surge of pride in a job well done. Pride is spelled out in capital letters on the faces of the students as they carry home Mother's Day gift plants that they have had a part in growing or when they presented a gift of tomato plants to a teacher who had done a special favor for one of their physically handicapped classmates.

Inside the greenhouse the special education students are a valuable asset to the overall horticultural program at the school. Probably the biggest job of all is developing the proper attitude toward the plant materials—a realization that without a proper and cautious approach, what has taken several months to do can be undone in a split second. Most of the boys and girls are able, after much coaching and reminding, to develop this attitude.

Repetitious and routine activities like propagating from cuttings, transplanting seedlings, watering, and grooming plants are popular activities with the students. Throughout the entire program an effort is made to maintain a business-like atmosphere. Whenever possible the students' attention is made to focus on proper work attitudes.

Special Instruction

As far as their experiences in horticulture are concerned, the students are seldom given a traditional classroom experience. Instruction is primarily given on an individual or small group basis as they progress through an assigned job. With these boys and girls, repetition is of prime importance to grasping a concept or acquiring a skill or attitude. Some effort is made to include horticultural subject matter into the content of the regular special education courses. For example, some basic horticultural terms are included in the spelling lists. Some drill in the meaning of terms is handled in a similar fashion.

The purpose of the first experimental class was to determine whether or not mentally handicapped students could profit from instruction in ornamental horticulture in a comprehensive high school. Our conclusion is that such a program can be a successful experience for many boys and girls. Similar instruction has been offered on a voluntary basis to special education students since the first year of the program.

Employment Opportunities in Agricultural Occupations for the Physically Handicapped

IRVIN E. ASHLEY, JR.
Eastern New Mexico University
Roswell, New Mexico

Little information is available upon which to justify, develop, and conduct educational programs in agriculture for the preparation of physically disabled persons for employment in agricultural occupations. To aid in the development of these programs, information is needed regarding the physical competencies of physically disabled persons to perform agricultural and agri-business activities.

The Study

The study described in this article was concerned with paraplegic students at the University of Illinois who were essentially nonambulatory (individuals who for all practical purposes are bound to wheelchairs regardless of cause or manifestation of disability). The primary purposes of the study were to determine whether or not paraplegics possess the physical competencies required for employment in ornamental horticulture, whether or not certain ornamental horticulture activities could be performed by paraplegics from a wheelchair, and whether or not paraplegics possess a realistic evaluation of their physical abilities to perform certain activities involved in ornamental horticulture occupations. Twenty paraplegics who were students or alumni of the University of Illinois participated in the study.

The paraplegics rated their physical ability to perform ten activities in ornamental horticulture. Examples of the ornamental horticulture activities used in the study are watering pot plants with a hose, transporting pot plants and fertilizer bags from the ground level, transplanting plants, and arranging garden supplies on shelves. Each ornamental horticulture activity was demonstrated to the paraplegics by an able-bodied person prior to self-evaluations by the paraplegics. The paraplegics were not informed of the performance phase of the study until the self-evaluation forms were completed. A panel of judges then rated the paraplegics in the actual performance of the ornamental horticulture activities.

Findings

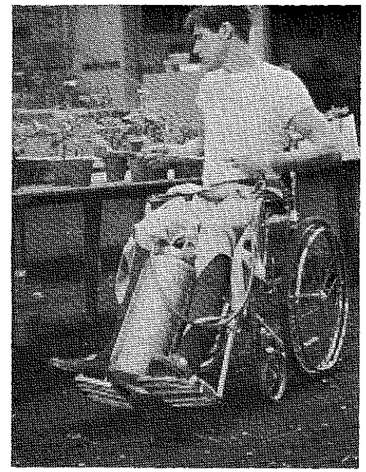
Data from the self-evaluations of paraplegics regarding their ability to perform activities in ornamental horticulture and the ratings by judges of the paraplegics' ability to perform these activities revealed that paraplegics possessed a realistic evaluation of their physical ability to perform these activities. Age, longevity of disability, and work experience after onset of disability appeared to be contributing factors to the competency of the paraplegics to self-evaluate their physical ability to perform the selected activities in ornamental horticulture. Alumni and seniors possessed a more realistic evaluation of their physical abilities to perform the activities than did juniors, sophomores, or freshmen.

Performance ratings by the judges of the ability of the paraplegics to perform the selected activities revealed that the paraplegics possess the physical competencies necessary for performing the selected physical activities in

(Continued on page 93)

Irvin E. Ashley, Jr.

Irvin E. Ashley, Jr., is Director of Vocational Education at Eastern New Mexico University, Roswell, New Mexico. This article is based on Dr. Ashley's E.D. thesis, "Analysis of Opportunities for Paraplegics in Certain Ornamental Horticulture Occupations," which was completed at the University of Illinois in 1968.



(Right)
Paraplegics possess the physical competencies necessary for employment in some agricultural occupations.

Outdoor Laboratories for Teaching Horticulture

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Agricultural and Technical College
Farmingdale, New York

The purpose of the ornamental horticulture curriculum at State University Agricultural and Technical College, Farmingdale, New York, is to provide a two-year technical education to meet the needs and ever increasing demands for technically oriented specialists for semi-professional careers in floriculture, landscape development, nursery management, and turfgrass management. Although the curriculum is not planned for transfer purposes, a significant number of graduates enroll in four-year colleges for further study in landscape architecture, horticulture, agronomy, conservation, and other related areas.

The strength of the ornamental horticulture program lies in the richness of first hand experience which is possible for students through outdoor laboratory and field exercises as well as through classroom study. Students study plant materials such as flowers, turfgrass, trees and shrubs. They propagate and grow plant materials to mature size. They also care for plant materials in greenhouses, plant nurseries, arboretums, and gardens.

OUTDOOR FACILITIES

The Department of Ornamental Horticulture at Farmingdale has the best developed outdoor facilities for teaching horticulture in the eastern United States. The gardens hold international reputation with 30,000 or more persons visiting the ornamental gardens each year to revel in the beautiful surroundings or to study in the unique gardens that have many herbaceous borders and plantings. These facilities are necessary for teaching technical skills needed in the management of horticultural areas. Over a period of forty years the faculty and students have developed the horticultural facilities through landscape design and construction projects.

Greenhouses

There is a range of glass and plastic greenhouses for growing a wide variety of flowers and plants covering one-half acre. Also in this area are hot beds and cold frames for holding and starting plants for further growth and development in the greenhouses. Each greenhouse has its individual temperature control for growing special plants for demonstration and study. In the conservatory and adjoining greenhouses tropical plants, including orchids, are grown. Here students learn the management of greenhouses devoted to special plants and how these plants can be used for indoor planting of buildings. One greenhouse is devoted to growing roses the year round, another to carnations. The other houses are devoted to a variety of cut flowers and pot plants for study and practice in greenhouse management. The flowering plants also supply the materials used in flower arranging courses.

Arboretum and Pinetum

Two sections of arboretum and two sections of pinetum covering five acres of land are devoted to the study of woody plant materials. Deciduous trees and shrubs arranged in a systematic manner provide teaching and study areas for learning woody plant materials in the arboretums. The same experience is duplicated in the pinetums where evergreens, both broadleaf and needle types, are planted in systematic arrangement. In addition, many unique and unusual woody plants for study are located on the 65-acre campus. The arboretum and campus trees serve as a laboratory for students electing courses in arboriculture. In this arboreal environment students receive instruction and develop skills of pruning, repair, disease control and nutrition in laboratory exercises.

Joseph F. Roesch

Joseph F. Roesch is Chairman, Department of Ornamental Horticulture, State University Agricultural and Technical College, Farmingdale, New York.

Nursery and Turfgrass Plots

A two-acre woody plant nursery makes it possible to rotate crops of trees and shrubs over a three-year period. Here the latest methods of nursery management are practiced from propagation and lining out in nursery rows to digging, balling, and burlapping of plants for landscape planting on campus and in the college gardens.

Turfgrass plots cover three-fourths of an acre for testing and demonstrating various species of grasses. This turfgrass laboratory for student and public use is further augmented by three golf course greens. The greens are used for instruction in design, construction, and maintenance of golf courses.

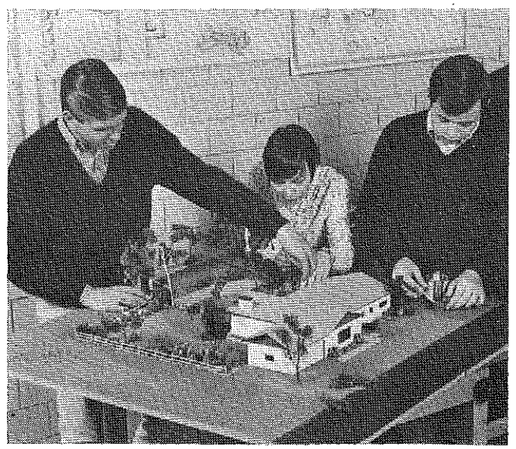
Gardens

More than a dozen gardens cover approximately two acres in the horticultural complex. Some of the gardens are named according to the theme or particular plant dominating the garden. For example, more than 250 varieties make up the Rose Garden; a vast display of blooms in bulbs, biennials, and perennials are in the Pool Garden; the Wheel Garden boasts of an unusual display of plants, wild flowers, and spring flowering bulbs in what can be termed a "construction" garden with brick walls in the shape of wheel spokes.

All of the materials in the various gardens are arranged in a manner to show good planting design. Within the garden areas there is a test garden for All-American flower selections and for the All-American Rose selections. In these test gardens new material is received each year, planted by students as part of course activities, and observed and studied by students. Evaluations by a national judge, a faculty member, are submitted to the testing organization. The All-America award selections are also displayed in the garden areas. The gardens are listed in national directories and visits from garden clubs, horticultural societies, and professional horticulturists occur throughout the growing season. There are colorful displays of flowers starting in May and extending through October. The gardens are open to the public at all times during daylight hours.

The facilities of the ornamental horticulture complex are not replaceable. Unlike most curriculums, the outdoor laboratories are composed of living materials which constantly need fertilizing, irrigation, spraying to control insects and diseases, cultivation, complete maintenance, and renewal of exhausted plants. From September to June, the facilities can be almost completely maintained through laboratory projects of the curriculum. Temporary service employees are necessary from June to September to protect and maintain the ornamental horticulture facilities.

Greenhouses and outdoor laboratory for teaching ornamental horticulture.



Students majoring in landscape development work with models.

Employment Opportunities in Agricultural Occupations for the Physically Handicapped

(Continued from page 91)

ornamental horticulture. Based on the data obtained in the study and a perusal of the job descriptions for certain jobs in ornamental horticulture, a plausible conclusion is that the types of job opportunities available to paraplegics interested in ornamental horticulture range from skilled labor to professional positions. If some of the existing architectural barriers in ornamental horticulture facilities were eliminated, greater employment of the physically handicapped would be possible.

Recommendations

Recommendations were formulated to indicate how teachers of agricultural occupations and rehabilitation counselors might work together in the development of occupational education programs and facilities in agriculture to provide services to paraplegics and to the physically handicapped. The programs and facilities recommended were agricultural laboratories for physically handicapped persons with agricultural backgrounds who use agricultural knowledges and skills in their jobs or who need agricultural work for its therapeutic values and secondary and post-secondary programs to prepare physically handicapped students and adults for the world of work.

Additional research is needed to determine the occupational opportunities in various areas of agriculture in which paraplegics and other physically disabled persons might be employed. Information is lacking concerning how agricultural educators might proceed in the development of educational programs for paraplegics and other physically disabled individuals. Considerable attention should be focused on those physically handicapped students who, because of their handicapping condition, cannot succeed in the regular vocational education program without special educational assistance or who require a modified vocational education program. The Vocational Education Amendments of 1968 place special emphasis on program development for these persons.

Teaching Agriculture in the Peace Corps — A THIN FRONT LINE IN ONE BATTLE AGAINST HUNGER

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David C. Swanston

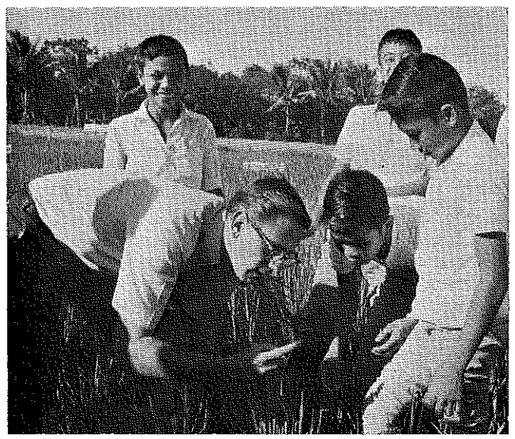
In the last decade, the classroom has become an important battleground in the Third World's war on hunger—and an unusual group of Americans have joined the fight. As population growth multiplied the need for food production, countries in Asia, Africa and Latin America began to turn to schools for assistance.

Malaysia's five-year plan that began in 1966, for example, called for two streams of education—one academic, the other vocational—with agriculture playing a major role. The Philippines launched a program to teach rice production in public high schools. Universities in countries from Paraguay to Lesotho expanded their agriculture programs. In fact, in dozens of countries one of the prime objectives of the education system became the development of well-trained farmers.

Trained Agriculturalists

A study sponsored by the Massachusetts Institute of Technology and the U. S. Agency for International Development reported the new priorities in 1964. "Education for all, through primary and preferably through secondary school, is obviously a desirable objective," the study said. "However, it may have to take second place to the needs for trained agricultural technicians and other workers . . ."

The necessity for agriculture education was obvious. Programs were developed, classes started and plans were made. But not much happened. In October, 1967 Rene Maheu, Director General of UNESCO, surveyed developing countries and reported: "Agriculture education in particular and education in rural areas more generally are suffering from gravely inadequate resources and from a poverty of ideas which is even graver." In other words, not enough money and not enough qualified teachers. It was the sort of vicious circle that hampers development in much of the Third World. There had been no agriculture education programs, consequently, there were no trained agriculture graduates and, as a result, no qualified teachers to get a program going.



Peace Corps Volunteer Joe Lovelady and his students examine a stock of IR-8 rice near San Mateo, a small town in the Philippines. Lovelady, who is from Angleton, Texas, and a graduate of Southern Methodist University, was given special training in rice production for his teaching assignment.

Breaking the Circle

To help break the circle, thirteen countries turned to the Peace Corps. They requested qualified Americans to teach agriculture in secondary and university classrooms and help train local extension agents. The Peace Corps agreed and responded with four basic groups of Volunteers:

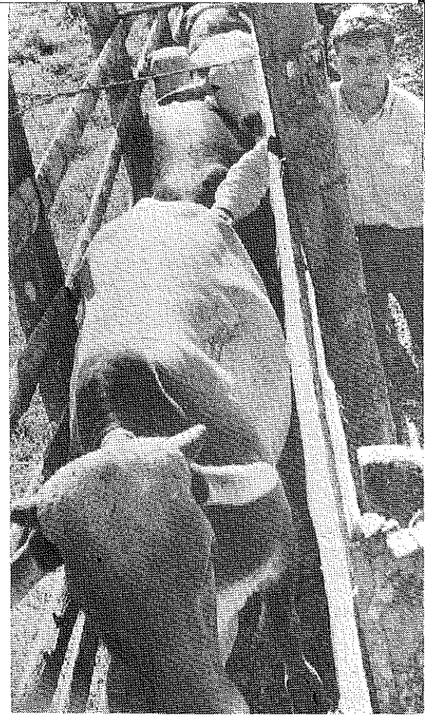
- Agriculture education graduates to teach in college classrooms, usually as teacher trainers.
- Science graduates to teach science in agriculture programs.
- Liberal arts graduates who are given specialized training by the Peace Corps to teach one narrow area of agriculture in public schools.
- Agriculture graduates and experienced farmers to teach agriculture classes in high schools, work in agricultural training centers and help train extension agents.

All in all, there are about 200 Volunteers working in one of these four areas right now. However, since Volunteers often take on a wide range of assignments there is a certain amount of overlapping and some of the distinctions between an agriculture Volunteer and an agriculture-education Volunteer become fuzzy.

Teaching Agriculture

In Ecuador, for example, a group of Volunteers conduct experiments and demonstrations at the Santo Domingo Animal Reproduction Center. Using a herd of forty Brahman and Santa Gertrudis cattle, the five Peace Corpsmen are demonstrating how new livestock and modern techniques can spell success for Ecuadorian farmers. "This is an education process," Volunteer Fred Weller explains. "We can't — don't — expect overnight success. But somewhere between overnight success and no change at all is where we are operating. And we think we can show that it is working and will continue to work." Weller brought an impressive set of agriculture credentials — he grew up on a farm and has a degree in animal science from Iowa State University — to the job, and does most of his teaching in the field.

By contrast, Joe Lovelady, a Volunteer agriculture teacher in the Philippines, has degrees in divinity and music and spends most of his time in school. Lovelady teaches high school students in San Mateo to plant the new IR-8 "miracle" rice. He was trained in rice production by the Peace Corps at an intensive two-week program at the Siniloan Rice Training Center near Manila. He limits his agriculture teaching to the rice production class. He lectures on planting and tending the rice and conducts demonstrations in a small paddie in a corner of the schoolyard.



Peace Corps Volunteer Fred Weller prods a reluctant bull as the herd is put in the corral for the night at the Santo Domingo, Ecuador Animal Reproduction Center. Fred is one of several volunteers who work to introduce improved breeds of cattle and better livestock management practices to the farmers of the area. Weller received a B. S. in animal husbandry in 1967 from Iowa State University.

In addition to the Philippines and Ecuador, Volunteer agriculture teachers serve in Kenya, Fiji, Tonga, Western Samoa, Chile, Paraguay, Iran, Nepal, Guatemala, Thailand and Malaysia.

Malaysia's programs are among the oldest and are probably the most diverse of all Peace Corps agriculture education efforts. The Peace Corps has helped agricultural education in Malaysia, a Southeast Asian nation bordered by Thailand, for five years and, right now, fourteen Volunteers are teaching agriculture on several levels. Volunteers work in teacher training colleges, agriculture training stations, and public high schools.

The Peace Corps estimates that the Volunteers have had a hand in training more than 100 agricultural teachers and about 500 extension workers.

In the class garden of the Tuaran Agriculture Training Station in Sabah, Malaysia, Peace Corps Volunteer Erik Sorensen and one of his students discuss diseases of plants. Sorensen is a graduate of the University of Arizona and serves as a science teacher.

Erik Sorensen, for example, teaches science to 36 young men at the Agriculture Training Center in Tuaran, a small town in Sabah, one of Malaysia's states on the island of Borneo. Sorensen, a 24-year-old graduate of the University of Arizona, conducts classes aimed at helping the students, who will become Junior Agriculture Assistants, understand the diseases that affect Malaysia's crops. "I've tried to make the class really applicable and practical," Sorensen says. The students have a garden, take several field trips a year and have collected and classified most of the insects of the area, he adds.

Two new groups of agriculture teachers for Malaysia began training this summer, and a number of smaller programs have been planned for several other countries.

"We get many more requests for agriculture teachers than we can fill," Jack Frankel, Peace Corps agriculture specialist, says. "We have qualified science teachers—and that's important —but there just aren't enough agriculture educators to go around." As a result, the Peace Corps has launched a drive to recruit agriculture teachers.

Planning for Effective Teaching

H. H. GOLDEN
Teacher of Agriculture
Louisa, Virginia


H. H. Golden

Planning is a necessity. The busy housewife sets up a schedule for the week; the businessman organizes his work at the office; parents plan for the education of their children; the contractor follows a detailed blueprint in building a house; the farmer diversifies and rotates his crops. Success or failure of each enterprise depends upon the adequacy of planning.

Planning is as much a necessity for the teacher as for the housewife, the contractor, or the farmer. Neither ingenuity nor experience can serve as a substitute for thorough planning.

Rewards of Planning

What are some of the rewards of careful planning for teaching? First, continuous and thoughtful planning gives purpose and direction to what takes place in the classroom. Aimless rambling, fruitless activity, and disciplinary incidents are reduced to a minimum. Wise selection and organization of varied and appropriate learning materials and activities are most likely to insure the achievement of worthwhile objectives.

Another outcome of thorough planning by the teacher is an atmosphere of confidence and security in the classroom. Students gain confidence in the leadership of the teacher. The teacher, in turn, is freed of details of classroom management and control which stem from poor organization. Good organization is conducive to good teaching.

Still another advantage of the careful planning of instruction is that time is saved in the long run. The teacher who systematically accumulates and organizes a file of references, curriculum guides, resource units, and audio-visual materials is able to plan with a minimum of time and effort. While it is imperative for the beginning teacher to prepare and use complete written plans, he may develop a pattern or habit of thinking which will later enable him to substitute mental plans for written ones. Even though all plans are not written, teachers should mentally go through the steps of planning: What are my specific objectives? What materials and resources do I need? What learning activities are likely to be best for achieving my objectives? How much time should be devoted to each? How successful was the lesson? How can I determine how well my students have achieved the objectives of the lesson? No teacher can ever completely abandon the use of written plans.

From an administrative standpoint written plans are imporant for two reasons: to make supervision more effective and to facilitate the work of substitute teachers. Because supervisory visits can only be made periodically, written plans provide a record of the continuity of learning experiences which would not otherwise be evident. Some principals consider written plans so important that they require new teachers to prepare both unit and daily plans as evidence of adequate preparation.

Principles of Effective Planning

Effective teacher planning:

—facilities learning

—provides for continuity in learning

—provides for the correlation of knowledge and skills derived from the various subjects offered in school

—takes into consideration the readiness of the student to learn

—recognizes individual differences in student interests, needs, and abilities

To discharge his responsibility well, the teacher in today's school must plan more effectively than ever before. An increase in number and heterogeneity of the school population, rapid expansion of all fields of knowledge, newer developments in teaching methods, and an increasing volume of instructional materials have compounded the complexity of planning for instruction.

Plant Materials for Teaching Ornamental Horticulture

EDWARD E. EVAUL, JR.
Teacher of Agriculture
Columbus, New Jersey

In recent years instructional materials for programs in ornamental horticulture have increased tremendously. However little has been written about plant materials useful and necessary for teaching ornamental horticulture. The study reported in this article was designed to determine a list of plant materials that teachers of agriculture thought useful in teaching and businessmen thought profitable to the horticulture industry.

Ten teachers from New Jersey, Pennsylvania, and Maryland and thirty businessmen, selected through ornamental horticulture specialists' recommendations and from professional association directories, furnished data for the study. Teachers were asked to rate turf, greenhouse, and nursery plants as to their importance educationally. Businessmen were asked to rate the plants as to their importance to the business economically. Rankings of the plant materials were obtained by combining the ratings of teachers with those of the businessmen for each group of plant materials.

Selecting Plant Materials

In the accompanying lists, plant materials needed for instruction in ornamental horticulture are listed according to educational and economical value. Ratings assigned to plant materials by teachers were similar to ratings assigned by businessmen in the horticulture industry. Plant materials are listed in descending order of importance.

Money is a limited resource in most schools. The ranking of plant materials should be helpful to teachers with limited financial resources to operate ornamental horticultural programs. Through the use of the accompanying lists, teachers can select plant materials according to importance educationally and economically.

GRASSES

Merion Kentucky Bluegrass
Common Kentucky Bluegrass
Pennlawn Red Fescue
Creeping Bentgrass
Kentucky 31, Tall Fescue
Annual Bluegrass
Chewing Fescue
Perennial Ryegrass
Colonial Bentgrass
Highland Colonial Bentgrass
Redtop

WEEDS

Knotweed
Chickweed
Crabgrass
Goosegrass
Wild Garlic
Dandelion
Buckhorn
Quackgrass
Sheep Sorrel
Ox-eye Daisy
Oxalis
Bull Thistle
Burdock

FLOWERS

Cut
Chrysanthemum
Carnation
Rose
Snapdragon
Gladiolus

Pot
Chrysanthemum
Geranium
Poinsettia
Easter Lily
Azalea
Hydrangea
Daffodil

Bulbs
Hyacinth
Tulip
Daffodil

BEDDING PLANTS

Petunia
Marigold
Zinnia
Pansy
Begonia
Salvia
Snapdragon
Ageratum
Impatiens
Phlox
Alyssum
Aster
Delphinium
Verbena
Portulaca
Larkspur
Lobelia
Calendula
Babys Breath
Forget-me-not
Strawflower
Foxglove
Sweet William
Bachelor Buttons
Primrose
Cosma
Canterbury Bells
Hollyhock

FLOWERING PLANTS

Yew
Azalea
Holly
Forsythia
Myrtle
Juniper
Fuchsia
Arborvitae
Boston Ivy
Euonymus
Boxwood
Weigelia
Spruce


Edward E. Evaul, Jr.

Edward E. Evaul, Jr., is Teacher of Agriculture, Northern Burlington Regional High School, Columbus, New Jersey. This article is based on Mr. Evaul's Master's Project, "Plant Materials for Ornamental Horticulture in Secondary Schools," which was completed in June 1969 at Rutgers University, News Brunswick, New Jersey.

(Continued on page 99)

Expanding Vocational Agriculture Through Area Schools

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Scranton, Pennsylvania


Robert D. Muzzi

Vocational educators have long realized the need for expanded and comprehensive programs in vocational education. Many small school districts have tried to establish and expand vocational offerings but have floundered due to the inability to provide the flexibility and diversification required to meet the needs of society. The Vocational Education Act of 1963 made such a move possible through provisions for the establishment of area vocational-technical schools. These area schools are established and operated jointly by a number of school districts within a given geographic region. This arrangement allows for the flexibility and diversification of programs needed while at the same time allows smaller school districts to continue the vocational programs within their own districts which are successful and adequate.

Advantages and Disadvantages

The impetus of the area school movement in Pennsylvania is having notable effect upon agricultural education. School administrators are concerned about the role of vocational programs in the comprehensive high school. Many are of the opinion that all vocational programs belong in the area school and thus advocate the transfer of existing programs to area schools. In many cases this is a sound move, while in other cases it can be the ruination of a sound, on-going program. In some instances, weak programs can be strengthened by transfer to an area school as it increases the attendance area and pupil population.

Generally, agricultural departments now located in comprehensive high schools should continue to function in these high schools. Too many administrators use the area school as a means of eliminating overcrowded conditions, handling unruly pupils, and solving troublesome scheduling problems. Some disadvantages in transferring agricultural education into area schools are:

—Longer distances for transporting students; too much time is spent in traveling to and from school.

—Loss of local farms and businesses which serve well for supplementing in-school instruction.

—Adult programs would lose some of their effectiveness by moving the center of activity to more distant environments.

—Too much time is spent in the program for college bound students posing a scheduling and transportation problem.

—Students have little time for extra-curricular activities making a well-rounded education difficult.

Reasons for moving agricultural education into area schools are:

—More thorough training for terminal students.

—Homogenous grouping of students.

—Higher reimbursement than high school programs.

—Flexibility in curriculum offerings.

—Increase in specialization possible.

—Field trips easier to schedule as longer periods of class time are available.

—Usually, better facilities and equipment.

The Question

One can readily see the logical question, "should vocational agriculture programs be kept in the comprehensive secondary school or be moved into the area vocational school?" Before answering, a third alternative should be considered—that of operating programs in both schools. This is a realistic approach. Many Pennsylvania schools are supporting two programs since a more comprehensive agricultural education program can be provided. The local high school can:

—Offer a "general" agriculture course at the seventh- and eighth-grade level, which serves as an exploratory program to develop interest in agriculture.

—Offer a ninth-grade vocational agriculture course to interested students to introduce basic skills and determine areas of interest.

—Continue at the tenth-grade level with the development of basic skills and further exploration for areas of interest for undecided students. At this age, many students are not ready to select an area for their life's work, which should be the case when enrolled in an area school.

—Provide for eleventh- and twelfth-grade students regular vocational agricultural programs such as production agriculture, agricultural business management, or combinations of the areas of instruction—agricultural production, agricultural supplies, agricultural mechanics, agricultural products, ornamental horticulture, agricultural resources, forestry, technical, and pre-professional.

—Allow students to transfer to the area vocational-technical school at any grade level when he, his teacher, and guidance counselor feel he is ready for the specialized technical course at the area school.

—Keep all college bound students in the local high school where the time requirement is less and academic courses for college entrance and preparation can be scheduled.

—Provide the regular young farmer program and special adult courses.

The area vocational-technical school can:

—Offer the regular vocational agricultural program if requested by sending districts too small to maintain programs.

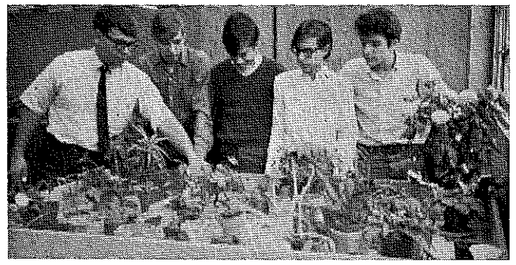
—Provide highly specialized and technical programs in areas such as landscape horticulture, floriculture, agricultural mechanics, food technology, and chemical technology.

—Offer the programs most needed and requested by students and the agricultural industry.

—Conduct young farmer and adult programs.

Articulation

One aspect in the articulation of area programs with programs in local schools is the FFA. The FFA as now constituted is well adapted to both the comprehensive and area schools for students of production agriculture. Many problems have arisen in non-production programs which are going to be difficult to solve because most of the non-production programs are offered in area schools. This is where the problems are more acute. The problems can be lessened by the establishment of sub-chapters within the FFA. The FFA can function equally well in comprehensive and area schools.


A horticulture instructor in an area school teaches a unit on plant materials.

We must be cognizant of the fact that we are dealing with a variety of students; therefore, programs must be "tailor-made" to satisfy their needs. Agriculture education is concerned with four distinctive groups of students whose future occupations will require knowledge and skill in agricultural subjects—those who plan to enter or engage in production agriculture, those who plan to enter non-farming agricultural occupations, those who desire further post-high school training, and those who plan to continue their education for entering an agricultural profession.

The local, comprehensive secondary school will continue to meet the more general needs of studnts in the earlier school years in addition to meeting vocational and technical needs. Specialized vocational-technical education will be provided in the area vocational-technical school. There is a need for both. We must not forget that the controlling purpose of vocational education is to fit persons for gainful employment.

Plant Materials for Teaching Ornamental Horticulture

(Continued from page 97)

Dogwood
Privet
Lilac
Magnolia
Maple
Abelia
Hibiscus
Deutzia
Hemlock
Gardinia
Mountain Laurel
Golden Chain Tree
Willow
Rose of Sharon
Gingko
Honeysuckle
Barberry
Tulip Tree
Shrimp Plant
Stephanotis
Ash
Trumpet Vine
Bittersweet
Silk Tree
Catalpa

FOLIAGE PLANTS

Philodendron
Coleus
African Violet
Begonia
Split Leaf Philodendron
Caladium
Rubber Plant
Dieffenbachi
Dracaena
Peperomia
Rex Begonia
Snake Plant
Palm
Wandering Jew
Prayer Plant
Crassula
Devil's Ivy
Shrimp Plant

SHRUBS

Japanese Holly
Japanese Andromeda
Cotoneaster
Laland Firethorn
Spreading Japanese Yew
Upright Japanese Yew
Dwarf Japanese Yew
Convex Leaf Holly
Rose Bay Rhododendron
Hick's Yew
Saucer Magnolia
Azalea
Mountain Laurel
Doublefile Viburnun
Lilac
Andora Juniper
Showy Border Forsythia
Vanhouttee Spirea
Korean Spice Viburnun
Star Magnolia
Pfitzer Juniper
Winged Euonymus
Linden Viburnum
Mock Orange
Deutzia
Japanese Barberry
Wisteria
Hybrid Mock Orange
Siebold Viburnum
Blackhaw
Flowering Almond
Beauty-bush

GROUND COVERS AND VINES

Myrtle
Pachysandra
Baltic Ivy
Boston Ivy
English Ivy

TREES

Flowering Dogwood
Sugar Maple
White Pine
Pin Oak
Red Oak
Red Maple
American Holly
Canada Hemlock
Sweet Gum
Scarlet Oak
Kwanzan Japanese Cherry
Washington Hawthorn
Colorado Blue Spruce
Japanese Maple
Little Leaf Linden
Tulip Poplar
Norway Spruce
Austrian Pine
Carmine Crabapple
Honey Locust
Parkman Crabapple
Paper Birch
Hopa Red Flowering Crabapple
Norway Maple
Eastern Redbud
Ginkgo

WHAT MAKES INSTRUCTION VOCATIONAL?

KEITH CARLSON, Vocational Agriculture Teacher
Belmond, Iowa

"Vocational Agriculture? Who are you kidding, it isn't really vocational. It's just like all other courses; tests determine our grades; all you have to do is repeat what is studied in class. We are all treated alike; our interests must be your kind of agriculture or they are not encouraged. What activities in vocational agriculture make it vocational?"

If one of your students made these comments, how would you answer? Are you so certain about your program to ask students to answer these questions?

The Vocational Concept

Just what is the claim that vocational agriculture is "vocational"? I believe the vocational concept has a complete, all encompassing claim on vocational agriculture. The vocational aspect of the program cannot be secondary to agriculture. The vocational aspect is first. We have a responsibility to each student to help him or her develop fully. Then we should be concerned about developing agricultural abilities and understandings.

This outlook is idealistic, but we should have that type of outlook about vocational agriculture programs. We should not overlook students in our attempt to teach agriculture. In practice we should place emphasis on the student; their interests will lead them to agriculture. In the vocational agriculture program at Belmond (Iowa) High School, an attempt is made to place the student first.

Occupational Experience Programs

Occupational experience programs are central to the vocational agriculture program. In developing experience programs no requirements are placed on students. We do not force every student to have an experience program if he does not want one. But through an evaluation of their goals and aspirations, most students exhibit a desire to prepare themselves for life. By working out a series of desirable experiences, students soon have an occupational experience program. Up to one half of a student's grade can be placed on this program, but every effort is made to resist making grades the object of the occupational experience program.

Some students never develop an occupational experience program with this approach. However, there are fewer "paper" programs with this approach than when experience programs are required of all students.

Not all of the occupational experience program must be strictly agricultural in nature. Bulletin boards, displays, and student-teacher conferences insure sufficient emphasis on agriculture. And this is done with the student's interests and desires as the center of attraction, not a series of rules and regulations.

Career Information

The curriculum includes typical production agriculture, farm management, and agricultural mechanics. However, we integrate career information into each instructional area. This information provides a reason for studying each unit. A career orientation exchange center is maintained in the classroom. All material concerning careers is made available to all students. In addition, students are urged to bring in material concerning careers that may be of interest to other students. In this way we are constantly exchanging information about careers.

Each summer the FFA chapter conducts an Ag-Business Tour for students who have been studying agriculture their sophomore year. Students raise the money, plan the four-day tour, and make their own decisions.

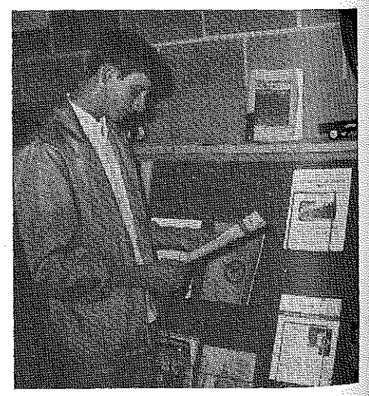
Keith Carlson

Keith Carlson was the recipient of one of the NVATA Career Orientation Awards presented at the National Convention in Dallas, Dec. 1968.

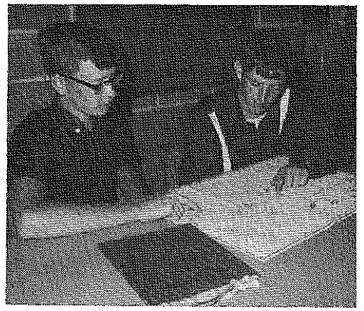
This past year sixteen different farms and businesses were visited within 300 miles of Belmond. Group interaction was emphasized by tour reviews, cooking their own meals, and stressing the importance of working together.

Student-Centered Programs

Tours, exchange of materials, and occupational experience programs may not be sufficient for the student who wants to take part in a student-centered program. But these activities are a start in that direction. Experimentation with programed instruction and non-structured classroom situations lead me to believe that I have a long way to go before I have individualized instruction in the classroom. But experiences on student's farms and in the agricultural mechanics laboratory have provided encouragement to take a good look at many classroom procedures which may have placed the student in a secondary role. Can we dare seek a program that is flexible enough so that even the most timid student can mold a program to fit his interests?



A career orientation program must provide students an opportunity to read current literature about vocations.



(Right)
Vocational agriculture students at Belmond High School plan the annual Ag-Business Tour for sophomores.

Teaching Students to Keep and Use Records

HERBERT BRUCE, JR., Teacher Education
University of Kentucky

Herbert Bruce, Jr.

One basic reason for keeping records with a supervised occupational experience program is to learn how to keep records and how to use them. For many years we have realized this fact and have placed emphasis on record keeping. If we believe records are important, we should expect students to keep accurate and complete records on their experience programs. For students to keep good records, they must be taught how to keep records.

Value of Records

Records are as valuable as a person makes them. If they are kept accurately, studied carefully, and used frequently, they can be extremely valuable. More specifically, records are valuable because they provide information that can help increase income from agriculture. Information from accurate records is valuable to the teacher in the following ways:

—Records provide excellent teaching material.

—A teacher has a good basis for guiding and supervising students when good records are kept.

—One logical basis for course building is records kept by students.

—Good records can be used to help determine the need for agricultural education.

—Records furnish proof of accomplishment.

—Records lead to the improvement of teaching.

Information from accurate records is valuable to the student in the following ways:

—Records provide a basis for sound planning.

—Good records make it possible to prepare a sound financial budget.

—Efficient use of resources is possible when good records are available.

—Evaluation is possible where records are available.

—Records are very useful in preparing reports (occupational experience program summaries, income tax, social security, and FFA contests and reports).

—Records assist students in becoming good observers.

Using Records Effectively

Students in agriculture should be interested in knowing what records tell them about their programs. Correct interpretations of complete, well-kept records can assist greatly in making needed improvements. Teachers of agriculture should recognize that most students are capable of keeping records which provide useful information in program analysis. Complicated accounting is not necessary. Teachers should also recognize that they are capable of teaching this kind of record keeping.

Proper use of records will remove guesswork and cause the decisions that affect income to be based on facts rather than prejudice, custom, or chance. This being the case, the teacher must also assume the responsibility of teaching a student how to use the records he keeps.

Youth Organizations Aid in Teaching

W. T. JOHNSON, Supervision
North Carolina Department of Public Instruction


W. T. Johnson

The value of youth organizations is very important in an effective instructional program in vocational education. FFA has resulted in a more effective program by providing members participating experiences in various areas of leadership. Members participate in many activities where, in most cases, they learn while they earn.

Values of FFA

Those engaged in vocational education realize that through youth organizations the following may be realized.

—A more effective use of organizational procedures.

—Participating experiences in many areas of leadership.

—Closer cooperation between other groups in the school and community.

—An outlook and appreciation for career opportunities in the broad field of agriculture and related occupations.

If these statements are accepted as values of youth organizations, then the national, state, and local leadership in vocational agricultural education should accept the responsibility to see to it that the FFA is an intracurricula activity. Among other objectives, a definite part of the vocational agriculture curriculum should include participating in public meetings, speaking in public, buying and selling cooperatively, and solving problems in an organized way by permitting the members to participate.

This cooperative way of involvement in the various areas of a total program should lead to the development of the following qualities: leadership, citizenship, character, scholarship, improved agriculture, cooperation, service, thrift, patriotism, and recreation.

Developing Leadership

State staffs and teachers should provide leadership and aid students in organizing an effective program that will involve all students in agriculture in planning and executing activities designed to develop qualities of agricultural leadership. Leadership schools and workshops will have to be planned first for teachers. Teachers must be engaged in planning and executing the program. Then an effort should be made to give this type of training to officers and selected members with teachers participating on the state, district, and federation levels. Perhaps the same type of training should also be given on the chapter level.

To provide the leadership needed, the employment of additional personnel to work with youth organizations may be needed. Persons working with youth organizations should use the awards given by foundations and other agencies to stimulate interest in the courses taught. States should devise approaches that encourage teachers to use the awards program to inspire and encourage students to do a better job in courses. Students should participate in the awards programs.

If an effective program is carried out in high schools where students are involved in planning and carrying out the leadership program, there will be little difficulty in continuing similar activities in post-high school programs. This means, however, that someone should be responsible for the post-high school youth program and cooperate with other youth leaders and staff members in making youth activities an integral part of the total post-high school program. If a more concentrated effort is given to the operation of youth organizations as an integral part of the instructional program, training would be more meaningful and the organization would tend to hold students in school thus decrease the drop-out problem we have today.

PROCEDURE FOR ORDERING BACK ISSUES

A recent change in the procedure for handling orders for back issues will result in prompt delivery. Orders for 10 or fewer copies of back issues will be mailed directly by the Business Manager from Madison, Wisconsin. Address all orders for back issues to:

Doyle Beyl, Business Manager
THE AGRICULTURAL EDUCATION MAGAZINE
Box 5115
Madison, Wisconsin 53705

Cost of back issues is 50 cents per copy. Payment should accompany the order. A list of back issues available may be obtained from the Business Manager.


Odell T. Barduson

Promoting Safety in Agricultural Mechanics Shops


W. Forrest Bear

ODELL T. BARDUSON, Supervision
Minnesota Department of Education
and
W. FORREST BEAR, Teacher Education
University of Minnesota

The promotion of color coding, safety zones, and non-skid for agricultural mechanics shops in Minnesota was a cooperative project involving state supervisors, teacher educators, vocational agriculture teachers, and high school students. The project was launched by the preparation of two publications — "Safety Color in the School Shop" and "Safety Zones and Non-Skid Areas for the Agricultural Mechanics Shop" — which were distributed to all vocational agriculture teachers in the state.

Plan

Agricultural education seniors enrolled in courses on methods of teaching agricultural mechanics at the University of Minnesota were informed about the program and were involved in research and shop renovation projects during student teaching in the high schools. Sixteen area meetings for teachers of agriculture were conducted by the Agricultural Education Section of the State Department of Education. Schools desiring to participate in the project were selected for meeting sites. The shop renovation was planned and demonstrations prepared in advance of the meetings. The meetings were then held at schools in which shops had previously been color coded and had provided safety zones and non-skid material in the shop.

Action

Eighteen months of preparation and program promotion cannot be counted a success without action in high school shops. Shop renovation is a big task. The approach used at Glencoe (Minnesota) High School will be used to illustrate how the project operated.

The school had an agricultural mechanics shop without one item color coded, no safety zones were outlined, and non-skid was non-existent. There was a agricultural mechanics class of fourteen senior boys with varying abilities and interests. These two conditions, plus the teacher's interest, provided the necessary components for a successful instructional program leading to the renovation of the agricultural mechanics shop.

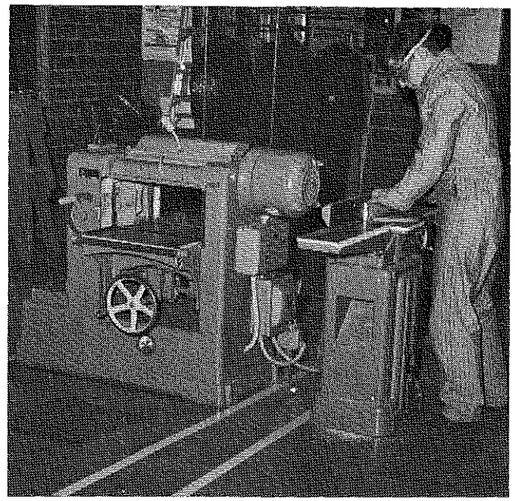
Organization was the key to success in the program. All the paint, non-skid, and zone tape materials were ordered before school started. A two-week instructional unit on machine parts, service and adjustment, and color coding and safety zones was prepared.

The shop renovation program was proposed to students stressing such goals as safety, tool nomenclature, machine adjustment, painting techniques, neatness, and pride of workmanship. Student's acceptance or rejection was at a balance during the initial phase of the project. Each student was assigned an area of activity, for example, the radial arm saw, drill press, or jointer. It was his responsibility to clean and adjust the machine, color code, and lay out the safety zone and the non-skid area.

Two weeks were required to complete the instructional program and four weeks to complete the shop work. As the unit progressed interest mounted and determination to have the best shop area produced the desired goals of pride of workmanship and self-discipline to complete an assignment.

Results

The success of the program was assured through teacher planning, developing student interest, creating favorable attitudes, and the teacher acting as the project adviser rather than the project director. Rapport with school administrators was promoted. Students now have a new concept; it is now "our shop" rather than "your shop." Safety is evident and good housekeeping habits now are the rule rather than the exception.


Jointer and planer properly color coded with safety zones and non-skid on the floor. (Photo by Kenneth Stenzel, Vocational Agriculture Teacher, Glencoe, Minnesota)

An Instructional Program in Ornamental Horticulture

TRAVIS E. HENDREN
Teacher of Vocational Agriculture
Cleveland, North Carolina

The ornamental horticulture program at West Rowan High School (Cleveland, North Carolina) has been in operation four years. Each year we improve the curriculum and the quality of training offered students. The curriculum is designed to meet prevocational as well as avocational needs of students.

Curriculum

The curriculum includes four major units of instruction. The unit on Orientation and Guidance is designed to enable students to develop understanding and knowledge of the importance of ornamental horticulture and to enable students to explore the occupational opportunities in ornamental horticulture. Each of the major units of instruction provides opportunities for students to study and explore occupations specifically related to the subject matter being taught.

The unit on Nursery Practice includes instruction in plant propagation, propagation and growing structures, transplanting, grass production, controlling insects and diseases, and safety in using insecticides and fungicides. The unit on Floriculture includes instruction in greenhouse management, greenhouse structures, marketing, floral design, and floriculture crops. The unit on Landscape Gardening includes instruction on landscaping principles, developing the public, private, and service areas, identification and selection of plant materials, drawing the landscape plan, and planting and maintenance of materials.

Activities

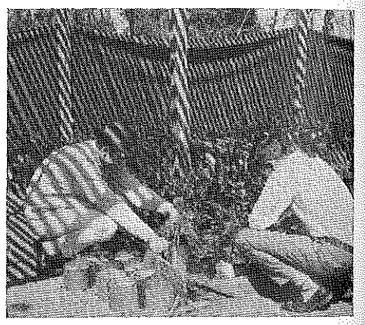
We have a double class-laboratory period each day. This makes it possible to take numerous field trips where we observe and critique landscape arrangements. Also we take trips to nurseries, garden supply stores, florists, and landscape gardeners where students conduct interviews as a part of the occupational exploration phase of the course. Students are able to learn many practices by actual experience both in the greenhouse and classroom. In 1968-69, flower arranging was added since a number of girls were enrolled in the course.

Facilities

Students enrolled in ornamental horticulture built a 20′ by 40′ headhouse and equipment storage shed. We lease a tractor with lift, mower, plow, lime spreader, and tiller tool. By mowing the school grounds, the county furnished materials to build the storage shed which is of aluminum with a concrete floor. There is a 5′ by 20′ mist propagation bed inside one greenhouse with an automatic time clock. From 2,000 to 3,000 cuttings are made each year with very good liveability.

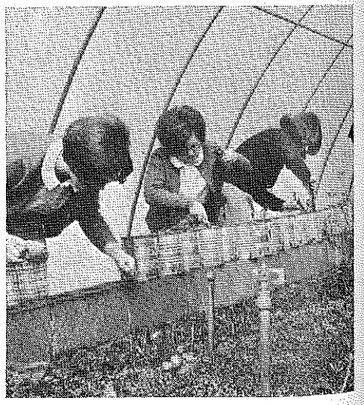
Travis E. Hendren

Travis E. Hendren, Teacher of Vocational Agriculture at West Rowan High School, Cleveland, North Carolina, is Vice-President of Region V, NVATA.



Weeding and fertilizing plants in the slat house.

Operating steam heat soil sterilizer.



Potting rooted cuttings from the mist propagation bed.

Instructional Materials — A Time-Saver for Teachers

HOWARD TURNER
University of Georgia

Howard Turner

Howard Turner is an Engineering Editor for the American Association for Agricultural Engineering and Vocational Agriculture, University of Georgia, Athens.

Experience has shown that adequate curriculum materials are necessary for the teaching-learning process. When teachers spend half of their lesson-planning time searching libraries for reference material and the balance of the time organizing the information found, it is time for change. It was this situation that prompted the organization of what is now the American Association for Agricultural Engineering and Vocational Agriculture (AAAE & VA) twenty years ago at the University of Georgia.

After eighteen years experience in the development of curriculum materials, G. E. Henderson, Coordinator of AAAE & VA, had this to say in a paper presented to the American Society of Agricultural Engineers in 1967.

> Probably all of us who have prepared subject matter have tended to develop something of an inferiority complex.
>
> The reason: as you associate with administrators, teacher educators, principals and others, you sometimes get the feeling that education is measured in terms of modern structures, an efficient administration, ample equipment, teaching guides, teaching techniques, visual aids and any number of other items or combination of items, but not necessarily subject matter.
>
> When there is recognized need for expanding a teaching program into new areas, there are those who seem to feel that most of the job is done when an outline is prepared and a few references listed. It reminds me of a sign that hung in a restaurant. It read in large letters "T-BONE 35c." In smaller letters it read "With meat—$3.50." This lack-of-subject-matter situation was reflected by a concerned teacher when he said, "You can no more teach what you don't know, than you can come from some place you haven't been."

AAAE & VA, a national organization supported by twenty-two participating states representing approximately 75 per cent of the nation's population, produces curriculum materials in agricultural mechanics. Both teachers and students have accepted these instructional materials almost without question. Many teachers regard AAAE & VA's curriculum materials as the best teaching aids available.

Why?

A part of the answer may be found in the results of a study last year involving fifteen teachers in three states. The study was conducted during the preparation of a new book, *Small Engines — Care, Operation, Maintenance and Repair*. A group of vocational agriculture teachers in Georgia, South Carolina and Oklahoma were asked to test the preliminary draft of the book in their classrooms and laboratories to determine its adequacy for teaching.

Although the teachers participating in the study had received from thirteen to seventeen weeks training in small engines and had from one-half to three years experience teaching small engines, they had used only two or three references for teaching small engines. Contrast this with the 400 references used in the development of the small engine book. Not all of the information from the 400 references was included in the book, but all of the references were reviewed — a job that would be impossible for a teacher even if the resource materials were available to him. In many cases a teacher who is limited on resource material resorts to teaching only that which he knows.

Whether a teacher prepares his own lesson plans or gets help from other sources, AAAE & VA's publications are usually quite easily adapted. Teachers participating in the study were able to use the draft copy of AAAE & VA's publication without changing its organization. In fact, most of the teachers altered their own plans in favor of the plan outlined in the publication. This gave better coverage of the information made available in the text.

Time-Saver for Teachers

The teachers reported that the use of the preliminary draft of the publication enabled them to save 17 per cent of the time they devoted to lesson planning. A 17 per cent saving in time devoted to lesson planning may seem insignificant at first; but when you consider the total number of man-hours saved, the time saved by some 10,000 vocational agriculture teachers in the nation is tremendous.

The study was made with a black-and-white preliminary draft prepared primarily for review and criticism. The final published book has the benefit of some 1,700 suggestions submitted by educators, service men, and manufacturers of small engines. It is printed in four colors for additional effectiveness.

How did the publication on small engines prepared by AAAE & VA help teachers save time? Here are some clues revealed by the study.

—Ninety-eight per cent of the teachers agreed that all principles discussed in the book were easy to understand.

—Ninety per cent of the teachers felt that the information was adequate and complete. A few thought there was more information than needed.

To produce instructional materials of this type requires a great amount of time. The cost is high. For example, the costs for research, writing, illustrating, and testing the small engine book, excluding printing costs, were approximately $60,000. Most teachers agree that the effort and expense are well justified in the time saved by both teachers and students. And more important, students are not cheated of vital knowledge and information as when teachers do not have adequate instructional materials.

BOOK REVIEWS

GERALD R. FULLER, Special Editor
University of Vermont

HANDBOOK OF AGRICULTURAL OCCUPATIONS by Norman K. Hoover, Danville, Illinois: The Interstate Printers and Publishers, 1969 (Second Edition), 385 pp. $5.95.

This second edition of the publishers' best seller in the field of agricultural education is well timed. In the six years since the first edition, much new information about agricultural occupations has become available, and teachers are better prepared to work with their students in using it. Many of the chapter headings have been reworded to conform more closely to occupational titles commonly found in state studies.

The book is more than a revision. It is 50 per cent larger, and several new features are added. This edition has over 100 illustrations, about three-fifths of which show the employee working on the job. A new chapter has been written that should aid greatly in preparing to study agricultural information. This is entitled "What You Should Know About Occupations."

Two chapters have been re-structured to stress occupations in agricultural products. Occupations in fruit and vegetable products are now combined with livestock. Separate chapters are now provided for horticulture and for forestry.

An important added feature is the 24 occupational briefs contributed by some 18 educators and/or industry representatives. These apparently were chosen because of their close association with, or experience in the occupation described in the brief.

This reference is written in the language of the student, and in many instances, is addressed to him in the second person. Most students will like to use this reference. Girls, and minority groups, may wonder about opportunities for them. Although they are in no sense ruled out in the text, no illustrations are included showing such persons employed in agricultural occupations.

The appendix has been expanded to include information primarily of value to the teacher in reconciling occupational terminology in research and teaching with DOT nomenclature. A list of institutions offering post-high school programs in agricultural occupations should be of value.

As recommended by this reviewer of the first edition, the book should be on the reference shelves of departmental libraries, school counselors and school libraries. Because of its broad scope, teachers will find this to be a valuable supplement to students' work experience and to first-hand contact by students through field studies and interviews.

Harold M. Byram
Michigan State University

SCIENCE FOR BETTER LIVING. Yearbook of the United States Department of Agriculture. Washington, D.C.: Superintendent of Documents, 1968, 386 pp. $3.00.

This yearbook will be useful to vocational educators whether a teacher in a secondary or post-high school program, teacher educator, counselor, or supervisor. While the book does not specifically describe careers in agriculture, it does open many vistas for exploration by students at all levels. In addition, the scope of areas covered by the research described in the book will reveal avenues for study many of which are frequently missed by both teachers and students in vocational education.

Some of the research covered by the book is indicated by color pictures comprising the first 28 pages. These pictures show scientific achievement in such areas as sensing devices on airplanes and space craft, measuring damage by insects and disease, biological controls for insect and plant pests, results of selective breeding of livestock, and improved packaging and processing of foods.

The table of contents is divided into five sections with a series of articles listed under each section. The major sections are Abundance for All, City and Country, Natural Resources, Growing Nations and World Trade, and For Better Living.

Raymond M. Clark
Michigan State University

CONSERVATION EDUCATION by Joan Carvajal and Martha E. Munzer. Danville, Illinois: The Interstate Printers and Publishers, Inc., 1968, 98 pp., $2.50

"A bibliography is a strange kind of publication. It never satisfies its audience; it goes out-of-date as it goes to press, and it is never as complete as one would like." Thus writes the President of the Conservation Education Association in the foreword of this booklet. This book contains the result of a survey taken between 1957 and 1966.

Starting with a category on ecology entitled the "Inter-relationship of Resources," the bibliography proceeds through the "Natural Resources," "Role of Man," "Tools for the Teacher," "Vocational Materials," and "Avocational Materials." Each major category contains logical sub-categories which assist the reader when searching a particular subject matter area.

In addition to a short annotation, the authors have suggested the group to which the particular title is most apropos. The groups used are early elementary, middle grades, high school, and teachers and group leaders. The authors suggest basic collections for the above groups with the exception of the teachers and group leaders.

This book is an excellent source listing for teachers who are working in conservation or biology. It could well be used by instructional materials specialists in states where approved bibliographies are used.

William H. Annis
University of New Hampshire

1969 Program
Agricultural Education Division, AVA

Boston, Massachusetts
December 5-10, 1969

Theme: Opening the Door to the Seventies

Wednesday, December 3 and Thursday, December 4

9:00 a.m. - 1:00 p.m. and 7:30 p.m. NVATA Executive Committee Meeting

Friday, December 5

8:00 a.m. - 12:00 noon AVA Departmental Meetings

1:00 p.m. - 4:00 p.m. Agricultural Education Policy Committee Meeting

4:00 p.m. - 6:00 p.m. AATEA Executive Committee Meeting

4:00 p.m. - 6:00 p.m. NASAE Executive Committee Meeting

7:00 p.m. - 9:00 p.m. Agricultural Education Division Standing Committee Meetings
- Standards and Policies
- Research
- Professional Information
- Publications
- Membership
- Professional Personnel Recruitment

8:00 p.m. - 10:00 p.m. AATEA Executive Committee Meeting

8:00 p.m. - 10:00 p.m. NASAE Executive Committee

Saturday, December 6

8:30 a.m. - 10:30 a.m. Agricultural Education Division Public Information Committee Meeting

9:00 a.m. - 10:30 a.m. NVATA First General Session

1:15 p.m. - 2:15 p.m. NVATA and Agricultural Education Division Special Program
Speaker: Donald McDowell, Executive Director, National FFA Foundation

2:30 p.m. - 5:00 p.m. NVATA First Regional Meeting

2:30 p.m. - 4:00 p.m. NASAE Business Meeting

2:30 p.m. - 4:00 p.m. AATEA Business Meeting

4:00 p.m. - 5:00 p.m. Joint NASAE and AATEA Meeting

6:00 p.m. NVATA State President's Dinner

Sunday, December 7

8:00 a.m. - 9:30 a.m. Harvestore Breakfast for Agricultural Education Division

1:15 p.m. - 2:30 p.m. NVATA Second General Session

2:45 p.m. - 3:45 p.m. NVATA and Agricultural Education Division Group Meetings

4:00 p.m. - 5:00 p.m. NVATA Reception for Agricultural Education Division

7:00 p.m. - 8:30 p.m. Agricultural Education Division Meeting
Symposium: Spotlight on the Northeast
Chairman: Jesse A. Taft, Program Officer, USOE, Boston

8:30 p.m. - 9:30 p.m. Agricultural Education Division Business Meeting
Chairman: Ralph E. Bender, AVA Vice President for Agricultural Education

Monday, December 8

7:00 a.m. - 8:30 a.m. State Councils of Farmer Cooperatives Breakfast for Agricultural Education Division

8:45 a.m. - 10:00 a.m. Agricultural Education Division Meeting
Topic: Research in Agricultural Education
Chairman: Richard A. Baker, Director RCU, Auburn University

9:00 a.m. - 11:30 a.m. NVATA Second Regional Meetings

10:15 a.m. - 11:30 a.m. Agricultural Education Division Meeting
Topic: Meeting Some of the Special Needs in Agricultural Education
Chairman: James C. Fink, State Supervisor, Harrisburg, Pennsylvania

6:00 p.m. NVATA Past Officers' Dinner

Tuesday, December 9

7:30 a.m. - 11:30 a.m. NVATA Breakfast and Final General Session

7:30 a.m. - 11:30 a.m. NASAE Breakfast Meeting

7:30 a.m. - 11:30 a.m. AATAE Breakfast Meeting

Wednesday, December 10

7:00 a.m. - 8:30 a.m. Agricultural Education Policy Committee Meeting

8:45 a.m. - 10:00 a.m. Agricultural Education Division Meeting
Topic: Planning and Operating a Vo-Ag Program in a Regional Center
Chairman: L. L. Turner, State Consultant, Hartford, Connecticut

10:15 a.m. - 11:45 a.m. Agricultural Education Division Meeting
Topic: What We See Ahead for Agriculture — A presentation by members of the National Advisory Committee to the Agricultural Division of the AVA
Chairman: Alexander Nunn, Retired Editor of *The Progressive Farmer*

Agricultural business students at Joliet (Illinois) Junior College examine weed seeds. (Photo by Max Kuster, Joliet Junior College)

Robert W. Walker (standing right), University of Illinois, talks with a group of students at Joliet (Illinois) Junior College about the critical need for agricultural occupations instructors.

Herbert Bruce, Jr
College of Educ.
University of Ky.
Lexington, Ky. 40506

Stori

"COMPLIMENTARY
COPY FROM THE
EDITOR"

ROBERT W. WALKER
University of Illinois

Frank W. Adams, Teacher of Agriculture at Douglas, Arizona, conducts an adult course in welding and machinery repair. (Photo by Frank W. Adams)

A portion of the approximately 200 persons who attend the annual fish fry sponsored by the East Texas State University Collegiate FFA go through the serving line. (Photo by G. R. McCarver, East Texas State University)

Paul Hemp (seated left), Chairman of the Agricultural Education Division, University of Illinois, and Lloyd Phipps (seated right), Chairman of the Vocational and Technical Education Department, visit with agricultural education students from The Ohio State University who visited the University of Illinois during an Agricultural Education Society member exchange. (Photo by Robert W. Walker)

AGRICULTURAL EDUCATION

Agricultural Education

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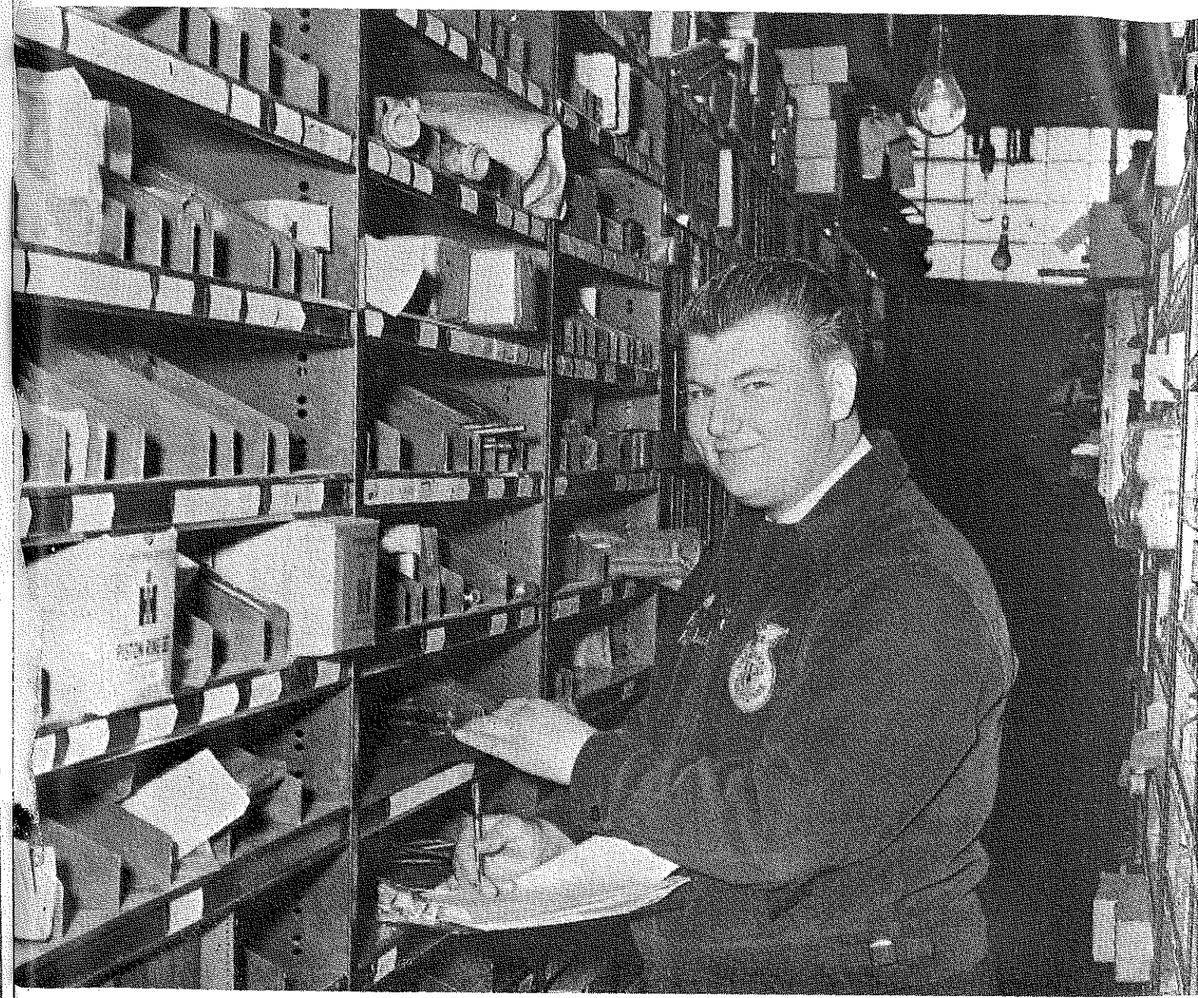

Featuring —

INSTRUCTIONAL PROGRAMS IN AGRICULTURAL SUPPLIES AND SERVICES