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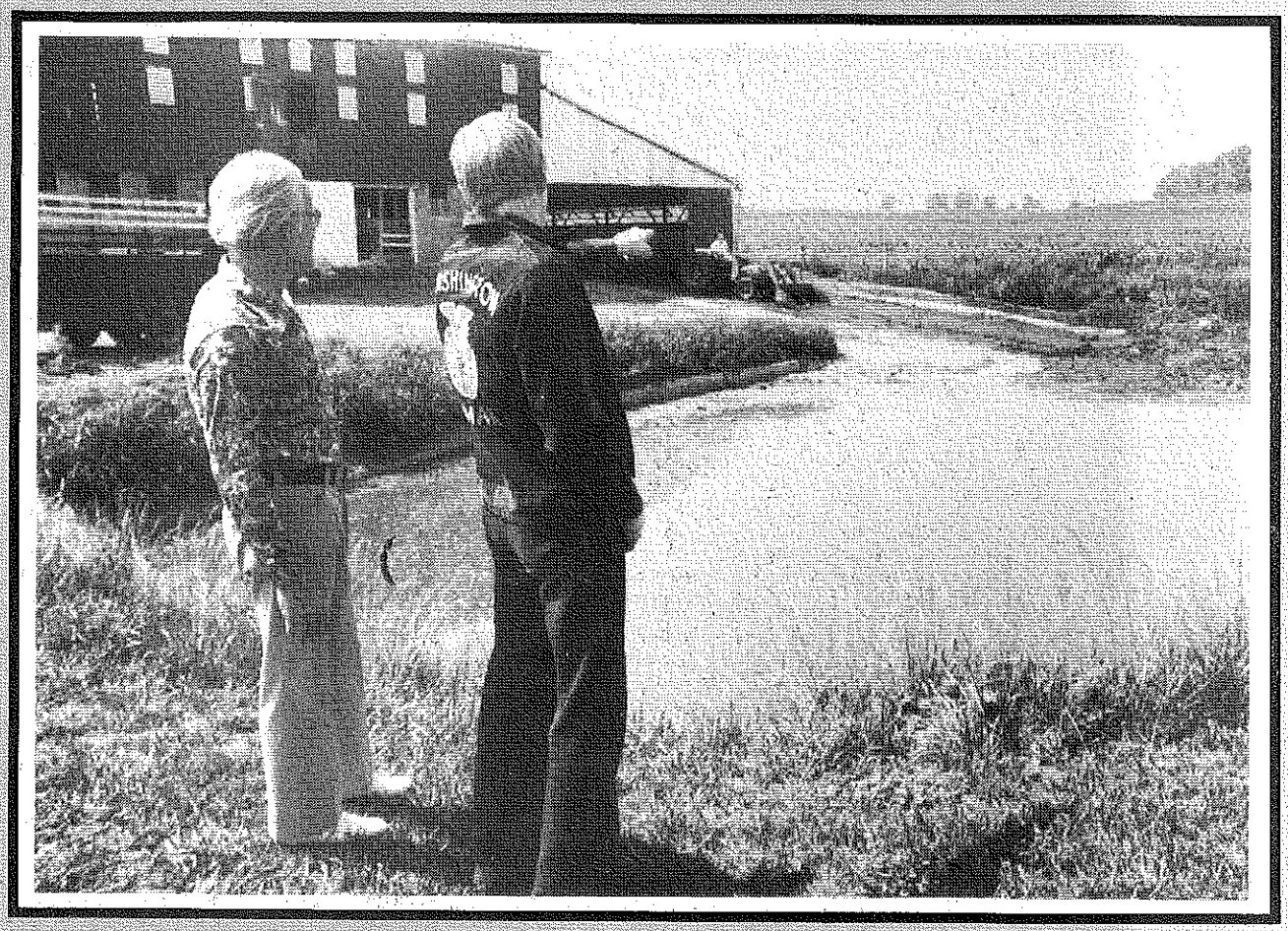

THEME: Using Laboratories

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EDITOR'S PAGE

Instructional Laboratories Maximize Teaching-Learning Efficiency

JASPER S. LEE, EDITOR
(The Editor also serves as Professor and Head, Department of Agricultural and Extension Education, Mississippi State University.)

Programs of vocational-technical education in agriculture use a variety of facilities for instructional purposes. One of the more prominent facilities is the instructional laboratory. The laboratories needed are those which maximize efficiency in the teaching-learning process. Laboratories should be equipped with fixtures, supplies, and other apparatus used in developing agricultural competencies.

A variety of laboratories are used in modern instructional programs. In high school programs, the typical laboratory is often known as the "shop." Further, we need to move away from the use of the term "shop" because it dates our instruction and programs. We need to move toward using the term "laboratory" in conjunction with the facilities in which hands-on learning takes place. Also, not every program needs a "shop" as part of its facilities.

A few examples of the laboratories which may be needed include the following: bedding plant laboratory, agricultural mechanics laboratory, forestry laboratory, meats laboratory, farm supplies and sales laboratory, and beef cattle laboratory. The kind of laboratory facilities needed depends on the content of the instructional program.

Laboratory Design

The nature of an instructional laboratory is dictated by the competencies students need to develop for their agricultural career objectives. In other words, the design of and equipment and supplies in a laboratory should be determined by a program's educational objectives. Far too often, a particular area of instruction is included because the facilities are available. This doesn't mean that new facilities are needed if a program is to be modern or that new facilities have modern programs. Personal observation will occasionally reveal poor programs in modern facilities and good programs in old facilities. Instructional laboratories should be modified so that they develop relevant skills.

The laboratory facilities should be appropriately arranged and maintained. Improved arrangements make instruction more efficient and less demanding on the teacher. Poor laboratory arrangement may contribute to student management problems. For example, locating a laboratory some distance away from the school reduces time efficiency and often makes opportunities for students to misbehave. (Appropriate references should be used in planning facilities. The December, 1980, issue of THE MAGAZINE addressed the theme of Facilities.)

Laboratory Use

An instructional laboratory is an asset to a vocational-technical agriculture program only if it is properly used. There must be specific instructional objectives every time a laboratory is used. Laboratories are more than places for busy work or to escape the classroom. They are facilities in which professional teachers go about the business of teaching.

Competency development in agricultural mechanics is more than students building gun racks, cedar chests, and simple projects brought from home. Carefully planned, substantive projects are excellent vehicles for competency development.

Laboratories can be used to teach affective, cognitive, and psychomotor skills. Effectively using a laboratory probably requires more instructional preparation time than classroom instruction. Careful planning is needed to keep educational achievement high. It is suspected that educational efficiency in many of the 2 or 3 hour programs that make heavy use of laboratory facilities is low. A short-term (1 hour) experience of higher quality is better for learning than a longer-term (2-3 hours) experience of lower quality.

There are many sources of information on using instructional laboratories.

This Issue

The theme for this issue of THE MAGAZINE is Using Laboratories. Many suggestions are presented to help teachers make more efficient use of them. The assistance of the Theme Editor, Dr. Jack Pritchard of Oklahoma State University, is greatly appreciated.

The Cover

The cover photograph shows a vocational agriculture student discussing alternatives in his SOE — a "real world" learning laboratory. (Photograph courtesy of the National FFA Center, Alexandria, Virginia.)

THEME

Using Learning Laboratories

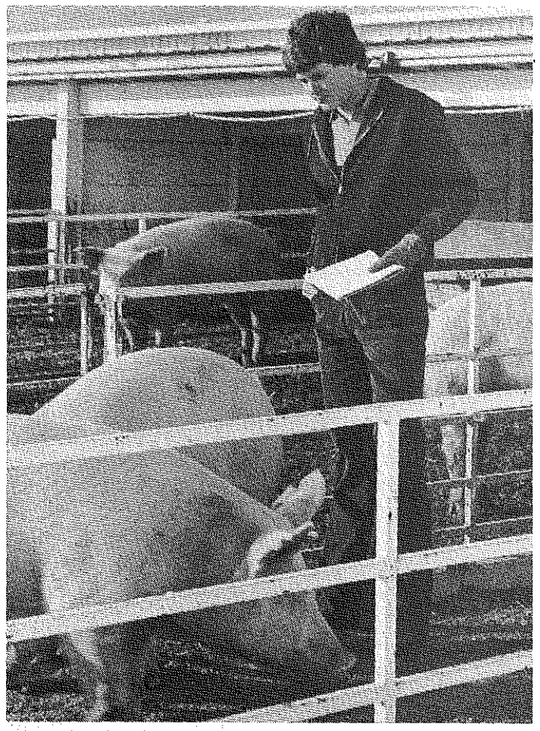
By Jack Pritchard, Theme Editor

Editor's Note: Dr. Pritchard is Professor, Department of Agricultural Education, Oklahoma State University, Stillwater, Oklahoma 74078.

One of the really unique aspects of teaching vocational agriculture is that the learning setting may take place in any number of locations. Teachers of vocational agriculture have said for years that much of the excitement associated with teaching vocational agriculture comes from the wide variety of learning settings available to the teacher. The setting could easily include the classroom, mechanics laboratory, greenhouse, school farm, local farm, community business, or a student's home setting, to name a few. Most of these are usually referred to as "learning laboratories."

There is very little doubt in the minds of those who have taught vocational agriculture that the laboratory is a very effective teaching/learning setting for students of vocational agriculture.

Learning in the laboratory setting is usually related to the development of various skills and abilities which might not be so easily taught, or maybe not taught at all, in the classroom. In vocational agriculture, we have usually thought of the laboratory as the place where information and abilities are applied. The "extra step" available to teachers of vocational agriculture is that there is always the opportunity to apply what is learned. Many believe that this "application phase" of vocational agriculture is one of the real strengths of the program.



Laboratory activities allow students to "learn by doing." This student at Hawkeye Institute of Technology, Waterloo, Iowa, is selecting replacement gilts on soundness of feet and legs. (Photograph courtesy of Virgil Christensen, Hawkeye Institute of Technology, Waterloo, Iowa 50704.)

It is interesting to note that in recent years the use of laboratories has received increased support from local communities. Laboratories are valued in providing students of vocational agriculture with practical hands-on experiences in agricultural mechanics facilities, school farms, and greenhouses. It is extremely gratifying to hear of the vast amount of local monies being channeled into these "learning laboratories." Such commitments on the part of local people for modern learning facilities indicate several things.

First, there is an awareness on the local level of what a viable vocational agriculture program must encompass. The local people are aware of vocational agriculture and what the program is doing for their young people. The image of vocational agriculture must be strong in order for local people to make such a commitment.

Secondly, there is an awareness in the community of the need for up-to-date facilities, equipment, instruction, and laboratories. These will be used to support instruction capable of preparing our young people for entry into certain fields of production agriculture or agribusiness.

You can be sure of one thing, local people do not make strong commitments for programs which cannot produce desired results. There may be those who question some of the things happening in a number of local communities. For instance, as we drive through some of our small communities we see rather poor or average school facilities as a whole, but we may see a new modern vocational agriculture facility nearby. This situation could very easily be a reflection of the communities' belief in that part of the system that gets results in terms of effective teaching and placement of young people in the community who are both productive in agriculture and good citizens.

Teachers of vocational agriculture in the field say that more and more of their students are coming from non-agriculture and non-farm backgrounds. It is quite easily seen that with these changes in our student population comes a strong challenge for every instructional program to provide as many "hands-on" experiences as possible. Laboratory experiences have always been an important part of every viable vocational agriculture program. Today, because of the dramatic changes in the background and experiences of our students, learning laboratories take on a whole new meaning and importance. For many students laboratory activities provide the first contact with the real, living, growing elements of agriculture.

It has often been said that we as teachers must "start where the students are" — not "where we think they should be." Many times the laboratory is that important first step in the learning process. The laboratory is a place where realistic learning activities become lasting experiences and sometimes lead to eventual placement of the student in a life-long agricultural career.

THEME

The Vo-Ag Shop As A Laboratory

By Clifton Braker

Editor's Note: Dr. Braker is Assistant Professor, Department of Agricultural Engineering, University of Arkansas, Fayetteville, Arkansas 72701.

Agriculture mechanics is an integral part of the instruction in vocational agriculture. Programs in agricultural mechanics vary greatly from one area or state to another, yet most all teachers of these programs have the same goal. This goal is to provide the mechanics activities related to the students' vocational agriculture objectives.

The vocational agriculture mechanics shop or "laboratory" is generally thought to be the place to make practical application of knowledge learned regarding mechanics. The philosophy of "learning by doing" is certainly applicable to this type of instruction. Students know that they will be doing some "hands-on" activities in the "shop" and are usually motivated to learn the subject being taught.

Evaluation

Evaluating instruction in a laboratory can be a problem for many teachers. In assessing student performance in mechanics programs, either or both the process or the product of the task should be measured. Both product and process assessments have their advantages — a decision must be made regarding which should be used. However, in many situations it will be advantageous to look at both process and product.

For example, in assessing an individual's skill in gas welding, the product can be easily judged. This can be done by looking at a finished weld and testing it for strength. In addition to this type of evaluation it may also be important to look at turning on, lighting, adjusting the torch, cutting or welding techniques, and turning off the oxyacetylene welding outfit. Any time safety may be involved in a skill, the process assessment should be a part of the total evaluation. By looking at the process, the areas of deficiency will become evident and additional work could be assigned. It is important for some areas to focus on both the process and product measures of performance.

Domains of Learning

Vocational skills are a complex integration of the three domains of learning — cognitive, affective, and psychomotor. Each area interacts with and is complemented by the other two. It is a mistake to assume that proficiency in one area indicates proficiency in the other two. For example, just because a student has a clear and extensive knowledge of masonry does not mean he or she can perform the psychomotor skills of mixing mortar and laying blocks. Conversely, proficiency in these psychomotor skills does not indicate a favorable attitude toward the masonry trade. Nevertheless, a vocational teacher must somehow assess and grade a student's performance.

The areas of cognitive and psychomotor development tend to lend themselves easily to traditional means of evaluation. Multiple choice, true-false, matching, short answer, and essay questions are all widely used as a means to determine the level of learning in the cognitive domain. Identification, work-sample, check lists, and numerical ratings are useful in determining proficiency in the psychomotor skills. The mere fact that scores can be derived easily is not enough.

The two areas must be weighed against each other and balanced to the point at which one combining grade can be reached. This is the evaluation problem. Which will be deemed the most important: knowing or doing? The view-

(Continued on Page 6)

Students in the agricultural teacher education program at the University of Nebraska-Lincoln are shown learning agricultural mechanics skills. (Photograph courtesy Jack Rudolph, University of Nebraska-Lincoln.)

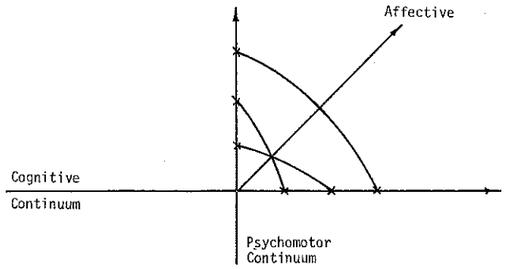
The Vo-Ag Shop As A Laboratory

(Continued from Page 5)

point of an educator is different from that of an employer. Industrial areas with training programs could possibly require less than those which expect immediate production. The dilemma is left up to the vocational teacher. It is he or she who must write the verdict on the grade report form.

The affective aspect of a student's development is not easily measured by such methods as true-false questions or skill samples. Attitudes and feelings toward subject matter are intangible and changeable. A few generalizations can be made about this elusive domain. Students who feel favorable toward a learning unit will usually study longer and score higher in the cognitive domain. They will tend to practice harder on the psychomotor skills, which should result in a higher quality product in this area.

These assumptions work conversely, also. If students receive high scores on cognitive and psychomotor skill tests, they are pleased with themselves. Their affective domain level should rise. This concept is illustrated as follows:



The above model shows a continuum of cognitive items intersected by a continuum of psychomotor items. The point of intersection should approximate the location of students when they enter a course. As the knowledge increases and manipulative skill improves, then the students interests or appreciations should increase. These domains are tied together. If the knowledge of students about a subject increases but they are never able to develop the necessary skills, then their interests may be low. Also, if the skill development is high but knowledge is low, the interest and attitude may also remain low. However, if both knowledge items and manipulative skills increase, then their interest and appreciation for a topic should increase.

The laboratory or shop can be a place to create interest, develop skills, and motivate students to learn more about agricultural mechanics. Scheduling students in the shop to learn about mechanics skills related to another area, such as animal science, can increase the student's interest in the area of animal science. Not only will the students be interested in learning mechanics skills, but they also should be more interested in the other areas of study. They can see how the mechanics program will relate to the other areas during the instructional program.

Broader Emphasis

To summarize, agricultural mechanics is an area that has broadened the emphasis of vocational agriculture programs. The theory of "learning by doing" is applicable to the mechanics shop. However, evaluating skills can be a problem. A teacher must consider the skill and determine if the product or process of completing the skill is more important. It is important to include safety in teaching all skills. Through the use of a laboratory or shop, interest may be created in other areas of instruction.

BOOK REVIEW

AGRIBUSINESS PROCEDURES AND RECORDS, by Delene and Jasper S. Lee, New York, New York: Gregg Division, McGraw Hill Book Company, 1980, 133 pages including a glossary, $5.32, $3.99 school price.

AGRIBUSINESS PROCEDURES AND RECORDS is designed to help students develop knowledge and skills in using efficient procedures for agribusiness operation. Recordkeeping is a strong emphasis throughout the text.

The text is divided into four units. Unit I, "Introduction to Agribusiness Procedures," prepares the student for development of skills needed in agribusiness. It includes two chapters: "Determining the Procedures in Agribusiness" and "Exploring Job Opportunities". These chapters discuss the relationship between farming and ranching as well as the effective operation of agribusiness. Career opportunities are also discussed in these areas of agribusiness.

Unit II, "Routine Agribusiness Procedures," discusses specific procedures in the general areas of communications, credit, billing, and inventory. There are three chapters included: "Using Effective Communications Procedures," "Handling Credit and Billing Procedures," and "Maintaining the Inventory."

Unit III, "Agribusiness Records," discusses the importance and uses of specific records in agribusiness. Maintenance of these records is included throughout the unit. It contains four chapters: "Determining the importance of Agribusiness Records," "Using Basic Recordkeeping Concepts," "Using Sales and Purchases Records," and "Using Payroll Records and Reports."

Unit IV, "Agribusiness Records Management," discusses the importance of records as a management tool. Unit four contains two chapters: "Filing Agribusiness Records" and "Understanding Data Processing and Recordkeeping."

At the end of each chapter, the 'end-of-chapter' questions provide another avenue of achieving the goals set for the student. Many illustrations, case situations, and work situations which are intertwined within the text provide ways of developing the knowledge and skills needed in a job.

The text is joint authored by Delene W. Lee and Jasper S. Lee. Delene Lee is a Professor of Business and Vice President for Financial Affairs at Mississippi University for Women. Jasper Lee is Head, Department of Agricultural and Extension Education, Mississippi State University.

James M. Garrison
Virginia Polytechnic Institute
and State University

THEME

How "Shop" is a Part of the Keota Program

BY PHILIP FUSS
Editor's Note: Mr. Fuss is a vocational agriculture instructor at Keota High School, Keota, Oklahoma.

Agricultural mechanics instruction is an important part of the vocational agriculture program. It provides a tool for "learning by doing" in agricultural mechanics. Students have the opportunity to learn marketable skills needed for today's highly mechanized agriculture. Further, instruction in agricultural mechanics helps students develop self-confidence. Student interest and attitude often improve. This change may carry over into other classes in the school.

The program at Keota, Oklahoma, has two vocational agriculture teachers. Ninety students are enrolled. The classes include Production Agriculture I, II, III, and IV; Vocational Horticulture I and II; and Vocational Agriculture Mechanics I and II.

Agricultural Mechanics Instruction

In Agricultural Mechanics I, high school junior students learn the basic skills in identification and use of hand tools. Along with this, the students are taught tool sharpening and conditioning. Other skills taught include arc welding, oxacetylene cutting and welding, braze welding, the use of power tools, and farm plumbing. Safety is heavily emphasized during all areas of agriculture mechanics. Electricity, small engines, concrete, and the use of the farm level are taught in vo-ag III. Agricultural mechanics is not taught in other production agriculture or horticulture curriculums.

Agricultural Mechanics II is offered only to senior students who have completed the theory and skill developments in Agricultural Mechanics I. Students apply skills already learned as well as develop new ones. This is accomplished through shop project design and construction as well as equipment repair.

Many competencies can be taught and learned through project work. The development of basic mechanical skills must be emphasized. Almost all the skills learned in the agriculture shop can be used in most all agricultural fields the student might choose.

Project Construction

Many vocational agriculture teachers may feel that the agriculture mechanics shop is used only for the repairing or building of projects for the student's own supervised agriculture program. This is true when the need for such work is required and should be of first priority. Many of the projects in our agricultural mechanics shop are designed, constructed, and sold to farmers in our community and surrounding areas.

Agricultural mechanics is one field where evaluation by performance is inherent. The students often have the opportunity to take an order from an area rancher for a particular project. To complete the project, the student must design, determine the bill of material, construct, and market the finished product to the client.

The construction of projects which are marketed to the public has served as an outstanding personal relations tool between our program and the community. The marketing of projects has also enabled us to better finance our total vocational agriculture program.

The demand for large hay handling and hay feeding equipment has been so great the past few years that students must work after class hours on a regular basis constructing these projects. These students learn skills that cannot be taught during scheduled class time. As graduates, these students can better perform their work, which is a strong indication of this very vital program.

Students begin to identify themselves as an important part of the program when they successfully complete a project from planning to the finished product. Once this feeling is developed, the students begin to recognize their own worth and value to the program, and more importantly, their place in it.

Project construction requires a lot of planning on the part of teachers. They should always be on the look-out for new ideas. It seems that these new ideas usually come about when changes in the supervised occupational experience programs of students require equipment and facilities or when the community demands it.

Ideas Unlimited

The National Vocational Agricultural Teachers' Association's Ideas Unlimited Contest, which is sponsored by Ruritan National, is a great way for teachers to share and exchange classroom, FFA, and other teaching ideas. This is especially true with agricultural mechanics project construction. The idea submitted may be original or borrowed. The contestant must tell how it is used and how it will help others by using 500 words or less, with not more than one page of descriptive materials.

In our state, each of the five districts selects a winner with one being recognized as the state winner during our summer conference. The state winner is then entered in the regional contest. Regional winners are selected with the national winner being selected from the regional finalists. The regional and national awards are presented during the NVATA Convention in December of each year. Contest rules should be available through the state secretary of the state associations.

In summary, agricultural mechanics is an exciting area of vocational agriculture to teach. The construction of projects provides a stimulus for skill development. Students will find it easier to enter the world of work if teachers take the time to train them.

THEME

Production Agriculture on Two City Blocks

By Dwight Surface and Wes Holley

Editor's Note: Mr. Surface is a vocational agriculture instructor at John Marshall High School in Oklahoma City, Oklahoma 73114. Dr. Holley is Assistant Professor, Department of Agricultural Education, Oklahoma State University, Stillwater, Oklahoma 74074.

How do you turn two city blocks (approximately 4½ acres) into agricultural production for 76 vocational agriculture students? What determines an agricultural production project? Is a production project the number of acres in cultivation, the number of head of livestock, or the size of a greenhouse? Consider production agriculture on two city blocks in Oklahoma City, Oklahoma. Oklahoma City is a community of 401,000 people and in the midst of those people are two city blocks devoted to production agriculture for the John Marshall Future Farmers of America. The 4½ acres are known to the students at John Marshall High School as the "school farm." The school farm idea is nothing new to most of us. However, this school farm has contributed greatly to students, community, and adults in many different ways.

Use What You Have

How does the John Marshall school farm provide opportunities? A very simple philosophy is followed: "**use** what you have." The facility has been available to students in vocational agriculture since the late 1950's. Only recently has it been expanded and updated to reach more students through a more effective learning environment. The Oklahoma City Public School System, recognizing the need for a new facility, designed and built a new "Life Science Laboratory" on the school farm site in 1980. The impact of the facility was anticipated, but not fully realized until after its completion.

The facility was designed to provide as many learning opportunities for as many people as possible. The guiding principle was a hands-on approach for those who would be in the vo-ag program and when appropriate, facilities would be available for other groups or classes. The promotion of production agriculture was basic to the design, allowing for as much versatility and flexibility as possible.

One agreement reached with Oklahoma City Public Schools was that the Life Science Laboratory would be available to as many students, children, and community groups as possible and that Oklahoma City students could and would be exposed to production agriculture.

The Design

The complex was developed with four primary areas: a classroom area, demonstration area, a containment area for animal growth and development, and a horticulture area.

Classroom Area

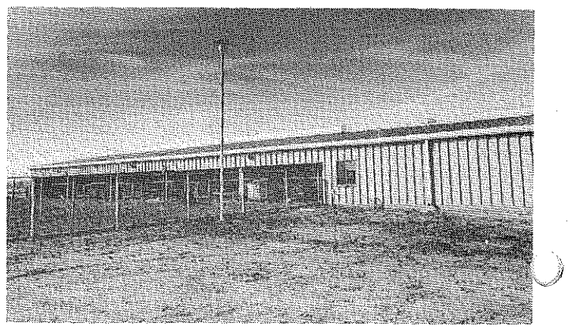
The classroom area is an excellent example of the versatility and flexibility of the building. The classroom has all the necessary elements to be classified as a well designed, usable classroom. It also doubles as a wash room for washing animals during cold weather. There are many other activities and groups utilizing this classroom area. FFA meetings, community meetings, Kiwanis meetings, legislative dinners, booster club meetings, and recreational activities are all conducted using the classroom facilities.

There are some very special activities which deserve special mention. Each year the members of Oklahoma League for the Blind are brought to the facility and a program is provided so that the children can touch and feel animals of all kinds. If this opportunity was not made available, these people would have little, if any, chance in Oklahoma City to experience that close contact with agricultural animals. Also, each year the Food for America program brings in young children from pre-schools, kindergarten, elementary schools, Bluebirds, Brownies, and Cub Scouts from throughout the city to visit the school farm.

Demonstration Area

The demonstration area serves a variety of needs for students who are participating in the vo-ag program. This area is equipped with a set of roll out bleachers which will seat 50 people. Demonstrations involving livestock skills, judging skills and many other areas can be performed by instructors or resource persons with ease. The area is large enough and has access so that large livestock equipment or vehicles can be brought in for demonstration purposes. It also doubles as an area where the local stock show is held, and temporary pens can be constructed to contain animals for special events, such as a barnyard and the Oklahoma League for the Blind petting area. Because of the accessibility of the demonstration area, groups or organizations will use the area to conduct special programs.

Surrounding the demonstration area are animal containment areas with connecting exercise lots and cattle. The pens are made available to students who wish to involve themselves in animal production such as fattening, showing, marketing, and, to a limited degree, breeding animals. The facility will house approximately 60 head of sheep and 20 beef animals. This allows students to apply classroom learning in practical situations. Pens are constructed to contain as well as protect animals from the environment and possible injury from dogs in the surrounding community. Additionally, the entire 4½ acre complex is surrounded with a 6 foot chain link fence.



One view of the facilities at John Marshall, showing the livestock area.

Each pen is designed with automatic waterers and gives freedom for each animal to roam in and out of the exercise lot. The individual pens for animals allow students to develop and implement rations and other special considerations for their individual animals which may need special medical treatment or care.

Horticulture Area

The horticulture area is adjacent to the Life Science Laboratory and provides students with an opportunity to grow crops as a production project. The students have this outside growing area and a greenhouse located at the high school. Each student participating in the plant production program must successfully grow and care for a certain number of plants. Each student is provided with growing space in the greenhouse and a portion of the garden area outside. The outside garden requires each student to plant, fertilize, and care for the plants throughout the summer. A portion of their grade is based upon how well their plants are grown and the amount of care given during the growing season.

If these facilities were not provided, less than 5 percent of the students would have projects other than some type of work experience program.

The Measure of Success

How do you measure the success of this particular urban program? At present the program has two teachers and 76 students enrolled. Thirty of those students have animal production projects while the remaining 46 have horticulture projects. In the last 4 years, the graduates of the program have gone on to major in agriculture in college or work in an agriculture occupation. Ten students are in college training to become vocational agriculture teachers, approximately 70 students are in college majoring in agriculture, and 60 students are employed in agricultural businesses. This is impressive enough, but consider some of the other achievements of the young people in this program: six state farmers, one American Farmer, one Western Region Horse Proficiency Award Winner, one member participating in the WEA Program, a State Vice President-Central District, a State President, a National President, Grand Champion Lamb at the American Royal and many other awards. The success of any program is directly related to how you "use what you have." The John Marshall program in Oklahoma City makes maximum use of learning laboratories — so can you.

The Food for America Program at John Marshall allows city youngsters to touch and feed farm animals, often for the first time.

BOOK REVIEW

Handbook of Livestock Management Techniques by Richard A. Battaglia and Vernon B. Mayrose, Minneapolis: Burgess Publishing Company, 1981, 583 pp., $24.95.

The Handbook of Livestock Management Techniques is a comprehensive text that covers most every phase of livestock production. Many new innovations and livestock practices are included in the book with numerous diagram-type illustrations to aid the reader in comprehension of the concepts.

The handbook includes management practices and chapters in livestock restraint, beef cattle, dairy cattle, swine, horses, sheep, goats and poultry management sections. An animal health chapter and a detailed appendix with a thorough glossary are also included in the text.

Each of the chapters is designed in a logical order, giving an introduction on each specie of livestock. It contains new important information such as estrus synchronization, artificial insemination, growth implants, heat detection and health techniques. The well known and proven practices in livestock management are discussed in detail and the book gives step-by-step instructions.

A section that is extremely well done is on abnormal birth presentations, which includes illustrated corrective measures. Another section that is good reading for any beginning hog farmer is a step-by-step procedure on preparing sows for farrowing. Included is a detailed listing of equipment and supplies needed and the type of restraint recommended.

The authors are both professors of animal science at Purdue University. They have developed an excellent text that would be informative to anyone. The text is well suited in animal production for high school vocational agriculture as well as basic animal science in community colleges and universities and would make a good reference for anyone.

Richard E. Jacobsen
Graduate Student
California State University,
Fresno, California 93740

THEME

Systematic Approaches to Planning, Organizing, and Using Agricultural Mechanics Laboratories

Agricultural educators recognize that agricultural mechanics is definitely a major part of instruction for all students enrolled in vocational agriculture. After identifying agricultural mechanization instructional units, organization and layout of the mechanics laboratory can proceed. A systematic approach should be followed when planning and organizing a laboratory. A systematic approach helps to arrive at the most efficient laboratory organization and equipment arrangement and to provide instructional efficiency and productivity.

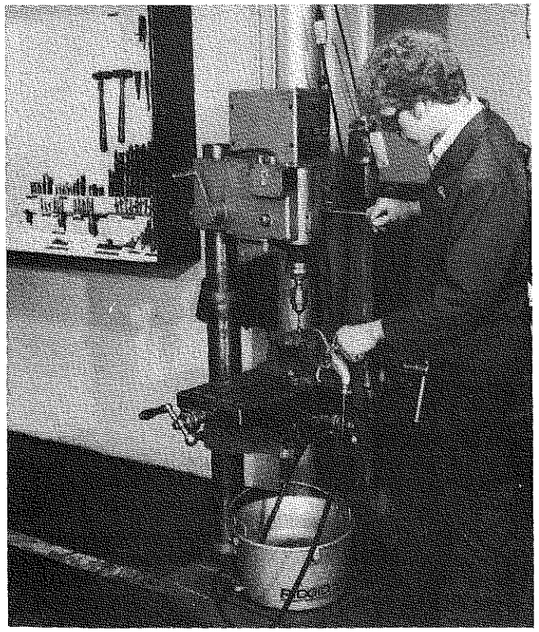
By A. Pat Pruitt and William Lamb

Editor's Note: Dr. Pruitt is Associate Professor, Agricultural Education Department, Utah State University, Logan, Utah 84322. Mr. Lamb is Assistant Professor in the same department.

Key Questions

Answers to questions such as the following should be obtained:

- How can an agricultural mechanics laboratory be organized that is efficient for teachers and students to work in and that can be maintained in an orderly manner?
- How can space and equipment be justified?
- How many students can the facility adequately serve? (This would include adults and other continuing education programs.)
- How do agricultural educators communicate with architects and facility planners?



The drill press work station has the necessary equipment on the tool board to do a variety of jobs. Note the oiler, multi-directional vice, and clean-up equipment.

A Systematic Approach

Usually, it is impractical or impossible to have enough work stations for every student in the laboratory. Therefore, the first step in implementing a systematic program approach is to identify the number, location, and type of work stations needed in the laboratory. These should be based on needs of the students, career choices, and transfer skills.

The second step is to organize the task and process analysis of the skills the students are expected to accomplish at each station. A schedule of rotation of students through the work stations in the various areas to accomplish specific learning objectives is essential. This is a student management skill needed by the instructor. The arrangement of tools, equipment, and materials is important. This may appear very technical, but it is the same type of procedure engineers use to analyze complex industrial units. In a teaching situation, it is as simple as the teacher thinking through the steps and going through tasks that are planned for the student to accomplish.

This familiarizes that teacher with the actual activities that are required for students to complete the assigned tasks. Once each task is broken into steps, the flow of material, tools and students is obvious. A rotation schedule should be planned to move students through the work stations. Equipment purchases should be made to "balance" the systematic rotation. The amount of equipment needed in any one area depends on the task time and the number of students that fit into the rotation schedule.

To determine the number of machines, equipment, and materials needed, an engineer/teacher would time the length of machine-time required for each student. The number of students to complete the task would indicate an ideal student-machine ratio for the most efficient use of time for that task. For project construction and farm machinery repair, the efficient flow of material, equipment, and students through the laboratory is an absolute essential.

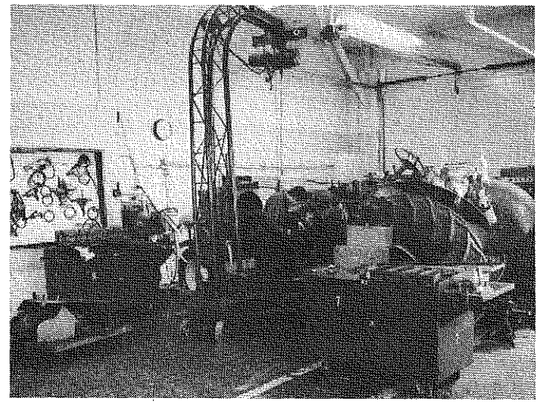
In the laboratory the instructor assists, instructs, and supervises students. The distance the teacher walks to supervise is also related to the distance students, tools, and materials travel. The travel paths of the teacher must be considered to minimize teacher effort and maximize teaching efficiency. The supervision time of students at work stations and elsewhere must be considered. The learning objective is the essential aspect in student management for skill development.

If there is a question concerning the efficiency of a laboratory arrangement, various alternatives should be outlined in order to find better ways of doing things or comparing alternatives. It is often helpful to write out steps, draw flow charts, and measure distances. This prepares the instructor to do another technical engineering process called "work simplification." As with most management techniques, work simplification involves the use of common sense. After work simplification comes economy in motion principles and station organization.

Laboratory Efficiency

In the past, laboratory efficiency has not been studied by agricultural educators. Travel path studies need to be conducted to bring about improvements and make agricultural mechanics laboratories more efficient. Agricultural educators have been slow in making time and motion studies, laboratory work efficiency studies, and adapting to procedures that are standard. Laboratory management has not kept pace with productivity improvements. Many vocational agriculture departments are using floor plans, equipment organization ideas, and teaching units that are out of date, even though they are just off the press. Some teachers are known for running junkyard type, unorganized shop programs.

Until leadership from within arrives with innovative solutions, agricultural educators will continue to be forced to be their own engineers. At least a systematic approach is a defensible, organized procedure for finding answers to laboratory management problems. The organization of learning activities for maximum productivity and efficiency of time and effort is one area where everyone can make improvements in instruction through a systematic approach and improve "learning by doing."



Engine, transmission, and final drive repairs on large tractors require a minimum floor space of 20 x 25 feet. This allotted space allows for the crane, tools, benches, and parts to be in close proximity.

ARTICLE

Lesson Plans on Soybeans Now Available

The American Soybean Association (ASA) and BASF Wyandotte Corp. are producing vocational agricultural lesson plans on soybean production, announces Mr. Dan Reuwee of ASA.

The lesson plans, which include student work sheets and visual teaching aids, will be available, free of charge, to vocational agriculture instructors in major soybean producing states. The plans have been developed for use in both secondary schools and adult education programs.

ASA and BASF recognize that a vocational course specifically geared to the principles of soybean production is beneficial to the health of the whole industry.

By Jeff Winton

Editor's Note: Mr. Winton is with the American Soybean Association, Box 27300, St. Louis, Missouri 63141.

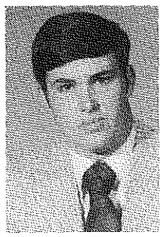
"Production practices are changing so rapidly that we see a need for continually updating agricultural courses to keep students and producers aware of the best and latest techniques available," says Mr. Burghard Elster of BASF.

"Since economics is such an important part of soybean production today, economic analyses — of planting, growing and harvesting — are key elements of the lesson plans," explains Mr. Reuwee of ASA. "Such basic education helps promote our objective of improving profitability for soybean farmers throughout the country."

The lesson plans, which consist of nine units covering topics ranging from minimum tillage to pest control, are available from American Soybean Association, Box 27300, St. Louis, MO 63141, Attn: Mr. Dan Reuwee.

THEME

Learning Laboratories for Prospective Teachers of Vocational Agriculture



By James R. Collins and James D. White

Editor's Note: Mr. Collins is Graduate Teaching Assistant and Dr. White is Assistant Professor, Department of Agriculture Education, Oklahoma State University, Stillwater, Oklahoma 74074.

The leadership aspect of vocational agriculture programs has been a major selling point for many years. Many school administrators, legislators, and community leaders, even those with no interest in agriculture, have supported vocational agriculture over the years because of the leadership training that students receive through vocational agriculture and the FFA. It is quite apparent that if we are to have quality programs and the high levels of support necessary to maintain these programs, leadership activities must have a high priority from the local chapter level all the way to the national level.

Teacher and Student Background

One of the key figures in the development of leadership in vocational agriculture is the local vocational agriculture teacher. The quality of leadership activities and training that takes place in a local vocational agriculture program can many times be traced to the leadership background of the local advisor. Many vocational agriculture teachers come from a background of active FFA participation in high school. Their background in, and many times their enthusiasm for, leadership activities and leadership development may depend upon the degree to which leadership was emphasized in their home high school FFA activities. However, some vocational agriculture teachers do not possess an FFA background.

Regardless of whether vocational agriculture teachers have a background in FFA, they tend to have one thing in common: most have been involved in a teacher education program preparing them to teach vocational agriculture. This period of time can be a very crucial period in the leadership development of the prospective vocational agriculture teacher. The time that a student spends in college represents a void between active participation in the local FFA chapter and entry into the vocational agriculture teaching profession. Even if students continue their membership in local chapters, many times their ties to the FFA may be weakened by being a long distance from home or by the lack of time available to devote to the local chapter, due to the demands of college work.

For the prospective teacher without a background in vocational agriculture and FFA, the college years may represent a time in which he/she would like to take more interest in what the chapter is doing "back home," but are unable to do so because of the same limitations as the previously mentioned students. The college years clearly represent a void that needs to be filled in the career of the prospective vocational agriculture teacher. For students with an FFA background, it is an opportunity to continue and build upon the leadership training which started in the local chapter. For the student with no FFA background, it can be a time for the development of leadership qualities which will be necessary upon entering the teaching profession.

College or University Leadership Experiences

In order for young people who are preparing for careers as vocational agriculture teachers to develop leadership during their college years, there need to be sources of leadership activities available to them. Two excellent sources for leadership activities are the undergraduate agriculture education courses and the Collegiate FFA. Through these sources, students can be provided a variety of leadership activities which will benefit the students regardless of their leadership backgrounds.

Classroom Activities

Pre-service courses in agricultural teacher education can be used to accomplish not only objectives in program planning, supervision, teaching methods, to name a few, but also provide the forum for the development of leadership skills and abilities. Two activities which offer excellent leadership opportunities are public speaking and parliamentary procedure. These are activities which can benefit students both personally and professionally. The students develop speaking skills and gain an understanding of democratic principles which will be useful to them throughout life, regardless of whether they choose to enter the teaching profession. The benefits are even greater if the student teaches vocational agriculture, since they will aide them in teaching these skills to their students.

A teacher who has personally participated in a parliamentary procedure contest or a public speaking contest will have an advantage when the time comes to train students for these contests. This personal experience in a contest situation may tend to increase a prospective teacher's enthusiasm for these types of contests and encourage the student to promote these types of activities upon entering the teaching profession.

At Oklahoma State University, students are given the opportunity to participate in both the parliamentary procedure and public speaking contests in their undergraduate agricultural education courses. These class contests also hold an extra advantage for the students. The contest judges are usually members of the state supervisory staff that the students will be working with when they enter the teaching profession. This allows the students to become familiar with the supervisory personnel prior to entering teaching. Also the supervisory staff becomes familiar with the people who will soon be under their supervision.

Departmental Club Activities

Collegiate FFA activities at Oklahoma State University offer a variety of leadership activities for prospective vocational agriculture teachers. Students have the opportunities to hold offices and serve on committees similar to the high school chapters. Officers are elected each semester and students are encouraged to serve on the various committees that carry out the chapter's program of activities.

Collegiate members take an active role in promoting the agricultural industry and the university as well as working to recruit potential students. Recruitment activities are not limited to only the agricultural education program but are aimed at the entire College of Agriculture as well. Chapter members also work with high school FFA chapters to create an awareness of agricultural careers among high school students. These types of activities give the collegiate members an opportunity to use public speaking skills before high school groups and help them to become oriented to working with high school age students.

Collegiate FFA members are also highly involved in working with high school students through the various FFA activities. This enables the prospective vocational agriculture teacher to become involved in these activities in a manner that is different from the participant role that they may have had while in high school. Members work at the Tulsa State Fair and the State Fair of Oklahoma in Oklahoma City and assist with the livestock show activities. This provides the members with opportunities to see these types of activities from a different viewpoint and also provides them with a chance to keep up-to-date while attending college.

Many times in the period between high school participation and entry into vocational agriculture teaching, there are major changes in the types of livestock that are considered desirable in the show ring. Aside from the leadership benefits of these activities, members can be helped to avoid entry into the teaching profession and finding that what they thought was a good animal is now standing at the bottom of the class.

Leadership and judging contests are areas where members can gain leadership experience. In taking on the responsibilities of assisting in the conduct of these types of contests, members can gain valuable insights that may aide them later on in their careers. Other activities, such as serving as a judge for a local chapter's creed speaking contest, give the students experiences which are of personal as well as professional benefit.

OSU Collegiate FFA members conduct various fund raising activities. Although the leadership benefits of such activities are not readily apparent, they become more clear as the money is put to use. The chapter recently began its own scholarship program for prospective vocational agriculture teachers who are involved in student teaching. These scholarships are intended to help relieve some of the financial pressures of the student teaching experience. The chapter also contributes to the OSU agricultural education scholarship program which is underway. These types of activities which are based on working to help others can help develop the service discipline much needed in the vocational agriculture teaching profession.

Opportunities at the University

The time that a prospective vocational agriculture teacher spends at a college or university indeed offers some opportunities in the area of leadership development. Agricultural teacher education departments and collegiate FFA chapters can play a key role in filling a void that exists and provide a time for erasing leadership deficiencies. This can be easily accomplished through student involvement in classroom and departmental club activities. If vocational agriculture is to continue to provide the level of leadership training that has won support for the program in the past, we must have vocational agriculture teachers with a broad background in leadership. The current shortage of vocational agriculture teachers tends to make it even more critical. If we ever allow vocational agriculture to reach a point where leadership and FFA are not synonymous, any troubles that we have now may be only the tip of the iceberg.

The Research Committee of the Agricultural Education Division, AVA, Calls For Papers

This is the CALL FOR PAPERS to be considered for presentation at the Ninth Annual National Agricultural Education Research Meeting on December 3, 1982, in St. Louis, MO, in conjunction with the American Vocational Association convention.

PAPER PROPOSAL SPECIFICATIONS: Seven copies of the research summary (not to exceed five pages double spaced) should be submitted for use in determining the final program participants. The summary should include:

A. Objectives of the Study
B. Methods
C. Data Sources
D. Results and/or Conclusions
E. Educational or Scientific Importance of the Study
F. Name(s) and Mailing Address(es) of the Author(s)

Deadline for Receiving Paper Proposals:
June 15, 1982

Send Paper Proposals to:
J. Dale Oliver, Program Chairman
National Agriculture Education Research Meeting
Division of Vocational and Technical Education
243 Lane Hall
Virginia Polytechnic Institute and State University
Blacksburg, VA 24061

THEME

Uses of Land Laboratories

By Charles Zinner
Editor's Note: Mr. Zinner is a vocational agricultural teacher at Plant City High School, Plant City, Florida 33566.

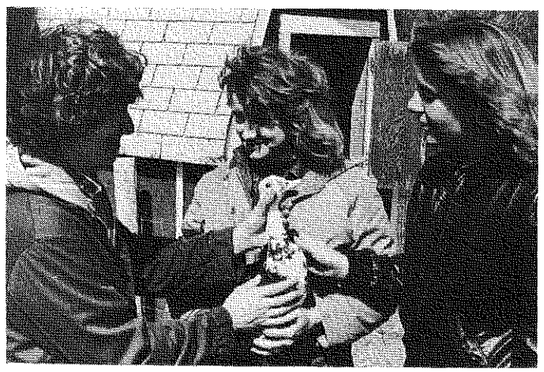
A "land laboratory" is an area operated by the school for making observations, demonstrations, and practices of the processes learned in vocational agriculture. This includes student activities, FFA activities, and projects supervised by teachers in order to provide more in-depth experiences or a wider variety of experiences than other agricultural projects offer. The school land laboratory may include the forests, machine storage areas, barns, nurseries, greenhouses, and land for livestock and plant production.

The definition of "land laboratory" also includes the school farm which is primarily used to provide more extensive farming experiences than those found on the land laboratory. While both are educational, the land laboratory provides opportunities for students to gain agricultural proficiencies in an educational setting where as the emphasis on a school farm is more on farming. Excluded from the definition of the land laboratory is the agricultural mechanics laboratory.

A Florida Study

A study was made in Florida to determine the use made of land laboratories. A total of 102 departments were randomly sampled, with 85 percent responding from middle, junior, senior high, and agricultural school. Characteristics pertaining to the use of land laboratories were examined. The findings were:

- Slightly over half of the respondents stated that they did not have a policy statement and objectives for the land laboratory.
- The teacher was most frequently indicated as the person responsible for establishing instructional policies. This was followed in order by the teacher and advisory committee, the teacher and administration, and teacher and principal.
- Over 70 percent of the land laboratories did not have any type of student-owned projects.



These students are gaining valuable learning experiences on a school farm. (photograph courtesy of Oz Gilbertson, University of Nebraska -Lincoln)

- Of those land laboratories having student-owned projects, slightly over 80 percent indicated that up to 25 percent of the students at their school had projects on the land laboratory.
- About 77 percent of the land laboratories with student-owned projects did not charge rent for those projects.
- Beef animals were the most common animals raised on the land laboratory followed by swine, poultry, dairy cattle, and horses.
- The most common types of plants grown on the land laboratories were vegetables, ornamentals, pasture, agronomic crops, forestry, fruit, and turf.
- As for records kept on the land laboratory, over 80 percent indicated that records were kept. Of those keeping records, the teacher and class were the ones most responsible for it.
- Over 40 percent stated that the teacher was responsible for making the annual management decisions. One-third indicated that both the teacher and students made the decisions.
- As for daily operational decisions, the teacher was seen as being the most responsible for the decisions.
- Approximately 83 percent indicated that teachers received no extra compensation for managing the land laboratory.
- Over two-thirds stated that the teachers had insurance for any persons working or using the land laboratory.
- Groups which used the land laboratory other than the vocational agriculture classes, were elementary classes, adult education classes, elementary, junior high and high school classes, and finally elementary and adult classes. Most land laboratories had only the agriculture classes using the facility.

Staffing

Most departments did not have any hired persons working on the land laboratory other than the teacher. Of those which did have a hired person, approximately one-fourth indicated that those persons worked full-time. The most frequent duties performed by persons hired to work on the land laboratory were general custodial duties. The salaries of those persons were indicated as being paid by the FFA (25 percent) and the School Board (25 percent). Other sources of salaries were listed as the federal government, Neighborhood Youth Corps, the agriculture department, and CETA.

Land Laboratory Purposes

The most important purpose of the land laboratory as indicated by the respondents was to provide opportunities to practice competencies learned in class. The second most important purpose was to provide experiences for students to work together cooperatively. To teach agricultural competencies was the third most important purpose. The three least important purposes of the land laboratory as perceived by teachers were to provide summer employment for students, provide part-time employment for students, and to conduct agricultural demonstrations for the community.

Conclusions as to the use of land laboratories in Florida were that teachers were the principal decision-makers regarding daily operations, annual management decisions, and establishment of instructional policies regarding the land laboratories. Additionally, the uses made of land laboratories in Florida agribusiness and natural resources education programs were varied. It is interesting to note that when Poucher (1952) conducted his study in Florida, he found 90 percent of the departments had operational land laboratories. When this study was conducted in 1978, the percentage had risen to 93 percent. Teachers of vocational agriculture in Florida realize the importance and significance of the school land laboratory.

THEME

Fire Up Your Students!

By Lewis Eggenberger
Editor's Note: Dr. Eggenberger is Professor, Departments of Agricultural Education and Agricultural Engineering, Texas Tech University, Lubbock, Texas 79409.

Put some fire into the eyes and minds of your students by using your laboratory to teach how engines operate. A student's eyes will be wide open and a smile will appear from ear to ear when an engine "fires off" after being assembled. If you want this reaction from your students, you must use the proper teaching techniques.

Have Engines Available

Small gasoline engines that are in operating condition should be available for each pair of students in the class. A two or three horsepower horizontal shaft engine is an excellent choice for this purpose. It will be easier for you to organize your class instruction if you are teaching with similar model engines and the parts can be removed with little difficulty.

Do not attempt to repair an engine the first time a student disassembles and assembles an engine. Your purpose should be to teach the student how an engine operates and how to replace all the parts, and to motivate the student when the engine "fires off," without the stress of repairing the engine.

One effective teaching method is to discuss how engines operate and to teach appropriate theory as students disassemble and assemble an engine. For example, what better time exists to teach the principle of the four-stroke cycle engine than when the student has removed the cylinder head allowing the movement of the piston in relation to exhaust and intake valve movement to be seen. Of course, teachers will need to prepare visual aids that can be used at this time to enhance the learning process. My experience indicates that you must also have the visual aids because some students can not easily understand a cut-away drawing. For example, it is essential that you have some small engine float-type carburetors and visuals of a cut-away carburetor when teaching the theory of carburetion. The students can be provided the opportunities to remove the fuel bowl allowing them to observe how the fuel level is maintained, and to observe how the air movement through the carburetor creates low pressure areas that cause the fuel to mix with the air.

Disassembly and Assembly Sheets Needed

Other essential teaching aids include a repair manual for each pair of students and a disassembly and assembly job sheet. Some repair manuals contain an overhaul procedure. If yours do not, you will need to prepare one. The step-by-step procedure should be included in the job sheet, and each item should be referenced to the page(s) in the repair manual. It is important that the students be reminded to read carefully and to follow written instructions since this will be expected of them upon employment.

Use of Video Tapes

Again, to light up the eyes of your students, use video equipment. As a teacher, how many times have you said, "Be sure to align the timing mark on the camshaft gear with the crankshaft gear" and only two of the fifteen students observing could see the marks? The video camera is an excellent aid in magnifying the small engine parts so everyone can see demonstrations.

Five video tapes of the disassembly and assembly procedure of small gasoline engine parts have been filmed by the author. Each tape is approximately twenty minutes long. From these tapes students can observe certain related activities and then immediately perform these skills on the engine. If available, it is recommended that you set up two television monitors so the students can progress at their own rate.

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Fire Up Your Students!

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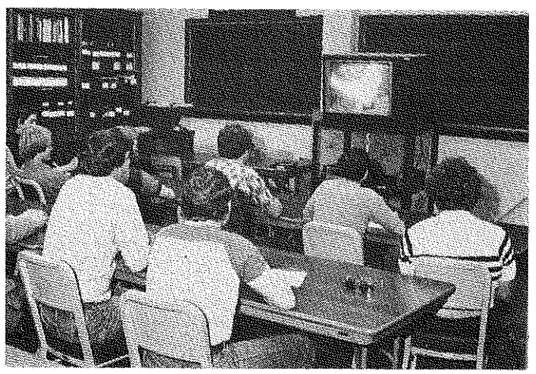
The use of the video media will also provide you with more time needed to teach on an individual basis. While some students are observing video tapes, you will be able to assist those students who are having difficulty in performing certain skills on their engines. Can you think of a better technique in compensating for the difference in the abilities of students?

Repair an Engine

Now that you have "fired up" your students they will be ready to bring an engine from home and, in their words, "fix it." Be sure that you tell them to bring in a repairable engine, not an old junker. It is advisable not to attempt this instructional unit if you do not have adequate knowledge and enough tools, including special tools, equipment, and supplies. You must have available or have access to micrometers, torque wrenches, valve grinding and seating equipment, cylinder hones, and an assortment of pullers. You may also need main bearing and valve guide reamers. If you do not have readily available parts you may wish to stock a small supply. Points and condensers, keys, main bearing seals, gasket sets, standard ring sets, and rope would be some of the items you need.

The important parts of this unit are teaching the students to measure with precision tools, to determine the correct repair procedure, and to perform the specialized skills. As an example, the student must be able to read and use a micrometer to determine the wear on crankshaft journals and the wear within the cylinder. After students have determined the condition of the engine, they will need your advice to make some critical decisions. Will a set of standard rings be adequate? Should the cylinder be honed to oversize? Should a short block be purchased? Should the engine be scrapped? It is also important to have the student present an estimate of repairs to the owner of the engine because the owner may prefer to purchase a new piece of equipment.

Whatever you do as a teacher, be sure that the students do the repair work thoroughly and correctly. In repairing small engines the question "should I let the student short block the engine" always arises. I don't recommend this method or repair if the existing block can be repaired economically. Remember, the student loses the opportunity to learn numerous skills if you decide to use a short block.



Students in this class are shown observing the orderly process of disassembling a small gasoline engine. The next step will be for them to go into the laboratory and begin work with engines.

Clean Engine Thoroughly

Based on my experience, it is very important during the repair procedure to thoroughly wash the engine block with hot water and soap after any machine work has been performed. Valve seating, reaming valve guides, and honing cylinders will leave metal particles that will destroy an excellent repair job when the engine is started. Be positive that all aluminum particles are removed from the cylinder and crankcase after you have honed a cylinder. The honing oil mixed with the aluminum particles will adhere to any surface so be especially careful in inspecting the various crevices in the block for contamination. If metal particles are left in the engine block, they will be mixed with the oil when the engine is started and ring failure will occur immediately. Remember, if you wipe the cylinder and crankcase with a white cloth and receive any indication of contamination, wash the block again.

Engine Stand and Flywheel

You may wish to fabricate a metal stand for the vertical shaft engines and machine a heavy flywheel welded to a hub which will act as a flywheel in place of the mower blade. A vertical shaft engine attached to a stand will not run properly without a heavy flywheel. Of course, you can have the students bring the mower deck to the laboratory and attach the engine to the deck and install the blade before attempting to start the engine. Don't forget to check the maximum and minimum RPM's according to specifications.

A Rewarding Experience

To develop pride among your students, paint the engines and install new decals. Won't mom and dad be proud when their son or daughter brings home that old engine that is nice and shiny and will start the first time they pull the rope? Teaching in the laboratory is enjoyable and rewarding!

1983 Themes
The Agricultural Education Magazine

January	Achieving Quality Classroom Instruction
February	Achieving Quality Relationships with Business/Industry
March	Achieving Quality Supervised Occupational Experience Programs
April	Achieving Quality Programs with Decreasing Resources
May	Achieving Quality Summer Programs
June	Achieving Quality Program Supervision
July	Achieving Quality Teacher Education Programs
August	Achieving Quality Adult/Young Adult Programs
September	Achieving Quality Laboratory Projects
October	Achieving Quality Student Organizations
November	How Others Perceive Us
December	Assessing Student Performance

ARTICLE

Local Vo-Ag Programs are Laboratories in Training New Teachers

By Sam Robb and Fred Reneau
Editor's Note: Mr. Robb is the Vocational Agriculture Teacher at Pinckneyville High School, Pinckneyville, Illinois 62274. Dr. Reneau is Assistant Professor, School of Agriculture, Southern Illinois University, Carbondale, Illinois 62901.

The training of future vocational agriculture teachers must include technical agriculture and reality in the teaching activities used in the instructional process. The present trend of large numbers of college students entering agricultural education without having the benefit of high school level vocational agriculture makes the utilization of local vocational agriculture activities more essential to the development of these prospective teachers of agriculture. The use of local vocational agriculture programs as teaching laboratories benefits agriculture teacher education majors and high school vocational agriculture programs.

Activities Involving Local Vo Ag Programs

The activities using local vocational agriculture programs in training future teachers of agriculture can be divided into two major areas: teaching related activities and FFA activities.

Active involvement in the day-to-day activities begins at least a year prior to the agriculture education major's professional teaching semester. Agriculture education majors teach mini-class sessions involving classroom problem solving and the mechanics laboratory. This allows the agriculture education major to begin to see the teacher's position as being reality. Checking roll, grading tests, assisting in shop, reviewing the curriculum taught, and the identification of available resources in a local department are a few of the activities completed.

FFA, being a integral part of vocational agriculture, must be included in the development of future vocational agriculture teachers. FFA activities in which agricultural education majors participate at Southern Illinois University involve local, sectional, district, and state events. Students plan, organize, and conduct several events for high school FFA members each year.

Fall activities include: Attendance at the FFA Reporters Workshop and District Illinios Association of Vocational Agriculture Teachers (IAVAT) meeting as well as the National FFA Convention. They attend and serve as judges for FFA sectional contests including soil judging, crops judging, parliamentary procedure contest, and the grain and poultry shows.

Spring activities include planning, organizing, and conducting District V parliamentary procedure, public speaking, creed, poultry, dairy and livestock contests; judging proficiency award entries; invitational public speaking contest; and a section 24 agricultural mechanics project show.

Summer activities include participation in the State FFA Convention, program meeting for student branch IAVAT, and the set up of a display booth.

Benefits to the Agriculture Education Majors

The learning experiences agriculture education majors participate in involving local vocational agriculture programs and FFA activities provide a realistic view of what it is to be a vocational agriculture teacher. These prospective teachers get a chance to actively participate in classroom and FFA events prior to their professional student teaching semester. This interaction provides the agriculture education student a means to better understand the duties and responsibilities of the vocational agriculture teacher, the daily activities, classroom methods used, and a realization of what today's high school students are about. Some students come to the realization that they are not suited to a teaching career and withdraw from the agricultural education certification option.

Benefits to the Agricultural Education Program and Teacher Educators

The agriculture education program benefits from maintaining closer ties to the local high school vocational agriculture program. The utilization of local programs and FFA activities well in advance of the professional semester provides flexibility in the semester to semester and year to year learning experiences gained by the agriculture education majors. This flexibility allows the teacher education program to be

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An agricultural teacher education major is shown assisting in the preparation for the Greenhand ceremony.

Local Vo-Ag Programs are Laboratories in Training New Teachers

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constantly up-dating the types of activities conducted in the program.

Teacher educators in agriculture must stay up-to-date in teaching methods, their area of technical agriculture, and in-tune to today's vocational agriculture programs. Learning activities involving local vocational agriculture programs mandate that the teacher educator be a coordinator for successful completion of these activities. For these activities to succeed in training the agricultural education majors, the teacher educators must be aware of what is happening in the local vocational agriculture programs.

When an agriculture education student decides not to pursue the teacher certification program, this allows more time for the teacher educator to supervise those students truly interested in a teaching career. Most students who deselect themselves remain in the agricultural education department to complete the agricultural information specialization.

Benefits to the High School Vocational Agriculture Students

High school vocational agriculture students benefit from observing an agricultural education major not much older than themselves who is striving to develop a career. The interaction between these two groups can lead to a more positive relationship between the vocational agriculture teacher and the students. Having an agriculture education student in class provides the high school students with another real career option — the option being to get an education and become a vocational agriculture teacher.

Other Benefits

The local vocational agriculture program gains the experiences of the prospective teacher. For example, the local teacher may have little or no experience in poultry judging. The prospective student teacher may take on some responsibility of training a poultry judging team. In another situation, the prospective teacher may work with students in need of special help in the mechanics laboratory which would allow the vocational agriculture teacher to continue regular classroom and/or shop activities. Or the vocational agriculture teacher may simply desire to do a better job, realizing there is someone observing their every move as a teacher of agriculture.

Commendations

Vocational agriculture teachers should be commended for their support as demonstrated through their cooperation in allowing agricultural education majors to get actively involved in the vocational agriculture program and in the many FFA activities at the local, sectional, district, and state levels. The backbone of a sound agricultural teacher education program depends to a large degree on the experiences and support local vocational agriculture teachers are willing to provide agriculture education majors in preparation for the professional student teaching semester.

ARTICLE

Women As Shop Teachers: Is Nothing Sacred?

In the last 10 years women have begun to enter agricultural jobs at the professional level in an increasing number. They are proving their professional competence as vo-ag teachers, veterinarians, and soil conservationists. Probably, in no other profession, have they excelled as much as they have as vocational agricultural teachers.

The highest percentage of females teaching vo-ag can be found in the more urbanized East and West. In those areas, there has been a tendency to specialize in an agricultural subject, such as floriculture. Their success has led to an increasing number of women teaching vo-ag.

Job opportunities in teaching vocational agriculture have lured women into traditionally male dominated, production agriculture teaching positions. Without the vo-ag teacher shortage, many women would not have been given a chance to try their skills. Many local school communities in production agriculture areas, if given the choice of equally qualified males or females, would opt to hire men. In some instances, better qualified women have been refused employment because of a traditional view of the "place of women" (Dunne, 1981).

By Leverne A. Barrett and Nancy L. Barrett

Editor's Note: Dr. Barrett is Assistant Professor, Department of Agricultural Education, University of Nebraska, Lincoln, Nebraska 68583. Ms. Barrett is the Agriculture Mechanics Instructor, Twin Rivers School Farm, 4469 Farnam, Omaha, Nebraska 68131.

Because there are fewer women teaching production agriculture and agricultural mechanics, they sometimes feel that their performance is viewed by supervisors and teacher educators through a "magnifying glass." This situation puts women teachers in difficult positions. Not only must they live up to their own professional ideal, but they must learn to deal with increased pressure from these "external sources." Most women vocational agriculture teachers would like to be treated like any other teacher; that is, given help when help is needed, but freed of the "I told you so statements."

What About Women Teaching Agricultural Mechanics

Hiring women as production agriculture teachers is all right, but can they teach students agricultural mechanics when many men don't feel qualified? To answer these questions, a definition of qualification is needed. A woman certified to teach vo-ag is not necessarily qualified. "Qualified to teach" agricultural mechanics means the teacher has acquired the skills necessary to be competent. Sometimes outside observers may answer the question with a no, because they fail to differentiate between a beginning and an experienced agricultural mechanics teacher.

During World War II, thousands of women were employed in traditionally male, mechanically oriented occupations. To question whether women should teach students agricultural mechanics is not important. If women are willing to secure the needed competencies to teach agricultural mechanics, that is all that should be necessary. A recent study at Kansas State University found that vo-ag teachers, administrators, and parents showed no preference between males and females. However, students showed a slight preference for male vo-ag teachers (Parmley, 1980).

What Unique Qualities Do Women Bring To Mechanics Classes

We suggest that women may approach teaching agricultural mechanics skills a little differently than do their counterparts. First of all, they probably are more conscious of how students learn skills because they had to learn them the hard way. Most girls do not grow up talking about mechanically related subjects with their friends and many are not given an opportunity to learn these skills on the farm. Therefore, women agricultural mechanics teachers are not as prone to take what a student really knows for granted. In other words, she can start where the student needs to begin learning.

Second, women agricultural teachers tend to try harder, because they can admit they "don't know everything." This approach tends to reduce the "unorganized way" of teaching in the classroom and laboratory, and centers in on what learning is needed. However, women can be as guilty as men and teach only theory failing to implement "learning by doing."

Third, women teachers present a role conflict to their male and female students. Boys react by saying "what can you teach me?" and girls say, "What are you doing here?" This is not an unhealthy situation. Just as elementary principals recognized the need for more male teachers, so too there is a need for women in mechanics. A Vermont woman summarized this point well. "No girl would be hired before a guy, no matter what the situation. My father owns a garage and he would never hire a girl even if she was the best in the class" (Dunne, 1981). Female agricultural teachers will help break this stereotype.

Many enlightened production agriculture programs across the country have girls enroll. Many vo-ag teachers treat female students the same as males; while others find "different things" for them to do, rather than learn agricultural mechanics skills. A female agricultural mechanics teacher can present quite a challenge to both boys and girls: "if she can do it, so can we!" Conversely, girls may say, "I can't do it," but the female ag teacher may accurately sense their fear and offer encouragement. These unique qualities can be beneficial to any vo-ag program.

Teacher Education and Women

Two problems facing teacher education regarding women students in agricultural education are retention in the program and practical experience in agriculture, especially agricultural mechanics.

Although the United States Department of Education projects an increase in the number of females expected to enroll in agriculture, technical, and trade and industrial education at the secondary level, the number of women preparing to teach these male-intensive programs is by no means encouraging. Of women education students, less than one percent are completing undergraduate degrees in male-intensive vocational subjects (Kane, 1978).

Secondly, more and more individuals, male and female, enrolling in agricultural education programs are lacking adequate practical agricultural mechanics skills. With these kinds of problems, can teacher education continue to rely entirely on previous experience and expect to develop qualified teachers? Previous quality experience is very valuable, but it is not always available in sufficient quantity. It's no wonder that so many agricultural teacher education graduates decide not to teach! What, then, can be done? We suggest several possible alternatives:

1. Recognize the importance of previous experience and document validity.

2. Identify competencies early in a student's preparation and plan an individual experience program to fulfill deficiencies under supervision. (Several good engineering programs now require work in the field as part of their studies throughout their program.)

3. Provide sufficient skill related courses. If these can't be found in the existing program, facilitate taking them elsewhere, such as at a community college.

4. Encourage a special option or minor in agricultural mechanization for all students lacking the needed basic or job entry competencies.

Conclusion

Women teachers in agricultural mechanics can open doors for female students considering entering non-traditional careers. As male peers and students become accustomed to the idea that women are capable of teaching male-intensive agricultural mechanics courses, they may gradually become accustomed to accepting more girls into their classes.

Women in agricultural education are here to stay. Not many will choose to teach agricultural mechanics, because they will not be adequately qualified. Those who do wish to teach agricultural mechanics will have a difficult time acquiring the needed competence through existing programs.

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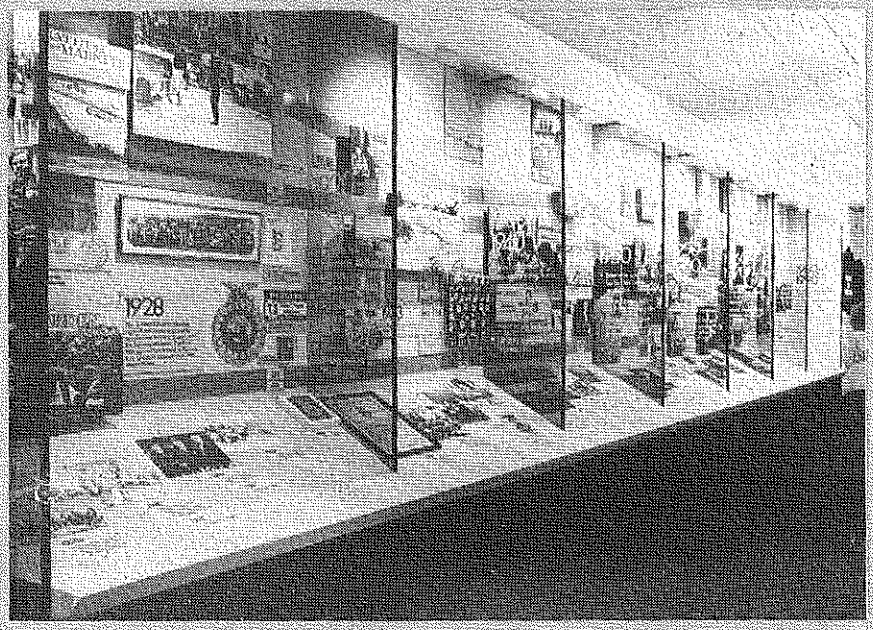

An exhibit entitled "Milestones of Progress" in the FFA National Hall of Achievement located at the National FFA Center in Alexandria, VA, has been completed and is open to the public.

Two exhibits located at the National Hall of Achievement at the National FFA Center in Alexandria, VA. The Hall has been completed and is now open to the public. The exhibit in the foreground is entitled "Learning to Do, Doing to Learn" and the other is "The Success Story of American Agriculture." (Photographs courtesy of the National FFA Center)