The
Agricultural Education
Magazine

September, 1984
Volume 57
Number 3

THEME
SOEP: Mechanics

THEME

SOE In Mechanics — Now Is The Time

By Clinton O. Jacobs, Theme Editor

(Editor's Note: Dr. Jacobs is a Professor in the Agricultural Education Department at the University of Arizona in Tucson, Arizona 85721.)

The new school year is upon us. Curriculum planning is completed, the calendar of dates and activities is nearly filled, enrollment is firm and you and the students are enthusiastic. If you have been following this year's theme of articles in this professional magazine, you will recognize this as the ninth issue devoted to SOEP. SOE in Mechanics is treated in both a philosophical and practical manner by the authors who have written for this issue. Their insights and suggested approaches to making the supervised occupational experience program a viable instructional tool warrants your attention. The timeliness of the ideas presented not only lend themselves to immediate use for this year's application but provides direction for long-term planning for the total program of vocational agriculture.

Are the intended purposes and outcomes for SOEP in mechanics any different than any other type of SOE? Hardly! Possibly the most unique outcome from work experience instruction in agricultural mechanics which results from SOE placement in a well-managed mechanics oriented work center is the change in attitude and interest of the student.

Perhaps for the first time the student understands what school is all about and how personal qualities and knowledge of the applied science of agriculture can be utilized in a productive and challenging business. Perhaps he or she also has a new awareness of the competencies that are really, in fact, required to progress in a related occupation and the aptitude and amount of real work required to make the business succeed. Perhaps for the first time the student may understand the true meaning of entrepreneurship and the potential it holds for him or her. Last, but certainly not least, a well conducted SOE in Mechanics work experience adds that dimension of "work experience" so often required for entry level employment. How many students do you know who have "hired on" at a work center following a successful SOEP, or been offered employment in a similar position? I trust that the opportunity has presented itself many times!

The Cover

Placement in agricultural mechanics provides opportunities to learn from people who work in the business and apply skills on modern equipment. (Photograph courtesy of Glen Shinn, Mississippi State University.)

THEME

SOEP In Mechanics For Production Agriculture

By Joe Farrell

(Editor's Note: Mr. Farrell is Vocational Agriculture Instructor at Hill City High School, Hill City, Kansas 67642.)

Supervised Occupational Experience Programs are a great way to provide students with Successful Opportunities in Education. As a teacher of vocational agriculture, I strive to provide these successful opportunities for my students. This is done by helping the students set achievable goals in order to obtain a positive self-esteem and develop pride in their work.

In a production agriculture program, the student's SOEP should be the root of the agricultural mechanics program. Since all aspects of the vocational agriculture program are inter-related, this can be done by blending the SOEP into the classroom, agricultural mechanics laboratory, recordkeeping, and FFA. In this way, the studies and classwork become motivating factors for students to see a direct benefit to themselves through their SOEP..

SOEP Related Projects

Safe and proper use of equipment are taught before any laboratory work takes place. Once these are understood, skills are demonstrated and practiced. All necessary skills must be mastered prior to project construction. Students are required to develop a working drawing of their project before any construction takes place. This drawing enables the student to build the project in an organizaed and systematic manner.

At Hill City High School, the agricultural mechanics program is a vital link in the student's SOEP. The students select shop projects that directly relate to their SOEP whenever possible. For instance, a student with a beef cattle program might construct a gate or panel as a freshman. Projects for the following years chould be a loading chute, stocktrailer, and a squeeze chute.

A student with a crop production program might build a hopper for a grain auger the first year. This could be followed with a header trailer for the combine, a grain cart, and overhauling a tractor engine. A senior student might also have time to hard surface a set of drill points for a hoe drill. Project idea books have various ideas to help students discover their needs.

Non-farm students with a work experience program have the same opportunities as a student with a production program. In our community, these students easily find employment on farms because of the training which they have received while working on our chapter farms. It is common for my students to be building something for their employer in the school shop.

FFA chapters and civic organizations are also a good source of projects for town students. Our chapter owns a squeeze chute. This was built by a non-farm student. It is leased out to members and other cattle producers in the area. We have also built playground equipment and rebuilt trash containers for the Chamber of Commerce.

Lawn care services are also a popular SOEP for town students. These innovative individuals usually construct trailers to haul equipment and repair engines on mowers, tillers, and snowblowers. In addition to project construction and repair, they are also involved with servicing the equipment. This type of program is an excellent learning experience and makes recordkeeping meaningful.

A swine finishing unit, owned by the FFA has two self feeders and a watering tank mounted on the outside of the pen. This unit was built by a student living in town. He also managed the unit for two years. His interest in swine production lead him into partnership with a farm student. They finished out two groups of pigs while attending high school.

Using The School Farm

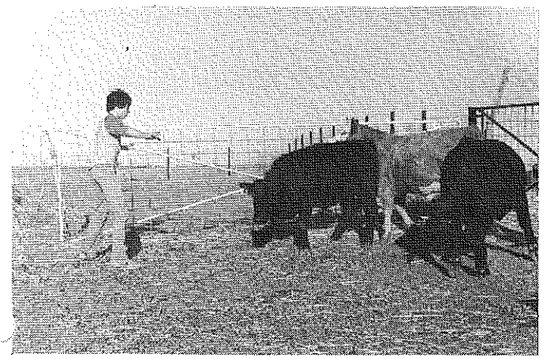
Our chapter farm is also a major source of agricultural mechanics experience for the students. They adjust, repair, or rebuild the equipment depending upon the need. Most of the chapter equipment is purchased used, and we do the majority of our own repair work. Quite often, breakdowns occur in the field and require on-the-spot repairs or adjustments.

Besides providing learning by doing experiences, the students can also see the effects of improper adjustments or worn parts. An example of this occurred last fall when wheat was planted with a hoe drill that had worn points. Naturally, we had a poor stand in some rows because the seed could not be planted deep enough to germinate. Our next step was to purchase new drill points and hard surface them. Other repairs and adjustments we have made for our equipment have worked very well.

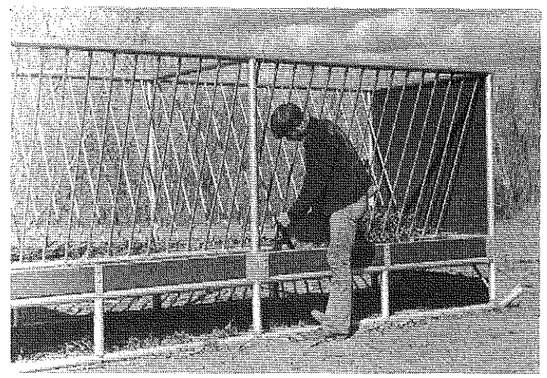
Over the years, we have completely overhauled four different tractor engines. We have also built mounting brackets for the anhydrous ammonia tank and attachments, and reconstructed a hitch for a planter.

Anyone entering the business of farming today must be able to utilize older used equipment. Adapting used machinery for some of the modern techniques sometimes involves making major changes in the construction of the equipment. Some of my students have done this type of reconstruction for their family farm or an employer. Any experience along this line is definitely a help to young farmers today. Occasionally, new equipment is purchased unassembled so students may have the experience of putting it together. This is also a financial savings for our FFA chapter.

Another important aspect of mechanics is servicing equipment. With the high cost of farm machinery today, farmers need to give their equipment proper care in order to get the best return from it.



Student with Calves. Gates make an outstanding freshman project. This former student is now a young farmer and continues to find his gates useful.



Student with Combination Hog-Grain Feeder. This project, constructed in the school shop, provides efficiency for the student's SOEP.

SOEP In Mechanics for Production Agriculture

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Block Classes

In order to teach students other skills necessary to compliment their SOE program, block classes are taught. These classes are an indepth study in areas such as electrical wiring, landscaping, surveying, concrete, tractor and machinery operation, and farm shop tools and equipment. The possibilities with these nine-week block classes are endless. My topic areas are changed occasionally to fit the needs of my students' SOE programs.

These skills are beneficial to students in the following ways:

Wiring: Any electrical wiring on the farm or in the home can be handled by these students. One of my crop production students did all the wiring for a grain hauling system.

Landscaping: This class consists of actual planting and care of trees, shrubs, and lawns. Trimming and pruning techniques are useful for students with lawn service programs. Other students find this class helpful when planting windbreaks for their cattle as well as farm beautification.

Surveying: Proper use of these instruments is helpful to a student building a fenceline feed bunk, or laying out a fence on newly acquired property.

Concrete: Students have found this class useful for all types of concrete work. It has been beneficial to students building slabs around automatic watering systems and floors for grain bins.

Tractor & Machinery Operation: The safe and proper way to use and handle farm machinery is taught to beginners.

Farm Shop Equipment & Tools: This class prepares students to set up or organize a farm shop.

Recordkeeping is just as necessary in agricultural mechanics as it is in crop or cattle production. Our Kansas record book has a section to record service of farm equipment. I emphasize to my students the importance of keeping these records for the best service from the equipment and in case of premature breakdown. When the servicing dates and mileage or hours are recorded in the record book, a person can easily determine maintenance time. Since the majority of these activities are conducted outside the school day, students learn to keep these records on their own. Hopefully, this practice will continue as the student acquires more equipment and becomes established.

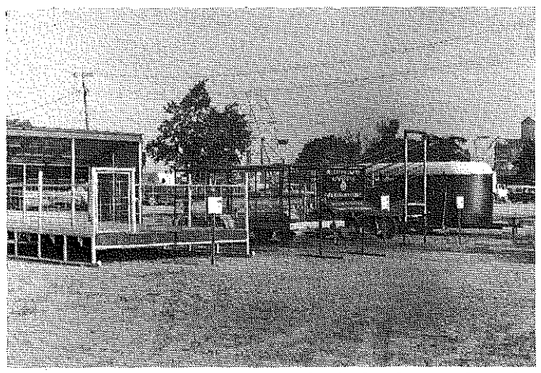
Using the FFA

The FFA organization provides proficiency awards for outstanding SOEP. These awards provide motivation for students to expand and apply mechanics activities to their programs. Some of the proficiency awards relating to mechanics include the agricultural electrification and the agricultural mechanics areas. The publicity and cash the individual receives through winning these awards serves as an incentive to set high goals.

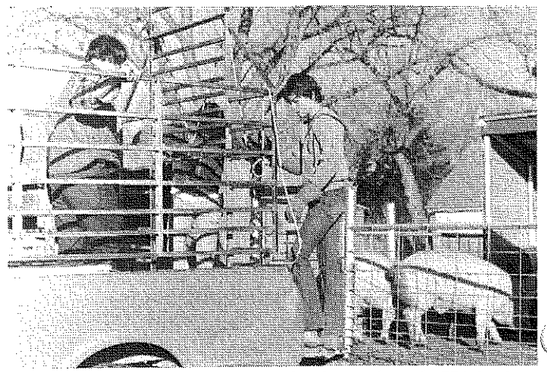
Our FFA chapter holds a member-parent open house and banquet each spring. During the open house, parents tour the laboratory, and see the projects of all the students. Quite often parents will see something under construction that would also work for their child's SOEP. The printed banquet program includes a section on agricultural mechanics. During the banquet program, we show slides of the award winner's SOEP. The narration and slides points out the application of these projects to the student's SOEP.

Our chapter also conducts SOEP tours. These tours are beneficial to new members. They can get ideas and see what others have built and how they are using it. Pride of ownership is evident in the older students, and they relate experiences of using their laboratory-built equipment. Sometimes they explain ways their projects could be improved or made more useful to them.

Fairs that conduct agricultural mechanics exhibits for FFA chapters provide an incentive for quality work. To have their project chosen to be a part of the chapter display is an honor for my students. These displays also require a written explanation of the project which includes how the project will be used. Besides ribbons, trophies, plaques, and monetary awards, students also receive praise and compliments on their projects displayed at fairs. Ideas are also born through viewing what other chapters have built. Another advantage is that judges offer critiques on the projects and this makes students aware of the importance of safe design, efficient utilization of materials, and quality workmanship.



Ag Mechanics Display at County Fair. This display shows evidence that our projects relate to the students' SOEP. The swine finishing unit is owned by the FFA chapter.



These students are getting ready to market the pigs from the FFA finishing unit. The finishing unit provides town students with a production SOEP. The pick-up stock racks were also built in the laboratory.

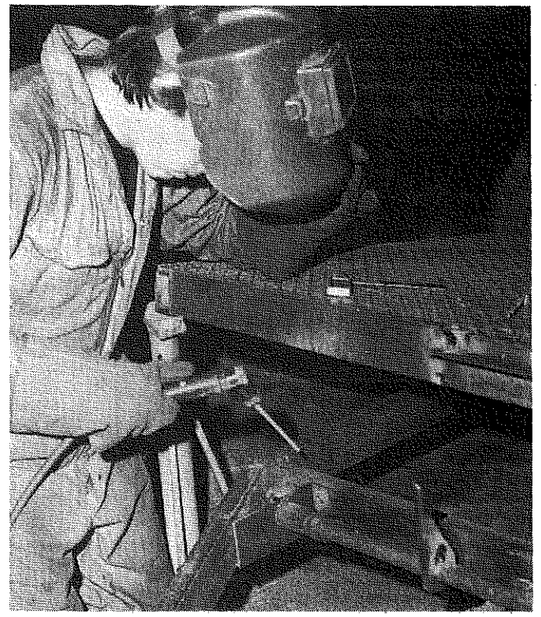
The Future

As we look to the future in our agricultural mechanics programs, we are sure to find endless application of the computer. This will also have an effect on the SOEP. Students today are being exposed to computers and need to continue to acquire all possible knowledge about them.

Monitors and controllers have already found their way into combines, planters, sprayers, and tractors. Using many of these devices is like using a calculator. Future controllers and monitors will be highly sophisticated and some will require programming by the user. A person familiar with calculators, video games, and personal computers will have little trouble programming a computer or monitor. However, servicing, repair, and perhaps installation will require a deeper knowledge of the device. Teachers are also faced with a new challence. They must prepare themselves with knowledge and abilities to meet the high technology needs of their student's SOEP.

As a vocational teacher, I am pleased with any success my students achieve. However, I feel a great deal of satisfaction when I see former students using their vocational skills as a young farmer. Successful farming practices or operations as well as homemade equipment means that my former students are putting their vocational agricultural knowledge to good use. Often this homemade equipment is built at a financial savings and is an improvement over the commercial product. When former students display an ability to use their skills on their own, I realize that my goals have been reached.

The Successful Opportunities in Education a student receives through a SOE program are impossible to list.



Student Working on Project. A student with a lawn service is in the process of building a tilt-bed trailer. Building projects that relate to the SOEP develop pride in ownership and are put to good use.

When these opportunities are experienced through an agricultural mechanics program, they become life skills. These mechanic skills will continue to benefit and reward our students as they enter those careers they were developing in their SOE while in high school.

THEME

SOE In Mechanics For Horticulture

By Barbara Rothenberger

(Editor's Note: Ms. Rothenberger is the Horticulture Instructor at the Columbia Area Vocational School, Columbia, Missouri 65201.)

After a couple of years of teaching Horticulture with a Bachelor of Science Degree in Agriculture with a horticulture major, I decided I did not like the idea of a temporary certificate and went back to school to work on my Master's in Agricultural Education. There were several stumbling blocks, but I was prepared for most of them. However, when my advisor told me I had to take a course in Agricultural Mechanics, I almost flipped. I complained to the Professor who was teaching the course that I could not see why I had to take a course in Mechanics. After all, I had no intention of ever teaching a shop course. The Professor then very patiently explained to me the importance of agricultural mechanics in horticulture. Well, I still would not feel competent teaching a shop course, but I have since discovered how important mechanics is in the horticulture field.

Needed Competencies

Members of my horticulture advisory committee feel that a student should have a good background in mechanics to be employable in the horticulture field today. The four major areas of horticulture that we deal with are: florist, nursery/landscaping, turf and lawn care management and greenhouse grower.

The owner of a local greenhouse range and chairman of our horticulture advisory committee has always been especially vocal about the mechanical training our students should receive. A first priority for him would be welding.

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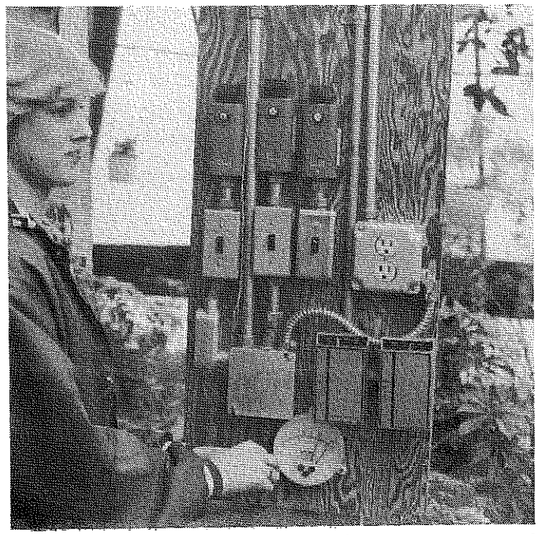

An understanding of the mechanics of greenhouse temperature control is a competency required by most students who are to be placed in a greenhouse management SOE.

SOE In Mechanics for Horticulture

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Most growers build their own greenhouses when they start out or have additions. Knowing how to do your own construction saves a considerable amount of money. Aside from the original construction, there are many other mechanical devices that an employee must know how to operate and repair. An important piece of equipment in any greenhouse is the propagation bench. The mist system is essential to keep a steady supply of rooted cuttings. Not only is a solenoid valve required for the operation, but also an on/off time clock to turn the mist system on in the morning and off again in the evening and an intermittent program repeating timer to turn the mist off and on at preset intervals.

Individual attention must be given to each student prior to placement in an SOE.

One of the newest pieces of equipment on the market is the Genesis rooter. One of my students works for his father in a greenhouse/garden center operation. His father this past year purchased a Genesis rooter. He reports faster results in rooting, as much as two weeks, and better roots. It is especially helpful for plants which are normally difficult to root and have a tendency to rot.

Time clocks also can run lights for controlling day length. A knowledge of plumbing and electricity are essential for working with these pieces of equipment. More sophisticated growers are now using larger pieces of equipment to help speed up their greenhouse production. One of the most expensive of these is the automatic potting machine. This can cut down production costs immensely by doing the work of several employees in a fraction of the time.

Another time saving piece of equipment is the direct seeder which will sow seeds directly into growing trays. Although this is an expensive piece of equipment, it can pay for itself in several years in labor savings. According to the supplier, the direct seeder allows the average operator to seed up to 500 trays per hour or almost 136,000 potential seedlings. For a student to be employed in a greenhouse where this piece of equipment is being used would require knowledge of agricultural mechanics.

Fertilizer injectors are improving, but also are more complex than the older, less exacting models. Other pieces of equipment which might be found in a greenhouse are an electric soil sterilizer, heating cables, fan and cooling pads, heaters, pH testing meters, thermo-alarm systems, recording thermometers and barometers, thermostats and humidistats, many different types of sprayers, soil shredders, mixers and many many more. Not all will be found in every greenhouse, but students should have at least a working knowledge of a majority of them.

Watering is an essential and time consuming task in greenhouses. Newer methods employ automatic watering systems, with pipes running the length of each bench and small plastic tubes running from the pipe into each pot, making it possible to water entire benches at the same time with one turn of the valve. Students learn early how to install this watering system, in fact, students installed one in our pot plant greenhouse at school. They also must learn how to take care of this watering system when the tubes

Servicing the small engine and maintaining the rotary lawn mower are essential skills to be included in specialized horticulture curriculum.

get clogged up, or are not working effectively. Bench and bed construction is also important to a greenhouse grower. Some are permanent structures while others must be very flexible to be maneuvered with the various crops being grown.

With the rising cost of labor, horticulturalists have been increasing the use of small engines. Such work as trimming, mowing, tilling and even raking or blowing leaves is all being done mechanically. The newer engines are smaller, lighter in weight, and therefore easier to transport. One piece of equipment which we have used in our program is the "weed eater."

Anyone working in lawn maintenance must have a good working knowledge of small gas engines. The most important, of course, is the lawn mower, whether it is the common rotary mower, the reel mower or a large garden tractor with belly mower. Many students get their first start on an SOE project by mowing lawns. Quite a few have discovered this to be very profitable, often having more lawns to mow than they have time to do. Last year, one of my students won the state Turf Proficiency Award for his lawn mowing business.

If students do not know how to repair their own mower, they will soon find themselves not mowing as many lawns, waiting for someone else to repair the mower and reducing their profits by having to pay the added expense. Other pieces of equipment associated with lawn care are hedge trimmers, chain saws, and edgers. While not all are necessary pieces of equipment, they can speed up a job.

Nursery

There are even larger pieces of equipment to know how to operate when a student is placed in a nursery job situation. On a field trip this fall, the owner of a local nursery demonstrated to several of my classes the use of his new tree planter. This is an expensive and potentially dangerous piece of equipment and an employee would need to know as much as possible about operating, care and maintenance of it. He told the classes how quickly he could dig and plant a tree by himself and feels that the expense is justified by his being able to do it by himself quickly and easily.

Florist

For the student placed in a florist shop, mechanics is not as prevalent, at least for larger pieces of equipment. Simple things such as scissors, knives, etc. need to be sharp and in good working order so that workers may efficiently and effectively carry out their work. A pic machine, another basic floral tool, must be in good repair. Malfunction can be costly in tempers as well as time. Glue guns are an invaluable tool to most florists and can be frustrating (and painful) if they are not operating properly. New guns have come on the market that, while more expensive, do not have the drop of hot glue problems that the old ones did.

While a major repair of a florist cooler is best left for a professional refrigeration repairperson, the average florist needs enough knowledge to be a general repair and handy person. There is no greater disaster that can befall a florist, especially before a major holiday, than for a cooler to break down. Repair people are not always available, especially at night or on weekends and fragile, perishable flowers can not wait long without refrigeration.

Every horticulture class should have some mechanics included in their curriculum if we are to train our students to be not only employable, but competitive in their employment.

THEME

SOE in Mechanics for The Technical Institute Program

By Dean L. Byerly

(Editor's Note: Mr. Byerly is an Instructor at the Northeast Iowa Technical Institute in Calmar, Iowa 52132.)

The purpose of the Farm Implement Mechanics program at Northeast Iowa Technical Institute (NITI) is to train students for employment in farm equipment dealerships or farm equipment service centers on large farms. Our placement records show a 50-50 ratio of student completers returning to the farm or seeking employment in dealerships. The SOE program is one of the strong points of the curriculum for all completers. A very high percentage of our graduates who seek employment in dealerships return to their SOE stations to work full-time.

Curriculum Content

The course of instruction identifies a total of 112 quarter credits and 2610 contact hours for completion. Students enrolled in the program can complete the requirements in seven quarters or 21 months. Supervised Occupational Experience is scheduled for the second six weeks of the third quarter and for the first six weeks of the fifth quarter for a total of 480 hours or 18 per cent of the total graduation requirements. The first SOE coincides with spring planting season of Northeast Iowa; the second or fall experience is planned for the beginning of harvest season. During these times, dealerships are very busy and there is a good demand for student placement and work experience.

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SOE In Mechanics for the Technical Institute Program

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Work Stations

A problem with SOE is finding and retaining appropriate work stations. Some dealerships look upon the student as potential cheap help. Others work with the student so that knowledge is gained about the operation of a dealership and of day-to-day work in the service shop.

Some students must be placed in a dealership close to home because they have chores at night and on week ends. We encourage some students to take jobs where they must live in town, take a room, and get out on their own. It gives them a chance to find out what the real world is like, how to budget their money, how to manage their time off, and how to take care of running their own life.

The instructors at NITI are responsible for locating the work station. In many cases, we have graduates working at a particular dealership so the owner understands the program. We discuss the goals of an SOE program with the owner/manager and identify how the students personality and prior training will fit into the dealership. We try to match a student to the needs of the dealership. In most cases, we have worked with these dealerships long enough so that they know what SOE is, what to expect from it, and their obligations. It is also important that the dealership personnel be informed of what is expected of them and the student during SOE.

All students are employed at minimum wage. When we run into a dealership that says that the wage rate is a problem, it is generally indicative of other factors or that there is just no work available.

There are some work stations that are not appropriate. They do not view vocational school training as valid. They think that the worker can come there directly from high school and that is all that is needed. There are some dealerships who wish to hire students at minimum wage for cheap labor and not do any training. We also have had dealerships that think that we should pay them. When we find one of these places, we try to convince the dealership that the vocational school, the high school, the student, the dealership, and the farmer are all involved in training future mechanics.

We also place students for SOE's in independent repair stations. The experience at independent repair shops where students work entirely on farm equipment has been beautiful. In some cases, we have had better cooperation and support from the independent repair stations than we have had from full line dealerships.

The SOE also allows students to evaluate dealerships. They get a chance to observe some negative management practices such as dirty working conditions, poor public relations, insufficient parts on hand, poor supervision and support. Also, other technicians may consider the students a threat to their security. The big part of the supervisors' job is to isolate problems, to bring them out in the open and discuss them with the technicians, shop manager, or whoever might be upset.

On the positive side, the student in a good work station will find out that there is support from the dealer, the shop manager, and most important of all, support and understanding from the other technicians.

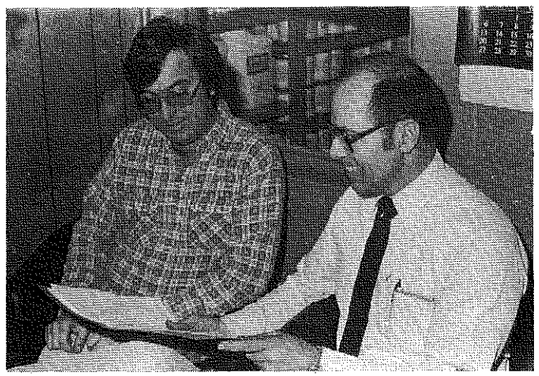
Financial Support

SOE is financially supported by the local dealership with encouragement from OEM Company. There is no financial support from the district service manager or sales manager. However, the dealer needs to feel that the dealership is helping to train future technicians and that the company recognizes this is an important part of the cost of doing business.

Student Supervision and Evaluation

Student supervision at the SOE work station is conducted by the instructors at Northeast Technical Institute. Generally, the students are visited three times during each six weeks of work experience. This gives us an opportunity to meet a majority of the staff in an informal setting. We have found that setting up a specific appointment for the visit has not been practical. Rather, we work on a daily schedule for each station.

We always make it a policy to visit with managers and encourage their input and evaluation. We spend most of our time in the service shop with the student, the service manager and the technicians. We reinforce our concern with them about why the student is there and ask for their support in helping the student learn about the dealership and service practices.



A potential placement center manager and the author discuss the SOE agreement.

Student and manager discuss checking the oil level in the mechanical front wheel drive on a tractor.

The primary thrust of our supervisory visit is to check upon the progress of the student in accordance with the work station agreement. The design of the agreement is to assure understanding on the part of the dealership, school and student that the SOE will provide a variety of occupational experiences which are common to the job requirements of a farm equipment mechanic.

Like most occupations, the experiences work upward in technical requirements. During the first six weeks of SOE a student is largely involved in machinery set-up in addtion to their working as a mechanic's aide in the service department.

Our supervisory visits are intended to assure that students are exposed to other areas in the agreement including new machinery delivery, field service calls, evaluating machine problems with the machine owner, writing job-orders and working in the parts department. The experience which we like students to receive are exemplified in the listing of jobs which appear on their report form. Each student is expected to submit a weekly report to the supervisor. The student's weekly SOE report provides excellent feedback to the supervisor on the extent of experiences and attitude of students toward their training.

Each supervisor conducts a weekly evaluation of the student's performance at the work center. The evaluation form is completed by the supervisor in conference with a supervising employee at the work center.

The evaluation provides an excellent tool to promote dialogue between student, supervisor and work center personel. Students welcome the weekly feedback that this instrument provides.

Summary

The supervised occupational experience is a very strong instructional element in our school program. We have been highly pleased with the support we have gotten from the farm equipment industry in Northeast Iowa. SOE is a super program which mutually benefits the student, the instructors, the school, the dealership and ultimately, all of the agricultural industry.

THEME

Pre-Occupational Preparation for Mechanized Agriculture

By David A. McCarthy

(Editor's Note: Dr. McCarthy is discipline leader for the Mechanized Agriculture program at the University of Minnesota, Technical College, Waseca, Minnesota 56093.)

Over the past several years, supervised occupational experience programs have played a crucial role in preparing mechanized agriculture students for a variety of careers. This program has provided and continues to provide students with direct learning experiences in the performance of skills associated with their future mechanized agricultural occupations. Instructors in these programs are faced with many challenges, however, as they deal with diverse student abilities, interests, future career goals, and backgrounds. Besides realizing that the classroom and laboratory cannot simulate the real world situation, instructors are also faced with economic constraints, time constraints, and numerous lecture and laboratory preparations.

The challenge that persists is somewhat perplexing. How can mechanized agriculture instructors provide beneficial learning experiences in their respective educational institutions under such constraints?

Pre-Occupational Preparation

At the University of Minnesota Technical College, Waseca, the supervised occupational experience program for mechanized agriculture students is provided in three contrasting formats:

1. hands-on laboratory training as an integral part of the student's technical college curricula;

2. directed study credit in one of the technical college laboratories;

3. one quarter (12 weeks) of work experience in an agricultural business or industry or on a highly mechanized farm (POP).

As one might suspect, these three means for providing supervised occupational experience at the post secondary level are not unique to the University of Minnesota, Waseca. One should realize, however, that the objectives, methods, and procedures may contrast to those used in other post secondary institutions. The Pre-Occupational Preparation (POP) program, which provides one of three supervised occupational experience formats for our mechanized agriculture students, will be discussed more specifically.

At the University of Minnesota Technical College, Waseca, Pre-Occupational Preparation is a mandatory component for each mechanized agriculture student. As indicated, students are required to spend a twelve-week in-

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Pre-Occupational Preparation for Mechanized Agriculture

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ternship in a related agricultural business, industry, or on a highly mechanized farm. This POP format enables students to receive on-the-job supervised occupational training and twelve college credits under the direct supervision of persons not directly associated with the college. The specific objectives of this cooperative program are:

1. to enable students to learn more about the occupations of their choice through work experience;

2. to allow students to experiment with occupational goals early enough to enable them to alter these without losing valuable educational time;

3. to encourage students to assume a more mature attitude toward their academic preparation;

4. to assist students in recognizing the need for classroom instruction as it relates to their occupational goals;

5. to permit students to work in actual situations that cannot be duplicated in the classroom;

6. to give students the experience of working with equipment which, because of size or content, is not available at the college;

7. to enable students to acquire experiences gained through actual customer and employee relationships;

8. to allow students the opportunity to develop a sense of responsibility required in the business world;

9. to help students learn, through real experience, the value of personal qualities such as neatness, politeness, courtesy, and concern for the clientele with whom they are working;

10. to provide students with the experience related to the process of seeking employment;

11. to provide the college with valuable information about the industry, establish contacts, and obtain advice from business leaders in areas of curriculum, laboratory planning, student recruitment, and placement; and

12. to help develop industry support for the technical college through industry's participation in the program.

Planning

During one of the first quarters on campus, students are exposed to the Pre-Occupational Preparation program by means of a mandatory orientation course. During this course, students are requested to discuss this program with their instructor/counselor and other mechanized agriculture staff. Informational forms are completed, backgrounds and abilities are discussed, career goals are tentatively established, and decisions regarding the time for their internship are discussed in detail.

Approximately one quarter prior to the internship, these students meet once again with their instructor/counselor. At this meeting, it is vitally important that the specific learning goals and objectives be established for their internships. This process forces students to identify the specific skills to be learned during the twelve-week program. When completed, the goals and objectives from is attached to the job application form. Both forms are then mailed to prospective POP employers for review prior to the interview process.

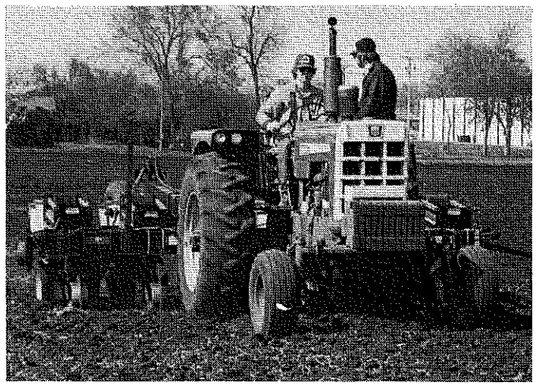
After the completion of the interview and initial student placement, the goals and objectives further aid in identifying the more specific role of the employer. The objectives serve as the primary guide outlining the specific duties of the employer who is actually serving in the capacity of an associate instructor.

Supervision

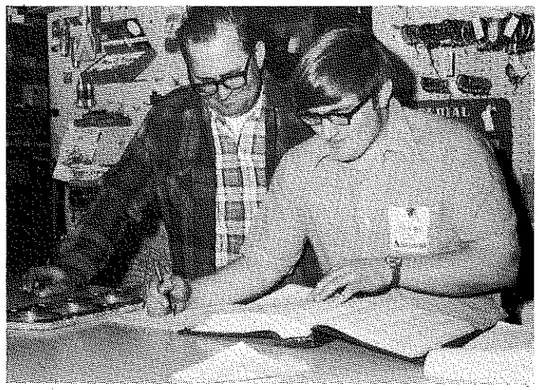
Faculty visitation is essential to ensure the success of internship. In recognition of this fact, the POP coordinator or the instructor/counselor is required to visit the student on-site at least once, and preferably twice.

There are actually several purposes and related benefits for these on-the-job supervising visits. The student and employer individually discuss personal concerns which relate to the student's success. Concerns should be openly discussed to prevent possible conflict between the student and the employer or co-workers. Secondly, the objectives should be reviewed to ensure that the student's goals are being addressed.

On-site visitations enable the POP coordinator and the instructor/counselor to broaden their knowledge in various areas of mechanized agriculture. Instructors keep more current on recent mechanization technology and changes in the industry, which, in turn, provides greater insight into their respective courses. Finally, successful business contacts may establish further use of POP employers into roles such as guest speakers and advisory committee members.



On-farm SOE supervision of a planting operation by an instructor/counselor of a student pursuing the mechanized agriculture program.



Student receives 12 weeks work experience instruction from parts department manager.

Evaluation

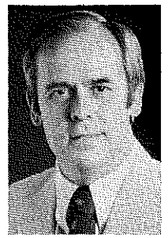
Students are required to write three monthly reports while working in the internship. The first report requests information concerning the business or industry in which they are working. Students are requested to provide an overview of the business structure, the size of the business, the products and services provided, the trade area serviced by the business, the administration structure, and their initial responsibilities. In the second report, required during the ninth week of the internship, students are requested to indicate the goals and objectives achieved and provide a self-evaluation of their progress. The third and final report, required at the end of the internship, requests that the student develop a list of specific experiences and skills yet needed to achieve his/her occupational goals. The three reports are mailed to the college for review and grading by the POP Coordinator and the student's instructor counselor.

Further, the POP employer is responsible for evaluating the student at the end of each month. An evaluation form consisting of twelve employee work characteristics is provided. Upon completion, the employer and student review the evaluation form and discuss the student's strengths and weaknesses as perceived by the employer. The employer evaluation forms are also mailed to the college and filed in the POP office for future use in determining the final grade for the student.

The Pre-Occupational Preparation program at the University of Minnesota, Waseca, is an extremely successful program. As a cooperative educational program, POP provides a means of obtaining supervised occupational experience in a realistic environment. Industry support, administrative support, and strong faculty involvement are necessary and vital to the program's success. The methods and procedures used in the program not only benefit students, but also faculty, the educational institution, and the mechanized sector of the agricultural community.

THEME

Occupational Experience . . . A Catch 22?



By Glen C. Shinn

(Editor's Note: Dr. Shinn is a Professor in the Department of Agricultural and Extension Education at Mississippi State University, Mississippi State, Mississippi 39762.)

Remember last May when your graduates were looking for jobs? Unemployment for their age group was 19.4 percent and several employers were still not sure they were going to make it through the economic crunch with their shirt! Every classified advertisement in Implement & Tractor and Farm Building News specified experience as a prerequisite. Your students may have felt victimized . . . they could not get a job without experience and they could not get experience without a job!

After meeting with the vocational agriculture advisory committee, you may not have felt so good either. While helping to determine what should be taught, they identified service tasks which required specialized training, tools, and equipment. They also suggested service skills be taught using late model equipment which will be hard to bring into the laboratory. It is almost frightening to think about using a $30,000 row planter or a $80,000 combine, even as a demonstrator!

Problems such as these are easier to manage if you insist on a planned supervised occupational experience (SOE) program. By working after school hours, Saturday mornings and during the summer, students can accumulate 2,040 hours of bonafide experience while enrolled in a specialized vocational agriculture program. That is the equivalent of a solid year of work experience, plus the two years of formal education. Three years credit in two years is not bad!

The dealers who agree to provide supervised work experience make you feel a lot better too. They are willing to help identify tasks which can best be taught on-site along side an experienced technician. By articulating the school-based instruction with industry-based experience, you can not only do a better job but may do it easier!

When you review the original legislation which created vocational agriculture, it calls for a program which ". . . shall be to fit for useful employment, . . . and shall be designed to meet the needs of persons . . . who are preparing for a trade or industrial pursuit or who have entered upon the work of a trade or industrial pursuit;" (Public Law 347, 1917). This purpose is woven throughout all existing vocational legislation. If experience is necessary for employment, then SOE is a necessary part of a total program!

Designing A Total Program

The first question to ask is "What are the purposes of the program?" If our purpose is congruent with the legislative charge, then employment is a primary outcome. Employment, however, depends on more than technical skills. Employment is contingent on individual integrity and the ability to work with both supervisors and peers.

(Continued on page 14)

. . . HELP WANTED . . .
I & T
. . . experience . . .

. . . HELP WANTED . . .
FBN
. . . experience . . .

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MECHANIC. Must have John Deere experience, diesel injection, air conditioning. Have own tools and be willing to relocate. Send resume to Reed-Merrill of Ogallala, Rt. 1, Box 51, Ogallala, NE 69153. 4-84-2t

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MECHANIC. Must have J.D. experience with CP and utility. Salary dependent on experience. Steel Tractor, Inc., 7270 Hwy 85/87, Fountain, CO 80817. Phone: 303-392-9292. 4-84-2t

SERVICE TECHNICIAN. Prefer J.D. experience. Repair tractors and combines. Wage depends on experience. Offer vacation, profit sharing, insurance and overtime. Sedalia Implement Co., Box 876, Sedalia, Mo 65301. 5-84-2t

Occupational Experience . . . A Catch 22?

(Continued from page 13)

The second question deals with "What activities may be used to accomplish the program's purposes?" A complete program must include well-planned classroom and laboratory instruction, structured experience in dealing with real-world situations, and the individual and group leadership skills needed to become an effective employee and productive citizen.

Several studies have identified competencies necessary for career success. McClay, et al, (1978) conducted a national study identifying competencies necessary in agriculture/agribusiness. Jacobs (1972) identified competencies needed by teachers of agricultural mechanization in the Western United States. Crabb (1981) conducted a case study of John Deere dealerships in Northeast Mississippi to determine the nature and frequency of service jobs performed throughout the year.

Perhaps the best information comes from the replication of appropriate studies in your community. The survey instruments are readily available and it is a good way to get to know the perceived needs of your consumers. Most people feel complimented when they have an opportunity to express their opinions.

How can you structure them into a well-planned course of study, once these competencies are identified for your program? Begin by identifying competencies which have broad application throughout the agricultural industry. These should be included during the first two years of "Basic Ag I & II." An example is "Servicing the Air Cleaner Element." Regardless of the job title, most everyone employed in agriculture uses engines to help perform their work.

The second level of competencies should be structured into a career cluster. Students with career objectives in agricultural mechanics and who are enrolled in a specialized secondary program should focus on the high priority competencies identified by the advisory committee. "Making hydraulic hose" and "Checking alternator output" are tasks which are important if the student plans to work in a tractor dealership. Often a lesson on general principles, such as types of thread used for hydraulics or series/parallel circuits must precede the mastery of the competency.

Third level competencies such as "Recognition John Deere's 15-speed transmission" or "Testing Ford's dual-power hydraulic priority control valve" are machine specific and should be scheduled for specialized post secondary programs. These three competency levels should be articulated in the secondary, post secondary and industry training programs.

The Summer Sub-Component

It seems there is never time to do all of the important things during the regular school year. And didn't it burn you last spring when someone asked, "What are you doing when school is out?" Too, every time you turn around either your administrator, school board, or some other expert is trying to cut the program back to ten months. A year-round program is much easier to justify when the summer is used to teach critical skills to students.

Crabb identified the season of the year when service jobs were performed in tractor dealerships. Using these findings, May through August was an active time for farm and industrial equipment dealers. During this four month period, 48 percent of the hydraulics, 43 percent of the electrical, and 41 percent of the power train service jobs were performed. With a good deal of planning and some lead instruction, this could be the perfect learning experience for students in agricultural power and machinery.

Most dealerships have excellent training material like Ford's Trac-Com and Deere's Pathfinder programs. Taken to the limit, the instructor could schedule time for weekly individual or small group instruction. Too, a few minutes each week in consultation with the supervisor would allow for diagnosis, planning, and remedial instruction for the student.

In nature, the strongest structure is the triangle. In education, a triad composed of the student, teacher and employer would strengthen our program.

Summary

Successful programs recognize student needs. If classified advertisements are any gauge, employers value experience. In the past, vocational agriculture programs banked on the home farm experiences of the student. When linked with state-of-the-art technical information, plus individual and small group leadership skills; the students and programs were a SUCCESS!

Today, we still provide technical and leadership skills but the majority of students do not come to the program with a solid background experience. To maintain our success record, programs must be structured to provide real-world experiences.

Successful programs also recognize community needs. Ask any employer for a quick profile of an ideal employee and you will likely get five characteristics: honesty, dependability, reliability, sobriety, and the willing to do a day's work for a day's pay! At first, the list looks impossible . . . until you realize that these are not inputs. They are outcomes. They result from well-planned classroom and laboratory instruction, realistic personal goal setting, individual leadership skills, and real-world experiences and expectations.

Successful programs also recognize the necessity for students to continue to grow. Mr. Leon R. Brodeur, President and Chief Operating Officer of Firestone Tire and Rubber Company recognizes this need. Through his efforts, twenty scholarships will be made available to secondary students who participate in the FFA Agricultural Mechanics Contest in November. Winners will be selected based on contest rank, SOE programs, academic achievement, leadership, and community service. The scholarships may be used for post secondary education so necessary for success in tomorrow's technical world!

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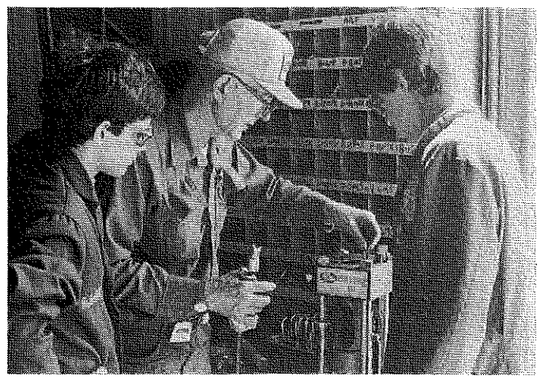
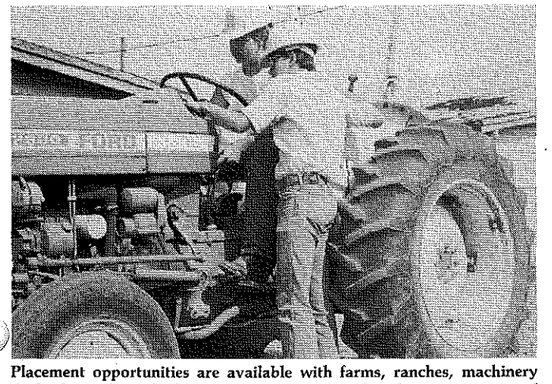
Tyler, R.W. Basic principles of curriculum and instruction. Chicago: University of Chicago Press. 1950.

Vocational agriculture graduates need experience to get a job. They can gain it through a well-planned SOEP.



SOE provides opportunities to practice basic skills and learn new techniques using tools which may not be available in the school laboratory.



Placement opportunities are available with farms, ranches, machinery dealerships, farm building contractors, agricultural construction and fabrication companies, and many other local agricultural agencies.

A SOEP can match a student with a professional who is willing to share his experience.

THEME

SOE In Ag Mechanics — A Point Guide System

By Dale Perritt

(Editor's Note: Dr. Perritt is in Agricultural Mechanics at Stephen F. Austin State University in Nacogdoches, Texas 75961.)

When you hear the words "Supervised Occupational Experience Program", what type of program and student comes to mind? Many people generalize the SOEP to be primarily for production agriculture students and those students involved in job placement programs. If so, what are we doing with other students in specialized programs such as Agricultural Power and Machinery and General Agricultural Mechanics? In Texas, these are known as preemployment laboratory training programs. These classes are often set up for two or three consecutive hours in length and are not necessarily job placement oriented. Should these students be required to have an SOEP? When we consider the purposes of the SOE, the conclusion is obvious.

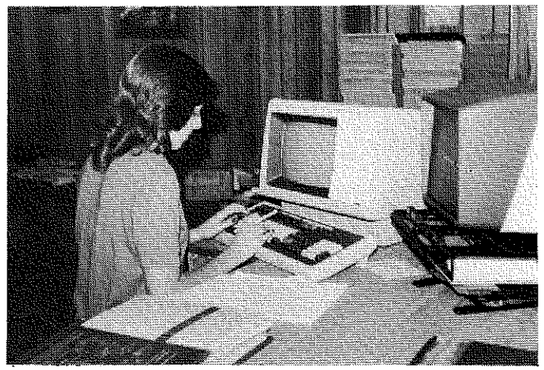
Developing A Skill Inventory

In specialized programs, we attempt to teach the student skills unique to a given occupation. When a student enters a power and machinery program as a junior and exits two years later, how do we know the student has developed salable skills? We must have some means of measuring his/her accomplishments on a day-to-day and week-to-week basis.

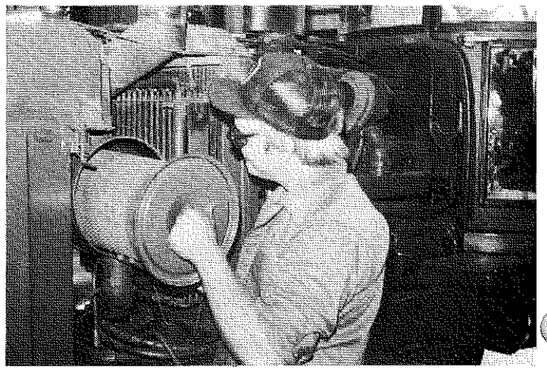
An example of the need for an effective, measurable SOEP in agricultural mechanics may be related to a student pilot. After classroom and instructor-assisted flight, the student solos. At that time, the student is not ready to assume the role of commercial aviator; yet, without the solo flight, there is no real proof that the student has mastered the basic skills of piloting a plane. The same may be true in agricultural mechanics. If we simply stop at the end of classroom/laboratory instruction, how may we be sure the student possesses the basic skills needed on-the-job?

One viable method to measure student achievement outside the classroom may be a SOEP developed to build an inventory of skills common to a particular job; a SOE designed to be an extension of classroom/laboratory instruction but completed outside class time to reinforce concepts previously learned. Classroom/laboratory instruction may address agricultural mechanics in a more general nature while the SOEP may focus on specifics.

The question then becomes: what are the basic skills needed in agricultural mechanics occupations? How do we know what competencies a student should possess after completing the program? The 1978 National Ag Occupational Competency Study identified and validated competencies needed for entry and advancement in major agricultural and agribusiness occupations. There are eight occupations listed under the agricultural mechanics occupation cluster. The results and importance of this study are well documented, but how often do we actually use the competencies outlined in this and other studies to build a SOEP based on reliable data?



A student employed at a local machinery dealership uses the computer to locate needed parts.



Servicing air cleaners and dust unloading valves is considered an important skill of the "set-up mechanic".

JOB TITLE						
SET UP MECHANIC OF FARM AND INDUSTRIAL EQUIPMENT (Total Points for Credit – 1,000)	POINTS	Flat Rate Manual or Estimated Time	Time Required	Where Skill or Job was Performed	Total Points	
COMPETENCIES						
I. MAINTAIN AND SERVICE POWER AND MACHINERY SYSTEMS. A. Change Oil and Filter	30	30 min.	35 min.	Contracted with Mr. Low on 4020 John Deere	30	
B. Check Coolant Freeze Point	10	5 min.	8 min.	After school in lab on school tractor	10	
C. Service Air Cleaners	15	15 min.	15 min.	Clark Ford Tractor Ford 4600	15	
II. MAINTAIN AND ADJUST TILLAGE EQUIPMENT A. Service and Adjust Tandem Disc	40	1 hr.	1 hr./ 20 min.	Assisted Mr. Ross at his farm on Saturday	40	

Designing the SOEP

When a student enters a specialized program, an individual SOEP should be outlined which will best complement future career plans. For example, a student enrolled in an Agricultural Power and Machinery class may have a career interest which will require skills related to the occupation of set-up mechanic of farm and industrial equipment. From the competency study, we may identify the skills and the order of importance of each skill related to that occupation. The student's SOEP then may be based on industry needs and job skills congruent to a particular area.

Obviously, great care must be taken in counseling and advising students concerning the selection of a job specific SOEP. The local resources available to aid a student in the completion of a particular type of SOEP must also be considered. Are machinery dealerships available and willing to employ students on a part-time basis during the busy seasons of the year? Such job titles as parts person would require at least part-time employment in a dealership to be practical. Whereas a student with a SOEP directed toward Production Agricultural Mechanic may be able to complete many of the competencies outside of school in the form of directed laboratory experiences or in part-time employment on farm.

After examining the various job descriptions and job competencies found in the National Ag Occupations Competency Study, it becomes evident that the incorporation of all the competencies into a SOEP may be impractical if not impossible. The job title "set-up mechanic" involves some 113 competencies. Some of the competencies are simple and would require little time and equipment, while others would be time consuming and require extensive equipment and technical assistance. It may be feasible to select a workable number of competencies which are considered the most important for the actual job description. This task may be somewhat easier than expected because the competencies have been ranked according to order of importance.

Changes in technology which may effect the importance of some of the competencies since the 1978 study need to be considered when planning the SOEP. It would be beneficial to look at recent studies by Shinn, Crabb, and Jacobs which analyze actual jobs performed in machinery dealerships throughout the year. Comparing these and other studies which attempt to evaluate needed job skills may help to develop a SOEP which is based on the perceived importance of the skills and the actual skills needed in frequently reoccurring jobs.

Another major consideration in selecting competencies to be including in a SOEP involves local adaptation. Certain geographic areas of the country may require skills which will be of less value in other localities. These regional differences, of course, should be reflected in an individualized SOEP.

A Point Guide System

Once a list of competencies to be addressed in a SOEP have been selected, a value should be assigned to each. A

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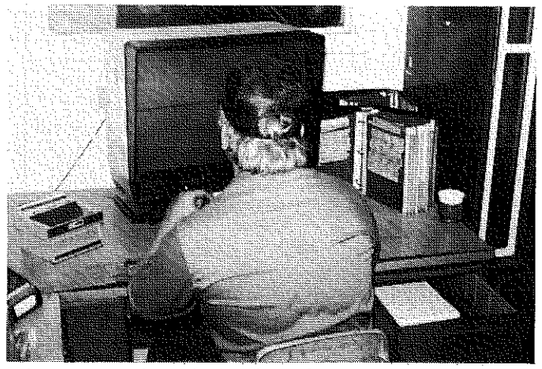

Using a parts catalog and microfilm to determine part name and stock number is considered an essential competency needed by a parts person.

Controlling a constantly changing parts inventory is made much easier on the computer.

SOE In Mechanics . . . A Point Guide System

(Continued from page 17)

point value should be based on more than perceived importance. Such variables as the degree of difficulty and the amount of time required to complete the skill must be considered. It may be very time consuming and important to know how to remove the tin-work from a tractor but it may be a relatively simple task. A better balance may be obtained if a point value is assigned based on all three variables. A flat rate manual would be a valuable tool in determining the amount of time that should be spent on a particular job involving agricultural machinery.

A possible outline form for a SOE involving some of the skills needed as a "set-up mechanic" is shown:

In Texas, there is currently an optional point guide system for students in production agriculture not involved in entrepreneurships. The student must accrue 1,000 points by the end of the year, with a maximum of 500 points in any one subject matter area. Likewise, the total number of points required for a SOEP in agricultural mechanics should be of adequate scope to challenge the student while remaining realistic.

Records of the student's SOEP activities may be kept on placement sheet pages of state adopted record books or on self-developed outline forms as in the example. Regardless of the method, accurate records are essential to a successful SOEP.

Implementation

Contemplating the use of a good point system for completion of the SOEP in agricultural mechanics will certainly bring to mind a number of assets and liabilities. Naturally, a SOEP based on selected competencies with assigned values will require close supervision. Teachers will need to take the time to plan and closely scrutinize the student's SOEP. The logistics involved in directed laboratory experiences and student placement always present a few hurdles which must be overcome.

In comparison, the establishment of needed competencies at the beginning of the year will give direction to the SOEP. The experiences gained will be structured rather than an after the fact log of unplanned, unsequenced jobs which may or may not be relevant to the student's needs. All too often in a SOEP involving placement, the student gets locked into one skill or task, day-after-day routine and never gains the broad base of experiences needed in a SOEP.

Involving the specialized student in a SOE must become and remain a priority. A successful SOE may greatly enhance the student's ability to find, keep, and progress in the occupation for which he/she was trained.

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Coming In October . . .

SOEP: Forestry, Conservation and Recreation

THEME

Teaching Safety Through SOEP

By Herbert E. Hansen and Herschell P. Weeks

(Editor's Note: Dr. Hansen is an Associate Professor in the Agricultural Engineering Department at Oregon State University, Corvallis, Oregon 97331; and Mr. Weeks is a Vocational Agriculture Instructor at Cascade High School, Turner, Oregon 97392.)

Teaching the safe operation of tractors and agricultural equipment is often passed by because of the time required to do a thorough job. We, as educators, often will demonstrate the safe use of only one piece of equipment as part of a unit on tractor safety. We quite often operate on the premise that we do not need to specifically teach safety for all of the equipment our students will be operating during their SOEP.

An outcome of this instruction may be the issuance of a tractor operator's certificate or a tractor and farm machinery operator's certificate. In addition to the moral responsibility we have as teachers to teach safety, the rise of legal suits for damages due to injury increases the importance of teaching these areas thoroughly.

A half million dollar lawsuit in California, a million dollar suit in Massachusetts, both were against school systems because of student injuries.[1] Under certain conditions, teachers may be held liable for their actions in a court of law.[2] Such lawsuits are not common and are generally thought of as something that will never happen to me, but the facts show that they do occur. As vocational agricultural teachers, we have a responsibility to provide for our student's safety in the classroom, in the laboratory, during field trips and also during their SOEP.

In 1925, Prosser and Allen[3] had this to say, "Effective vocational training can only be given where the training jobs are carried out in the same way, with the same operations, the same tools and the same machines as the occupation itself". Guilinger[4] wrote, "Most vocational agriculture educators believe that supervised occupational experience is the best means of delivering hands-on experience for students. It must be remembered however, that in our early years these types of experiences were taught at the school and practiced at home under parent supervision with assistance from the vocational agriculture teacher. Over the years, the vo-ag curriculum has changed so that it now involves greater varieties of students from more diverse family backgrounds. The school is expected to offer more of the skills and competencies for students which in turn places greater legal burdens on the vocational agriculture instructors.

Proper instruction in machine safety must be given prior to placement in an SOE.

Training Programs

In Oregon, the responsibility for training 14 and 15 year old youths rests with the Cooperative Extension Service and the vocational agriculture teachers. These two agencies are the ones designated by statute to sign the approval sheets for the issuance of tractor and agricultural equipment operator's licenses. There has been a wide range of programs offered to achieve this needed training with some counties and school districts not offering any training for certification.

On the other hand, some schools such as Cascade High School of Turner, Oregon, offer a program which is more extensive than that which is required by the Oregon statute. In this school, students are required to take 20 hours of safety instruction in tractor operation and an additional 10 hours of machine operation and another 4 hours specific to industrial safety for agribusiness. To improve the training offered statewide, the Oregon State University Cooperative Extension Service and the persons responsible for in-service training for the vocational agriculture teachers have planned a series of joint workshops to introduce the agreed upon reference and support materials to teach an effective unit.

The Oregon State University personnel developed an instructor's supplement to the Hobar Publications "Safe Operation of Agricultural Equipment" manual. This material was selected due to its organization and content but needed some supplementation for explanation of Oregon's statutes. Chapter 1-7 are required for the tractor operator's permit and chapters 8 through 10 are required for the agricultural equipment permit. The supplement includes:

(Continued on page 20)

Teaching Safety Through SOEP

(Continued from page 19)

a. an outline of youth jobs which require training.
b. basic requirements of a certification program in Oregon.
c. a list of references and audio-visual aids.
d. example questions (and answers) for the written exam.
e. example layout of the performance test course.

The supplement and manuals are stocked by the university bulletin service so they are readily accessible to teachers and others.

One-day, six-hour workshops are being conducted throughout the state with representatives from state agencies, insurance companies and others assisting in presenting state and regional perspectives. With the introduction of the supplement and workshops, an increased interest in teaching the safe operation of tractors and agricultural equipment is anticipated.

When teaching tractor and agricultural equipment safety, each piece of equipment the students will be using during their SOEP should be included. Not only shall all safety features be pointed out, but proper adjustment should be practiced by the students. A working knowledge of the equipment is important so that in a field situation the student will be able to detect improper operation which could lead to a hazardous condition. The instructor should set a good example. Bekkum and Hoerner[5] stated, "In fact, failure to maintain an atmosphere of safety awareness could cause the instructor to be considered negligent in the legal sense of responsibility."

To protect our students and indeed the instructor, it is worthwhile to take the additional time to not only teach safe operation of tractors and equipment in a general sense but to include the specific items of equipment the students will be using during their SOEP. The level of competence taught should include the thought process that are a part of a safe operators' skills.

The skills of safe tractor operation begin when the student has developed the proper mental attitude and desire to be safe.

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BOOK REVIEW

ANIMAL SCIENCE AND INDUSTRY, by Duane Acker. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1983, 3rd edition, 658 pp., $27.95.

In the third edition of ANIMAL SCIENCE AND INDUSTRY, the author has expanded the areas covered. Five additional chapters have been included, and various other chapters have been revamped. Many of the sections existing from the prior edition have also been augmented. The author's reworking of the third edition served to increase the comprehensiveness of the text.

Essentially, the text is written so that each chapter can be utilized in the order in which it is found in the book, or it can be cited as a supplement in the area that it addresses. Some of those areas covered in this text are importance of animal agriculture to everyday life, food products of animal agriculture, by-products of animal agriculture, marketing, and other economic and business considerations. Production topics addressed include nutrition, behavior, physiology, reproduction, breeding systems, and genetics. The animal species mainly dealt with include swine, dairy cattle, beef cattle, horses and ponies, sheep, and poultry. Some insight is also provided on goats.

The production schemes are covered in a very basic sense. Each area is highlighted, but not delved into extensively. The text provides a good overview of modern animal science and how it relates to the larger scheme of animal industry. It would be very fiting to use in an introductory animal science course either in universities or community colleges.

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THEME

Teaching Appropriate Knowledge and Skills

BY EARL E. BAUGHER

(Editor's Note: Dr. Baugher is an Associate Professor in the Department of Agricultural Engineering at Kansas State University, Manhattan, Kansas 66506.)

Agricultural Mechanics is an essential part of vocational agriculture and as such, is vitally important to the SOE program. However, the extent to which agriculture mechanics is taught and the kinds of learning activities that take place vary greatly from one state to the next and even from one vocational agriculture program to the next. Most of the time, the agricultural mechanics content taught as a part of a vocational agriculture program is a direct reflection of the philosophy of the instructor. As a result, some programs offer students a great variety of valuable experience in agricultural mechanics. In others, the tunnel effect is prevalent and little is actually taught beyond the basic skills related to hand tools and welding. This results in a "shop" program which leads to project construction as the major activity that takes place in agricultural mechanics.

Project Construction

It is true that designing, working out a bill of materials, and the actual construction of a project is a valuable experience for a student. It does provide him or her with a great deal of personal satisfaction; a sense of accomplishment. In addition, it is highly visible and serves as an outstanding public relations tool in the promotion of vocational agriculture.

While project construction as a part of the SOE program is desirable, we must not lose sight of the many other agricultural mechanics skills that should be taught. Consider the skill possibilities for SOE programs developed around horticulture, forestry, crops, livestock, fruit and/or vegetable production and others. Consider the part that mechanization can and should play in each of the program areas.

Importance

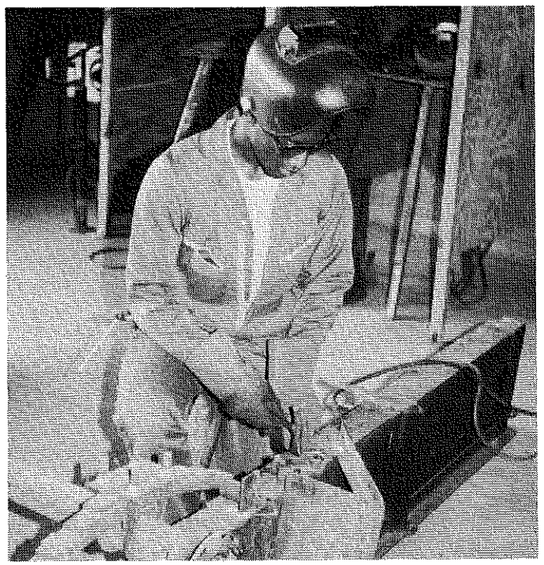
Offering a complete program in agricultural mechanics has never been more important than it is today. With the current economic situation as it is in agriculture, it is certainly to the vocational agriculture students advantage to have as many agricultural mechanics experiences as possible.

The American Society of Agricultural Engineers' (ASAE) Education and Research Committee, "Instruction in Agricultural Mechanization" (A-214), has identified six instructional areas in agricultural mechanics. These include Power and Machinery, Structures and Environment, Electric Power and Processing Soil and Water Management, Agricultural Construction and Maintenance and Food Processing. In order to provide the vocational agriculture student with the experiences necessary to adequately support a top notch SOE program, regardless of the area around which it is developed, he or she needs instruction in these areas as they apply to each program.

From the practical standpoint, there is not any way that all desirable agricultural mechanics skills can be offered to all students. Therefore, the answer is to develop a systematic approach and be highly selective in choosing the subject matter to be taught. You should consider such criteria as community and student needs, agricultural mechanics priorities, instructor background and abilities, and facilities and equipment available.

As you develop a program in agricultural mechanics, involve your advisory committee in helping make decisions and keep the school administration advised of proposed changes.

When you make changes in an on-going program, it may also call for a change in your personal organization. Look ahead! Lesson plans may need to be developed; you may need to learn a new skill; and tools, equipment or materials may need to be purchased. In any case, to be most efficient and still get the job done, you must take time to plan and organize your instructional activities. If you do, it will pay dividends may times over.



Skills beyond those provided in project construction should be taught to students. (Photograph courtesy of Dale Perritt.)

THEME

SOE In Agriculture Mechanics: Teacher Education's Responsibility

By John W. Slocombe

(Editor's Note: Dr. Slocombe is an Assistant Professor in the Department of Agricultural and Extension Education at the University of Idaho, Moscow, Idaho 83843.)

For more than seven decades SOE programs have been a very effective and meaningful way for vocational agriculture students to develop essential occupational competencies. Traditionally, SOE programs have consisted of cow, sow, and plow enterprises in the form of ownership or placement. However, this decade has attracted more students into vocational agriculture which have limited opportunities for traditional SOE programs. Thus, modifications must be made in vocational agriculture programs to meet the needs of the changing clientele.

Since 1930 and before, agricultural mechanics instruction has been one of the primary components of the vocational agriculture program. Skill development activities related to technology changes in agriculture have been the primary focus of agricultural mechanics instruction in most vocational agriculture programs. Because of the rapid advancements in agricultural mechanization and parallel developments in other fields, there is a growing need for better education for those entering today's agricultural industry.

SOE In Agricultural Mechanics

One option for SOEP which has not received much attention from vocational agriculture teachers is agricultural mechanics. This type of a SOE program allows students to develop skills and abilities through ownership, placement, or directed laboratories using school or community facilities. Furthermore, an abundance of resources are available to most teachers which can be used to provide occupational experiences to students interested in agricultural mechanics. Even though little emphasis has been placed on the development and implementation of SOE programs in agricultural mechanics, numerous opportunities are available.

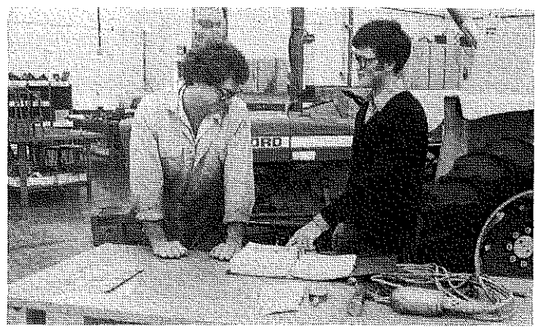
Why are these types of SOE programs considered foreign to vocational agriculture students and teachers? Are SOE programs related to agricultural mechanics that much different than other types of SOE programs? Why are SOE programs related to agricultural mechanics not being implemented by many vocational agriculture teachers?

Student teachers, cooperating teachers and teacher educators should work jointly to further identify opportunities for SOE programs in agricultural mechanics.

Teacher Education's Responsibility

These questions remain unanswered to many vocational agriculture instructors nationwide. When asked to describe a SOE program in agricultural mechanics, one teacher said, "They offer poor money making capabilities for students." Another teacher said, "It is difficult to differentiate between a SOE program and an approved project in the agricultural mechanics laboratory." Other teachers commented that, "they didn't understand how to assist a student in planning a SOE program in agricultural mechanics," "their facilities were inappropriate for SOE in agricultural mechanics," "they didn't have time to supervise students conducting SOE programs in agricultural mechanics utilizing school facilities," "a SOE program in agricultural mechanics is only for non-traditional students enrolled in vocational agriculture."

These comments indicate that teacher educators need to provide instruction about alternatives for SOE in agricultural mechanics through preservice and inservice agricultural education programs. In addition, teacher educators need to conduct research to evaluate the effectiveness of SOE programs related to agricultural mechanics.



Service and maintenance of agricultural machinery is one type of a directed laboratory SOE program in agricultural mechanics.

The Preservice Program

The preservice program in agricultural education should include instruction about SOE, opportunities for prospective teachers to observe vocational agriculture instructors assisting high school students in developing SOE programs related to agricultural mechanics, and opportunities for prospective teachers to assist high school student in conducting SOE programs related to agricultural mechanics.

Regardless of the type of SOE program conducted by vocational agriculture students, implementation procedures are quite similar. Upon completion of the preservice curriculum in agricultural education, prospective teachers should understand the basic principles undergirding SOE. Further, they should realize the importance of teaching a unit of instruction about SOE which will prepare students for occupations related to agricultural mechanics.

Now more than ever, teacher educators should emphasize the development of non-traditional SOE programs. Including early experience programs in the preservice curriculum provides prospective teachers opportunities to observe vocational agriculture instructors assisting students in developing and conducting SOE programs in agricultural mechanics.

During the student teaching experience, prospective teachers should learn how to implement alternative types of SOE programs in agricultural mechanics from vocational agriculture instructors in their student teaching centers. Many vocational agriculture teachers have considered this type of SOE foreign to vocational agriculture. Thus, teacher educators need to observe through supervisory visits that viable experiences related to SOE in agricultural mechanics are being provided to prospective teachers.

The Inservice Program

The national SOE workshops have renewed the emphasis on SOE. The 1984 National SOE Workshop emphasized alternative types of SOE available through directed laboratory programs for students with limited opportunities and special needs. If these types of SOE programs are to be implemented by vocational agriculture instructors, teacher educators need to conduct inservice education programs to acquaint them with implementation procedures. Comments presented in this article reveal that teachers have several misconceptions about SOE programs related to agricultural mechanics.

Alternatives for SOE programs in agricultural mechanics need to be presented to vocational agriculture teachers. In some states, this has been most effectively accomplished by using model schools. The model schools have a variety of SOE programs related to agricultural mechanics being conducted by vocational agriculture students in the form of ownership, placement, and/or directed laboratories. While most vocational agriculture instructors consider SOE and agricultural mechanics as two separate entities, the model school illustrates how these two entities complement each other in providing occupational experiences to students.

Teacher educators need to promote SOE in agricultural mechanics to all vocational agriculture instructors. As agricultural jobs continue to become more service oriented, fewer vocational agriculture students will have opportunities for conducting traditional SOE programs. Thus, the time is ripe for teacher educators to prepare vocational agriculture instructors to serve the needs of students through non-traditional SOE programs such as agricultural mechanics.

Research Activities

Since 1980, many states have launched research projects to determine the effectiveness of SOE. Supervised occupational experience programs must be evaluated on a regular basis through systematic research procedures in order to identify strengths and weaknesses. Systematic research can provide the direction needed by vocational agriculture instructors and teacher educators to improve the effectiveness of SOE programs.

While much research has been conducted to determine the effectiveness of traditional SOE programs, very little has focused on non-traditional SOE programs such as agricultural mechanics. As more vocational agriculture students become involved in non-traditional SOE programs, teacher educators need to be prepared to provide vocational agriculture instructors solutions to problems that arise. This can most effectively be accomplished by disseminating the findings of research related to non-traditional SOE programs. Thus, teacher educators must remember, if it is to be, it is up to me.

Summary

SOE is an important part of a viable vocational agriculture program especially during times of rapid change. Vocational agriculture instructors must use the resources in his/her community with imagination and innovativeness in planning SOE programs to meet the needs of students.

SOE programs related to agricultural mechanics can provide students with many occupational choices. However, teacher educators must place more emphasis on promoting these non-traditional SOE programs to prospective teachers enrolled in the preservice curriculum and to vocational agriculture instructors through inservice education. In addition, it is essential that teacher educators conduct research that focuses on the effectiveness of SOE programs related to agricultural mechanics.

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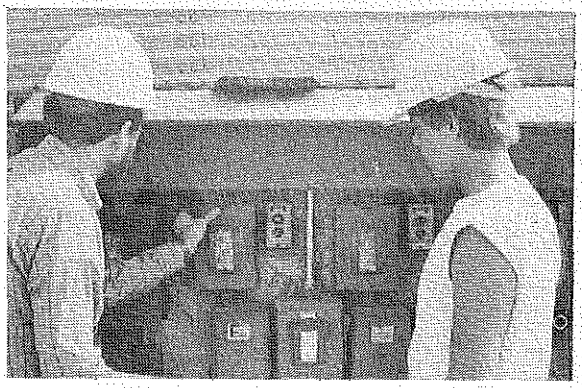
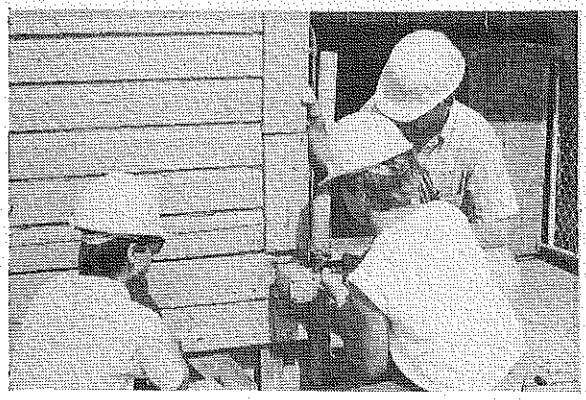
Stories in Pictures

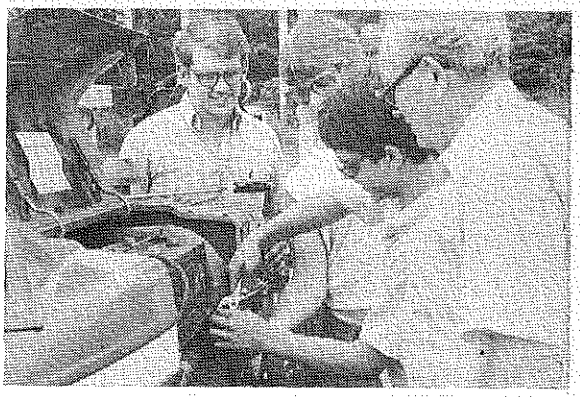
It's good to have an expert to explain the "how to do it" when the book isn't very clear!



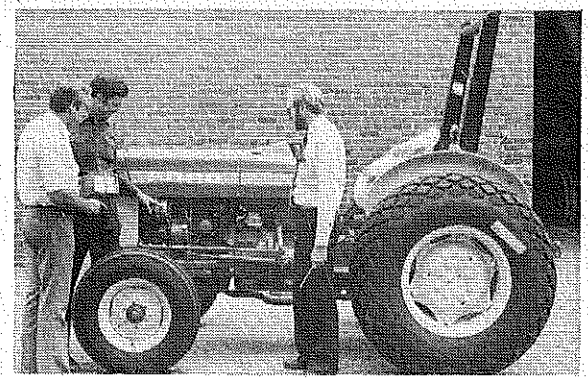
American agricultural industry is highly mechanized. Tomorrow's employee can gain a better understanding of the operation and maintenance of production and processing equipment when the school and industry work together.



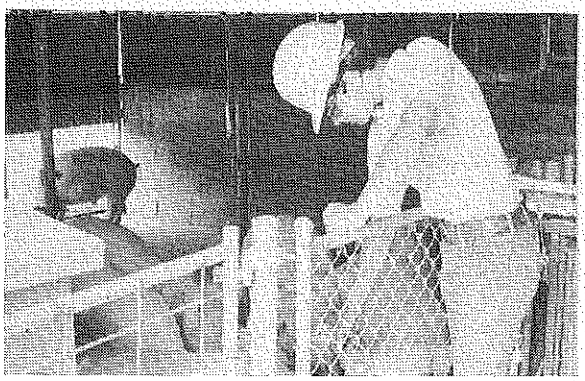
People who construct or renovate farm buildings continue to use new tools and equipment to increase productivity and help to make a profit.



Summer provides opportunities for the vocational agriculture teacher to deliver small group instruction while students are on the job.



Sound inservice programs involve teachers, teacher educators, state supervisors, and industry specialists to plan classroom, laboratory and experience-based instructional programs.



Many students can combine production agriculture and agricultural mechanics into an "experience of a lifetime"!

(Photographs courtesy of Glen C. Shinn)