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STORY IN PICTURES

by Robert Walker,
University of Illinois

Featured — AGRICULTURAL MECHANICS
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THE AGRICULTURAL EDUCATION MAGAZINE

Vol. 44 January 1972 No. 2

It is with great personal and professional pleasure that I begin this tenure as Editor of the Agricultural Education Magazine. It is my hope that through the coming issues, Agricultural Educators at the secondary, post-secondary, state departments of education, and university levels will gain and contribute ideas which will help us all perform our job to help young people and adults prepare for their next phase.

Research shows there is a need for workers in the field of Agricultural Mechanics, both on and off-the-farm. The fact also shows there are several levels of jobs, and the requirements for these jobs. The implications of planning appropriate educational programs are strong. First, the society should identify the educational opportunities in Agricultural Mechanics in the local, state, and national areas because so many people migrate. An employment opportunity is open to everyone due to personnel, health, retirement, and other reasons. Second, he should identify the levels of jobs and the qualifications needed by workers in each job. Excellent educational facilities are available from several sources that could determine which curricular content is needed. Third, teachers conducting vocational programs which will expose young people to the world of work, especially at the elementary and junior high levels. Are you high school students learning basic carpentry skills, since you are using these tools as home repair? Are secondary and post-secondary students obtaining marketable skills in Agricultural Mechanics, learned either on-the-job or in a school laboratory situation? What is the answer?

The instructional areas of Agricultural Mechanics is a very important part of most secondary school vocational agriculture programs, making up to 25 to 50 per cent of the course time depending on the local situation. It is essential that the teacher have an adequate background in the Agricultural Mechanics areas in which he will provide instruction. He should prepare himself for the agrivocational experience prior to college graduation, coursework while in college, or in-service workshops or schools taken after beginning teaching.

The Agricultural Mechanics phase of vocational programs at secondary and post-secondary levels enable many students who are not succeeding in the regular academic programs to succeed in the mechanically oriented courses.

The basic reason we are educators is to help others achieve successful competencies. How well is your Agricultural Mechanics program organized to do this job? — RRD

Agricultural Mechanics

In this day of modern American agriculture, there is a great need for mechanics skills in farming and in many ag-related occupations. Taking care of the up-to-date machinery and equipment needed to operate a large modern farm requires much greater technology and skill than was required in the days of horse-drawn implements.

Kennes farmers own about a billion dollars worth of farm property and machinery, an equal book value, what it would cost to replace it. What would be the cost to repair one major component? Net annual income of these same farmers is about one half million dollars in excess of their savings accounts and replacements. Our farms are becoming more mechanized, and there are more people, Technology has added to the dictionary as "something handed down from the past, an inherited culture, attitude, etc." Those of us who have been connected with the early vocational agriculture programs know that great changes have taken place in ag mechanics, that we have learned from and built on the past, and that more changes will be needed in the future.

The vocational agriculture teacher has to have a wide variety of mechanical skills to meet the needs of farm boys and young men engaged in the business of farming. The ag mechanics areas of instruction deal primarily with the specialized mechanical activities carried on during the daily operation of a farm and the performance of these activities in a profitable manner. Proficiency in the use and maintenance of equipment is among the first requirements for survival of the family-type farm today. No other part of the vocational agriculture program offers a greater opportunity to the teacher for immediate visible and tangible results than does ag mechanics. No other part of the vocational agriculture program is accepted more eagerly by the students than well planned and conducted ag mechanics classes. No other vocational program offers the wide variety

From Your Editor...
The Vocational Agriculture teacher has to have a wide variety of mechanical skills to meet the needs of farm boys and young men engaged in the business of farming.

The ultimate goal of a farm mechanics training program for the boy who plans to return to the farm should be the ability to protect the investment in farm power, machinery, buildings, and equipment through proper operation, adjustment, preventive maintenance, and repair. Minor construction projects are also a part of the goal. This ability requires a wide variety of manual skills, knowledge, and judgment.

The high school farm mechanics program should provide from the simple to the more complex. Freshmen boys still need to be acquainted with the hand tools and the proper usage of each tool. They need to learn to properly sharpen chisels, plane irons, screw drivers, and drill bits. Each one of these jobs should be accomplished by appropriate shop practice training.

Each job should be studied in class. Each student should take notes on steps and procedures to be followed or have an exercises sheet explaining the procedure to be followed. A systematic approach to teaching students new skills such as the "traditional" procedure of explanation, demonstration, and execution for teaching shop skills is still hard to beat.

The agriculture mechanics information outlined in the courses listed in this article is taught in Kansas vocational agriculture departments. Variations in scheduling and emphasis may be found due to local facilities, enrollments, and community needs.

Below is a suggested list of areas for skill development for beginners in agricultural mechanics:

1. Chiseling, turning, and drawing as applied to learning simple shop skills and construction of small projects which the skills being studied. Learning of symbols in blueprint reading, making detailed drawings, figuring a bill of materials.
2. Tool conditioners including hand tools, chisels, woodwork, and other tools.
5. Sheet metal and soldering a. Tin copper b. Join two pieces metal and sweat together c. solder sheet iron and temper cold chisel.
6. Piano tuning a. Tuning and marking wood using saw, tape, carpenter tool, eye spanner b. sawing board with hand saw c. Sawing and cutting with hand saw.
7. Applying electric wire a. Insulating wires b. Metal and other common materials used in exposed wire installation.
8. Soldering electric wire a. Rain proofing b. Damp proofing c. Electric wire and heat for you d. cost of electric power compared to other sources.
9. Driving and using tools for you
e. Sawing and cutting wood using saws, tape, carpenter tool, eye spanner f. Sawing board with hand saw g. Sawing and cutting with hand saw.

In learning a skill, it is desirable that the student complete a small project to take home. For example, a new drawing of a small box and the finished painted nail box in the carpentry of the furniture shop is a feed scoop for sheet metal and cold work, a foot scraper for cold metal work and content, and good for electric work, and replacing a harness being a tool fitting all good projects. A simple project, as we have done, will develop enthusiasm, pride, and comfort to the student. It also makes a valuable impression on the parent.

Practically all of the sophomore, junior, and senior mechanics work we are using will fall under the five headings listed below:

1. Agricultural construction and maintenance
2. Farm power and machinery
3. Farm buildings and conveniences
4. Farm electricity
5. Soil and water management

The sophomore year in many of our schools has a special period class, which is especially valuable in agriculture.

A Suggested Change

The writers believe that agricultural mechanics curricula should be changed in another way—to ensure that the instruction provided is related to the activities students perform as part of their educational programs and work in the various activities at various times. The students must prepare to meet the full requirements of the course in a manner that will be meaningful to their future careers. This requires that the curricula be altered to those which the students will meet. This is the purpose of their program and, once this is accomplished, the students will be prepared to meet the full requirements of the course in a manner that will be meaningful to their future careers.

Impact of the change in agricultural science and practice is very important to the full requirements of the course in a manner that will be meaningful to their future careers.

It should be noted from the information summarized in Table 1 that the change in agricultural science and practice is very important to the full requirements of the course in a manner that will be meaningful to their future careers.
caring the operation and maintenance of electric motors, machinery, handling equipment, and farm power and machinery items, such as hoes and gasoline tractors should be introduced near the beginning of the vocational agriculture program—preferably in the first year of the program.

Opposition

But echoes from the past can be heard. You cannot introduce areas of specialized study too soon. What about basic mechanical skills? What about the individuals who discover that they really do not want to farm?

In attempting to answer such responses one should consider at least three conditions. First, educators have found that students are capable of performing higher level activities than were previously thought possible. They are finding that much of the blame for poor student performance should be placed on the poor use of teaching techniques and materials instead of the students' inability to perform specific tasks. Data presented in Figure 1, when compared with the year in vocational agriculture in which teachers provided related instruction, indicate that the students' actual performance often exceeds the teachers' perception of their abilities.

Second, data shown in Figure 2 reveal that many basic mechanical skills could and should be taught before the student enters the first year vocational agriculture program. While many students reported performing the operations listed, their initial performance of the operations generally occurred before entering the ninth grade. On the other hand, teachers reported related instruction was provided during grades nine and ten.

In addition, much of the instruction provided as part of the agricultural construction and maintenance or basic skills area dealt with items not generally used on the farm. For example, less than one-third of the young and adult farmers surveyed reported using such items as power hacksaws, acetylene welders, portable electric grinders, table circular saws, radial-arm saws, band saws, jokers, wood-turning lathes, needle-nosed pliers, etc. Perhaps our basic skills area needs to be reexamined.

Third, the basic purpose of the production agriculture program is to develop those skills and abilities which are of value to farming and related occupations. Students enrolled in production courses should be given the opportunity to develop these skills. Even students who fail to enter a production agriculture occupation have reported that agricultural mechanics instruction provided in such programs was of value in other occupations.

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**Summary**

Right or wrong, many high school students appear to be forgetting the area of agricultural science and mechanics without their teachers' aid or instruction. In spite of this, the student has an opportunity to perform mechanics activities long before related instruction.

---

**Figure 1**

Percentage of vocational agriculture students who reported the school gave them the ability to perform specific tasks.

<table>
<thead>
<tr>
<th>Task Description</th>
<th>Teachers' Perception</th>
<th>Students' Actual Performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrical wiring</td>
<td>60%</td>
<td>80%</td>
</tr>
<tr>
<td>Plumbing</td>
<td>45%</td>
<td>70%</td>
</tr>
<tr>
<td>Automotive repair</td>
<td>50%</td>
<td>75%</td>
</tr>
<tr>
<td>Agricultural mechanics</td>
<td>30%</td>
<td>60%</td>
</tr>
</tbody>
</table>

---

**Figure 2**

Percentages of production agriculture students who reported the school gave them the ability to perform specific tasks.

<table>
<thead>
<tr>
<th>Task Description</th>
<th>Ninth Grade</th>
<th>Tenth Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrical wiring</td>
<td>20%</td>
<td>60%</td>
</tr>
<tr>
<td>Plumbing</td>
<td>15%</td>
<td>40%</td>
</tr>
<tr>
<td>Automotive repair</td>
<td>30%</td>
<td>50%</td>
</tr>
<tr>
<td>Agricultural mechanics</td>
<td>10%</td>
<td>30%</td>
</tr>
</tbody>
</table>

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**Instruction in Fundamentals of Electricity**

John T. Short
Instructor, Vocational Agriculture
Atoka, New Mexico

One of the most interesting jobs that can be given to vocational agriculture classes is often left untouched because of the limited skills and experience of instructors, costs of materials and supplies, and lack of part-time help. It is the purpose of this article to discuss the projective for higher vocational agriculture classes, if they are used in the teaching of electricity, lesson on fundamentals of electricity.

For the past ten years, this department has used the cooperative effort provided by our local Public Service Company. The Public Service Company has rendered two qualified, competent, and interested men, each contributing four hours of their time and effort helping teach the lesson. Also, all supplies and equipment that have been added to the school.

In the writer's opinion that most educators of vocational agriculture could work together, obtain the same results working with whatever power company is in their area. As a follow-up to this, the department that had four numbers receive expense paid for the National FFA Convention.

5. Demonstrations given by resource personnel and vocational agriculture instructor covering the following:
   a. Series circuits
   b. Parallel circuits
   c. Safety features concerning electricity
   d. Affects of size and kind of wire on efficiency
   e. Affects of length of wire on efficiency
   f. Reading of meters
   g. Actual making of toy motors
   h. Wiring diagram tracing source of power
   i. Types of electrical motors

---

**Figure 3**

Checking starter and running windings, and changing directions of the motor rotor.

---

**Figure 4**

Wiring board, showing stripboard, breaker box, solenoid, light, and two-way and three-way switches.
The SMALL ENGINE STORY

Harry J. Hoerner
Department of Agricultural Education
The Pennsylvania State University
University Park, Pennsylvania

Small engines instruction at the secondary and post-secondary levels is becoming more important and popular as an integral part of a comprehensive education program. This instruction may also be used as a first course in a series of specific power mechanics courses of study. Small engines are used in a variety of industries including farm and garden equipment, recreational vehicles, and home maintenance tasks.

Curriculum specialists indicate we are in the age of the comprehensive course approach, whereby students from a list of offerings, build their own personalized and total course of study. A course in small engines can be as short as three, six, or nine weeks (one semester), or as long as one semester.

What's Happening in Pennsylvania

The Department of Agricultural Education at The Pennsylvania State University has provided leadership in formulating course content and equipment recommendations. This instruction is disseminated through the Department's in-service teacher training and through courses conducted in 14 centers throughout the state. Two different, yet related, courses in small engines are being offered by Pennsylvania's teachers. These on-credit University courses have 13 to 16 hours of class time. The first course is Small Gasoline Engines, Number One—Operation and Theory; and the second course is Small Gasoline Engines, Number Two—Complete Overhaul. Both courses will be expanded.

Engine Operation

An in-service, off-campus course entitled, Small Gasoline Engines, Number One—Operation and Theory, has been conducted throughout Pennsylvania over the past five years. Thirteen of these courses have been taught by agri-cultural mechanics specialists to 23 enrolled students, and 15 audits. About 70 percent were teachers of vocational agriculture and, the remainder, teachers of industrial arts, industrial education, and other community and elementary age students. Small engine instruction needs to be expanded.

The course, Small Gasoline Engines, Number Two—Complete Overhaul, will be offered from March and April of 1971. For other communities in Pennsylvania, we do not have course instructors to include large engines. This course is offered as part of the course Small Gasoline Engines, Number One—Operation and Theory.

Complete Overhaul

The Spring of 1971 is a central warehouse and new parts are available for the next class meeting the following week.

During the third session, class members continue evaluating and performing their engines. Several time demonstration was conducted which are: breaker—plunger guide replacement, main bearing replacement, replacing "striped" threads, and carburetor—governer requiring. Again class members turn in needed parts request forms, and are cautioned that this is their last opportunity to order parts.

The last section is primarily used by class members to reassemble and run their engines. The only instructor demonstrations which are at this point are torqueing techniques and carburetor adjusting. Class members complete forms indicating their repairs activities, estimated value of engine before repair, parts cost and estimated value after repair. The engines repaired at the Strattonville, Pennsylvania, class showed that average cost of repairs including labor was $5.86, the average value of engine before repair was $177.80 and following repair was $182.60. This form on a 10 cubic-inch engine indicated the engine was not operating properly and required new rings. Repairs activities performed including filing the ignition breaker points, cleaning armature, replacing the points, and replacing the cylinder, replacing (stator rings), 

(Continued on next page)
SHOP SERVICE MANAGERS RESPOND TO THE EDUCATOR...

In a recent study, conducted to determine the knowledge and skills required by beginning farm machinery mechanics, many farm service managers from whom data were obtained took time to express their views about what they thought was important in establishing a program. These comments are worthy of serious consideration by program developers; in fact, the following statements, excerpted from among many, constitute what a specialized segment of industry said to educators.

"Pick boys who really want to be mechanics. Teach the basic things that a beginner should know. We need young men in the field of mechanics very, very badly. I tried to answer this (information form) as if I was starting from scratch with a beginner."

"Just because you teach mechanics in high school, even on a voluntary basis, is not enough to make a young man really want to be a mechanic. Tractors and farm machinery, particularly hydraulics, are changing fast and someone will have to service them. But there will have to be enough interest created for a young man to choose mechanics for a living."

"A mechanic should have a number of basic skills, and technical knowledge will come naturally. But with technical knowledge, you will not naturally gain the skills. Here are a few things he should know:

1. How to be interested in his job.
2. Safety should be at all times — proper handling of tools, stands, jacks, etc.; also fire hazards, ground, and walking around in walkways.
3. How safely and clean parts is the feeding of the basic mechanic.
4. The mechanics head and heart. Therefore, the first thing he must do is to learn to use his proper tools and quickly thereafter to eat very well in this world.
5. I can't keep the clock, I can't make living in (mechanics) trade.

"I judge a man's pride in his work by the way he works and takes care of his tools. If he (mechanic) knows what (tool) he has and where it is with study and experience somehow he may be called a mechanic."

"Find the desire in the student to serve, to work, and to be a success, and you will find that he will take instead of just replacing a part and having it fail again. He will always replace the part at sight for the equipment he expects to work on well.

"The beginner needs to know what a specific (mechanic) unit is doing, why it is doing it, and how it is being done. Then he needs to know the knowledge that is required in doing repair work correctly."

"The beginner for farm machinery mechanics should be broken down into two parts. About 1/5 of the time should be spent in the classroom in theory and 3/5 in the field. The related instruction such as wiring, engines, hydraulics, etc. is important that the students learn the modern test equipment, such as oscilloscope, push button, flow meter, distributor tester, voltmeter, ammeters, flow meters, and dynamometers. The basic theory and application is most important in elementary mechanics."

"I am under the impression that we could take a young man with a general technical background and teach him how to need to know, while earning a salary, in a matter of months. If he spent all of his training in actual 'nuts and bolts,' it would take him a longer time to teach him the skills he should know. I would think it would take several years.

We have two 14-year-olds working as apprentice mechanics, 15 year old now. We have one 14-year-old, one 15-year-old, and two 16-year-olds working as new equipment salesmen. We also use these youngsters as cotton picker mechanics, and they learn and develop skill quicker than the older men. After one season on these pickers, they are capable of making field service calls on their own."

"Many mechanics do not keep their work area clean. They should take old parts out of the scrap pile to keep them from getting mixed up with the new parts they plan to install in the unit they are selling. Also, if these old parts are out of the way, it will give the mechanics more work room and save time in separating parts."

...I suggest the young mechanic learn to work clean, have his repair parts clean, and his tools and tools box or tray clean. He should always put tools back in their respective places when the job is done. Never leave them scattered all over the floor. We all know that when a customer comes to the shop to have some work done, he looks at the mechanic; and if he sees that he is clean, his tools are clean, and his bench is clean, he says to himself, 'Now I know I am going to get a good job done here.' As a rule, he is right. Another thing, the beginning mechanic should learn to do as the master mechanic tells him. He should be nice to him and it will be a pleasure for the master mechanic to work with the young mechanic, that is the best and quickest way to become a good mechanic."

Could these comments apply to all educational programs? The application of these suggestions, then curriculum planners should consider attitudes, aptitudes, desire for success, pride in workmanship, work habits, and respect, and tools for equipment and training in addition to skill development. Vocational education that is to incorporate the psychological aspects in the development of prospective employers ignites the major problem confronting industry today.

---

Stated steel floors are an example of one roof developments in agricultural mechanics which need to be recognized in curriculum development. This picture shows a framed, reverse-angle display of a shaped steel roof which is standard use in today's building operations.

To do this, teachers should collect local data similar to that summarized in Figures 1 and 2 and construct profiles for the type of floor desired. Such profiles could then be used as a basis for designing and sequencing agricultural mechanical programs which, in turn, would aid in developing a more efficient and effective educational program.
The agricultural mechanics facilities in Minnesota high schools were studied to determine the factors which influence the size and quality of the facilities provided. Financial factors studied included the Enrollment Aid Review Committee, the E.A.R.C. value, and the effect index. Teacher related factors were tenure, quarter hour credit in agricultural mechanics, and number of vocational agriculture teachers in the system. Total free floor space, free floor space per student, and the high school enrollment in agriculture were also considered.

Financial Effort and Ability

Financial data for each school in the study were obtained from school records in the Research Section, State Department of Education. The indicator of a school district's financial assets as determined by the Equalization Aid Review Committee is the E.A.R.C. value per Resident Populitl. This amounted to an adjusted average value of taxable property in the school district divided by the number of resident pupils in average daily attendance. It averaged $7,755 for the schools in the study.

The financial effort a school district makes in relation to its ability is the local effort index by E.A.R.C. It is expressed in mills and is the total mill rate needed to meet all local cost. This mill rate becomes an index of local effort and may be used to compare the relative contributions of the local districts in support of educational programs. Local effort index averaged thirty-nine mills for schools in the study. Coefficients of correlation between these and other factors influencing agricultural mechanics facilities appear in Table I.

Table I: Coefficients of Correlation of Factors Influencing Agricultural Mechanics Facilities

<table>
<thead>
<tr>
<th>Factor</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. E.A.R.C. Values</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Local Effort Index</td>
<td>-0.62**</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Teacher Tenure</td>
<td>-0.15**</td>
<td>-0.46**</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Quarter Hour Credits</td>
<td>0.10**</td>
<td>-0.22**</td>
<td>0.11**</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. No. of V.O.-Ag Teachers</td>
<td>-0.07</td>
<td>0.24*</td>
<td>0.08</td>
<td>-0.18**</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Teachers in the School</td>
<td>-0.06</td>
<td>-0.11**</td>
<td>-0.07</td>
<td>0.10**</td>
<td>0.12</td>
<td>0.09</td>
<td>1.00</td>
</tr>
<tr>
<td>7. Total Free Floor Space</td>
<td>-0.08</td>
<td>-0.05</td>
<td>-0.13</td>
<td>0.09</td>
<td>0.11**</td>
<td>0.11**</td>
<td>0.10**</td>
</tr>
<tr>
<td>8. Free Floor Space per Student</td>
<td>0.09</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Total H.S. V.O.-Ag Enrollment</td>
<td>-0.01</td>
<td>0.16**</td>
<td>-0.14**</td>
<td>0.04</td>
<td>-0.06**</td>
<td>0.05</td>
<td>-0.30**</td>
</tr>
</tbody>
</table>

*50 level of significance = 0.13**5% level of significance = 0.17

No significant positive relationships were found between E.A.R.C. value, local effort index and the related factors which were thought to influence agricultural mechanics facilities. It appears that more schools build to minimum State Department of Education recommendations and thus financial conditions do not affect size of shops, construction features, or quality of tools available.

Factors which were positively significant at the one per cent level include: (1) quarter hour credits of agricultural mechanics earned by the teacher in college and the number of teachers in the school; (2) quarter hour credits in agricultural mechanics and total free floor space in the shop; (3) number of agricultural teachers in the school and total free floor space.

College Credit in Agricultural Mechanics

The quarter hour credits of agricultural mechanics earned in college by the teacher had a definite effect upon the total number of tools in the agricultural mechanics shop. This is illustrated graphically in Figure 1.

When instructors' college quarter hours ranged from 0 to 10, thirty per cent of the schools had a total number of tools; twenty-six per cent had an average number of tools; and fourteen per cent were well equipped.

However, when quarter hours reached the 25-50 level, twenty-five per cent of the schools had a small number of tools, twenty-five per cent had an average number of tools, and thirty per cent were well equipped.

Conclusions

The financial ability or financial effort of a school district was a significant factor for determining agricultural mechanics buildings provided. This is reflected by the fact that the only 13 per cent of the high schools reporting met the minimum standards.
PROFESSIONAL IMPROVEMENTS IN BASIC MECHANICAL INSTRUCTIONAL COMPETENCIES

The implementation of the provisions of Public Law 90-576 caused extensive assessment of the Alabama Vocational Agricultural Education Program. The mandate to provide vocational education to persons of all ages wherever they might encounter serious problems in adjusting to the numerous programs in isolated rural settings to fulfill these requirements. It was determined that professional improvement became evident in the change of teachers from the traditional agricultural curriculum to the vocational education curriculum. The change was extended and adopted by the Alabama Vocational Agricultural Education Teachers Association (AVAETA) as a change in the curricula for their new teaching roles in the vocational education program. This change was adopted in addition to a previous commitment to serve vocational agriculture.

In the occupational clusters identified in the Alabama rural industrial areas, instructional materials were selected by the Vocational Agriculture Teachers to accommodate teachers in the following agri-industry trades under the (1) Building Construction Trades, (2) Electrical Trades, (3) HVAC Trades, (4) Metal Working Trades, and (5) Power Mechanics Trades. A review of these occupational clusters revealed that basic mechanical instructional competencies were already possessed by vocational-technical teachers as a result of their association with agricultural technology. It was also determined that these competencies would be required in addition to a greater depth of understanding in the areas of fluid power, electrical systems, and mechanical systems.

A survey was conducted of 271 teachers of vocational agriculture to ascertain a measure of their perceived instructional competency to teach high school students in each of six occupational clusters. Tables I through VI represent the relative rankings of the instructional competencies by percent response. For the purpose of this survey, the Basic Woodworking Trades were incorporated into Building Construction Trades and Drafting was listed separately. The rationale supporting this was the similarity of the building construction and wood-working skills required for job entry level employment. Instructional Drafting was considered...

<table>
<thead>
<tr>
<th>TABLE I</th>
<th>INSTRUCTIONAL COMPETENCIES OF ALABAMA VOCATIONAL AGRICULTURAL TEACHERS IN BUILDING CONSTRUCTION TRADES, RANKED BY PERCENT RESPONSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instructional Competencies</td>
<td>Rank by Percent Response</td>
</tr>
<tr>
<td>(1) Building Construction Trades</td>
<td></td>
</tr>
<tr>
<td>(2) Electrical Trades</td>
<td></td>
</tr>
<tr>
<td>(3) HVAC Trades</td>
<td></td>
</tr>
<tr>
<td>(4) Metal Working Trades</td>
<td></td>
</tr>
<tr>
<td>(5) Power Mechanics Trades</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TABLE II</th>
<th>INSTRUCTIONAL COMPETENCIES OF ALABAMA VOCATIONAL AGRICULTURAL TEACHERS IN ELECTRICAL TRADES, RANKED BY PERCENT RESPONSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instructional Competencies</td>
<td>Rank by Percent Response</td>
</tr>
<tr>
<td>Grounding Procedures</td>
<td>1</td>
</tr>
<tr>
<td>Service Entrance Installation</td>
<td>2</td>
</tr>
<tr>
<td>Wiring Principles</td>
<td>3</td>
</tr>
<tr>
<td>Wire Size and Types</td>
<td>4</td>
</tr>
<tr>
<td>Circuit Breakers, Fuses and Circuit Breakers</td>
<td>5</td>
</tr>
<tr>
<td>Wiring Systems</td>
<td>6</td>
</tr>
<tr>
<td>Generation of Electricity</td>
<td>7</td>
</tr>
<tr>
<td>Measurement Instruments and Meters</td>
<td>8</td>
</tr>
<tr>
<td>Wiring of Heavy Appliances</td>
<td>9</td>
</tr>
<tr>
<td>Refrigeration and Air Conditioning Systems</td>
<td>10</td>
</tr>
<tr>
<td>Mathematics of Electrical Trades</td>
<td>11</td>
</tr>
<tr>
<td>Electrical Codes</td>
<td>12</td>
</tr>
<tr>
<td>Sketching, Drafting, Blueprint Reading and Technical Communication</td>
<td>13</td>
</tr>
<tr>
<td>Electric Motors</td>
<td>14</td>
</tr>
</tbody>
</table>

(Continued on next page)
TABLE III
INSTRUCTIONAL COMPETENCIES OF ALABAMA VOCATIONAL AGRICULTURAL EDUCATIONAL STUDENTS IN FARM MECHANICS, RANKED BY PERCENT RESPONSE

<table>
<thead>
<tr>
<th>INSTRUCTIONAL COMPETENCIES</th>
<th>RANK BY PERCENT RESPONSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic Instruments</td>
<td>1</td>
</tr>
<tr>
<td>Blueprinting and Drawing</td>
<td>2</td>
</tr>
<tr>
<td>Orthographic and Isometric Projection</td>
<td>3</td>
</tr>
<tr>
<td>Technical Sketching</td>
<td>4</td>
</tr>
<tr>
<td>Architectural Drawing</td>
<td>5</td>
</tr>
<tr>
<td>Description Density (Layout)</td>
<td>6</td>
</tr>
<tr>
<td>Government (Military)</td>
<td>7</td>
</tr>
</tbody>
</table>

TABLE IV
INSTRUCTIONAL COMPETENCIES OF ALABAMA VOCATIONAL AGRICULTURAL TEACHERS IN MASONRY TRADES, RANKED BY PERCENT RESPONSE

<table>
<thead>
<tr>
<th>INSTRUCTIONAL COMPETENCIES</th>
<th>RANK BY PERCENT RESPONSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mixing Mortar and Related Materials</td>
<td>1</td>
</tr>
<tr>
<td>Tools and Equipment</td>
<td>2</td>
</tr>
<tr>
<td>Finishing and Paint Mixture Work</td>
<td>3</td>
</tr>
<tr>
<td>Types of Masonry Materials</td>
<td>4</td>
</tr>
<tr>
<td>Mathematics of Masonry Building</td>
<td>5</td>
</tr>
<tr>
<td>Building Components</td>
<td>6</td>
</tr>
<tr>
<td>Characteristics of Masonry Materials</td>
<td>7</td>
</tr>
<tr>
<td>Blueprint Reading</td>
<td>8</td>
</tr>
<tr>
<td>Waterproofing</td>
<td>9</td>
</tr>
<tr>
<td>Laying Concrete Blocks</td>
<td>10</td>
</tr>
<tr>
<td>Laying Clay Tile</td>
<td>11</td>
</tr>
<tr>
<td>Laying Brick</td>
<td>12</td>
</tr>
<tr>
<td>Handling Products and Tools</td>
<td>13</td>
</tr>
<tr>
<td>Contractor's Responsibilities</td>
<td>14</td>
</tr>
<tr>
<td>Fireproofing</td>
<td>15</td>
</tr>
</tbody>
</table>

TABLE V
INSTRUCTIONAL COMPETENCIES OF ALABAMA VOCATIONAL AGRICULTURAL TEACHERS IN METALS TRADES, RANKED BY PERCENT RESPONSE (INCLUDING FERROUS, NON-FERROUS AND ALLOYS)

<table>
<thead>
<tr>
<th>INSTRUCTIONAL COMPETENCIES</th>
<th>RANK BY PERCENT RESPONSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic Uses of Metals</td>
<td>1</td>
</tr>
<tr>
<td>Style and History of Metals</td>
<td>2</td>
</tr>
<tr>
<td>Characteristics of Metals</td>
<td>3</td>
</tr>
<tr>
<td>Identification of Metals</td>
<td>4</td>
</tr>
<tr>
<td>Manufacturing of Metals</td>
<td>5</td>
</tr>
<tr>
<td>Metal Treatment of Metals</td>
<td>6</td>
</tr>
<tr>
<td>Machine Processes of Metals</td>
<td>7</td>
</tr>
</tbody>
</table>

TABLE VI
INSTRUCTIONAL COMPETENCIES OF ALABAMA VOCATIONAL AGRICULTURAL TEACHERS IN POWER MECHANICS TRADES, RANKED BY PERCENT RESPONSE

<table>
<thead>
<tr>
<th>INSTRUCTIONAL COMPETENCIES</th>
<th>RANK BY PERCENT RESPONSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluids and Principles of Combustion</td>
<td>1</td>
</tr>
<tr>
<td>Identification and Function of Engine Parts</td>
<td>2</td>
</tr>
<tr>
<td>Lubricants</td>
<td>3</td>
</tr>
<tr>
<td>Engine Operating Principles</td>
<td>4</td>
</tr>
<tr>
<td>Lubrication Systems</td>
<td>5</td>
</tr>
<tr>
<td>Fuel Systems</td>
<td>6</td>
</tr>
<tr>
<td>Ignition Systems</td>
<td>7</td>
</tr>
<tr>
<td>Transmission of Power</td>
<td>8</td>
</tr>
<tr>
<td>Basic Machine Science</td>
<td>9</td>
</tr>
<tr>
<td>Measuring Devices and Measurements</td>
<td>10</td>
</tr>
<tr>
<td>Suspension Systems</td>
<td>11</td>
</tr>
<tr>
<td>Hydraulics and Pneumatics</td>
<td>12</td>
</tr>
</tbody>
</table>

Agriculture has always been subject to change. The most dramatic changes in technology and mechanization have occurred in the past 50 years and the rate appears to be accelerating in the race to completely mechanize machines for hand labor. With this ever-increasing trend, it wouldn't be at vocational agriculture teachers are concerned about equipping the student's knowledge and skill in food and fiber production agriculture? The question came to me as I looked for a way to increase enrollment in my area-vocational agriculture class and to offer more instruction in farm mechanization to meet the needs of those students. While reviewing the data of past graduating senior classes in agriculture, I found during my tenure of three years, only twenty students at that level gave contact with senior agriculture with an average of four senior students per year, a change seemed to be in demand.

The Present Curriculum
The Vocational Agriculture program at Alma High School is a 1-1/2 year pattern with a two-hour class at the senior level. This class is divided into a semester course covering farm management and a summer course in off-farm agricultural occupations with students gaining cooperative experience in a local business. Because of the lack of acceptance of the off-farm agricultural occupations course in the community, the absence of a variety of good training centers in a small town, and difficulties in scheduling a two-hour class period, it was decided that this course should be avoided and the class be broken into one-hour periods. With the help of the Principal, Superintendent, and Advisory Council, it was determined that more instruction in agricultural mechanics was needed. It was hoped that this new emphasis on agricultural mechanics would result in an increase in enrollment thereby serving more students in the community, and that instruction will relate more closely to the needs of students following graduation. In the past a high percentage of students have pursued occupations in farming and jobs involving mechanical skills.

New Courses
Because of the importance of production agriculture in the Flint Hills of Kansas, it was decided to retain a one-year course in farm management, and to add one semester's work in modern machine operation and small engine mechanics overhauling and maintenance. Content of the farm machinery course will include all of the major farm machines in this area. A major section of the course will deal with the operation, maintenance and repair of farm tractors with practical experience included. Advanced skills in welding cast iron, hard facing and welding the metal position will be included. The study of machinery will involve plows, mowers, row crop planters, combines, balers, field sprayers and grain drills. Students will be permitted to use machinery from the home farm at repair projects. The small engine overhaul course will be a complete study of operating principles of one-cylinder gasoline engines including general repair and overhaul. By offering courses of this nature at the senior level, I feel I am meeting the need of my students and community by preparing them for agricultural mechanization. A thorough background in farm management and mechanization will prepare young men for farming and many other careers related to farming to meet the future needs of agriculture.

JANUARY, 1972
Vocational teachers have many innovative and unique methods of introducing and motivating students to want to learn. The procedure outlined here proved to be very successful for me at Chilton County High School.

The first shop lesson included basic drawing. This study is completed by giving the students a copy of a simple floor plan obtained from the Agricultural Extension Service. This plan is easily duplicated and has a bill of materials list which is divided into hardware, electrical, plumbing, lumber, concrete, and masonry. This plan and bill of materials is used in teaching electricity, carpentry, plumbing, and concrete and masonry.

In the study of electricity the lesson plan includes basic electricity and is concluded by a thorough study of house wiring. In the study of house wiring the floor plan given to students is used and a list naming the names of electrical needs from service entrance to complete wiring of the house is given to the students. The students look up their electrical supplies in the small order catalog, listing kind, size, cost, etc. This list of electrical supplies is kept in each student's notebook.

The students must begin the study of basic woodworking. This includes figuring board feet of lumber, costs using local prices, how to cut door steps, lay out and cut rafter, roofing required, and lumber required to construct the house plan the students have been given. In figuring the lumber cost we start with the floor plan and do our work to the rafters and decking. This information is filed in the student's notebook.

From basic woodworking, the class moves into a study of plumbing. After a study of basic plumbing, the class is divided into three groups. One group estimates the very lowest price materials, the second group estimates the midrange price materials, and the third group uses the most expensive materials. This procedure points out that a person gets what he pays for. Again the mail order catalog is used by the students. At this time a well, including septic tank and field lines, is plotted a certain distance from the house. Adding the well and septic tank is important since most of these will be constructing homes in rural areas. This information is also filed in the student's notebook.

From plumbing the study moves into concrete and masonry. Again the basic fundamentals of concrete are studied. The course is completed when the students make the foundation and masonry work for the house plan.

After completing the study of these four areas and making up the bill of materials, the students put all these references together and make up an order for these materials that can be obtained from a mail order company. To study the student's order book carefully one can see how to make up an order, figure freight, sales tax and installment buying as compared to cash or bank loans.

These four areas are a full year's course. The course can, however, be stopped at any point to do other things.

Teacher demonstrations and student jobs are performed in all areas. Several field trips are made to new home construction to observe digging and pouring footing, installing the septic tank, plumbing, wiring and complete construction of a home. It is necessary that we visit two or three home construction sites since it is not possible to cover the materials as fast as a house may be constructed.

I feel the procedure described gave me an idea of the teaching methods used in many complimary remarks from students and parents concerning the program. The teacher and Thompson must be motivated to learn.

As I go about the county I find former students in certain jobs in the construction business I feel our shop course helped them find their place in the world of work.

BOOK REVIEWS


These two publications are reviewed together because you must have a copy of both before effective use can be made in the classroom.

The material covered is divided into three sections: Basic Electricity—Wiring Residential, Farm and Industrial Buildings and Maintenance of Electric Lines. The student manual contains objective study questions and subject matter for student use. The instructor's manual contains objective study questions, vocational material, test questions and reference material where applicable. The material is divided into sections for a semester course, but can be used in other circumstances, since the basic data is needed for a well-rounded career preparation. The books contain the information needed to teach Electricity in high school and for references lists for a more in-depth study are presented. These books will make the teacher's work much lighter.

Mr. Expelding has a background of teaching experience in vocational and industrial education. This coupled with his knowledge of sales and service for electrical suppliers provides an excellent technical and practical background.

This unit can be used by the average classroom teacher. The instructor selection makes good use of the material and adult group.

Robert T. Roesler
Principal
Clemson University

A National Agricultural Mechanics Codes Committee has been appointed, as many as one of the long, overdue contest areas, is just over the horizon. In fact, if all goes as planned, the first National Contest will become a reality during the National FFA Convention in October, 1972. Although this topic has been discussed and talked about for many years and even proposed but turned down, it wasn't until a consultant committee composed of high school VoA instructors, supervisors of Agricultural Education and fore teacher trainers in Agricultural Mechanics that the committee began to work seriously on the project.

The committee first met at the National FFA Convention in New York on May 25, 1971, to begin work on a proposal for the National Contest. On July the proposal was completed and submitted to the National FFA Board of Directors and National Office.

The proposal received a very favorable approval by the board and with the go-ahead to begin the fall of 1972 proposal was made available to participating states.

Contest Objectives

The committee had one major objective in mind during the planning of this programme of improving instruction in high school agricultural mechanics programs.

In my judgment there can be no basis for this or any other national Contest. The following secondary objectives were considered and had to have vital importance in planning the contest.

1. To identify the instructional areas in vocational agriculture mechanics.

2. To identify meaningful and teachable instructional activities.

3. To develop in vocational agricultural students manipulative skills and abilities related to agricultural mechanics.

4. To develop in vocational agricultural students decision and management making abilities related to agricultural mechanics.

5. To provide an opportunity for students with high manipulative and productive abilities to receive recognition.

The eight-man Agricultural Mechanics Consultant Committee included: Seated, left to right: Mr. O. Joseph Griinewald, State A-H Leader, Waverly, Maine; Mr. Frank Anthony, Associate Professor, Pennsylvania State University; Dr. Douglas D. Bissell, Assistant Professor, Montana State University; Mr. James Parks, Executive Secretary, Maryland FFA Association, Owings, Maryland; Standing, left to right: Mr. James Duke, Assistant Professor, University of Wyoming; Mr. Oswood C. Milne, Vocational Agriculturist, Manhattan, Kansas; W. H. Morse, Chairman, Agricultural Education, Iowa State University; Mr. George L. White, District Supervisor, Vocational Agricultural Mechanics, Auburn, Alabama.

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To increase public awareness of agricultural mechanics and its importance to the vocational agricultural program.

To stimulate improved communication between VoA instructors, teacher educators, state supervisors and national leaders in vocational agriculture concerning teacher preparation, curriculum content and facility needs for institutions in agricultural mechanics.

The Contest

A brief description of the rules and activities being recommended for the

(Continued on next page)
Why Should I Belong?
Richard C. Weber

In the early days of our professional organizations we did not have the "Let George do it," attitude that we are seeing today. These beginning members had a direct plan of action and specific professional and political goals to guide their endeavor; and everyone was involved. The programs were strong and much success came from these early efforts. Today, however, some of our potential and inactive membership have forgotten why these groups were organized in the first place and what their current goals are. They cannot see the need for the leadership to carry the load and not become active and personally involved. This kind of attitude is unfair to everyone concerned. It imposes upon the person who is actively participating because he has to handle more than his share of the work of the organization; and it is unfair to the person who is inactive because he keeps the benefits, secures the efforts of the group, not realizing the sacrifices made by others in his behalf. If we are ever to sit on our bottoms and criticize the organization and its leaders and do not try to help better the organization by becoming involved, then I say we are getting out of it much more than is rightly deserved.

The Northwest State Officers Handbook aptly expresses what a person owes to his profession when it states that "Owing to one's professional position, there may be expected more than just financial support. It means supporting the officers and policies of the organization to the best of your ability, and when you do this your support will be considered by the leaders as a rich investment for the future of the profession."
In the United States, a country thought of as having an abundance of resources, the soil, the land, and the wealth, and freedom, we also find an abundance of poverty, unutilized minds, undeveloped and/or underdeveloped talents. This has been a problem in the past generations and will continue to be a problem as long as we are so equipped for the world of work, and stimulates people with certain problems which keep them from succeeding in a traditional program should also be served. Subsequently, when Congress recognized that the major purposes of the Vocational Education Act of 1963 were not being met, they redirected the aims of vocational education with the 1968 Amendments. Under the amendments, vocational agriculture could assist in the education of special needs students.

The 1968 Amendments mandate, through the "enlarging" of funds, which groups are to be served and which services are to be provided. Services are to include related remedial instruction, guidance and counseling, instruction facilitating occupational choices, and instruction relating to the occupation or occupations for which students are being trained.

What is a disadvantaged person? This term can have a variety of meanings to different individuals. Each person could be disadvantaged as compared to some other person or some standard dictated by society. Thus, we must set criteria for deciding whether or not one is disadvantaged.

First, let us begin by stating that a disadvantaged person may have not assumed a productive role in the society. Therefore, society may see him as a burden.

Second, a disadvantaged person may be one who has had no opportunity to pursue any kind of academic courses because of underdevelopment or underachievement, which are lower grades or lack of work experience, or for any personal reason. People who are handicapped may be considered physically or mentally handicapped. Characteristics that most disadvantaged persons appear to have might include: lack of confidence to think or to speak, vocabulary, or participation in the work of the school, and only one person of two or more, is not succeeding in a traditional educational program. Therefore, facilities are considered physically or mentally handicapped. Characteristics that most disadvantaged persons may have are that they might lack self-confidence to think or to speak, vocabulary, or participation in the work of the school system and to be assigned to a specific task that could be either a full-time or part-time student.

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EYE SAFETY IN THE CLASSROOM

Dennis Hirschfelder, Field Consultant
National Society for the Prevention of Blindness
New York, N. Y.

The quotes above are typical of eye accident cases, culled from newspaper clippings by the National Society for the Prevention of Blindness.

Evidence of the scope of the problem reveals itself in other recent reports:

Survey by The Ohio State University's Department of Agricultural Economics and Rural Sociology indicated 591 farm-related eye injuries occurred in Ohio during 1967.

The National Safety Council's Farm Department is currently sampling accident information from 30,000 farms representing a cross section of over 1,000,000 farms. Initial findings reveal that Wisconsin alone has 400 and 500 agricultural workers suffer eye injuries each year.

A 1967 California Survey indicated 371 farm eye injuries from pesticides and other agricultural chemicals alone.

A study, "Eye Injuries, Safety首のShortcomings in the Agribusiness," published in 1960 by Thomas McCollough at the State University of Iowa disclosed that, "Only during a given year, one farmer in ten might be wounded in the eye sufficiently to require a doctor's attention."

In each of these reports, agricultural students were among those injured. The problem's magnitude becomes apparent when projected to the 10,000,000 farm residents of the United States. The tragedy of the situation is that, unquestionably, almost all such eye injuries could easily have been prevented. How? Through the wise use of eye protective safety wear—a device which has saved the sight of thousands of industrial workers, and eye damage requiring students to miss school for weeks or even months, or in a few cases, to cope with the consequences of an almost complete blindness. Such eye accidents create serious educational and economic losses. Blindness, needless to say, brings with it personal and family calamities often of devastating proportions. Individuals working anywhere on a farm must learn to recognize situations which can cause eye damage and loss of sight; must know what type of safety eyewear should be worn; and must make certain that to have that particular equipment available in the workplace, on the tractor, or wherever it is needed will be needed. Clearly, the optimum time to create an awareness of the need for personal protective equipment is during the educational years. As agricultural educators, you hold the key to teaching the use of proper eye and face protective device, and other safety gear. Students, being a captive audience, offer a target market for safety eyewear. Individuals' attitudes can be altered directly and effectually. If one can instill sound safety habits in students, then the odds will favor their carrying these lessons on to the farm where they are unperverted by the temptations of the farm.

Eye Protection Equipment

Since agricultural educators teach many courses concerning farm operation—logic would point up the advantage in teaching the use of different types of safety eyewear, respirators, hearing protectors, and so on. Because of the variety of courses and subject matter included in agriculture curriculums, four general situations will be described along with the type of eye protective device recommended for each. It is hoped that this information will integrate this information into appropriate courses, particularly those relating to Industrial Agricultural Mechanics and Agricultural Education.

1. Farm Workshop (including re-pair, construction, and maintenance of farm structures) Hand tools, grinding wheels, power saws, hammers and drills should be used without the protection of at least plastic cover goggles (slightly less protection than safety spectacles or eyeglasses). Full face shield should provide general protection, especially during grinding; but a goggle provides better overall coverage; for example, when making repairs underneath farm machinery. Along with the regular goggle, each workshop should have burning and welding goggles available, in more than one shade tint, with at least a #5 available.

2. General Field Work

Welding, plastic cover goggles with hooded vents provide protection from flying dust and gas as well as from low-lying gases and fumes which will be encountered during field work. Safety goggles should be stored to tractors, and other farm machines, and in containers to protect them from dust. Special ventilated goggles to protect eyes from sharp edges of work during harvesting operations are also available.

3. Application of Anhydrous Ammonia and Other Agricultural Chemicals

Chemical-type cover goggles, hooded vents, are the absolute minimum protection equipment needed involved with the transfer or application of liquid fertilizers, herbicides, pesticides and other agricultural chemicals. In all general farming operations the operator should wear the full-face combination chemical mask. The importance of this recommendation is pointed out by medical advice; that eye injuries with and without any antiseptic treatment should not be kept under the impression that they can be treated at home. Eye injuries from chemical exposure are not always treatable by medical personnel, and may require hospitalization.

4. Application of Pesticides and Insecticides

Here, also, chemical-type goggles with hooded vents are an absolute minimum. A combination eye/face goggle would maximize protection.

Summary Information and Recommendations on School Eye Safety

1. All states require 100 percent eye safety coverage by law...all camp and class programs, workshops, and field experiences should follow the same code established by the National Safety Council.

2. Student eye damage and loss of sight can be prevented through the use of proper safety eyewear. The employee/employer relationship— and the student/teacher relationship—provides educators with the best protection of all. Conversely, lack of compliance may present hazards to teachers, as well as for students. A most important point made in the publication "Safety Practices in Agriculture Education," published in 1965 by the Florida Department of Education; "The possibility of a teacher becoming blinded in the legal action resides in one or more school-related pupil injury is greater today in any other period in history," which makes it imperative upon teacher wearing protective gear a must. In 1967, for example, a $500,000 suit was filed in California (which has a school eye safety law) on behalf of a boy who suffered an eye injury during a metal working class. More recently a $1 mill suit has been filed in California (Cerebral Standard Practice for Occupied and Educational Eye and Face Protection, 1970). The California Department of Education should be able to provide more detailed information about the American National Standards Institute (ANSI) Standards, which are based on experience and wisdom and are available in the School Eye Safety Law.

5. School Eye Safety Law

The federal government has adopted a standard requiring 100 percent use of industrial quality safety eyewear in school shop classes.

6. Local Laws

These laws specify that eye and face protective equipment must exist, or require that such equipment be used in accordance with the standard issued by National Safety Council or another recognized authority.

7. Individual "Visitor" use

The "Visitor" eyewear is not suitable for just what their name implies; temporary use by visitors.

8.簡易way to test for safety eyewear among students is to bring an electrician's or other current reading of the school eye safety law. It is necessary to wear properly fitting, approved, protective eyewear and, when possible, to obtain a proper safety eyewear prescription from an optometrist. However, the use of some protective eyewear is required for many activities, and the use of properly fitted eyewear is essential. The use of eyewear is also recommended for use in laboratories and other areas where eye injuries are possible.

9. The best way to test for school eye safety law. When students make full-period use of industrial quality safety eyewear they protect not only their eyesight...but their teachers from tort liability actions.

AGRICULTURE EDUCATION
A STARVATION PREVENTION PLAN

Grover C. Burkhart
Elementary School Principal
Benedict, Illinois

Are you interested in
seeing your children
and grandchild
grow to bed hungry
and even dying of
starvation? Assuming
that the answer to
this is negative, let me
discuss some positive
thinking about what
has been done and
what can be done to
prevent food
shortage in America and
the world.

In 1914 the Cooperative Extension
Service was started by the Act of Congress
and the Smith-Hughes Act of 1917 started
vocational agriculture in the public schools.
The Congress was very intelligent and
very well advised because they realized
these two important areas which would
effect the effectiveness of Agriculture Education.
And they said that "Learn by doing." This
was realized in the provision that a project
was to be required for at least six months
of the year. Agriculture education teachers
and instructors realized the importance of
learning by doing by having year
around farming projects instead of the
six months minimum requirements.

The second area was that in most
geographical areas the summer is the
important growing season. The Smith-
Hughes Act provided that agriculture
instructors be employed on a twelve
month basis with no more than thirty
days' vacation.

When Congress passed the Amend-
ments of 1968 they eliminated the pro-
visions of the Smith-Hughes Act except
for the appropriations. One can assume
that either Congress is less intelligent
or they are being improperly advised
about vocational education in agricul-
ture. It would appear that they were
advised by those who are against Agri-
culture Education which means that
they are voting for future starvation.
When the pollution problems are solved
we will have a new problem—starva-
tion.

New programs in education have
been started in the past year under
Federal programs for the gifted, disadvan-
taged, and handicapped are given
very important role in our schools
in training the young people who
in the Vocational Act of 1961
important to our society. However,
these new programs are being added under
agriculture in addition tof addition
agriculture.

New ideas should be considered
determining the role of agriculture
education programs in local com-
unities. To illustrate how effective
agriculture education is let us look
at the following problem. In the
future one farmer will grow whole
food and fiber for fifty people in
years he will probably support hundred
people.

Since the average farmer's
productivity is at least forty years old
without providing about 40,000 meals per
year. This would be 2,000 of
people over a period of
years. If each agriculture teacher was
teach one two farms a year and
salary was 15,000 dollars per
year, this would be less than
50 percent.

Recent research indicates that every
new farmer adds three
territories in off-farm agriculture
opportunities. This indicates that
training for preparation for agriculture
equipment other than farming. The opportunity
for college graduates in agricul-
ture number about 25,000 per year. It is
very difficult for the agriculture teacher
prepared for the

in the For

in addition to the economic
more importantly the education
the PAA has played. Are you
to the PAA Education
is the question. If the
PAA Education

in addition to the economic

in the For
The survey indicated farmers feel that skills and abilities in the tractor and machinery area are the most valuable to them. This is definitely an area where they can tie in a dollar and cent return on their time invested. They find all the areas valuable, but they rate the competency area the lowest.

I feel that these results may be somewhat deceiving. For example, if a farmer has a welder he realizes the value of welding and ranks it higher than does a non-welder. The farmers ranked reading a micrometer low, but many have never used one and they don't realize its value. The farmers ranked the use of glass the lowest, and I feel this is a valuable area that the farmers would find more valuable if education were offered in this area. When a skill is ranked low it may be because of a lack of knowledge in this area. When a skill is ranked high it is usually used widely, and that is why it is considered valuable by the farmer.

I feel skills and abilities are very important, but the boys must be exposed to many areas so they will know what's available in all phases of agricultural mechanics. A letter from a farmer helped point out that it is possible to make the boys aware of these different areas, but that they should be made aware of the possibilities in all areas.

The survey points out to me that skills are considered valuable by those in farming. I am in teaching today those boys the best I know how, and I feel this survey will aid me in reaching the goal.