Stories in Pictures

ROBERT W. WALKER
University of Illinois

Richard Waldron, Teacher of Agriculture, Eaton, Colorado, efficiently organizes materials for agricultural mechanics. Project plans, class-time charts, and measurements are taped on these hinged panels. (Photo by Paul J. Foster)

Vocational Agriculture teachers from Indiana and Cambria counties (Pennsylvania) attend a two-day diesel clinic conducted by personnel from the Tractor and Implement Division of Ford Motor Company. (Photo by Weisbein, Indiana Evening Gazette)

Featuring —
INSTRUCTIONAL PROGRAMS IN AGRICULTURAL MECHANICS
The project has been used widely but abused frequently as a teaching device. It is more successful when taught as a part of a programme for keeping students busy than as a device for effective teaching and learning. Are the type, number, and complexity of agricultural mechanics projects determined in a number of cases primarily by what projects students have the means or inclinations to provide? The nature and extent of project and laboratory work should be determined primarily by the objectives and nature of the instructional program rather than by what students can be persuaded to provide for shop work.

How effective as a teaching device is the project in agricultural mechanics when it is accompanied by little if any instruction and supervision? When students' projects are not acceptable as a basis of instruction and supervision, the activity is described more appropriately as shop work than as project or laboratory work. Projects, almost by definition, emphasize the development of skills. Yet too often the development of concomitant understanding is overlooked or, in some cases, ignored. If we are not careful...
The cover picture:
Mike Donnelly, vocational agriculture student at Vergennes, Vermont, receives instruction as the operation of a cornharvester is being demonstrated. The information being provided by William Scott, vocational agriculture teacher, during a supervisory visit to Mike's home demonstrates the value of the Frost Farm Sales & Service, Ferrisburg, Vermont. (Photog by G. R. Fuller, University of Vermont)

From the Editor...

ful, we find ourselves inappropriately separating theory and practice in agricultural mechanics instruction. We teach the former in the classroom then go to the laboratory for the latter, frequently neglecting to relate the two. Somehow we've come to use the practical (project) as a means of developing and clarifying the concepts already taught (linear teaching system). We expect students to grasp? When project activity in agricultural mechanics is determined primarily by what students make available, a very productive approach toward a curriculum for many students. It is not too difficult to argue that the subject matter of agricultural machinery must disappear because it is not a natural prototype for the school curriculum. It emphasizes power, machinery, electricity, and related areas for which it is difficult if not impossible for students to provide projects.

How do we revitalize the project as an effective teaching device in modern instructional programs in agricultural machinery? Perhaps the place to begin is to delete from our vocabulary terms like farm shop and agricultural shop as labels of facilities for laboratory instruction in agricultural machinery. Also, we delete the facilities as agricultural machinery laboratories. There is a chance we will be more inclined to use the facilities for meaningful project activity. But regardless of the term used to describe laboratory facilities, it is essential that schools assume full responsibility for providing adequate laboratory facilities and appropriate laboratory space and project experiences that are part and parcel of the instructional program. Project activity and laboratory instruction in agricultural mechanics should be a way be limited by students' inability or lack of desire to provide projects of the appropriate type, variety, and complexity. Project activity in agricultural mechanics must begin with a well-planned, up-to-date curriculum. Today and in the future these curricula will emphasize areas of instruction in agricultural mechanics for which it is impossible for students to provide well-suited projects. And of great importance is the requirement that project activity become, both in concept and practice, laboratory instruction contributed directly and effectively to the teaching-learning process. When used properly, projects in agricultural mechanics are a means of effective teaching, not an end in itself.

JRW

Guest Editorial...

recognized as equivalent to other professional training. Agricultural education departments and agricultural engineering departments must realize that both have some responsibility for training the type of teacher desired or we will soon lose control of the teacher education in agricultural machinery. Many teachers see teaching agricultural machinery as having only industrial backbones and little or no formal education beyond high school. These men are deeper, more frequently attending extension classes, enrolling in correspondence courses, and going to summer school trying to improve professionally.

I believe the time has come for us to follow the example we have used in student teaching and plan our teachers of machines in industry for extended periods of time for which they would receive credit, possibly at the master's level, for the internship-type training. To become adequately prepared in this manner may require as much time and effort as is required for meeting the requirements of a doctoral program. And it should be justified as rewarding as though the student has pursued and achieved a higher degree in an educational institution.

Still, the real problem that must be resolved in our thinking is, "when is a person well-educated?"

HAZARDOUS OCCUPATION ORDER

When the Secretary of Labor's agricultural hazardous-occupations order became effective in January 1969, it kept many youth from jobs which they had previously performed and caused concern to a number of farm operators who had traditionally hired youth. Approximately 294,000 vocational agricultural students are in the 14 to 16 years age group to which the agricultural hazardous-occupations order applies.

Exemptions Approved

These problems were brought to the attention of the U.S. Office of Education during the summer of 1968. Problems resulting from the hazardous-occupations order were discussed at national, regional, and state meetings during the fall and early winter of 1968. Since the original order provided for requesting special exemptions, it was decided that the Division of Vocational and Technical Education, U.S. Office of Education, would request an exception from certain parts of the agricultural hazardous-occupations order. The exemption proposal was submitted to the Secretary of Labor. The proposal was approved by the Secretary of Labor.

Two programs were then developed to carry out the specifications of the order. Each program is designed to meet the requirements of the order.

Program 1 - The vocational agriculture teacher signs exemption certificates for youth 14- and 15-year-old vocational agricultural students who meet specified requirements to operate farm machinery. Accordingly, we assisted in developing two training programs — Vocational Agriculture Training Program which has two separate Tractor Operation and Vocational Agricultural Training Program in Safe Machinery Operation — which were submitted to the Department of Labor with the request for exemptions for the agricultural hazardous-occupations order.

Program 2 - Interested agricultural educators approached the Secretary of Labor's Office for Protection, Education, and Training Programs in Safe Farm Operation to develop a program to train youth for safe farm machinery operations. The program was submitted to the Department of Labor with the request for exemptions for the agricultural hazardous-occupations order.

The training programs in safe tractor and farm machinery operations were prepared and published by the Rural Manpower Center at Michigan State University. A copy of the accompanying article is available at the Michigan State University library. Copies were distributed to teachers of agriculture through state representatives.

The vocational agriculture training programs include two specific programs — one for safe tractor operation and one for safe farm machinery operation. We attempted to incorporate flexibility into the programs so they would be usable in the various regions of the country. No attempt is made to tell the teacher how to teach tractor and farm machinery safety, rather, when instruction should be provided. Many of the items are in terms of suggestions.

However, there are certain requirements that must be met before a student is eligible to receive an exemption certificate. The requirements are as follows:

1. The student must be at least 14 years of age.
2. The student must be enrolled in a school whose program of instruction meets the minimum on a weekly basis.
3. The student must be enrolled in a program that meets the minimum weekly instruction requirements.
4. The student must be enrolled in a program that meets the minimum weekly instruction requirements.
5. The student must be enrolled in a program that meets the minimum weekly instruction requirements.
6. The student must be enrolled in a program that meets the minimum weekly instruction requirements.
7. The student must be enrolled in a program that meets the minimum weekly instruction requirements.
8. The student must be enrolled in a program that meets the minimum weekly instruction requirements.
9. The student must be enrolled in a program that meets the minimum weekly instruction requirements.
10. The student must be enrolled in a program that meets the minimum weekly instruction requirements.

The program on safe tractor operation requires a minimum of 15 hours of instruction. Twenty-five percent of the time should be devoted to instruction and operation of farm machinery. Students successfully completing the safe farm machinery course must have supervised operating experience and pass both a written and practical skills test. A student must complete successfully the safe tractor operation course before he is eligible to take the safe farm machinery operation training programs.

The farm machinery operation course requires a minimum of 10 hours of instruction. Fifteen hours would be more desirable. The particular types of equipment on which instruction is given will be decided by the local teacher. Students successfully completing the course must have supervised operating experience and pass both a written and practical skills test. (Continued on next page)
BOOK REVIEW


This book sets forth basic concepts of welding in a very readable and well illus-trated format. There has been a real attempt to clarify the various welding processes and identify applications for each in terms that persons other than those in the welding profession can comprehend. For those needing a good reference on selected aspects of welding, the book contains chapters on Gas Welding, Shielded Metal-Arc Welding, Gas Tungsten-Arc Welding, Gas Metal-Arc Welding, Resistance Welding, Special Welding Processes, Metallurgy of Welding, Weldability of Metals, Brazing and Soldering, Surfacing, Flame and Arc Cutting, Strength of Materials, Design of Weldments, Test-ing Welds, Production, Economy and Cost Estimating, Safety in Welding, and Welding Symbols. The authors are members of the Department of Engi-neering and Technology, Western Michigan University.

This complete and well-written book should be available to all students who require an interest in welding. The book could be used as a text in comprehensive high schools, vocational-technical schools, and technical school and technical classes.

Edwin J. Love
University of Arkansas

THE AGRICULTURAL EDUCATION MAGAZINE

September, 1969

COMPETENCIES IN FARM POWER

NEEDED BY TEACHERS

Robert Johnson

Marlyn Wacholz

Robert Johnson, Vocational Agriculture Teacher
Long Prairie, Minnesota

Marlyn Wacholz, Vocational Agriculture Teacher
Marlboro, Nebraska

Mechanization of American farms has increased at an unprecedented rate in recent years. With mechanization has come new responsibilities for vocational agriculture teachers in selecting understand-ings and abilities which should be taught in agricultural mechanics. Accomp-panying these new responsibilities is a higher degree of competence in agricultural mechanics needed by teachers.

A group of specialists including teacher educators in agriculture, state super-visors of agricultural education, teacher educators in mechanical agriculture, and agricultural engineers were asked to indicate the degree of competence in farm power needed by vocational agri-cultural teachers. In addition, vocational agriculture teachers in Minnesota were asked to indicate the degree of competence in farm power that they possessed and to specify where (at home, in high school, in college, in-service education, or self-taught) they had acquired competence in farm power. The competencies studied were grouped into the following categories: engine preventive maintenance, engine performance test-ing, and engine repair.

Degree of Competence

The list accompanying the article indicates the specific competencies to which specialists and teachers respond- ed. The level of competence needed or possessed is reported in mean ratings ranging from 0 (no competence) to 4 (high degree of competence).

In all cases specialists indicated a higher degree of competence needed than the degree of competence teachers reported they possessed. Many specialists and teachers needed to place greater importance on competencies pertaining to service and minor repair and less importance to competencies relating to major repair. For example, contrast the ratings indicated for in-stalling and adjusting spark plugs with the ratings given complete tractor en-gine overhaul.

How Competence is Attained

Teachers were given six categories from which to select indicating the ma-jor means used for developing competence in farm power. The categories were home, high school, college, in-service education, self-taught, and other. College was indicated as the major source for the development of children of the thirty-four abilities studied. Self-taught was the major source for the development of seventeen or thirty-one abilities and was listed as one of the three first choices for all abilities. This finding may be partial-

(Continued on page 81)
VIDEO TAPE: An Aid in Teacher Education

THOMAS A. HORNER
Iowa State University

Numerous studies have been conducted evaluating the effectiveness of video tape for instructional purposes. At present two experimental studies are underway at Iowa State University evaluating the effectiveness of video tape in teaching agricultural mechanics. A number of advantages of using video tape in agricultural mechanics can be pointed out based upon these and other studies.

Video tape allows for flexibility in instruction. Other visuals such as the overhead projector, models, charts, and the chalkboard can be used in conjunction with video tape. There is an ease of viewing materials by getting close-ups on small, hard-to-see items easily seen by the total class. Individual and information that cannot ordinarily be brought into the classroom easily becomes a part of classroom instruction through the use of video tape. Video tape adds variety to the instructional program promoting interest and motivation increasing student learning.

A point made by a number of researchers is that video tape is probably best used as a supplement to classroom instruction rather than the only means of presenting subject matter. Any visual or teaching aid can be used over and its effectiveness can be greatly decreased through improper use.

Video Tape in Teacher Education

Another possible use for video tape is that of teacher education and teacher self-evaluation. During 1969 twelve instructors in the Agricultural Engineering Department at Iowa State University used video-tape for self-evaluation. Each instructor presented a hour lecture in the classroom which was recorded on video tape. Following the lecture the instructors viewed the tape as many times as they wished noting under desirable as well as desirable characteristics of their presentation.

Using video tape for instructor self-evaluation brought to mind the possibility of its use for teacher education in agricultural mechanics. Beginning with the fall quarter in 1969, each student in our course on Methods of Teaching Agricultural Mechanics presented a 15-minute demonstration which was recorded on video tape. During the quarter each student presented two 15-minute demonstrations and a one-hour lesson. Video tape was used on the second short demonstration to give the students a chance to present one demonstration prior to the taped exercise.

Steps to Follow

I believe there are three basic steps to follow in using video tape for teacher education in agricultural mechanics.

1. Prior to the actual demonstration the student should be checked out by the instructor on the demonstration making sure that the student has all the needed and that he can perform the skills he plans to demonstrate in the class. At this time the student also becomes familiar with the video tape equipment. As future vocational agriculture teachers they should learn how the video tape equipment is used in their high schools.

2. The second phase involves the student actually teaching the class. As shown in the photograph the student presents the 15-minute demonstration while the members of the class observe and evaluate his presentation. The demonstration is recorded on video tape. A camera operator is important. He uses the zoom lens to move in on small objects as well as the student as he moves in front of the class. Other visual aids such as the overhead projector, chalkboard, charts, and the demonstration equipment are used during the presentation. These visual aids are quite easy to see on tape and add greatly to the total effectiveness of the demonstration.

3. The third phase involves the evaluation of the demonstration. The student and instructor observe and evaluate the 15-minute presentation noting strong and weak points of the demonstration. The instructor completes an evaluation form on each student assigning a grade to each presentation. After the student and instructor evaluation the student may view the tape as many times as he desires. An instructional media center on campus makes facilities available for the student to view the tape at his leisure.

Some Possibilities

This program has been well accepted by the agricultural education students involved in the course. I believe it is good for the student to take a look at himself. There are many characteristics that can be noted such as how he writes on the chalkboard, how he holds his demonstration, how he moves in front of the class, and his eye contact with the class. The video tape serves as a memory mirror in that the student can take a look at himself over and over by reviewing the tape.

In any judgment a main purpose of our educational program is to aid the student in developing a self image. Self-evaluation is the key point of this exercise. I find certain there is a definite carry-over for the student when he teaches the class for one hour later in the quarter, when he does student teaching, and when he actually takes a position as a vocational agriculture teacher.

COMPETENCIES IN FARM POWER

NEEDED BY TEACHERS

(Continued from page 59)

ly explained by the fact that most recently learned experiences are most easily recalled. As teachers teach, farm power abilities to students, the learning situations appear to be self-taught although the basis for their knowledge may have come from some other source.

With one exception, teachers who were teaching agricultural mechanics possessed a higher degree of competence for all farm power abilities than did teachers who were not teaching agricultural mechanics. This would be expected since a teacher's interest and ability undoubtedly have some influence on the type of employment selected and the division of teaching assignments in multiple-teacher departments.

Teachers who had completed the minimum number of hours of agricultural mechanics in college reported the highest percentage response with no competence in farm power abilities and the lowest percentage of response with much competence in the abilities studied. Teachers who had the highest number of quarter hours of agricultural mechanics in college generally reported a higher degree of competence in farm power abilities.

Recommendations

All the farm power abilities and understandings investigated in the study are appropriate for agricultural mechanics instruction in a vocational-technical school. In multiple-teacher departments offering specialized courses in agriculture mechanics classes, a majority of the abilities are appropriate.

In single-teacher departments, where time is always a factor and equipment frequently a limiting factor, it may be necessary to select specific abilities for the farm power course.

In the farm power instruction in single-teacher departments, we suggest the first seven engine preventive maintenance abilities, the first seven engine performance testing abilities, and the first six engine repair abilities. Other abilities could be added depending upon the needs of students, community demands, and employment opportunities.
Procedures for Purchasing Tools and Equipment

W. FORREST BEAR, University of Minnesota

TOM FOSSENOE, Minneapolis, Minnesota

- Include a picture of the desired tool.
- List safety features of the new tool.
- Sketch a shop diagram showing location of the tool, non-skid area, and safety signs.
- Specify voltage, phase, and cycle, ventilation, gas, and similar changes that must be made to adapt the tool to the shop.
- List courses in which the tool will be used.
- Prepare a tool requisition list.
- For each item on the requisition provide a detailed description of the item, accessories, catalog number, page number, quantity, unit price, and specify all items to be for F.O.S.B. school.
- List of accessories and supplies needed for existing tools.
- Large items that are advisable to submit the order on bids.
- Submit requests and bid according to school schedule. The earlier the better.
- Present the prepared materials to proper school administrative personnel. This could be the principal, superintendent, purchasing agent, or business manager. The teacher should discuss the preference listing and clarify any questions that might arise. If bids are received, teachers may need to analyze the bids and re-submit recommendations to the school administration.
- Check the order upon arrival, promptly install or store tools and suggest location in the completion of reimbursement forms.

School Administrator's Responsibilities

School administrators have the following responsibilities in regard to purchasing tools and equipment for agricultural mechanics.

- Become familiar with requests as outlined by the teacher.
- Present requests to the Board of Education.
- Initiate the necessary approval application for purchase order form which will qualify for reimbursement.
- Place tool and equipment orders or request returns to the teacher for placement orders.

Bid Notice

It may be necessary for the vocational agriculture teacher to prepare a bid notice for tools and equipment. The following format for a bid notice is suggested.

Bids will be opened on Vocational Agriculture shop equipment and tools for the respective departments in the public school of (name of town). Bids will be received by the Board of Education of (School District) until (time) (date) day.

The tabulation of bids will be made by the Board of Education at (time) (date).

W. FORREST BEAR

THE AGRICULTURAL EDUCATION MAGAZINE

W. FORREST BEAR is Professor, Department of Agricultural Engineering, University of Minnesota, St. Paul. Tom Fosseenoeh is Manager, School for the Board of Education of Statche Company, Minneapolis, Minnesota.

W. FORREST BEAR

THE AGRICULTURAL EDUCATION MAGAZINE

W. FORREST BEAR is Professor, Department of Agricultural Engineering, University of Minnesota, St. Paul. Tom Fosseenoeh is Manager, School for the Board of Education of Statche Company, Minneapolis, Minnesota.

W. FORREST BEAR

THE AGRICULTURAL EDUCATION MAGAZINE

W. FORREST BEAR is Professor, Department of Agricultural Engineering, University of Minnesota, St. Paul. Tom Fosseenoeh is Manager, School for the Board of Education of Statche Company, Minneapolis, Minnesota.

W. FORREST BEAR

THE AGRICULTURAL EDUCATION MAGAZINE

W. FORREST BEAR is Professor, Department of Agricultural Engineering, University of Minnesota, St. Paul. Tom Fosseenoeh is Manager, School for the Board of Education of Statche Company, Minneapolis, Minnesota.

W. FORREST BEAR
A Post-Secondary Program in Farm Machine Technology

HAROLD D. HUBER
Spoon River College
 Canton, Illinois

When one has been a part of a pioneering effort, it is interesting to look back and evaluate. In this article I intend to present a candid picture of the development and operations of the Farm Machine Technology Program at Spoon River College, Canton, Illinois. I shall point up some of our problems and how we have attempted to solve them.

The Need

First, let us look at the need that stimulated the development of the Farm Machine Technology Program. The U. S. Department of Labor reported in 1963 that the average age of farm equipment dealership personnel was approximately 55. Another national survey showed that there was an immediate need for at least 20,000 farm equipment mechanics in 1965.

Following the enactment of the Vocational Education Act of 1963, officials of the Illinois Training Institute established ways in which they could assist in the development of training programs to help alleviate the shortage of personnel in the farm equipment industry. A study of the Illinois Retail Farm Equipment Association showed an enormous need for farm equipment service mechanics in Illinois alone. With the help of a Supervisor of the Mechatronics and Program Planning for the International Harvester Company and the supervisory staff in the vocational occupations of the State Board for Vocational Education, the staff of what was then Canton Community College threw their energy into the development of the program. The four original instructors, including two technicians and two vocational agricultural teachers, were employed July 1, 1965.

The Curriculum

The present curriculum in farm machine technology is outlined in the accompanying table. Orientation includes one week of disassembly and reassembly procedures on an operational single-cylinder, air-cooled engine. The last three weeks of orientation involve disassembly and reassembly procedures on an operational four-cylinder, water-cooled engine. During the orientation instruction much time is devoted to inspection, analysis of engine wear problems, and principles of operation.

During the four weeks of orientation instruction, students are scheduled in A.M. and P.M. sections. One-half of the students are in the shop and classroom area for five hours in the morning while the other half have a five-hour schedule in the afternoon. Each group is under the direction of two instructors. At the termination of the orientation instruction, students are grouped into four sections. The four groups rotate through the specialized phases of instruction. Students are in each phase for six weeks. A typical schedule is as follows:

<table>
<thead>
<tr>
<th>Time of Day</th>
<th>Subject or Phase</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.M.</td>
<td>The Shop Procedures</td>
</tr>
<tr>
<td>A.M. B</td>
<td>Electrical Systems</td>
</tr>
<tr>
<td>P.M.</td>
<td>Transmission and Design</td>
</tr>
<tr>
<td>P.M. D</td>
<td>Shop Procedures</td>
</tr>
</tbody>
</table>

During this phase of instruction, students work on line tractors in the shop procedures class. These tractors are secured from farm equipment dealers. The line point used involves locating the tractors are paid for by the dealer when he picks up the tractor to return it to the dealership.

A six-week schedule of courses is offered during the summer between the first and second year of the program. A new course, Farm Tractor Overhaul Review, was taught for the first time during the summer of 1965. The main purpose of this course is to better prepare some of the slower students for the cooperative-on-the-job employment experience.

Occupational Experience

After summer school, students are placed with cooperating dealers throughout central Illinois. Many students begin work immediately after summer school, some after officially training under school supervision until early September. In September of the third semester, students begin twelve weeks of on-the-job employment experience. The second employment semester lasts the remaining eight weeks of the fourth semester.

The on-the-job employment experience time allotment and schedule was one of the most difficult problems faced in developing the program. During the first two months of the program, the twelve-week employment experience was scheduled during the last part of the second semester. Our evaluation indicated that for the most part students were not sufficiently competent to the physical and mental demands at that stage. After further study and advice from the Farm Machine Technology Advisory Committee, the program was altered to the present pattern. The reason for placing students employed for the remaining eight weeks of the two-year program was primarily from the standpoint of the cooperative-three year idea. The school is dealing dealers to indicate a desire to have the first opportunity to hire students who have completed the program in three years.

Instruction on campus during the third and fourth semesters involves advanced machine servicing. This course material is developed by division the group into three subsections including and arranged for the training of students through diesel engines, transmission, and hydraulics. Each specialized area is taught five weeks.

Courses and Time Allotment for Courses in the Two-Year Curriculum in Farm Machine Technology

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
<th>Instruction</th>
<th>Per Week</th>
<th>Class</th>
<th>Lab</th>
<th>Shop</th>
<th>Semester</th>
<th>Total Weeks</th>
<th>Total Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gasoline Tractor Practice</td>
<td>220</td>
<td>15</td>
<td>10</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Orientation</td>
<td>20</td>
<td>10</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>90</td>
<td></td>
</tr>
<tr>
<td>Electrical Systems</td>
<td>20</td>
<td>10</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>90</td>
<td></td>
</tr>
<tr>
<td>Farm Equipment Sales</td>
<td>20</td>
<td>10</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>90</td>
<td></td>
</tr>
<tr>
<td>Shop Procedures</td>
<td>20</td>
<td>10</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>90</td>
<td></td>
</tr>
<tr>
<td>Intro to Automotive</td>
<td>20</td>
<td>10</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>90</td>
<td></td>
</tr>
<tr>
<td>Shop Mathematics</td>
<td>20</td>
<td>10</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>90</td>
<td></td>
</tr>
<tr>
<td>Farming Techniques</td>
<td>20</td>
<td>10</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>90</td>
<td></td>
</tr>
<tr>
<td>Assembly and Handling</td>
<td>20</td>
<td>10</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>90</td>
<td></td>
</tr>
<tr>
<td>Farm Mechanics</td>
<td>20</td>
<td>10</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>90</td>
<td></td>
</tr>
<tr>
<td>Agricultural Communications</td>
<td>20</td>
<td>10</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>90</td>
<td></td>
</tr>
<tr>
<td>Fundamentals of Electric Motors</td>
<td>20</td>
<td>10</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>90</td>
<td></td>
</tr>
<tr>
<td>Personal Procedures</td>
<td>20</td>
<td>10</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>90</td>
<td></td>
</tr>
<tr>
<td>Introduction to Diesel Systems</td>
<td>20</td>
<td>10</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>90</td>
<td></td>
</tr>
<tr>
<td>Advanced Tractor Overhaul</td>
<td>20</td>
<td>10</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>90</td>
<td></td>
</tr>
<tr>
<td>Diesel Engines</td>
<td>20</td>
<td>10</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>90</td>
<td></td>
</tr>
<tr>
<td>Hydraulics</td>
<td>20</td>
<td>10</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>90</td>
<td></td>
</tr>
</tbody>
</table>

The on-the-job coordinator maintains a job placement file listing employment opportunities available to graduates. A study of two graduating classes showed that 73 percent of the graduates were working in a farm equipment dealership or related agricultural business on the first of September following graduation. After that date the percentage declined to 67 percent, many graduates entered the Armed Forces.

Some Observations

Aside from other reasons mentioned in the article, employment experience has been more significant to the fall and spring months because of the peak time, seasonal work loads in the participating dealerships.

The Farm Machine Technology Program is oriented toward tractor overhaul. This emphasis was recommended both by the Advisory Committee and cooperating dealers. Dealers are in urgent need of personnel who can service modern equipment. Dealers feel that part-time labor can be hired for machine setup.

We are accomplishing the goal of preparing men for job entry into agricultural machinery. The emphasis is on men working in farm equipment dealerships and then migrate to other jobs as soon as possible because of the better wage conditions. The positions they will fill are somewhat limited and firm mechanics in automotive or manufacturing businesses. These positions are usually so poorly paid and the men are more apt to stay there if they have a farm equipment background.

I feel certain that when farm equipment dealership becomes competitive, we will see a turn-around in the situation. A greater number of the graduates will be retained in the farm equipment industry.
Public Relations for Vocational Agriculture

S. R. PUTNAM, Teacher of Agriculture
Danville, Connecticut

Everyone concerned with vocational agriculture must be a public relations expert if vocational agriculture is to succeed in the 1970’s. During the last decade many vocational agriculture departments closed both in urban and rural areas because of a lack of a viable program and a lack of good public relations. But during the same period many programs grew larger and stronger.

The factors common to those programs which succeeded — and which are missing from the programs which fail — are a good, adaptable, flexible program and a constant, positive public relations effort. These two factors work in concert. Without a continuing public relations program, an up-to-date curriculum alone cannot move us forward at the pace necessary for the 1970’s.

Public relations is the concern of everyone in vocational agriculture — students, teachers, administrators, and supervisors. But the bulk of the responsibility falls on vocational agriculture teachers. Teacher must be concerned about public relations with everyone — students, parents, administrators, supervisors, advisory boards, boards of education, farm and agricultural businesses, other businesses, local civic and social groups, and the general public.

Using News Releases

In Connecticut the state FFA Convention is held at the end of June. This is an excellent opportunity for news releases indicating the awards and recognitions achieved by students during the year. News releases are effective public relations activities that should be used throughout the year. I have found it best to prepare several copies of each news release and send or carry them to daily and weekly newspapers, radio stations, farm editors of newspapers, farm reporters of radio and television stations, the school newspaper adviser, the student weekly radio program adviser, school administrators, and the state FFA reporter. Through experience we have learned that people will read the news release to very little editing; if the release is edited, the least important part of the news is lost.

News releases should include the names of students and their parents whenever possible. The principal’s and superintendent’s name should be used whenever possible. It is easy to understand that the high school is a public good, but it’s hard to understand that each student is a regional good. I believe that the public has three basic misconceptions about vocational agriculture — that vocational agriculture students are less able academically than other students, that all vocational agriculture students are preparing for a farming vocation, and that vocational agriculture graduates cannot go to college. We must constantly nibble away at these misconceptions by re- buttals in our news releases. Sometimes a subtle approach is more effective than a direct approach when dealing with deep seated misconceptions.

Informing Administrators

During the summer months it is very important that teachers keep school administrators informed of their activities. A plan for the summer should be submitted to administrators and to the state supervisor. The principal and superintendent should get weekly, biweekly, or monthly reports of how teachers are actually spending their time during the summer.

Days taken as vacation should be reported to the superintendents’ office, at least one teacher should be on duty all times during the summer and should check in at the principal’s office daily to receive messages and mail and to let the office staff know that someone is on duty. The reporting of summer activities is very important. When my principal or superintendent is asked, “Why do you pay agriculture teachers during the summer?” I want him to be able to answer with information about my summer program and activities.

Involving Parents and Others

As supervisory instructional visits are made during the summer, relations with parents and employers are strengthened. I find it helpful to visit farms and agricultural businesses whenever you have half an excuse. Parents and employers should be made aware of recommendations made to students during farm or on-the-job instruction. This assures them that the calls are for instruction and not merely calls just to see the countryside.

We find it helpful to schedule an advisory committee meeting during the summer to summarize the year’s activities and to present proposed curriculum changes and events scheduled for the next year. In August we schedule a FFA picnic including invitations to all field supervisors and their parents. Prior to this, phone calls have been made for each incoming freshman where the student’s planned occupational experience program with the student and parents. These activities strengthen teacher-parent relationships.

During the school’s open house as a part of National Education Week, we encourage parents to visit the vocational agriculture department. Parents are also encouraged to attend the ex- hibition of the guidance department that outlines high school courses and programs taken by students, including vocational agriculture students in the college preparatory program. Each of the vocational agriculture teachers tells about the instructional program and career opportunities in his specialized area (horticulture, horticulture education, agriculture education, etc.). The program is concluded by a representative of the College of Agriculture telling about career opportunities in agriculture for college graduates and dispelling the myth that vocational agriculture students cannot be a true student of agriculture. I tell them to try it.

Informing Prospective Students

A big opportunity for public relations comes with our recruiting program which begins in January each year. Each of the eleven public schools and seven parochial schools in our area is visited with eight grade students and included in the recruitment schedule. A helpful and accurate job description of vocational agriculture. Principals, guidance counselors, and eighth grade teachers are very helpful. The program is devoted to questions and students interested in vocational agriculture fill out a form indicating their name, address, and parent’s name. Parents of all students who complete the interest forms are mailed copies of information about our vocational agriculture program including information about FFA, facilities, sample curriculum, list of agricultural careers open to vocational agriculture graduates, and an application form. Prospective students and their parents are invited to an “open school” evening the month before the FFA convention.

Nevir: Endline Task

Do not neglect public relations. A good public relations program has no beginning and no end. A day seldom passes which does not provide an opportunity to strengthen the public image of vocational agriculture.

Our annual FFA Parent-Member Banquet is an community effort and an excellent public relations activity. Although our community is largely industrial, local merchants contribute all the food for the banquet. The local Grange cooks and serves the meal and provides a meeting place. Every FFA member has a responsibility for the banquet. The year’s events and achievements are reviewed; foundation and chapter awards are given; honorary degrees are awarded and new officers installed. All administrators are invited, and many special guests are invited. All these persons are excellent public relations assistants.

Public Relations for Vocational Agriculture in the 1970’s

Why do you pay agriculture teachers during the summer? We have learned that people will read the news release to very little editing; if the release is edited, the least important part of the news is lost.

News releases should include the names of students and their parents whenever possible. The principal’s and superintendent’s name should be used whenever possible. It is easy to understand that the high school is a public good, but it’s hard to understand that each student is a regional good. I believe that the public has three basic misconceptions about vocational agriculture — that vocational agriculture students are less able academically than other students, that all vocational agriculture students are preparing for a farming vocation, and that vocational agriculture graduates cannot go to college. We must constantly nibble away at these misconceptions by rebuttales in our news releases. Sometimes a subtle approach is more effective than a direct approach when dealing with deep seated misconceptions.

Informing Administrators

During the summer months it is very important that teachers keep school administrators informed of their activities. A plan for the summer should be submitted to administrators and to the state supervisor. The principal and superintendent should get weekly, biweekly, or monthly reports of how teachers are actually spending their time during the summer.

Days taken as vacation should be reported to the superintendents’ office, at least one teacher should be on duty all times during the summer and should check in at the principal’s office daily to receive messages and mail and to let the office staff know that someone is on duty. The reporting of summer activities is very important. When my principal or superintendent is asked, “Why do you pay agriculture teachers during the summer?” I want him to be able to answer with information about my summer program and activities.

Involving Parents and Others

As supervisory instructional visits are made during the summer, relations with parents and employers are strengthened. I find it helpful to visit farms and agricultural businesses whenever you have half an excuse. Parents and employers should be made aware of recommendations made to students during farm or on-the-job instruction. This assures them that the calls are for instruction and not merely calls just to see the countryside.

We find it helpful to schedule an advisory committee meeting during the summer to summarize the year’s activities and to present proposed curriculum changes and events scheduled for the next year. In August we schedule a FFA picnic including invitations to all field supervisors and their parents. Prior to this, phone calls have been made for each incoming freshman where the student’s planned occupational experience program with the student and parents. These activities strengthen teacher-parent relationships.

During the school’s open house as a part of National Education Week, we encourage parents to visit the vocational agriculture department. Parents are also encouraged to attend the exhibition of the guidance department that outlines high school courses and programs taken by students, including vocational agriculture students in the college preparatory program. Each of the vocational agriculture teachers tells about the instructional program and career opportunities in his specialized area (horticulture, horticulture education, agriculture education, etc.). The program is concluded by a representative of the College of Agriculture telling about career opportunities in agriculture for college graduates and dispelling the myth that vocational agriculture students cannot be a true student of agriculture. I tell them to try it.

Informing Prospective Students

A big opportunity for public relations comes with our recruiting program which begins in January each year. Each of the eleven public schools and seven parochial schools in our area is visited with eighth grade students and included in the recruitment schedule. A helpful and accurate job description of vocational agriculture. Principals, guidance counselors, and eighth grade teachers are very helpful. The program is devoted to questions and students interested in vocational agriculture fill out a form indicating their name, address, and parent’s name. Parents of all students who complete the interest forms are mailed copies of information about our vocational agriculture program including information about FFA, facilities, sample curriculum, list of agricultural careers open to vocational agriculture graduates, and an application form. Prospective students and their parents are invited to an “open school” evening the month before the FFA convention.

Nevir: Endline Task

Do not neglect public relations. A good public relations program has no beginning and no end. A day seldom passes which does not provide an opportunity to strengthen the public image of vocational agriculture.

Our annual FFA Parent-Member Banquet is an excellent public relations activity. Although our community is largely industrial, local merchants contribute all the food for the banquet. The local Grange cooks and serves the meal and provides a meeting place. Every FFA member has a responsibility for the banquet. The year’s events and achievements are reviewed; foundation and chapter awards are given; honorary degrees are awarded and new officers installed. All administrators are invited, and many special guests are invited. All these persons are excellent public relations assistants.

The agricultural education magazine

September, 1969

Public relations is the concern of everyone in vocational agriculture — students, teachers, administrators, and supervisors. A good public relations program has no beginning and no end. A day seldom passes which does not provide an opportunity to strengthen the public image of vocational agriculture.

Our annual FFA Parent-Member Banquet is a community effort and it is an excellent public relations activity. Although our community is largely industrial, local merchants contribute all the food for the banquet. The local Grange cooks and serves the meal and provides a meeting place. Every FFA member has a responsibility for the banquet. The year’s events and achievements are reviewed; foundation and chapter awards are given; honorary degrees are awarded and new officers installed. All administrators are invited, and many special guests are invited. All these persons are excellent public relations assistants.

Never Ending Task

Do not neglect public relations. A good public relations program has no beginning and no end. A day seldom passes which does not provide an opportunity to strengthen the public image of vocational agriculture.

Public relations is the concern of everyone in vocational agriculture — students, teachers, administrators, and supervisors. A good public relations program has no beginning and no end. A day seldom passes which does not provide an opportunity to strengthen the public image of vocational agriculture.

Our annual FFA Parent-Member Banquet is an excellent public relations activity. Although our community is largely industrial, local merchants contribute all the food for the banquet. The local Grange cooks and serves the meal and provides a meeting place. Every FFA member has a responsibility for the banquet. The year’s events and achievements are reviewed; foundation and chapter awards are given; honorary degrees are awarded and new officers installed. All administrators are invited, and many special guests are invited. All these persons are excellent public relations assistants.
A Program for Agricultural Machinery Mechanics

KENNETH E. HUTCHINGS, Instructor
Lake County Area Vocational-Techical Center
Erlin, Florida

In the center of Florida in an area of citrus and vegetable production and processing and ornamental plant and flower growing the Lake County Area Vocational Technical Center has made a good beginning in living up to its name of "Training Today for Tomorrow's Occupations." The program for agricultural machinery mechanics is one of many opportunities being offered by which trainees may prepare for tomorrow's occupations. Other programs offered are in the areas of citrus and ornamental horticulture, farm equipment maintenance and diesel engine maintenance are offered in the evening division.

The Program

The objective of the course in agricultural machinery mechanics is to prepare persons gainful employment in the field of agricultural machinery. Instruction is geared primarily for students who desire employment in a a wide variety of positions such as mechanic, a parts clerk, or a salesman of farm equipment.

The course in agricultural machinery mechanics includes 1,000 hours of instruction completed in a ten-month period. The students attend school for six hours per day, 25 hours per week, 32 weeks per year. These hours are devoted to study and laboratory practice on design, function, operation, service, and preventive maintenance of agricultural machinery. The instructional program is organized to provide students the opportunity to apply in practice the theory and the knowledge studied in the classroom. This is accomplished by lectures and demonstrations using mock-ups and cut-away, diagrams, and other visual aids. In the laboratory, engines and tractors, including complete sets of tools and test equipment are used to instruct the students in the application of theory. In addition, there is a "live work" program in which tractor and other agricultural machinery brought in by owners and equipment dealers, are repaired by students. "Live work" is accepted only when it fits into the instructional program.

Students are provided other opportunities to gain knowledge by using manufacturers' representatives as guest lecturers and by field trips to equipment dealers' offices. Future plans include inviting manufacturers and local dealers to use the facilities at the area vocational-technical center for service schools. This activity has a two-fold purpose: not only will it aid the instructional program, but it will bring about more contact and cooperation between industry and the center which will enhance the success of the program.

Instruction in maintenance is adapted to the farm machinery industry dealing with topics such as attitudes, marketing and management, selling, advertising, buying, consumer credit and financing, and distribution. Students are taught to develop a spirit of cooperation with fellow workers and a sense of responsibility toward their employer and job. They are taught to develop safe work habits and neatness and cleanliness in the work areas.

Preparing Employees for Agricultural Machinery Dealerships

THOMAS R. STITT, Southern Illinois University
WILLARD H. WOLF, The Ohio State University

What should be included in a curriculum for students preparing for work in agricultural equipment dealerships? Should the curriculum be developed for specific job titles or are there common job titles which can be clustered into one curriculum? What are the most important attributes and understanding needed for the various job titles in agricultural equipment dealerships? These are illustrative of the many questions which must be answered when developing a mechanics curriculum in vocational agriculture. Traditionally, the answers to these questions have been determined by using facts secured from the school community. This remains an excellent policy, but with extensive availability of graduates and diversity of responsibilities of various job titles, it is critical to review employment needs and directed curriculum content on a more extensive than a school district or county.

• Common Elements of the Curriculum

The study of agricultural equipment dealerships in Ohio, six job titles were quite characteristic for the industry. The job titles were set-up man, shop foreman, equipment mechanic, partsman, equipment salesman, and truck driver-delivery man. The competencies needed for these jobs, including abilities and knowledge, were ranked according to their importance. The data indicated that curricula for potential employees in the industry should include safety and good housekeeping, oral communications, maintaining customers, meeting customers, and job functions of employees. The competencies for each of the six job titles are given in Table 1.

• Curriculum for Setup Man and Equipment Mechanic

The set-up man was ranked highest in need for both the ability and understanding of the machinery and equipment sold by the dealership. The ability to repair, replace, and adjust parts was ranked in the highest need category for both the set-up man and equipment mechanic. There were considerable similarities in the order of ranking of competencies for the set-up man and equipment mechanic. The major difference was in the degree of proficiency required which was greater for the equipment mechanic for both the set-up man and equipment mechanic job titles, the ability to repair, replace, and adjust parts such as the clutch was ranked order understanding of the function of the parts of the clutch.

• Curriculum for Partsman and Equipment Salesman

The partsman and the equipment salesman were rated high in knowledge of the ability dealing with salesmanship, human relations, and communications. These two job titles were also ranked high on items dealing with organizational structure and operational procedures of the equipment dealership. The curricula dealing with understanding of the

(Continued on page 71)
Organizational Innovation in a Comprehensive Community College

GAYLE W. WRIGHT, Parkland College, Champaign, Illinois

One of the hallmarks of the Spor-
nik craze was a sudden awareness of the urgent need for vocational and technical education. This realization sparked the establishment of post-high school institutions which would provide both transfer and vocational-tech-
nical education. Without doubt, this was a major factor leading to the ex-
isting comprehensive college movement in Illinois. As such, the occupationally oriented student now has a new dimen-
sion to consider—a dimension which fills a long-time void which has existed between high schools and baccalaureate institutions.

The comprehensive two-year institu-
tions in Illinois are fostering a new spec-
trum in education which allows students the flexibility to pursue either occupationally oriented or baccalaureate-
oriented programs. These institu-
tions also enhance the opportunity for adults to up-grade themselves through programs of continuing education.

One of these new institutions is Parkland College—a comprehensive college service area of 28 high school districts. The new college is dedicated to serving the broad educational needs of its member communities.

Organizational Structure

East Central Illinois has developed a host of farm programs. The socio-economic complex of Parkland’s district depends on a basic agricultural economy. Parkland has subscribed to providing agricultural programs which will meet the needs of the agricultural-
ly oriented student.

Recognizing the importance of proper organization to achieve the objectives of the school, Parkland College pro-
vides academic and vocational-technical programs within a six-division concept. This approach to the intermixing of disciplines in social science, life science, mathematics and physical science, business, communications, and physical education encourages interplay among vocational-technical and aca-
demic instructional faculty and staff. This policy is strongly promoted, it promotes the attainment of the basic goal of meeting the needs of the total student.

Isolation of instructional areas is dis-
couraged due to the belief that fulfill-
ing the individual is a common responsibility of both vocational-technical and academic involvement. This concept works together academicians and the traditionally isolated academic-oriented faculty and prevents the divisi-
sion which so often occurs. Each division, administratively and physically, houses both career and transfer elements such that equal dignity and stature is accorded all programs. This eliminates the typical academic-aptitude concept depicted by the “Front Door” transfer programs and the “Un-
der the Football Bleachers” emphasis too often given the vocational-technical programs.

Farm Equipment Technology

The organizational structure at Park-
land College permits the linking of cer-
tain programs through the identification of “core” courses. Typical of this is the reimbursement of automotive and farm equipment technology. Of prime concern in this endeavor is the efficient utilization of both personnel and facilities with emphasis on providing the best possible instructiona media for the students enrolled.

Technical core courses which are considered common to automotive and farm equipment students include internal combustion engines, engine analysis and overhaul, power trains, electrical-mechanical circuits and systems, hy-
draulics, and welding. These courses, reinforced by supportive and general education studies, account for the first year of a two-year associate degree pro-
gram in either farm equipment or in com-
mutative technology. Upon completion of this common first year, students make their career selection and take specific courses during the second year directly related to their chosen area.

Concealing there are advantages to homogeneous grouping of students, I believe that if early in the instruction-

al period correctly identified courses are core to more than one specialty area, students will gain a certain amount of “cross-training” from a heterogeneous association. In addition, they will have more time to make a realistic career choice. And the public will be better able to comprehend the attempt to sound administration of the tax dollars by being more responsive to the financial needs of the evolving insti-
tution.

Vocational Courses

In Parkland’s attempt to initiate the core concept it became apparent that some students, for varying reasons, would not successfully complete the two-year associate degree programs. A “split-off” concept evolved. Through self-identification and consultation with advisors, parents and counselors, stu-
dents may elect after one quarter of instruction to “split-off” into a one-
year certificate program. These pro-
grams are geared to skill development, and are essentially vocational in nature, and take a “hands-on” approach to educa-
tion.

In light of this, potential college dropouts become split-offs who have the opportunity to accumulate entry level skills which will enhance their competitive chance on the job market.

Representative of this concept are the alternatives in the automotive and farm equipment technology programs.

Preparing Employees for Agricultural Machinery Dealerships

(Continued from page 69)

job functions of employees of a dealers-
ship and understanding company oper-
ating procedures. This might be ex-
erct since employees in these two job titles are involved to a great extent in moving parts and equipment through the machinery. Therefore, the deci-

ding ability of the partsman and equipment salesman lowers. The foreseeing of a potential for the organization and accounts for the high ranking of related items.

• Curriculum For Truck Driver-

Delivery Man

This job title has traditionally been consid-
ered by those inside the industry as an entry level position with no knowledge or skill other than to deliver and load the stock. The job is not one that entails some understanding of the financial needs or the evolving insti-
tution.

Vocational Courses

In Parkland’s attempt to initiate the core concept it became apparent that some students, for varying reasons, would not successfully complete the two-year associate degree programs. A “split-off” concept evolved. Though

After one quarter of study a student may “split-off” and devote the re-

aining quarters to other auto-
motive or farm equipment service. If the student is correctly identified as a two-year student, this selection does not need to be made until the second year due to the core concept.
MECHANICAL COMPETENCIES NEEDED IN AGRICULTURAL OCCUPATIONS

Harold Anderson, Teacher Education
James F. Hah, Graduate Assistant
Colorado State University

Technological changes in agriculture have caused a division of labor into agricultural production and off-farm agriculture. Although the percentage of people who work on farms and ranches is declining, greater employment opportunities are anticipated in related enterprises associated with agriculture. The increase in agricultural occupations necessitates an evaluation of current programs in agricultural education to ensure that students acquire skills useful not only in farming but in related agricultural occupations.

To be able to plan and recommend an agricultural mechanics program that will meet the needs of students preparing for both production and off-farm agricultural occupations, it is necessary to ascertain to what extent mechanical competencies needed by employees in off-farm agricultural occupations are related to those mechanical competencies needed by farmers. In general, previous research has shown that the agricultural mechanics competencies needed by off-farm agricultural employees are similar to those needed by farmers.

Study of Business Firms

To determine the relationship between the skills needed by workers in off-farm agricultural occupations and the skills needed by workers in off-farm agriculture, a study was made of 25 agricultural firms in North-central Colorado. The town of approximately 15,000 population is surrounded by diversified irrigated farms and ranches and contains most of the service-related businesses for these production agriculture enterprises.

Personal interviews were made in each of the 25 firms. Each employer was asked to respond to the importance of 75 agricultural mechanics skills. These skills were obtained by reviewing recommended courses of study in agricultural mechanics in five western states. The list of the firms included a variety of functions. The largest number of farms performed the retailing function, other firms were rather evenly dispersed among the functions of processing, wholesaling, purchasing, distributing, and manufacturing. The 25 firms employed a total of 725 people; however, only 219 of these employees were employed on a full-time basis.

There was a relatively low relationship between the production agriculture and agricultural mechanics skills and the skills needed by workers in off-farm agriculture. Only nine of the 75 skills received a combined rating as being important in both production agriculture and off-farm agriculture. The nine skills listed as important for all agricultural employees were: practicing safety and shop cooperation; practical skill and housekeeping; safety instruction in use of hand and power tools; sharpening tools properly; repairing tools; arranging shop and mounting tools; compiling list of tools and equipment; and inventoring shop tools.

Conclusions

Although many of the skills taught in the agricultural mechanics curriculum were not considered important to the total group of agricultural employees, there was a direct relationship between these skills and those needed by employers in the farm machinery sales and service area. Some relationship was also found between agricultural mechanics skills and those needed by those involved in the processing of agricultural products. A relatively low relationship was found between the agricultural mechanics skills and those needed by employees in the processing of agricultural products. A relatively low relationship was found between the agricultural mechanics skills and those needed by employees in the processing of agricultural products. The study also shows a tendency for more emphasis on this phase of the undergraduate agricultural education program in the total program.

The number of semester hours in agricultural machinery recommended for off-farm agriculture is 12 hours.

FINDINGS

There is no clear cut division of responsibility relative to the teaching of major areas of instruction in agricultural education. The primary responsibility for teaching the departments of agricultural engineering, although there is some involvement by agricultural education departments. Some departments of agricultural engineering handle methods of teaching. There is little evidence of team teaching between the departments.

The major areas of instruction in agriculture education as undergraudate are following traditional lines. Undergraduate offerings in agricultural mathematics and agricultural education students are not keeping pace with technological changes in the field. The highest number of semester hours required for agricultural education undergraduates were in agricultural mechanics skills development, farm power and motors, farm machinery, and agricultural buildings and structures. The number of semester hours required for rural electrification and processing and materials handling is about the lowest of the major areas of instruction.

The most frequently reported advantages of existing organizational patterns for training agricultural education undergraduates in agricultural mechanics were: providing for specialization of the student and a student, free of influence of objectives, opportunities, and goals; cooperation with other agricultural courses taught; high status of physical facilities and equipment; and easy cooperation to operate and administer.

The most frequently reported disadvantages of existing organizational patterns for training agricultural education undergraduates in agricultural mechanics was in the difficulty in coordinating the program; inadequate instruction due to background, interest, and limited number of courses available; and existing courses were too theoretical and lacked practical application to agricultural teaching.

Anticipated changes in the next five years in the agricultural mechanics curriculum are: increased emphasis on off-farm agriculture; changes in undergraduate program; and changes in undergraduate curriculum. Changes in undergraduate parallel changes made in the last five years. Changes indicated as having taken place during the past five years were updating and intensifying course content, increasing emphasis on in-service education, redefining requirements in the undergraduate program, and utilizing specialists to teach agricultural mechanics. Changes anticipated in the next five years were further revision and refinement of the program.

Subscriptions Notice

All subscription orders for THE AGRICULTURAL EDUCATION MAGAZINE should be sent to:

Doyle Byrd, Business Manager
THE AGRICULTURAL EDUCATION MAGAZINE
Box 5115
Medicine, Wisconsin 53705

For groups, list in alphabetical order giving the complete mailing address and zip code for each. Make checks payable to THE AGRICULTURAL EDUCATION MAGAZINE.

The AGRICULTURAL EDUCATION MAGAZINE

SEPTEMBER, 1949
The Laboratory-Work Areas Approach for Instruction in Agricultural Mechanics

G. M. Walker and Jasper S. Lee
Mississippi State University

Jasper S. Lee

G. M. Walker and Jasper S. Lee are Associate Professor and Assistant Professor of Agricultural Education, Mississippi State University, College of Agriculture.

The Laboratory-Work Areas Approach for instruction in agricultural mechanics described in this article is explained in more detail in the publication, "Agricultural Mechanics Instruction in Secondary Schools," which is available from the author.

Organization of the Laboratory

The organization of the agriculture mechanics laboratory using the laboratory-work areas approach is to provide instruction in eight basic areas: agricultural power and machinery, welding, electricity, buildings and structures, carpentry, plumbing, concrete and masonry, metals, and tool fitting. All of these areas include the knowledge and skills needed in agricultural mechanics.

Most secondary level agricultural mechanics shops can be adapted very easily to include the eight areas of instruction. The accompanying drawing illustrates how the work areas may be arranged. Variation can be made in the arrangement of the work areas to suit individual needs and the architectural design of facilities. The work areas contain all of the tools and equipment normally needed for the educational activities and projects conducted in that area. A central storage room is needed for tools that are used occasionally and for the storage of hardware items such as nails, bolts, and screws.

The work areas organization of agricultural mechanics facilities simplifies the instruction of safety devices. For example, in the welding area a much larger and better fitted safety device to protect eyes is needed. Welding booths with views through plastic shields are economical and relatively simple to construct. Various power tools and the other areas become off-limits to students when they are assigned to a specific work area.

How the Approach Functions

The laboratory-work areas approach is based upon the fact that the agricultural mechanics instruction in the first course should be structured around learning basic knowledge and skills. Projects, especially those requiring advanced knowledge and skill, are delayed until students have acquired the necessary basic skills. Often students are introduced to each work area in agricultural mechanics during the first year in which they are enrolled. More in-depth instruction in the work areas is given in successive courses. The instruction is designed to move from the simple to the complex.

Some Advantages

Organizing the agricultural mechanics laboratory into laboratory-work areas facilitates ordering and provides for efficient use of tools in that students are working with them more of the time. Every tool has a storage place near where it is most used. Tools are not carried to a central tool room and stacked on shelves. Orderly arrangement facilitates cleaning. A clean and orderly work environment in the laboratory is an asset to any school system. Students learn work habits and how to care for working tools by imitating the examples that are set before them.

Organizing agricultural mechanics instruction around laboratory-work areas shows the nature of the instruction being offered. School administrators appreciate an organized agricultural mechanics laboratory for systematic instruction. Visitors to the school have an opportunity to observe the organizational arrangement and the activities being performed by the students. A well-organized facility that exemplifies the educational experiences that are provided in agriculture education is a means by which the general public admires a teacher who is able to show evidence of systematic instruction in agricultural mechanics.

Agricultural Mechanics for Prospective Teachers

(Continued from page 75)

course content, increased requirements in agricultural mechanics, increased use of staff specialists to teach agricultural mechanics, and updating the instructional program in agricultural mechanics.

* Since departments of agricultural engineering are primarily responsible for determining course content and teaching agricultural mechanics for agricultural engineering training, persons in these departments must be cognizant of needs of prospective agriculture teachers.

Summary

Evidence seems to indicate that there is no common agreement on how to prepare prospective teachers of vocational education in agricultural mechanics. No one is taking the major responsibility for determining what the agricultural mechanics undergraduate curricula should be, nor do they seem to be concerned. The responsibility tends to fall between various departments with agricultural engineering doing most of the teaching. Few curriculum innovations appear to be taking place.
Curriculum Revision in Vocational Agriculture

Charles Harvill, Vocational Agriculture Teacher
Paragould, Arkansas
and
J. A. Hayles, Teacher Education
Arkansas State University

There is growing evidence that vocational education in agriculture has made changes in curriculum patterns within the past few years. Agricultural education has been characterized by systematic planning at the local level. Persons in vocational agriculture recognize a need for reorganization of subject matter into a conceptual pattern that will produce greater understanding and depth of subject matter.

CURRICULUM REVISION

The teachers of vocational agriculture at Greene County Technical High School saw the need for a flexible curriculum that would stimulate a desire for learning, release the vocational agriculture program to the world of work, provide individual programs of study, prepare students for additional educational opportunities, provide personal instruction, and increase the opportunities for social and leadership activities. A survey was taken to determine the job opportunities for students terminating their education with high school and to determine the areas of instruction needed in the high school. Facilities of the vocational agriculture department were evaluated to determine the feasibility of incorporating new courses in the curriculum and for planning each course one semester in length.

The curriculum was revised to include courses in basic shop procedures for junior high school students. Two sessions are used to introduce and develop an understanding of mechanical drawing, tool identification, shop mathematics, leather work, rope work, woodwork, and the occupational opportunities available to students in vocational education. Three weeks of classroom instruction are rotated with three weeks of practical application in the shop.

Students are observed closely during the first year to determine whether or not they will be able to achieve in one of the advanced mechanics courses. If not, these students are placed in a special vocational education class for another year of instruction in shop fundamentals. Ten to fifteen per cent of the students need this extra training before enrolling in a regular agricultural mechanics course. The other 80 to 90 per cent of the students select with special counsel the courses which will provide experiences they need in their chosen field of occupational study.

THE CURRICULUM

The curriculum includes the following courses:

Agricultural Mechanics 1 Shop Skill Fundamentals: This course includes instruction in manual sharpening, woodworking, arc welding, plumbing, painting, small power tools, electricity, wood lathes, tractor maintenance, and concrete.

Agricultural Mechanics 2 Shop Skill Fundamentals: To enroll in this course, students have to complete Agricultural Mechanics 1, shop, and any additional classes required to meet the training requirements for the Arkansas Cooperative Extension Service.

Agricultural Mechanics 3 Gasoline Engines: Students are taught the theory of the operation of small engines through the repair and tune-up of multi-cylinder engines.

Agricultural Mechanics 4 Drawing and Blueprint Reading: Students learn to use drafting tools, read blueprints, and develop an understanding of mechanical design.

Agricultural Mechanics 5 Metal Work: Instruction in advanced sheet metal work, oxy-acetylene welding, arc welding, and use of the metal lathe is given in this course. A prerequisite for enrolling in this course is the completion of Agricultural Mechanics 1 and 2.

Agricultural Mechanics 6 Electronics: Students learn about electronic circuits, conductors, resistors, tubes, transistors, coils, capacitors, power supplies, microphones, loudspeakers, amplifiers, oscillators, and the application of the superheterodyne principles and components.

Agricultural Mechanics 7 Carpentry: Students are advanced work in building construction. Students must have completed Agricultural Mechanics 1 and 2.

Agricultural Mechanics 8 Equipment Operation and Repair: Students learn the operation and maintenance of hydraulic-powered machinery, plows, harrowers, cultivators, drills, planters, mowers, rakes, balers, and combines. Students must have completed Agricultural Mechanics 1 and 2.

Agricultural Science 1 Animals: Students are taught fundamental knowledge relative to livestock nutrition, feed stuffs, digestion; selection, fitting, and showing; and reproduction systems, principles of genetics, and breeding practices. Students conduct research and gain practical experience in the animal industry.

Agricultural Science 2 Plant and Soil: This course is an introduction to the basic plant and soil sciences with emphasis on soil properties, acidity and lime, fertility and fertilization, growth processes of plants, plant propagation, insects and diseases, and seed and plant selection.

Agricultural Science 3 Horticulture: Students learn procedures of greenhouse management and study the growing of fruits, vegetables, flowers, trees, shrubs, turf grasses, and other plants grown for sale, ornament, food, and interest. Students must have completed Agricultural Science 1 and 2.

Agricultural Science 4 Irrigation and Farm Irrigation: This course includes detailed study and practical application of production and management practices pertaining to field crops such as corn, cotton, rice, soybeans, and cereals. Students must have completed Agricultural Science 2 to enroll in this course.

STAFF AND ADMINISTRATION

There are three teachers in the vocational agriculture department with each assigned a field of specialization—high school students, soil science, and animal science. The staff includes a soil scientist, an animal scientist, and a mechanical engineer. The number of sections and size of each course is a function of the number of students enrolled in the course. The flexible curriculum allows students to enroll in as many courses as he is able to schedule.

Students terminating their education with high school graduation are given credit for Agricultural Science 1 and 2 which enables them to take two or more semesters of vocational agriculture each year. Many students in their junior and senior years enroll in one or two semesters of occupational agriculture courses each year. These students may take two semesters of junior high school and two semesters of vocational agriculture courses in senior high. Class schedules are arranged so that students may take the courses they need to build a solid foundation for their future vocations.
FUNDAMENTALS OF SERVICE. ENGINEERS. Moline: Deere and Company, 1968, 234 pp. $6.50 single copy; $4.85 each for ten or more copies; $61.00 for 300 or more copies.

This manual covers all engine systems—fuel (three types), intake and exhaust, lubrication, cooling and new governing. The 670 illustrations and actual photos of bulbs and wires and interest to the material presented. Also included are test equipment and service tools needed for engines, engine diagnosis and testing, a complete chapter on tune-up, test tools, and glossary. All theory in this comprehensive publication is related to actual use.

The Service Publications Department at Deere and Company researched the manual. Chapters were assigned to experts in the field. Service engineers at the Deere Waterloo and Duluth, Iowa, factories were the key chapters. Copy was reviewed by the company's own design engineers and by outside vendors to assure technical accuracy and comprehensive coverage. As with other publications in the series, all material is presented objectively and without a commercial message.

The book was originally prepared for use in training apprenticeship mechanics at retail dealership. But it should be useful to anyone interested in engines. The simple clear explanations and the comprehensive coverage should make the publication applicable to a wide range of educational situations.

Benton B. Beigel
Illinois State University

FUNDAMENTALS OF SERVICE—HYDRAULICS. Moline: Deere and Company, 1967, 170 pp. $4.00 single copy; $3.75 each for five or more copies; $35.00 for 300 or more copies.

This manual starts with the basic ideas of how electricity works. Then introduces the symbols and words used in hydraulic diagrams. And has spot tests at the end of each chapter.

The publication is aimed at advanced machinery dealers for training new mechanics and high schools and vocational and engineering schools for courses in power machinery. The attractive, soft-cover book with quality paper, good layout, appropriate use of color and many clear illustrations should be useful as an instructional aid and reference in high schools, technical schools, colleges, and universities. Anyone with an interest in hydraulics should benefit from studying the manual.

Benton B. Beigel
Illinois State University

BOOK REVIEWS
GERALD R. FULLER, Special Editor
University of Vermont


This book is a product of the Portland Cement Association, an organization to improve and extend the uses of portland cement and concrete. The information contained in this publication undoubtedly is correct and of the latest source.

The text contains nine chapters beginning with what constitutes the portland cement industry and what is concrete and what is the Portland Cement Association. Then follows chapters on the chemical composition of cement, setting, hardening processes, strength, durability and weathering, expansion and contraction, use of cement and concrete. The book contains many photographs, charts and graphs to tell the better the story of cement and concrete.

The text is designed to give facts and figures on the industry as well as the scientific research involved. The text does not deal with the "how to do it" phases of concrete and concrete masonry. This text would best be used as a reference for each student. All of as a personal reference for the teacher and not as a required reference for each student. All of the companies who manufacture portland cement are listed as well as the Portland Cement Association District Offices.

Benton B. Beigel
Illinois State University

Outstanding Young Member Award, increased their contribution from $1,000 to $5,000 in support of the program. This will permit a winner in each of the six regions to attend the National Convention. NVATA is pleased that U.S. Steel found the program acceptable and decided to increase their contribution.

"Coffee House" was sponsored at the National FFA Convention for NVATA members and for student teachers.

For the third year, a Professional Personnel Recruitment booth was placed at the National FFA Convention. The booth had a new look thanks to the efforts of chairman of the event —Sam Stenard. Hundreds of advisors and thousands of FFA members visited the booth.

The NVATA By-Laws were reprinted to include all recent amendments and state associations were notified that a supply is available.

A certificate for the Professional State Association Award was designed and printed.

New application forms for the Outstanding Young Member Award and The Professional State Associations Award were developed.

Eight state associations are buying additional copies of "News and Views of NVATA" for distribution within the state. These are mailed in bulk to the National Office at a cost of 25 cents per copy. Associations now receiving "News and Views" are Washington, Kansas, Nebraska, Kentucky, Florida, Georgia, New Jersey, Virginia, and Minnesota. Nebraska sends copies to student teachers only. All others go to the state vocational agriculture teachers association.

Business, industry, and others continue to become more cognizant of NVATA as evidenced by more invitations to participate in meetings, appear on programs, and serve on important committees.

September 29, 1969

THE AGRICULTURAL EDUCATION MAGAZINE
Douglas Moen, vocational agriculture teacher at Burlington, Colorado, provides small group instruction on the care of the radish crop. (Photo by Irving Crew, 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-automatic baggers for planting plants. (Photo by Walter McCrory, Michigan State University)

Vocational agriculture students apply the results of research in agriculture. Prew, 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 M. S. Upton, South Dakota)

Featuring — INSTRUCTIONAL PROGRAMS IN ORNAMENTAL HORTICULTURE