Agricultural Education

October, 1969

Volume 42

Number 4

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-automatic baggers for packed plants. (Photo by Walter McCurdy, Michigan State University)

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

Featuring — INSTRUCTIONAL PROGRAMS IN ORNAMENTAL HORTICULTURE
Guest Editorial...

In Tune with Reality

The time has arrived when it is essential that the public become aware of the educational programs in agriculture and how they can benefit their lives. The public should be informed about the various educational opportunities available in agriculture, as well as the importance of these programs in making agriculture more efficient and productive.

The educational programs in agriculture are essential for the development of a well-educated workforce. They provide the necessary knowledge and skills that are essential for the success of the agriculture industry. The programs also help in the preservation of the environment and the sustainable use of natural resources.

In conclusion, it is crucial that the public becomes more aware of the educational programs in agriculture and the benefits they offer. By doing so, we can ensure that the agriculture industry continues to thrive and that the nation remains self-sufficient in its food production.
In Tune with Reality
(Continued from page 83)

The Challenge for Change

We have been responsible for a changing voca-
tional-agricultural program from the first day we walked into our classrooms seven years ago. Constant change in our educational program has been brought about by many factors. I go back to the Johns and Johns in the present 20th century. Our agriculture classes must face the challenge of change that is upon us. One of the main challenges that are on the horizon is the move from traditional to modern agriculture. The old methods are being replaced with new ones. The students are being trained to work with new equipment and techniques.

Agriculture has changed, 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 education programs 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 advancements 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. It is safe to say that 10 percent 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 more than 10,000 departments of vocational agriculture across the country. For example, changes in supervised experience programs were not placed in the headings as teachers of agriculture continue to seek the needs of students through various experience programs.

Most of the changes in teaching vocational agriculture have not been as drastic as the new math but have been improvements in the instructional program brought about by reworking what is taught to conform to the times. Next year, the size of the class will be limited to five members. This is a much smaller class size than in the past. The new program will be more individualized.

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 they are doing, to continue to devise and adapt new practices in teaching vocational agriculture, to continue to support the efforts of supervisors, teacher educators, and professional educators 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.

Realistic Instruction in Ornamental Horticulture

NATHAN H. CLARK
Ornamental Horticulturist
North, Massachusetts

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

The Needs

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 needs of the community regardless of where or location.

The need at the present time is for more highly trained and skilled workers to maintain park systems, private grounds, golf courses, nurseries, 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 class time is limited, students should be expected to devote more of their own time to study if they wish to progress.

The Program

At Exum Agricultural and Techni-
cal Institute we have developed pro-
grams 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 instruc-
tional program begins with the orienta-
tional students who are about to be promoted to the ninth grade. During April, May, and June they are taught a half-day class and given the opportunity to decide whether or not they want to study horticulture. During the freshman year, several course 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 peren-
nials, deciduous shrubs, evergreen shrubs, deciduous trees, evergreen trees, plant propagation, and landscape de-
sign. During the junior year, more advanced training is given in turf man-
agement and design. The program for seniors includes studies and practices in horticulture, plant identification, and landscape design.

The job analysis method of teach-
ing is used throughout all courses. Al-
though 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-equipped glasshouse and nursery which serve as ideal laboratories for carrying out applied 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 super-
vised 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 employer during this part of the year-round program. There are also some summer projects that students develop into skilled workers. As juniors many students do bit laboratorial potentials, hence they are encouraged to as-
time responsibilities and develop such abilities as a result of their studies that are often employed as crew foremen.

Knowledge and Attitude

Along with knowledge, skills, and good work habits, there is the even-
t taller necessity for proper attitude. We use every opportunity to empha-
size this. Students are frequently re-
rinded that they must be willing to devote more time than forty hours a week to their work if they are to get anything out of it. Also they must be productive, otherwise employers can-
ot afford to hire them. If they are not successful as an employee, they certainly cannot establish a successful business of their own.

As ouragricultural work is heavy and tiring, Students need to be aware of this and be prepared to accept it.

When students have gained a knowl-
edge of horticulture, developed the abilities to perform skills, formed good work habits, and acquired a proper at-
titude, they are ready to meet the chal-
lenge of the community, further edu-
cation, or both.
A Useful Facility in Initiating Ornamental Horticulture Programs

When this article was written, Earl B. Russell was an Agricultural Occupations Instructor at New Lenox, Illinois. Currently Russell is a Ph.D. candidate in agricultural education at The Ohio State University.

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 mixing, self-contained drainage, automatic lighting, and instantly adjustable lighting. This facility works quite effectively for plant propagation from seeds, cuttings, and layering and for small-scale production of a wide variety of horticultural plants. Although

1. 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.

2. 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 frame of 2 x 2's, with a 2 x 4-inch space through the entire frame, 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. Tenpered 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 covered with a u-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.

3. 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-mill polyethylene. The polyethylene and the box-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.

4. The automatic mixing system, connected to a water line by a convos garden hose, consists of a standard, 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, counter-balanced screen on the control which stimulates the surface of a plant leaf.

5. When propagating, when a uniformly high humidity is required, the mixing outlets 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.

6. Bill of Materials

<table>
<thead>
<tr>
<th>Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.</td>
<td>4x4x3/8&quot; (legs)</td>
</tr>
<tr>
<td>4.</td>
<td>2x12x14&quot; (floor)</td>
</tr>
<tr>
<td>1.</td>
<td>2x8x12&quot; (furring)</td>
</tr>
<tr>
<td>6.</td>
<td>2x4x14&quot; (framing and bracing)</td>
</tr>
<tr>
<td>2.</td>
<td>2x4x14&quot; (framing)</td>
</tr>
<tr>
<td>1.</td>
<td>1x8x14&quot; (box siding)</td>
</tr>
<tr>
<td>1.</td>
<td>1x5x10&quot; (box siding)</td>
</tr>
<tr>
<td>1.</td>
<td>1x4x14&quot; (door frame and fascia)</td>
</tr>
<tr>
<td>4.</td>
<td>4x6&quot; sheets tempered unfinish (floor)</td>
</tr>
<tr>
<td>64 ft.</td>
<td>6 ft. mullion (to secure polystyrene)</td>
</tr>
</tbody>
</table>

7. Hardware

<table>
<thead>
<tr>
<th>Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 pc.</td>
<td>6x12x3/4&quot; quarter-inch hardware cloth</td>
</tr>
<tr>
<td>1 pc.</td>
<td>6x12x3/4&quot; screw-on bolt Life-Line, Illinois</td>
</tr>
<tr>
<td>24 ft.</td>
<td>1/2&quot; x 1/2&quot; x 1/2&quot; x 1/2&quot; water pipe (schedule 40)</td>
</tr>
<tr>
<td>25 ft.</td>
<td>1/2&quot; copper greenhouse sprinkler nozzles</td>
</tr>
<tr>
<td>4.</td>
<td>1/2&quot; copper fixture units, rapid start</td>
</tr>
<tr>
<td>2.</td>
<td>2&quot; two lamp reflector units, rapid start</td>
</tr>
<tr>
<td>1.</td>
<td>1/2&quot; inch G-40 Lux lamp, rapid start</td>
</tr>
<tr>
<td>1.</td>
<td>1/2&quot; inch G-40 Lux lamp, rapid start</td>
</tr>
<tr>
<td>42 ft.</td>
<td>5/4&quot; angle iron (for light supports)</td>
</tr>
<tr>
<td>4.</td>
<td>3/4&quot; x 30&quot; threaded rod (through light frames to prevent sway)</td>
</tr>
<tr>
<td>70 ft.</td>
<td>1/8&quot; stove pipe (light supports)</td>
</tr>
<tr>
<td>12.</td>
<td>1/8&quot; cable clamps</td>
</tr>
<tr>
<td>12.</td>
<td>1/4&quot; single toggle pulleys</td>
</tr>
<tr>
<td>12.</td>
<td>1/4&quot; double toggle pulleys</td>
</tr>
<tr>
<td>12.</td>
<td>1/4&quot; double toggle pulleys</td>
</tr>
<tr>
<td>9/32&quot;</td>
<td>1/4&quot; eye bolts</td>
</tr>
<tr>
<td>12.</td>
<td>corn hole hooking or suspending wire (regular weight for lights)</td>
</tr>
<tr>
<td>12.</td>
<td>1/4&quot; cement hooks (for doors)</td>
</tr>
<tr>
<td>2.</td>
<td>2&quot; Loc-Lock</td>
</tr>
<tr>
<td>12.</td>
<td>1/4&quot; turn buttons</td>
</tr>
<tr>
<td>5.</td>
<td>1&quot; door knobs</td>
</tr>
<tr>
<td>4.</td>
<td>1&quot; rubber track casters</td>
</tr>
</tbody>
</table>

8. 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 mixing system, the table could be built for approximately $280.

9. 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. Immersible combinations of rooting media, lighting, fertilizing, and watering practices could be set up easily for student experimentation.

10. 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 lightening can be used for experimentation. We find the growth table an excellent facility for initiating an ornamental horticulture program.
AGRICULTURAL EDUCATION IN SIERRA LEONE, AFRICA

KEITH E. FIOCU, Teacher Education Washington State University

Agricultural education in Sierra Leone, West Africa, began in 1961 with the establishment of the University of Sierra Leone at Freetown. The university was patterned after the philosophy and principles of the Land-Grant universities of the United States. The basic conditions—social, agricultural, economic, and natural—are quite similar to those of the United States; however, the need for a Land-Grant institution is great in Sierra Leone as it was in the United States in 1862.

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 Ohio and is slightly larger than the state of Kansas. The climate is equatorial, with an average temperature of 26° C (78° F). The annual rainfall is about 120 inches, with most of it occurring in the summer months.

THE CHALLENGE

The greatest economic problem in Sierra Leone is the inability of the agricultural educator to produce ample food, clothing, and shelter. Although approximately 88 per cent of the adult population is farming, there is insufficient agricultural production to meet the needs of the country. The abundant rainfall, which is more than 65 inches in a three-month period, washes the latitic 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 diseases.

There are many complexities to the problems of agricultural education. The farms produce at subsistence levels. Their farms are small, averaging approximately one- to 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 commonplace. The mortality rate is especially high in children between the ages of two and five. 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 in the "new" kind of schooling that is being developed at Njau University. They will aid in the task of greater agricultural production.

THE PROGRAM

Prior to 1965, there were very few attempts at teaching vocational agriculture. Keith E. Fioe, who was appointed as an agricultural education specialist in 1965, has been instrumental in bringing about a new approach to agricultural education in Sierra Leone.

The primary objectives of the Agricultural Education Department of Njau University have been to: (1) increase the number of secondary school students who wish to continue with agricultural education; (2) increase the number of graduates in agricultural education; (3) improve the effectiveness of agricultural education; and (4) improve the agricultural education program at Njau University.

The primary objective of the Agricultural Education Department of Njau University was established in 1965 to meet the needs of the Ministry of Education and to assist the Ministry of Education in the establishment of vocational training schools at farms schools and secondary schools, to prepare teachers of agriculture for the vocational training schools and secondary schools, and to conduct research necessary for curricular 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 a five-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.

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 a pre-vocational training center. Students were trained to be farmers. They were taught how to maximize agricultural production. The teaching of profitable farming was planned as the most effective way to inculcate social status and responsibility for agricultural pursuits.

The pilot center for the study of agricultural education in secondary schools and rural communities was established in cooperation with a nearby secondary school on November 1965. The objectives of the pilot center were to study 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 agriculture in a secondary school that will serve as a demonstration for the community, to provide the opportunity for secondary school and agricultural 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 a location 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. Adaptable 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 and to the Ministry of Education. The students learned more rapidly when teachers "showed" them how to perform agricultural skills. The Ministry of Education "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 farm was made possible. The students learned the application of individual data was more readily accomplished when the concepts and principles also were applied in observation 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 to use the tradi-
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 sixes 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 beam and half garden shredder. The group also added suitable soil practices and today this plot is alive with the colors of geranium, marigold, salvia, nasturtium, and aster grown as bedding plants in the greenhouse by the special education students.

Proper Attitudes

Certain qualities of the 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 sense 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 gifts that they have had a part in growing or when they present a gift of tomato plants to a teacher who had done a special job for one of their physically handicapped classmates.

In 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—realizations that without a proper vantage point, what has been taken several months to do can be undone in a split second. Most of the boys and girls are able, after much coaxing 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 habits.

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 in grasping a concept or acquiring 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 skill 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 in a voluntary basis to special education students since the first year of the program.

Employment Opportunities in Agricultural Occupations for the Physically Handicapped

LITTLE INFORMATION IS AVAILABLE ON 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 the physically disabled persons to perform agricultural and agribusiness activities.

The Study

The study described in this article was concerned with paraplegics at the University of Illinois who were occupationally nonambulant (individuals who for all practical purposes are bound to wheelchairs regardless of cause or manifestation of disability). The primary purpose of the study was 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 horticultural activities. 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 were watering pot plants with a hose, transporting pot plants and fertilizer bags from the ground level, transplanting plants, and arranging garden supplies or 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 possess a realistic evaluation of their physical abilities 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 ornamental horticulture.

Irvem 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 1963.

(Continued on page 93)
Unique Facilities

Outdoor Laboratories for Teaching Horticulture

Joseph F. Roush
Agribusiness and Technical College
Farmington, New York

The purpose of the ornamental horticulture curriculum at State University College of Agriculture and Technical College, Farmington, 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 architecture, greenhouse management, and turfgrass management. Although the curriculum is not planned for teacher preparation, a significant number of graduates enroll in four-year colleges for further study in landscape architecture, ornamental horticulture, agronomy, conservation, and other related areas.

A length 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, turfgrasses, trees and shrubs. They propagate and grow plant material to maturity. They also care for plant materials in greenhouses, plant nurseries, arboretums, and gardens.

Outdoor Facilities

The Department of Ornamental Horticulture at Farmington has the best developed outdoor facilities for teaching horticulture in the eastern United States. The gardens hold international reputation with 2,000 or more persons visiting the ornamental gardens each year to revel in the beautiful surroundings or to study the unique gardens that have many horticultural and botanical interests. These facilities are necessary to train students in the 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 are musical plants, including cacti, that 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 for flower shows, and another to carnations. The other houses are devoted to a variety of cut flowers and pot plants for study and propagation in greenhouse management. The growing plants also supply the materials used in flower arranging courses.

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, baling, and burlapping of plants for landscape planting on campuses 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.

Arboretum and Plantation

Two sections of arborvitae and two sections of piney woods covering five acres of land are devoted to the study of woody plant materials. Deciduous trees and shrubs are arranged in a systematic manner to provide teaching and study areas for learning woody plant materials in the arborvitae. The same experience is duplicated in the piney woods where evergreens, both broadleaf and needle leaved 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, tying, disease control and nutrition in laboratory exercises.

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 200 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 garden planning design. Within the garden areas there is a test garden for All-American flower selection and for the All-American Rose Selection. In these test gardens new material is received each year, planted by students as part of course activities, and observed and studied by students. Evaluation by a national judge, a faculty member, are submitted to the testing organization. The All-American 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 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 notreplaceable. Unlike most curriculums, the outdoor laboratories are composed of living materials which constantly need fertilizing, irrigating, 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.

Employment Opportunities in Agricultural Occupations for the Physically Handicapped

(Continued from page 51)

ornamental horticulture. Based on the data obtained in the study and a perusal of the job descriptions for certain horticultural positions, 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 physically handicapped persons. The programs and facilities recommended were agricultural laboratories for physically handicapped persons with agricultural backgrounds who use agricultural knowledge 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. Laboratory work concerning how agricultural educators might proceed in the development of educational programs for paraplegics and other physically disabled individuals. Considerable attention should be given to the physical handicapped students who, because of their handicapping condition, cannot succeed in the programs for physically handicapped persons who wish to attend a program without special educational assistance or who require a modified or reduced curriculum. The Vocational Education Amendments of 1968 place special emphasis on program development for these persons.

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OCTOBER, 1967

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

DAVID C. SWANSTON
Peace Corps
Washington, D.C.

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 1969, 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. University 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 Malouin, 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 greater." 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.

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 at teacher's salaries.
- 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 who are trained to teach agriculture classes in high schools, work in agricultural training centers and help train extension agents.

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 became fuzzy.

Teaching Agriculture

In Ecuador, for example, a group of Volunteers conduct experiments and demonstrations in the Santo Domingo Animal Reproduction Center. Using a herd of forty Bessman and Santa Gertrudis cattle, the five Peace Corps Volunteers are demonstrating how new livestock and modern techniques can spell success for Ecuadorian farmers. "This is an education process," Volunteer Fred Wellar explains. "We can't — don't — expect overnight success. But somewhere between oversight 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." Wellar 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 by example.

By contrast, Joe Lovelady, a Volunteer agriculture teacher in the Philippines, is 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 Strive Rice Training Center near Manila. He limits his agriculture teaching to the rice production class. He teaches on planting and tending the rice and conducts demonstrations in a small paddle in a corner of the classroom.

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 and about 500 extension workers.

Erik Soeren, 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," Soeren 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 Franksel, 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
Luray, Virginia

Planning is a necessity. The busy housewife sets up a schedule for the week; the businessman organizes his work at the office; parents plan the education of their children; the contractor follows a detailed blueprint in building a house; the former dairy farmer writes out 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 inexperience 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 more likely to further the achievements 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 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 individualize and 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 I devote 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 important for two reasons: to make supervision more effective and to facilitate the work of substitute teachers. Because supervisors can only be made periodically, written plans provide a record of the continuity of learning experience 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 learning 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, new methods in teaching, and an increasing volume of instructional materials have compounded the complexity of planning for instruction.

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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 from professional association directors, purchased 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.

EDWARD S. EVAIL, JR.
Teacher of Agriculture
Colombus, New Jersey

GRASSES

M. M. Pennsylvania Bluegrass
Common Kentucky Bluegrass
Pennsylvanian Red Fescue
Cultivated Rye
Cultivated Rye
Grass
Kentucky 31, Tall Fescue
Annual Rye Grass
Chewings Fescue
Poisonous Botrytis
Collegiate Bluegrass
Hispanic Colonial Bluegrass
Redtop

WEEDS

Knotweed
Rye Grass
Culinary
Creeping Redtop
Witch Grass
Vegetable Oats
Bush Rye
Bermuda Grass
Grass Panicum
Saw Grass
Sandy Turf
Orchard
Bermuda Grass
Bermuda Grass

FLOWERING PLANTS

Violets
Lilies
Chrysanthemum
Camellias
Roses
Snapdragons
Gladiolus
Petunias
Arabis
Lilies
Lilacs
Hydrangeas
Dahlia
Bulbs
Trumpet
Tulips

Cut
Flowers

BEDDING PLANTS

Petunias
Marigolds
Zinnias
Canary
Nasturtiums
Salads
Snapdragons
Ageratum
Impatiens
Pansies
Alyssum
Aster
Dahlias
Potatoes
Lilies
Lilacs
Sorrel
Daisies
Tulips
Lilies
Daisies
Dahlias
Bulbs
Tulips
Dahlias

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Expanding Vocational Agriculture Through Area Schools

ROBERT D. MUGZI, Superintendent
Pennsylvania Department of Public Instruction
Scranton, Pennsylvania

Vocational education in Pennsylvania has realized the need for expanded and comprehensive vocational programs in vocational education. Many small school districts have tried to establish and expand vocational offerings but have been thwarted by the inability to provide the flexibility and diversification required by the needs of the vocational students. The Vocational Education Act of 1963 made such a possibility possible through provisions for the establishment of 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 is satisfactory and adequate.

Advantages and Disadvantages

The impetus of the area school requirement in Pennsylvania is expected to have a notable effect upon vocational education. School administrators are concerned about the role of vocational programs in the community high school. Many are of the opinion that all vocational programs belong in the area school and that advocates of 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, all programs can 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 in 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 as 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 special technical course at the area school.

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

Material Plants for Teaching Ornamental Horticulture

Snake Plant
Palm
Wandering Jew
Prazer Plant
Canna
Devil's Ivy
Shrimp Plant

ferredosa

Landscape Design

Dogwood
Park
Magnolia
Methi
Beech
Rhubarb
Honeysuckle
Centipede
Mountain Laurel
Golden Chain Tree
Willow
Rose of Sharon
Ginko
Buckeye
Barberry
Shrubby Plant
Saracenia
Thorn Apple
Butterfly Weed
Sage

FOLIAGE PLANTS

Philadelphia
Cotton
Albany
Sugar
Broom
Crepe
Silver Plant
Diascia
Euphorbia
Pleomele
Japanese Barberry
Wisteria

A horticulturist teaches an area school garden on a practical basis.

Plants for Teaching Ornamental Horticulture

Continued from page 97

Black NEVER
Flowering Almond
Benzoin
GROUND COVERS AND VINES

Myrtle
Pachysandra
Bispeever
Bouquet
English Ivy

TREES

Dogwood
Apple Maple
White Pine
Pecan
Red Oak
Red Maple
American Holly
Garden Honeysuckle
Sweet Gum
Eastern Oak
Kawan
Japanese Cherry
Witchhazel
Riccarton
Colorado Blue Spruce
Japanese Maple
Little Leaf Linden
Balmoral
Norway Spruce
Australian Pine
Carolina Crabapple
Honey Locust
Parkman Crabapple
Prairie Birch
Hope Red Flowering Crabapple
Norway Maple
Eastern Redbud
Ginkgo

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 general needs of students 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 central purpose of vocational education is to fit persons for gainful employment.

OCTOBER, 1969

THE AGRICULTURAL EDUCATION MAGAZINE
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 all are treated alike; our interests must be your kind of agriculture or they aren't 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 realistic, 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's interests which 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, 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 ensure 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. The way we do this is by 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.

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.

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 and carefully, 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 a basis for sound planning.
-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 contest reports).

Using Records Effectively

Students in agriculture should be interested in knowing what records tell them about their programs. Correct interpretation 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 brings the case, the teacher must also assume the responsibility of teaching a student how to use the records he keeps.

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

THE AGRICULTURAL EDUCATION MAGAZINE

OCTOBER, 1969

HARVEY BRUCE, Jr., Teacher Education
University of Kentucky

One basic reason for keeping records with a supervised occupational experience program is to learn how to keep records and how to use them.

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One logical basis for course building is records kept by students.
Youth Organizations Aid in Teaching

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.
— Experiences in many areas of leadership.
— Closer cooperation between the 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 agriculture education should accept the responsibility to see to it that the FFA is an intracurricular activity. Among other objectives, a definite part of the vocational agriculture curriculum should include participating in public meetings, speaking in public, hearing and selling cooperative, 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. Person working with youth organizations should use the awards given by foundations and other agencies to stimulate interest in the courses taught. States should devise a program that encourages teachers to use the awards programs 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 as 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 dropout problem we have today.

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An Instructional Program in Ornamental Horticulture

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

The ornamental horticulture program at West Rowan High School (Cleveland, North Carolina) has been in operation for four years. Each year we improve the curriculum and the quality of training offered students. The curriculum is designed to meet the vocational and academic 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 pesticides 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 in landscape 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 gardens 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.

Facilities

Students enrolled in ornamental horticulture built a 20' x 40' greenhouse and equipment storage shed. We lease a tractor with lift, mower, plow, tree spade, 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 20' by 20' mint propagation bed inside one greenhouse with an automatic time clock. From 2,000 to 5,000 cuttings are made each year with very good viability.

Instructional Materials — A Time-Saver for Teachers

HOWARD TURNER
University of Georgia

Instructional materials can be a great aid in simplifying 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 well spent. This is illustrated in the preparation of a new book, "Small Engine Care, Operation, Maintenance and Repair." A group of vocational agriculture teachers in Georgia, South Carolina, and Oklahoma were asked to test the preliminary drafts 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. Contra 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 himself.

Whether a teacher prepares his own lesson plans or gets help from other sources, AAEE & VA publications are usually quite easily adapted. Teachers participating in the study were able to find the draft copy of AAEE & VA publications without changing the 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 appear insignificant at first; but when you consider the total number of students in our schools, 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 distributed in four colors for additional effectiveness.

How did the publication on small engines prepared by AAEE & 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 costs are 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 chased of vital knowledge and information as when teachers do not have adequate instructional materials.
**BOOK REVIEWS**

GERALD R. FULLER, Special Editor

University of Vermont


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 restructured to stress occupations in agricultural products. Occupations in fruit and vegetable production 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 individual 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. Centuries and minority groups, may wonder about occupational possibilities 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 reconceiving 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, this 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 experiences and to first-hand contact by students through field studies and interviews.

Harald M. Boven

Michigan State University


This yearbook will be useful to vocational educators whether a teacher is 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 renew enthusiasm for study of 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 seeking devices on airplaine and space craft, improving breeding of livestock, and 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 Absurdities for All, City and Country, Nature's Resources, Growing Nations and World Trade, and For Better Living.

Bernald M. Boven

Michigan State University


"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 complete as one would like." Thus writes the President of the Conservation Education Association in the foreword of this booklet. This book contains the results of a survey taken between 1957 and 1966. Starting with a category on ecology entitled the "Interrelationship of Resources," the bibliography proceeds through the "Natural Resources," "Role of Man," "Tools for the Teacher," "Agricultural Materials," and "Agricultural Materials." Each major category contains logical sub-categories which assist the reader when searching for a particular subject matter area.

In addition to a short annotation, the authors have suggested the group to which the particular title is most appropriate. 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 leaders of environmental specialties in status where approved bibliographies are used.

William H. Anis

University of New Hampshire

AGRICULTURAL EDUCATION DIVISION, AYA

Boston, Massachusetts

December 5-10, 1969

Theme: Opening the Door to the Seventies

Wednesday, December 3 and Thursday, December 4
7:00 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
4:30 p.m. - 6:00 p.m. ATEA Executive Committee Meeting
7:00 p.m. - 9:00 p.m. NVATA Executive Committee Meeting

Sunday, December 6
8:30 a.m.-10:30 a.m. NVATA Executive 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
3:00 p.m. - 4:30 p.m. NVATA Business Meeting
2:00 p.m. - 5:00 p.m. Joint NASAE and ATEA Meetings
6:00 p.m. - 7:00 p.m. NVATA State President's Dinner

Monday, December 7
8:00 a.m. - 9:30 a.m. Harvester 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
5:00 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: Jean A. Aerts, Program Officer, USOE, Boston

Agricultural Education Division Business Meeting

Chairman: Ralph E. Beres, AYA, Vice President for Agricultural Education

8:30 p.m. - 9:30 p.m. Saturday, December 8

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 RCA, Auburn University

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

10:15 a.m. - 11:30 a.m. NVATA Educational Division Meeting

Topic: Meeting Some of the Special Needs in Agricultural Education

Chairman: James C. Finn, State Supervisor, Harrisburg, Pennsylvania

NVATA Past Officers' Dinner

9:00 a.m. - 11:30 a.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

NVATA Business Meeting

Joint NASAE and ATEA Meetings

NVATA State President's Dinner

10:15 a.m. - 11:45 a.m. LVATA Educational Division Meeting

Topic: What We See Ahead for Agriculture — A presentation by members of the National Advisory Committee to the Agricultural Education Division

Chairman: Alexander Nuit, Retired Editor of The Progressive Farmer

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OCTOBER, 1969
Agricultural business students at Joliet (Illinois) Junior College examine seed samples. (Photo by Mark 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 associations involvement.

"EDITOR"

"COPY FROM THE COMPLIMENTARY"

KIRK W. WALKER
University of Illinois

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

Paul Hemp (seated left), Chairman of the Agricultural Education Division, University of Illinois, and Lloyd A. Hope (standing 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)

Featuring —

INSTRUCTIONAL PROGRAMS IN AGRICULTURAL SUPPLIES AND SERVICES