

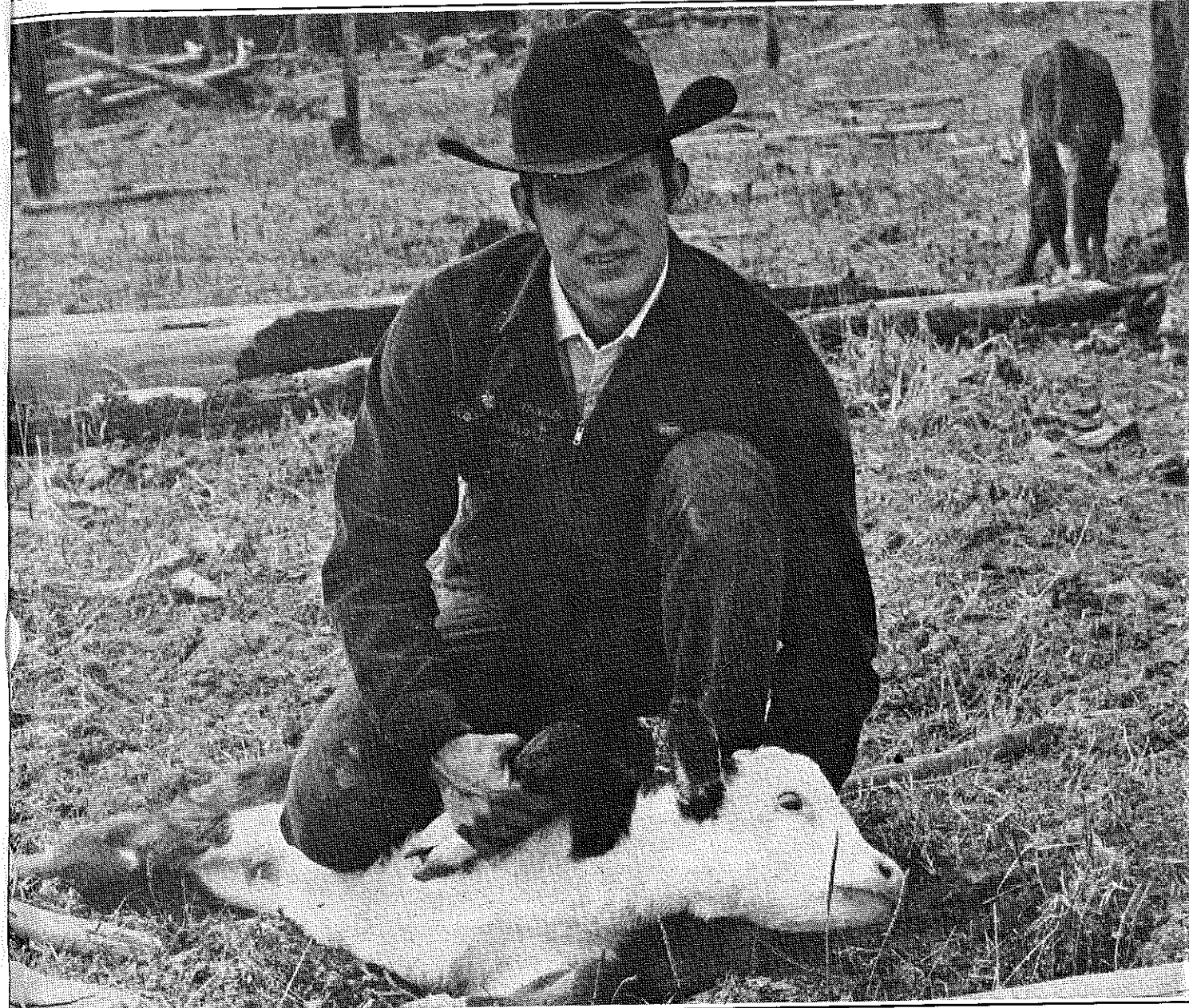


Agricultural Education

Volume 46

January, 1974

Number 7



Theme—**SUPERVISED PRACTICE**

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The
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Magazine

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COVER PHOTO:

Supervised Occupational Experience Programs have been a real "Plus" for Vocational Agriculture. Learning by doing helped Doug Gamma, Montana, earn the American Farmer Degree. (Photo supplied by Max Amberson)

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Editorials

A CLEARING HOUSE FOR
TRAINING PLANS

From Your Editor . . .



M. McMillion
Despite the millions of dollars which have been spent to find lists of competencies and performance objectives in agricultural occupations, the teacher does not have adequate information for making training plans even in the more common agricultural occupations. All of the research has given many publications, many competency lists, many performance objectives, a lot of clusters and commonality-of-need data, but a sequencing of activities according to difficulty or seasonality and suggestions concerning the amount of time to devote to each remains as uncirculated as favorite recipes prior to the invention of the printing press.

While recognizing that no two training plans should or can be identical, a collection of the best training plans developed and used by others could be helpful to those developing training plans for the first time. A collection of sample training plans could be a partial remedy to teacher ignorance concerning the tasks performed and a reminder to the training supervisor who cannot be expected to recall a comprehensive list of tasks in a short period of time.

Each day, all across the country, hundreds of student "data collectors" are going to an untold number of different jobs and recording in their record books the activity they performed, the date they performed it, and in many cases, the amount of time devoted to each activity. This untapped source of information, which is almost exactly in the form in which it is needed, is not going beyond the home school.

The record books and training plans are not going to a state or national contest where someone could select the best training profiles for teacher use. (Evidence to the contrary would make an interesting article.) The national foundation award forms have only nine lines for recording the activities performed.

How can the best of the training profiles being recorded be put into more hands? The student contest route has been mentioned. Using chain letters like housewives collect recipes probably would not be considered seriously even though it might put more useful information in the hands of teachers than the average \$100,000 project.

A scheme which should be considered seriously, although it is not the major suggestion of this article, is the collection of "favorite training plans" ala the farm women's club or faculty wives' favorite recipe cookbook. The collection could be made on a state or national basis by the agriculture teachers' association.

The most interesting possibility is a clearing house for training plans in which an individual or group would solicit exemplary training plans and exchange three or four training plans for each one received. After a year or two of operation, the best training profiles which passed through the clearing house should be made available to the profession in a publication that gives due credit to the student who recorded the training profile, his teacher, and perhaps even the employer. The clearing house idea would require a budget for soliciting, duplicating, and disseminating the training plans but would be minimal in comparison to some other efforts to obtain the information.

—MBM

Guest Editorial . . .

SUPERVISED OCCUPATIONAL EXPERIENCE—

CONTENT FOR

GROUP INSTRUCTION

T. R. Miller
Agricultural Education
North Carolina State University
Raleigh



T. R. Miller
students have the needed competencies. Furthermore, a great deal of this teaching must be *group* instruction, because

there is so little time, with the increased number of classes, the increased class sizes, as well as the reduction of some twelve month programs to nine or ten months.

It is evident from the literature that Vocational Agriculture is now in a better position to justify teaching S.O.E. as a part of curriculum content because a modern concept of S.O.E. has evolved. It includes exploratory experiences, work experience in agribusiness, cooperative work-study, production projects, improvement projects, and supplementary practices. This is a concept broad enough to include opportunities for every student, boy or girl, farm or non-farm, to develop a comprehensive, individualized occupational experience program in the broad field of agriculture

including production, marketing, processing, supply, and services. But the students need to see this "big picture" of opportunities in such a concept and be given class time help in planning their programs.

All students in Vocational Agriculture need to learn the "what," "why," and "how" of supervised occupational experience. There is inadequate time to do this via individual home visits and thus group instruction becomes a mandate. Not just a few days but perhaps as much as six weeks is needed to establish the concept and help students identify the opportunities important to them and to prepare plans for becoming involved. Field trips, former students, local slides, movies, display boards, supervised study—all need to be provided. The F.F.A. with its awards and specific aids need to be interwoven into the plans. More than this, every teacher needs to develop a twelve-month pattern of activities designed to support a high priority on supervised practice.

A key activity is some class time reserved every marking period for student assessment of progress on supervised practice and for making new or additional plans.

A key activity in this list is some class time reserved every marking period for student assessment of progress on supervised practice and for making new or additional plans.

Finally, one of the very best adult education programs by the Vo. Ag. teacher may be that of teaching the new concept of supervised practice to a group of parents of Vo. Ag. students. Some student teachers have already demonstrated the feasibility of this activity. Among the expected outcomes would be more adequate support for the Vo. Ag. department. But the most important outcome should be that of a more individualized program of competence building activities for every student in Vo. Ag. ♦♦♦

Themes For Future Issues

March —	Looking Ahead in Vocational Agriculture	July —	Program Planning and Evaluation
April —	Production Agriculture — Still in Vogue	August —	Teacher Education
May —	Summer Accountability	September —	School Organization and Articulation
June —	Administration and Supervision — Local to National	October —	Instructional Technology
		November —	Improving the Profession — the Job and the Teacher
		December —	Better Teaching and Learning

BOOK REVIEW

THE LIVING OCEANS, By Alec Laurie, Garden City, New York: Doubleday and Company, Inc., 1973, 187 pp., \$6.95.

The Living Oceans describes answers to many mysteries of the sea and at the same time raises many new questions. A detailed discussion of factors such as temperature, depth, and salinity give the reader an understanding of the ocean environment. Various ocean environments and their life-supporting potential are discussed in relation to some of the thousands of species of plants and animals found in the sea. The author describes life from the seashore to the ocean depths. The effects of currents on marine life and marine ecology are portrayed in word, picture, and diagram.

Circulation of water and the effects of the continental shelf and under water land forms are depicted. Research and research methods are explained so that the reader may envision what is being done and the problems being encountered in doing it.

The last chapter of the book is entitled, "Dominion Over the Sea," and elaborates on the changes man is making and the effects of those changes. He describes the

changes that have taken place in the growth pattern of fish species which are most important in human diets. History of cod, haddock, hake, herring, halibut, plaice, flounder, sole and turbot are included. The effects of canals, dams, and other structures are presented. Oil spills and other sources of pollution are illustrated.

Alec Laurie has a rich background in biology, chemistry, and oceanography on which to draw in writing about oceans and marine life. He also has had the valuable experience of editing scientific books for young readers. Although recently retired, Mr. Laurie is creating and providing new

methods of combating water pollution.

The book uses many technical terms but is generally written in a lively, readable manner. The book could be used for advanced high school students and would be interesting reading for teachers and college students. The book has a good emphasis on relation of the seas to the total environment. Some of the charts need more clarity and better labeling. There are numerous pictures, charts, and diagrams which enhance understanding and enjoyment in reading the book.

Rodney W. Tulloch
University of Kentucky

Switzerland Course

The ninth international course on Vocational Education and Teaching in Agriculture will be held in Switzerland during August 1974. Those interested in a group activity relating to this international event—group travel, planned group interaction with educators in agriculture from other countries, group discussions from the U.S.A. point of view, group side-tours and study, possible participation of spouses, university graduate credit for the course—are invited to contact me regarding such interests. — Dr. Ray Agan, Professor, Coordinator of Vocational Education, Sam Houston State University, Huntsville, Texas 77340.

STUDENTS REQUEST SUPERVISORY VISITS

Jewell Mooney, teacher
Lutesville, Missouri



Jewell Mooney

de-emphasized by some teachers.

In the 19 years that I have been at Woodland School, Lutesville, Missouri, farm visits and later occupational supervisory visits have been a very important part of the total Agricultural Education program. Many times the thought has occurred, "Is this visit to look at a small pig or a bull calf really worthwhile?" This question was put to a group of beginning teachers attending a course on Farm Management in Southeast Missouri two years ago. "Did you look forward to your agriculture instructor visiting you when you were in Vocational Agriculture?" The answer was an emphatic "yes!" These young teachers were asked for their honest feelings concerning visits by Agriculture Instructors. At Woodland, it has been my experience that if students feel that their instructor enjoys the supervisory visit he will have some- one each day to visit.

The supervisory visit is a time for counseling with the student about his personal problems as well as advising him concerning his project. My own schedule is filled two weeks in advance. As quickly as a week becomes available it is refilled.

Some parents are slow to let their sons and daughters try new experiences recommended by the instructor; however, the student's project is usually small enough that a new method can be tried without serious loss if the practice should fail.

Supervision of Vocational Agriculture students on the farm or at other places of employment has long been an activity looked forward to by both students and teachers and at the same time tolerated or

My own visitation schedule is filled two weeks in advance by student requests for visits.

I have been discussing the importance of the school day visit. It is agreed that some teachers let themselves become so involved in the community and adult work and young farmer meetings that the all-day program is slighted. My own opinion is that this is wrong. If another teacher is needed and the school will not respond to the need, then the Adult and Young Farmer Classes should take second place. This is not to relegate out-of-school groups to a position of lower importance because adult education is very important, but a one teacher department can only handle so much work. If we are hired for the all-day program, that is where our responsibility primarily lies.

We still find administrators reluctant to pay teachers the regular salary for the summer work. The reason is simply that the teacher has not proven that he is on the job during the summer months. If the teacher is not on the job during the summer months, he should not expect to be paid. A summer visitation program has always been stressed at Woodland. A program of activities has been filed with the superintendent and principal each year. However, to emphasize that the agriculture instructor was on the job a program including the names and dates of students to be visited and other activities including time and dates were given to students and administration.

The schedule of visits for the three summer months has proven very successful. The students and parents were expecting the visit and the administration knew where the instructor could be found if needed during the day. It is a wonderful public relations program between the teacher, administration and parents.

The Agriculture Instructor is, in most situations, the only teacher who is in regular contact with the community. His image affects the feeling of the community toward the school. Administrators are aware of this importance and most administrators will be happy to pay the regular salary during the summer months if they feel their instructor is hard at work.

Most administrators will be happy to pay the regular salary during the summer months if they feel their instructor is hard at work.

No one can put a value on the supervisory visit. We do know that many students become reliable citizens when they find an organization and a person upon whom they can depend — The FFA and the Agriculture Instructor.

Yes, the summer visit and the regular school year visits is important. Try it. You will find parents welcoming you and you will find administrators behind you all the way. I know. I have had six superintendents and four principals in 19 years, and all have backed our program in Vocational Agriculture. The supervisory visits are the backbone of the Vocational Agriculture Education programs. ♦♦♦

COOPERATIVE JOB TRAINING ON A NATIONAL WILDLIFE REFUGE

Charles R. Davis
Vocational Agriculture Instructor
Princeton, Minnesota

Two rural boys found fresh interest in their high school training program at Princeton, Minnesota through the local Vocational Agriculture Department's cooperative job training and placement program.

Ron and Dave participated in a (2) quarter class (18 weeks) involving a survey of agribusiness occupations and preparation for on-the-job placement as juniors. Both boys expressed a definite interest in wildlife management and were placed for the remaining (2) quarters of the school year, through the summer months and until the following November. A made-to-order training station was found on the 30,500 acre Sherburne National Wildlife Refuge located seven miles southwest of Princeton.

A work training agreement was signed by the boys, their parents, the instructor and the refuge manager after federal employee job applications were filled out. The following job description indicates the nature of their work:

Position Description—Student Aid
Supervision—Assistant Manager
Primary Duties—70% of Total

- Water Gauge Readings and Well Water Sampling**
—Read water gauges at established locations once each week. Take samples of well water at residences and other locations as designated by supervisor. Approximately 20% of duties.
- Lawn Mowing**—Grass cutting and maintenance at contact stations, headquarters and other areas as designated. Approximately 10% of duties.
- Trash Disposal & Area Clean-up**—Weekly run to contact stations, nature trail, headquarters, canoe accesses and other locations to empty trash receptacles and general clean-up in parking areas. Approximately 10% of duties.
- Geese-Flock Management**—Assist in care, cleaning of facilities, feeding, wing-clipping and other activities as required. Approximately 10% of duties.
- Maintain Leaflet Dispensers**—Refill leaflet dispensers at headquarters, contact stations, and nature trail. Keep and maintain records and inform supervisor. Approximately 10% of duties.
- Nesting Transects**—Assist in conducting a search for duck nests in selected areas. Approximately 10% of duties.

Other Duties—30% of Total

- Evaluation of woodduck boxes as to amount of use, number of young produced, repairs needed, etc.
- Assist with controlled burning and other related management practices.
- Assist with vehicle maintenance and repairs.
- Perform other refuge duties as designated.

A work schedule training plan was then established by the teacher and the refuge personnel. The required orientation and safety training instruction was given by the refuge

people and the boys were given a refuge vehicle drivers test involving the use of 4 wheel drive vehicles and snowmobiles. The actual division of duties were:

Check & Repair Woodduck Boxes	17.8%
Lawn Mowing	14.2%
Goose Flock Work	12.2%
Routine Maintenance	11.5%
Forestry Management	9.5%
Nature Trail Signs	9.3%
Water Samples & Flow Gauges	6.8%
Remove old wire & fenceposts	4.9%
Assist with Vegetation Study	4.0%
Trash disposal	2.6%
Refill Leaflet Dispensers	2.1%
Safety Meetings	1.1%
Controlled Burning	1.0%

The following special projects were assigned to the student-learners by the Assistant Refuge Manager in charge of supervising them depending on the nature of seasonal refuge concerns.

Projects for High School Assistants
December through March

- Project: Wood Duck Nesting Box Maintenance**
 1. Approx. no. of hrs. req.—40.
 2. Work period—afternoons, weekends.
 3. Duties—Student will replace nesting material & perform necessary maintenance on about 120 wood duck boxes. The refuge snowmobiles, snowshoes & a vehicle will be available for use in this project.
- Project: Evaluation of Use at Snowmobile Trail**
 1. Approx. no. of hrs. req.—8 days.
 2. Work periods—weekends.
 3. Duties: Student will visually monitor snowmobile use at the refuge trail. Data will be collected on no. of visitors, time spent on the refuge, violations of trail regulations, etc.
- Project: Routine carpenter work, vehicle maintenance, goose flock management and other duties to be performed during inclement weather when field work on the above projects is precluded.**
April through June
- Project: Ruffed Grouse Drumming Count**
 1. Approx. no. of hrs. req.—1½ hr./count.
 2. Work period—early mornings.
 3. Duties: Student will conduct a count of drumming male grouse along a 14-mile road transect from a vehicle beginning ½ hr. before sunrise. Fifteen stops, one at each mile interval, will be made and the number of male grouse heard drumming during a two-minute period recorded. This census will be run during the first two weeks of May only on days

Reprinted from *The Ag Man*, Osakis, Minnesota

(Concluded on page 165)



J. C. Simmons

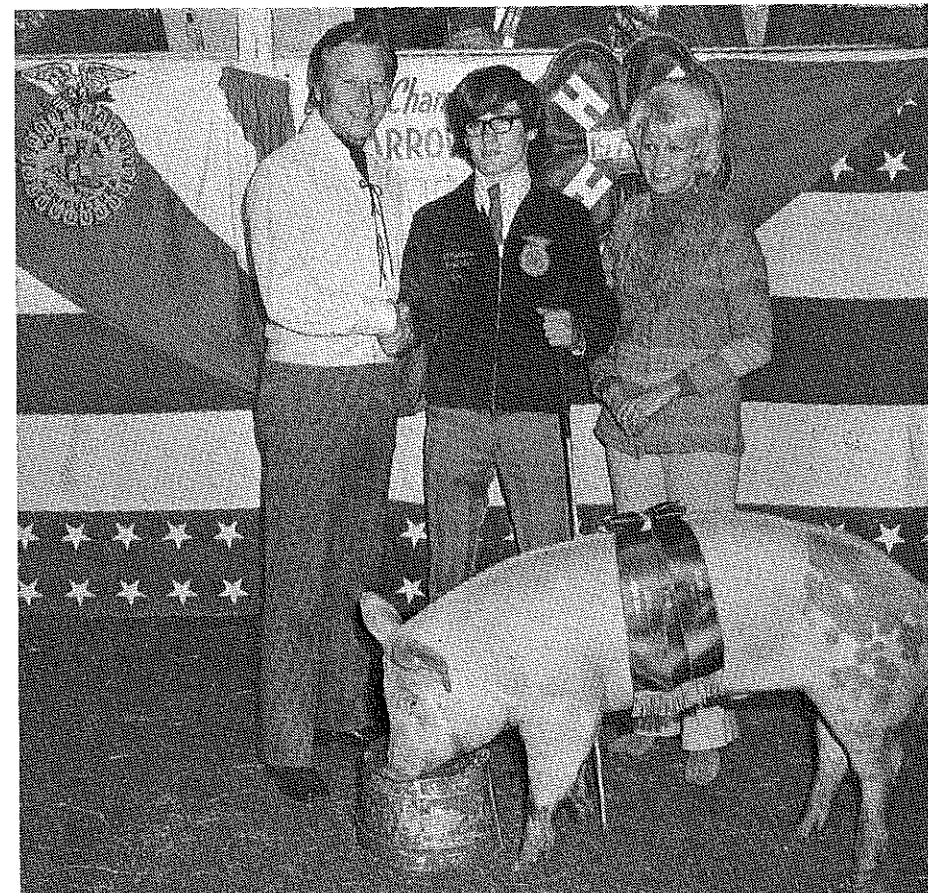
When one walks into the Vocational Agriculture Department at Slidell High School, (St. Tammany Parish, La.) there is no question at all about which department he is in. The classroom and shop walls are painted in the blue and gold FFA colors. This resulted from a project by a group of the students and they take a great deal of pride in what they have accomplished. Pride is an important ingredient in the total program of this department. This is reflected in the many banners and trophies that adorn the walls of the classroom. It is again indicated by the fact that the chapter has a very active and involved Parents Booster Club that assists with the many activities of the Slidell FFA Chapter and also an active alumni association made up of former members who are very interested in seeing the chapter continue the many successful activities accomplished while they were students and participating members of the chapter.

Perhaps the accomplishments and activities of the chapter would not be out of the ordinary in most situations. However, when it becomes known that Slidell, Louisiana is located only forty miles from New Orleans and has a population of 18,000, it becomes obvious that something different must be taking place there. Added to this, most of the residents are employed in New Orleans which is only a very short drive across Lake Ponchartrain. The total high school enrollment (10, 11, and 12) is 1,338. Of this enrollment, 117 students (boys and girls) are enrolled in the Vocational Agriculture course. Many students have been turned away because of the limited space and the fact that the department has only one teacher.

The basis for this successful FFA

A Successful Rural-Urban Situation

J. C. Simmons
Area Supervisor
Louisiana



Member of the Slidell FFA Chapter is congratulated by the buyer of his Grand Champion barrow at the District Livestock Show.

Chapter and Vocational Agriculture program, stems from the fact that the teacher of Vocational Agriculture, James Magee, Sr., is an active and energetic person who has the welfare of his students as the most important factor in the program. His relationship in the community has been most rewarding and has resulted in cooperation from many groups of people.

Since the current teacher began his tenure in this department 14 years ago, the chapter has been one of the recipients of the State Best Chapter Awards 14 times and has received 12 Gold Emblem Awards on the national level.

The chapter operates a 100 acre farm on which many of the students keep their show animals. Chapter members have shown approximately 380 animals at local, district, and state livestock shows over the past five years and accomplished the remarkable feat of exhibiting 38 champions. The State Award for showing the largest number of livestock at the Spring Livestock Show has been consistently won by the chapter. Many state proficiency awards have been won by individual chapter members and judging teams have consistently ranked among the top four winning teams on the state level.

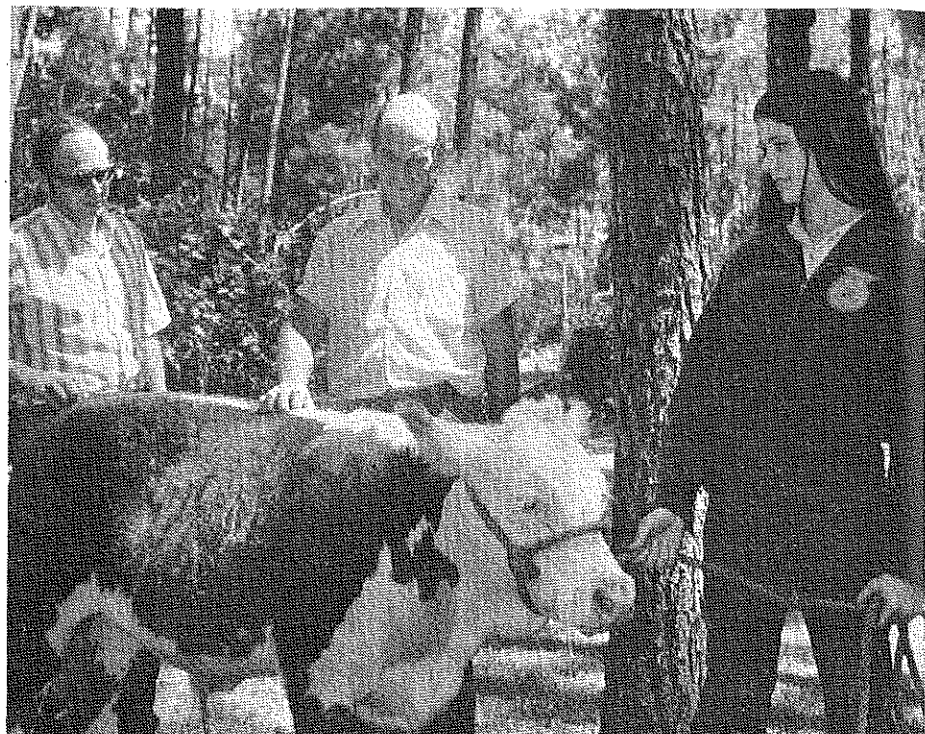
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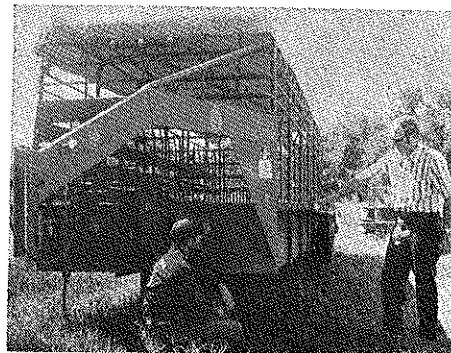
Many students live within the city limits while their parents own acreage outside the city where they keep their livestock. Beef animals, swine, and sheep are the most popular types of livestock in the community. Other FFA members keep their animals on a school farm.

While a surprisingly large number of former students have full-time farming operations, most graduates are either part-time farmers or they have entered some phase of the large field of agribusiness. Still other former Slidell FFA members have entered into some professional phase of agriculture.

In addition to the school farm, the department also has a farm mechanics shop, a greenhouse, and a food preservation center. Students have the opportunity to be exposed to all phases of the field of agriculture both in the production and agribusiness phases.



One of the Vocational Agriculture students and her father discuss the proper care of one of her show animals with James Magee, Sr., Vocational Agriculture teacher at Slidell High School.



James Magee, Sr. and a student examine the trailer owned by the chapter.

Although the department has many outside related activities, instruction in the classroom is not neglected. Subject matter relevant to all phases of agriculture is presented to the students.

The close cooperation of parents and school officials has assisted in making teaching agriculture at Slidell High School both successful and pleasant. ♦

BOOK REVIEWS

PROFESSIONAL FLOWER ARRANGING FOR BEGINNERS, by Robert L. Gordon, 1972 Vocational Education Production; California Polytechnic State University, San Luis Obispo, Ca., 102 pp., \$4.95 paperback.

The first four chapters present good basic materials on floral material, equipment, and care of flowers. Illustrations are clear and the material is easily read and understood. From this point on the book is surely the author's own. Color and design are related to setting, furniture and period. Few flower arrangement books try to do this.

Three types of flower arranging are discussed; the continental, Japanese, and western line. General shapes of arrangements are discussed with excellent illustrations throughout. The author also gives information on designing for competition.

This book offers useful, down-to-earth information that the average person can use. The author's background seems to have made him aware of the need for arranging flowers for the pleasure of it. The beginner is not interested so much in perfection as he is in beauty.

This book would be useful on the senior high school level as a text or reference for art, home economics, or special classes in horticulture. Some background knowledge of color, the art principles, principles of design, and color harmonies would be needed by the student.

*Chester L. Doshier
Vo-Ag Teacher
Fort Necessity High School
Fort Necessity, La.*

SUGAR BEET NUTRITION, by A. P. Draycott. New York: Halsted Press, 1972, 250 pp. Price \$19.50.

In this book Dr. Draycott assimilates the findings of numerous investigations and research studies concerning the nutrient requirements of sugar beet. Much of the data is extracted from experiments conducted in Great Britain where sugar beet is grown extensively. Use of the British system to express this data may be somewhat confusing to those not familiar with the system.

Following a general discussion of sugar beet production and fertilizer usage, the book presents a detailed description of each of the macro and micro-nutrients involved in the

nutrition. Chapters devoted to nutrients include: Nitrogen, Phosphorus and Sulphur, Potassium and Sodium, Calcium, Magnesium and eight micro-nutrients (boron, chlorine, copper, iron, manganese, molybdenum, rubidium and zinc). Nutrients are discussed in terms of the quantity found in the crop, deficiency symptoms, effect on growth and physiology, and soil-plant relationships as well as various other aspects.

The remaining chapters deal with organic and green manures, crop rotations and fertilizer residues, physical conditions of the soil, fertilizers and methods of application, cultural practices, diseases and pests, quality, and seed crop nutrient requirements.

As head of the Chemistry Section, Broom's Barn Experimental Station, Suffolk, England, Dr. Draycott draws on years of experience and work for the book. The book is well organized and makes use of numerous tables and extensive data as supporting evidence. It would be suited to students, teachers, and research persons at the college level. It would appear to be most useful to those involved with sugar beet production and nutrition studies.

*Stephen S. Miller
James Rumsey Vocational Technical Center
Martinsburg, West Virginia*

PRACTICAL—Key Word To Supervised Practice

*Don Claycomb
Instructor of Agribusiness
Trenton Junior College, Missouri*

Supervised occupational experience must be practical and valuable to the student. Sometimes very unrealistic views of supervised occupational experience are taken. If a program includes only looking over the manager's or a fellow employee's shoulder or following their steps, then let's call it what it is—exploratory observation. In other words, let's talk about supervised occupational experience that starts an individual on a level commensurate with his ability and on a level normal to beginning employees in a business—a true-to-life situation. In this situation we have provided a valuable working experience as opposed to looking over a man's shoulder whereby the student does not get the "feel of things."

If the working experience is to be valuable, it must be a true test of the student's ability—an experience that will give students the opportunity to prove themselves. Education in the past has had too many simulated or classroom experiences and many times they have not proven valuable. The student deserves the real thing; getting his or her hands dirty, proving themselves at the bottom of the ladder, and then moving up. Is this to say we are going to "toss them out to the wolves?" No, the instructor or coordinator is going to work with the student and the employer to see that the student's experience is valuable.

Why is it important that the job be an actual working experience? In the experience this writer has had in working with student placement, employers have been highly interested in a student's success on the job. Little interest has been shown in class grades; however, there has been interest in a student's ability to adapt to situations. This is a trait that is proven on the job; therefore, if we are to give a student a valuable experience, it is going to have to be a real-life experience. If it is to be a real-life experience, questions have to be answered such as: a) Is the time long enough for actual student involvement?, b) Does the student get the real feel of the business or is he strictly an observer?, and c) Does

a part of the business depend on his or her performance?

In answering these questions, time is a factor that must be considered. Certainly one or two hours a day is better than nothing; however, consideration should be given to providing a student an entire day for supervised employment if he or she is to become an integral part of the business.

Time of the year needs to be considered. For example, in the Corn Belt the summer school vacation months are not an active part of the year for agriculture. Usually, during the spring planting and the fall harvest are when the business operates at its peak—the time the student can actually see and feel what is going on. If the student has strictly a summer experience, much of the time is likely to be spent on rather routine jobs such as painting and mowing the grass.

A realistic employment experience has been emphasized; however, this is not saying we can just toss the student out, let him or her go, forget about them until the employment period is over. As an instructor or coordinator, we have definite responsibilities to follow the student's employment activities. We have supervision responsibility. As an instructor or coordinator, we are not going to know what is taking place in a training station unless we visit the student on a regular basis and rather frequently. If we make only one visitation during an extended period of time, we are not apt to get a true picture of what is taking place pertaining to the student's job. We need to visit with the employer, we need to visit with the student employee, and we need to be there often enough that we can actually see what is taking place. If there is a problem, we can do our part in adjusting differences.

We need to visit with the student employee to determine if he is satisfied doing routine work? If the student is satisfied, then there is some real question in my mind as to whether the student should be encouraged to take more responsibility, which he or she

may not be ready for. On the other hand, if the student feels the experience he is getting is not adequate, we need to visit the employer. Why is this student being held on a routine job? For instance, why is the student spending a week on a scoop shovel? A conversation with the employer may point out some inadequacies the student has that neither the coordinator nor student were aware of. Then we must sit down with the student and clearly explain what the student needs to do in order to gain a more meaningful experience.

Much of the time a coordinator is not going to realize problems and potential problems exist unless he is out on visitation. Many characteristics cannot be learned or sensed other than through face-to-face contact. Factors such as student employee appearance, facial and voice expressions, and attitudes reflected must be observed directly. Also, observed reactions of customers and fellow workers in addition to employers can give the supervisor much valuable information.

Another factor that should not be overlooked is to make the classwork practical. Rather than deal with corporate management problems we need to talk about the problems commensurate with the level where the student is working, such as problems dealing with feed deliveries, customer relations, etc.

Why must a practical approach be taken to supervised employment? Employers want from our programs students who:

- 1) Have been evaluated by employers under practical conditions.
- 2) Have proven their ability to adjust to a variety of practical job demands.
- 3) Have received practical classroom instruction related to the job duties they have performed and will perform in the future.
- 4) Have had practical job experience during the pressure periods of a business. ♦♦♦

BELIEFS ABOUT VOCATIONAL AGRICULTURE

BY TEACHERS AND PRINCIPALS



Herbert B. Schumann
Assistant Superintendent
Needville, Texas

H. B. Schumann

What do high school principals expect of teachers of vocational agriculture? How do these expectations differ from the views of teachers about their programs? Are the variables of school size, tenure of teachers and principals, previous experience of the principal as a teacher of vocational agriculture, and previous experience of the principal as a student of vocational agriculture related to views held by teachers and principals regarding programs of vocational agriculture? The answer to these questions formed the basis for research conducted by the Department of Agricultural Education at Texas A&M University.

Data were obtained by use of an information form sent to 260 randomly selected teachers of vocational agriculture and to 260 randomly selected principals from schools in which programs of vocational agriculture existed. Responses were in terms of levels of agreement to statements about various aspects of the program of vocational agriculture. Significant differences were determined by analysis of variance and set at the .05 level of probability.

Major Findings

Findings are reported in three categories according to agreement or disagreement between teachers of vocational agriculture and high school principals. Where significant differences occurred they are reported.

Areas of agreement by both teachers and principals

- Both teachers and principals agreed that the instructional program in vocational agriculture should emphasize a general understanding of agriculture rather than training for specific agricultural occupations.
- Teachers and principals agreed that students should be allowed to enroll in vocational agriculture without regard to their occupational plans.
- Both groups agreed that students who plan to obtain baccalaureate degrees in agriculture should be encouraged to enroll in vocational agriculture.
- Both agreed that course content in vocational agriculture should be determined by the type of agriculture in the local school area rather than that found in the state. Teachers agreed at a significantly higher level than did principals.
- Both agreed that the teacher of vocational agriculture should have had experience in an agricultural occupation in order to be an effective teacher.
- Both agreed that teachers of vocational agriculture should use advisory committees in planning vocational agriculture programs.
- Both agreed that teachers of vocational agriculture have the responsibility of providing systematic instruction for adults in the community. Teachers agreed at a significantly higher level than did principals.
- Both strongly agreed that an FFA chapter is essential if an effective program of vocational agriculture is to be conducted. Teachers agreed at a significantly higher level than did principals.
- Both strongly agreed that teachers of vocational agriculture should emphasize student participation in FFA leadership and judging contests. Teachers agreed at a significantly higher level than principals.
- Both agreed that teachers should emphasize participation in shows and fairs above the local level.



Earl S. Webb
Teacher Education
Texas A&M University

Earl S. Webb

- Both agreed that preparation for FFA contests should be conducted during classes rather than after school hours.
- Both agreed that students should be permitted to be absent occasionally from other teachers' classes in order to participate in vocational agriculture activities. Teachers agreed at a significantly higher level than did principals.
- Both groups agreed that teachers who resides outside the school district will be handicapped in conducting effective programs of vocational agriculture. Principals agreed at a significantly higher level than teachers.
- Both agreed that teachers of vocational agriculture should dress as well as other men teachers in the school system.
- Both teachers and principals agreed that classroom instruction (including agricultural mechanics) is the most important aspect of the vocational agriculture teacher's responsibility.

Areas of disagreement by both teachers and principals

- Both teachers and principals disagreed with the proposition that the best measure of the effectiveness of vocational agriculture programs is the percentage of graduates who subsequently become employed in an agricultural occupation.
- Both disagreed with the statement that vocational agriculture should be designed for students of low academic ability. Principals disagreed significantly less than did teachers.
- Both groups disagreed with the proposition that teachers of vocational agriculture should teach the same number of hours per day as teachers of non-vocational courses. Principals disagreed significantly less with the statement than did teachers.
- Both groups disagreed with the proposition that teachers of vocational agriculture should be employed on a 10-month basis as are teachers of non-vocational courses. Principals disagreed significantly less than did teachers.
- Both disagreed with the statement that teachers of vocational agriculture should perform agricultural practices such as pruning and grafting for people in the community.
- Both disagreed with the proposition that the teacher of vocational agriculture should permit other school personnel to use the tools and equipment in the vocational agriculture shop to construct projects for the school. Principals disagreed significantly less than did teachers.
- Both groups disagreed with the statement that more time should be devoted to agricultural mechanics than any other instructional unit in vocational agriculture. Teachers disagreed significantly less than did principals.

Areas of disagreement between teachers and principals

- Teachers disagreed while principals agreed with the proposition that vocational agriculture programs should place less emphasis on production agriculture and more on off-farm agricultural occupation programs such as cooperative part-time training and pre-employment laboratory training. The difference in levels of agreement was significant.
- Teachers disagreed while principals agreed with the statement that students should be given high school credit for production agriculture even though they do not have supervised farming programs. The difference between the two groups was significant.
- Teachers strongly agreed with the proposition that teachers of vocational agriculture rather than the principal and/or counselor should have the primary responsibility for determining which students should be permitted to enroll in vocational agriculture. Principals strongly disagreed. The difference in opinion between the two groups was significant.
- Teachers agreed and principals disagreed with the proposition that teachers should use a portion of time during the school day for activities related to adult education in agriculture. The difference in responses was significant.

AREA TECHNICAL SCHOOL DELIVERS FARMER COURSES

C. W. Dalby, Instructor
Technical Institute
Eau Claire, Wisconsin



C. W. Dalby

dents enrolled in five outlying centers study Farm Financial Management, Agricultural Engineering, Crops and Soil Management and livestock on the basis of 12 hours per week. Emphasis in all subject matter areas revolves around the management factor in order to improve net farm income.

Farm families with adequate farm income are generally happier in their work, more secure and tend to lend themselves to developing better communities. Four instructors, each a specialist in his field, develops his program of teaching around management factors leading to improved net income. The areas of instruction are correlated with other agricultural services in the communities. These include the Extension Service, Farm Record Associations, Banks, Production Credit, FHA, Farm Implement Dealers, etc.

A survey of enrollees to determine their status in farming was completed early in the instruction period. It revealed wide variances in cropping pro-

(Schumann & Webb Cont'd)

Relationship of variables with responses

In general, little relationship was found between responses and the variables of school size, tenure of teachers and principals, previous experience of the principal as a teacher of vocational agriculture, and previous experience of the principal as a student of vocational agriculture. It was observed, however, that responses of teachers with longer tenure tended to be like those of principals, whereas responses of principals who had been teachers of vocational agriculture tended to be like those of teachers.

Conclusions and Implications

In general, the professional climate existing between teachers of vocational agriculture and high school principals is favorable for sound programs of agricultural education. This investigation seems to indicate that improvements are

grams, livestock population, soil types and other farming factors; including machinery investment. The survey summary aided in programming the instructions to the needs of the students. As an illustration, students in the Greenwood, Wisconsin, community were raising 25 acres of corn per farm, while the Plum City area production average was 75 per acres per farm. These differences demand a varied approach and emphasis in the teaching program.

The farm management instruction is centered around financial management. This includes farm records and analysis, interest rates, credit management, farm loans, marketing and investments on and off the farm. The crops and soils management includes soil fertility maintenance, soil chemistry, crop selection to maximize income and weed control. The agricultural engineering work centers around the machinery investment necessary for maximum income; concrete, farm building construction; tractor maintenance and other agriculture engineering topics necessary in farm management. The livestock instruction includes all phases of dairy herd management with emphasis on swine, beef, sheep and poultry where needs warrant instruction.

Students vary in age from 22 to 50 and are fully employed in farming. Formal education varies from fourth

grade completion to a Master's degree. This range in age and formal education presents a challenge in evaluating the learning accomplishment. Their home farm progress plays a major role in appraisal of learning. Their annual increase in net worth, credit management, crop yield increases, livestock efficiency, and machinery management are some of the major considerations in learning evaluation.

The program is centered at the Area One Technical Institute in Eau Claire, Wisconsin. The classes are taught in outlying centers including Greenwood, Stanley, Mondovi, Plum City, and Menomonie. The classes are limited to 35 enrollees per class. A waiting list exists in most class centers.

In summary — success with the program centers around the following:

- Informing the public on the values of the program.
- Selection of a strong teaching staff.
- Surveying students to determine background, needs and type of farming program.
- Strict adherence to standards of attendance.
- An interesting and practical class discussion in all sections.
- A well coordinated instructional staff.

The program serves a need and improves farm income. ◆◆◆

continuing to take place in understanding between these two groups if a review of past research is a reliable measure. While the situation is fairly good it seems that additional measures are needed. Therefore the following recommendation is made.

Greater efforts should be made to improve communications between the two groups. Particular emphasis should be placed on policies governing vocational education and the degree to which policies affect the financial structure of vocational programs in local schools. Programs for the preparation of school administrators should include courses on the philosophy and administration of vocational education. On the other hand, pre-service education programs for prospective teachers of vocational agriculture should provide an understanding of school administration and supervision to acquaint teachers with problems faced by principals. ◆◆◆

Why Junior High Programs?



A. H. Halcomb

Career Education in junior high agribusiness programs in Alabama is relatively new. With the exception of the ninth grade, junior high programs have only been in operation for three or four years.

There are several reasons for this shift-down to the lower grades. Where enrollments were low in some departments and where the teachers had vacant periods, programs were initiated in grades seven and eight. In other cases, the top three grades were moved to another school, leaving a teacher with only a ninth grade class. It was necessary to drop down into grades seven and eight to maintain programs. In some instances, entire schools were closed and teachers were reassigned to other schools. Where two or more teachers were available in a school, courses could be offered in the lower grades.

The basic purpose of the seventh grade course is to acquaint the young student with the world of work. The gradual process of guidance, instruction, and practice is aimed at motivating the student to make a wise selection of an occupational objective. We refer to this course as CAREER GUIDANCE I.

Students are introduced briefly to or made aware of careers in the world of work. Occupations of all kinds including professional, semi-professional, skilled, and semi-skilled are explored with emphasis on the development of positive attitudes toward all jobs. Elementary skills are taught through the development of simple handicraft projects in wood, leather, plastics, electricity, metals, etc. Leadership characteristics are developed through class study and participation in youth organization activities.

Alvin H. Halcomb
Subject Matter Specialist
State Department of Education
Auburn, Alabama

The instructional program is supplemental with field trips, resource people, films, and other activities to make the course more relevant.

Our eighth grade course, CAREER GUIDANCE II, is a continuation of the seventh grade study. Since occupations of all kinds are explored, it is practically impossible to accomplish all this in one year. More emphasis is placed on job characteristics, skill requirements, educational requirements, and job opportunities. As in the seventh grade, simple shop skills are developed through the use of hand and small power tools in the shop.

The concept of career education is continued in grade nine which is entitled CAREER GUIDANCE AND BASIC VOCATIONAL EDUCATION I. Students study the employment opportunities and basic subject matter in sixteen instructional areas or clusters. These areas are: general farming, livestock production, crop production, agricultural supplies, general agricultural mechanics, metalworking, woodworking, masonry, building construction, power mechanics, electricity, agricultural products, ornamental horticulture, natural resources, forestry, and pre-professional agriculture. Since students are expected to choose one of the sixteen occupational objectives for specialized study during the eleventh and twelfth grades, teachers must do a good job in exposing students to all sixteen objectives. A thorough study of employment opportunities must be accomplished if the students are to become knowledgeable about jobs in the vast vocational area. The sixteen areas are further explored during the tenth grade, thus preparing students for specialized study during their last two years. This specialized study may be provided by the local teacher, in an

area vocational center, or by another vocational service.

As might be expected, approximately 50 percent of the instructional time is devoted to shop work. Field trips, resource people, and supervised practice or work experience programs supplement the instructional program. Again, leadership characteristics are developed through FFA activities.

In conclusion, career education is emphasized throughout the agribusiness education curriculum in Alabama junior high school programs. Through the gradual process of guidance, instruction, and practice, the student is motivated to make a wise selection of an occupational objective for further study and exploration. Teachers of agribusiness education are well qualified to provide this necessary and essential guidance so desperately needed by the younger students. In many cases, the

(Concluded on page 158)



Field trips are used in a study of natural resources. Job opportunities are also explored in conjunction with the unit.



Junior high school students learn basic skills along with employment opportunities in Career Guidance I and II courses.

area vocational center, or by another vocational service.

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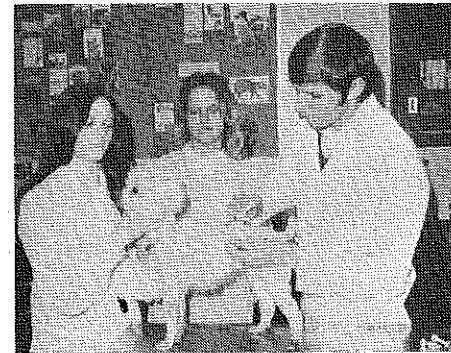
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(Concluded on page 158)

High School

SMALL ANIMAL LABORATORY—BUSINESS

Alan Penn
Small Animal Care Instructor
Clayton, Ohio



Mr. Penn, the instructor, demonstrates the proper procedure for administering medication to one of the school's dogs.



Kathie Karns does her daily job of cleaning the animal pens and feeding the animals in the ward area.

Small Animal Care is an educational program designed to prepare students for entry level employment as veterinary assistants, pet shop salesmen, kennel workers, animal groomers, Humane Society workers, laboratory animal assistants, and riding stable assistants. Traditionally, such training has been done on a technical school level or as a part of a co-op program such as agribusiness. However, with the help of an administration that has a very broad concept of education that allows for specialization, a local industry that claims it needs over fifty qualified employees in animal care each year, and an abundance of facilities and equipment, now an animal care program can be taught on the high school level.

The main emphasis in the program is "relevancy with an element of realism." It is realistic because 1) everything that is taught is based on behavioral objectives which the student will apply when they leave school to begin work, 2) the related class, laboratory and ward are set up like a combination veterinary office, pet shop, grooming salon, and kennel, and 3) live animals are incorporated into the program. Going into an industry that deals with animals without the experience of working with them is unrealistic. Five dogs, five cats, 100 rats, 25 gerbils, 15 hamsters, 50 mice, 20 guinea pigs, and 8 tanks of tropical fish provide the predominantly urban group of students the opportunity to experience a truly "hands on education." The students even have to come in on the weekends and over the holidays to care for the animals.

The program is relevant in two respects. First, it is a natural for agribusiness in the urban area. Young people have always been interested in animals.

Secondly, the small animal industry is on the upswing in the country today. More and more people have pets of all kinds, both large and small. All of these animals have one thing in common, their owner has a keen interest in their health and well-being. However, the owner cannot provide all the care that might be needed. This is why small animal care programs are being initiated in Ohio.

It is estimated that by the year 2000 there will be a shortage of over 12,000 veterinarians and animal caretakers in the United States. Therefore, additional trained personnel must be found. Small animal care is a preparatory step to higher levels of learning such as technical training and college.

PROGRAM CURRICULUM

The program at Montgomery County Joint Vocational School began a year and a half ago as a part of an agribusiness unit. After a brief year in this form, the program was advanced to a full-time unit. The two-year program classroom and lab study including six summer laboratory sessions the junior year and on-the-job training the senior year. Because of the specialized

nature of the program the student attend three hours of laboratory, 1½ hours of related class, and one hour of academics each day. This provides an in-depth and specialized training experience. A list of units taught are available from the author.

PROGRAM FACILITIES

To be able to instruct a specialized program, one must have the proper equipment. Our small animal care program was fortunate to have an input from an advisory committee of local veterinarians, pet shop owners, groomers, kennel owners, and Humane Society workers. This group of qualified individuals reviewed the possible equipment and facility needs and made their recommendations.

The local agriculture department used the advisory committee recommendations to set up the small animal care program. Aside from using the committee for this purpose, the members also volunteered to assist with instruction. The advisory committee is essential to the success of the program.

The unit-facility layout is very unique in that it is designed as a pet

(Concluded on page 158)

GROUND FAULT CIRCUIT INTERRUPTER INSTRUCTION

W. Forrest Bear
University of Minnesota

and

Roland Espenschied
University of Illinois



W. F. Bear

What is the latest in the electrical instruction? Shocking as it may be to you, it is the ground fault circuit interrupter (G.F.C.I.). The question has been answered, but how is your I.Q. on G.F.C.I.??

G.F.C.I.—WHAT?

According to Section 680-4f of the 1971 National Electrical Code (N.E.C.), the G.F.C.I. is a device whose function is to interrupt the electrical circuit to the load when a fault current to ground exceeds some predetermined value, but is less than that required to operate the over-current protective device of the supply current.

What does this mean when you have the three wire electrical service which includes the "hot," "neutral" and "ground"?

Let's assume you have an electric drill with a metal case and the windings are shorted to the case. The case is "hot" and the current is to flow through the grounding conductor to ground. The circuit fuse will then "blow" if enough current flows in the circuit. One major problem could occur, however, if you are holding the drill and provide an alternate path for the flow of current.

Electrocution could result from less than 10 m.A. and about 100 m.A. it is virtually certain. It is difficult to predict the exact number of milliamperes required to be fatal because the total amperes, duration of shock, moisture of the skin, and weight of the body all affect it. Reduced to an easier term, a 10-watt bulb uses 87 milliamperes.

The purpose of the G.F.C.I. is to disconnect the circuit at a m.A. value which will not be harmful to a human. At low current values, a person can let go of the charged drill case but at larger current values the person is held and damage or death can result. The

"let-go" current for man is considered as no greater than 5 m.A., therefore, Class A G.F.C.I. units are designed to function at this value.

G.F.C.I.—HOW?

If a circuit is operating properly, the "hot" and "neutral" conductors carry the same current. The primary components of the G.F.C.I. are a differential transformer, an amplifier, and a fast-acting circuit breaker. Output voltage necessary to actuate (trip) the G.F.C.I. is obtained from the differential transformer whenever current through the ungrounded wire is not equal to the current in the neutral wire (as caused by current flow from the ungrounded wire to ground). The differential-transformer output voltage created by the fault current is amplified and used to actuate the circuit breaker and open the circuit whenever the current exceeds a predetermined level.

G.F.C.I.—WHERE?

The G.F.C.I. can be installed in the main conductors of a service entrance to interrupt all power if a fault occurs.

This could present problems with lighting if all power went off and with certain equipment needed to be operated continuously. G.F.C.I.'s will be more frequently used on individual circuits where potential hazards are the greatest. Effective January 1, 1973, the N.E.C. required G.F.C.I. protection for personal residential occupancies on 120-volt single phase, 15- and 20-ampere receptacle outlets installed outdoors. Section 680-31 states specifically that all circuits supplying electrical equipment used with storable swimming pools be protected by G.F.C.I.'s. G.F.C.I.'s will be required for 15- and 20-ampere receptacles at construction sites on January 1, 1974 (N.E.C. 210-7). The Occupational Safety and Health Act (OSHA) could become active in the enforcement of the N.E.C. regulations. Other locations for the G.F.C.I.'s would be around boat docks, permanent swimming pools and any wet working area.

G.F.C.I.—DEMONSTRATION

"What you can't SEE won't hurt you" is a poor philosophy with electricity. To help you SEE those dangerous

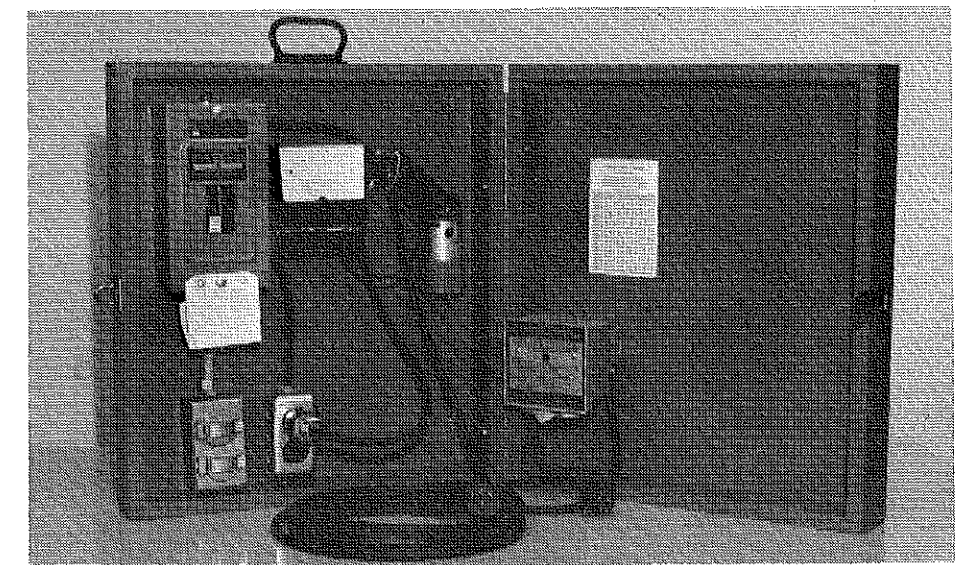


Figure 1 G.F.C.I. Demonstration Board

(Continued on page 166)

(Penn from page 157)

shop, grooming salon, kennel, veterinary clinic, and classroom all in one multi-purpose combination. Students operate each area as a commercial business which is open to the public.

The groomers have their own area in which they take in all breeds of dogs from the local public for a fee, to bathe, clip, and beautify.

The pet shop trainees have a product display area, sales area, and animal display area from which they can operate the MCJVS PET SHOP. For nominal but competitive prices, the local public can purchase small animals as pets, animal health products, and most any other product that is found in a local pet shop.

At the JVS kennel, local residents will soon be able to board animals while they take vacations. The students will run the total operation on a fee basis.

The veterinary assistant trainees have the most complete veterinary clinic in Ohio. The unit includes a lab for run-

ning routine laboratory tests such as fecals, blood tests, urine analysis, and cultures. There is also a surgery area having an operating table, anesthesia machine, surgery lights, and surgical instruments, and medications. This area is used for practice in assisting in surgery as a student would do in a veterinary office. An examination room is set up for practice in meeting clients and keeping accurate records. Future plans include practice in taking and developing x-rays.

The advisory committee is essential to the success of the program.

To date the small animal care program has had relatively good success in both producing a qualified worker for industry and in attracting new students to agriculture.

Industry support is good to date but there are a few who are skeptical and feel we are turning out a "bunch of

quacks." However, many local veterinarians, pet shops, kennels, and groomers, employ our students in the co-op situation and are pleased to have a person who they do not have to train prior to employment.

Student response to the course has been remarkable. The school sponsors a sophomore career orientation day each year and this past year over 200 students signed up to investigate the small animal care program. Of these students, only 25 can enroll next year.

In this age of career oriented education in agriculture, a program like small animal care is a must. It provides the student with a specialized training program which in turn prepares the student for a wide variety of occupations in the animal care industry.

To be relevant today, agriculture must continually change and specialize to meet the needs of industry, the student, and the community. We have attempted to do just that at Montgomery County Joint Vocational School. ♦♦♦

From the Book Review Editor's Desk . . .

BOOKS TO BE REVIEWED

COMMERCIAL CATFISH FARMING

By Jasper S. Lee
Interstate Printers & Publishers, Inc. (1973)

GREENHOUSE MANAGEMENT FOR FLOWER AND PLANT PRODUCTION

By Kennard S. Nelson
Interstate Printers & Publishers, Inc. (1973)

THE ADVANCE OF AMERICAN COOPERATIVE ENTERPRISE: 1920-1945

By Joseph G. Knapp
Interstate Printers & Publishers, Inc. (1973)

TRACTOR AND SMALL ENGINE MAINTENANCE

By Arlen D. Brown
Interstate Printers & Publishers, Inc. (1973)

EDUCATORS GUIDE TO FREE HEALTH, PHYSICAL EDUCATION AND RECREATION MATERIALS

Edited by Foley A. Horkheimer
Educators Progress Service, Inc. (1973)

EDUCATORS GUIDE TO FREE GUIDANCE MATERIALS

Edited by Mary H. Saterstrom and Joe A. Steph
Educators Progress Service, Inc. (1973)

APPROVED PRACTICES IN BEAUTIFYING THE HOME GROUNDS

By Norman K. Hoover
Interstate Printers & Publishers, Inc. (1973)

APPROVED PRACTICES IN SHEEP PRODUCTION

By Elwood M. Juergenson
Interstate Printers & Publishers, Inc. (1973)

MODERN CONCEPTS OF FARM MACHINERY MANAGEMENT

By Wendell Bowers
Stipes Publishing Company (1970)

FARM MANAGEMENT: PRINCIPLES, BUDGETS, PLANS

By J. H. Herbst
Stipes Publishing Company (1970)

INTRODUCTORY EXPERIMENTAL SOIL SCIENCE

By B. R. Sabey
Stipes Publishing Company (1969)

LAW AND COURT DECISIONS ON AGRICULTURE

By N. G. P. Krausz and H. W. Hannah
Stipes Publishing Company (1973)

ENGINEERING APPLICATIONS IN AGRICULTURE

By Wendell Bowers, Benjamin A. Jones, Jr., and Elwood F. Olver
Stipes Publishing Company (1973)

LABORATORY STUDIES IN FIELD CROP SCIENCE

By A. W. Burger
Stipes Publishing Company (1967)

If you feel qualified to review one of these books and desire to do so, write the Book Review Editor and he will send the book for review. Once reviewed, the book becomes the property of the reviewer.—James P. Key, Book Review Editor, Agricultural Education Department, Oklahoma State University, Stillwater, Oklahoma 74074

(Halcomb from page 156)

only vocational service providing this basic career information in a local school is the Teacher of Agribusiness Education.

When students complete the Career Guidance I and II courses, and have been exposed to the job opportunities through the study of the ninth grade curriculum, we in Alabama feel that junior high programs are serving their purpose. ♦♦♦

Opportunities in the Turfgrass Industry

W. F. Campbell and G. A. Long¹
Utah State University

Introduction

The growth, care, and maintenance of grass has become an important source of employment for vocational agriculture students. A consideration of the career ladder possibilities and preparation necessary for entry and advancement in the industry should be of value to teachers and students. The vocational preparation and counseling program for this field needs to be developed with an understanding of the growth and development of this industry. Only then can vocational education programs serve both the industry and students' needs effectively.

The turfgrass industry, whose modern era commenced immediately after World War II, exists because of the golf course, and the maintenance of golf course operations has been the prime generator of technical advances and industrial development. This industry was further advanced by the organization of such groups as the U.S. Golf Association, the Professional Golf Association, the Green Section of the USGA, the National Golf Foundation and the Golf Course Superintendents Association of America. According to the National Golf Foundation, for the period 1961-70, the number of golf courses increased at the rate of 350 per year, at which time there were slightly over 10,000 golf courses in the United States. The construction cost of golf courses today ranges from a bare minimum of \$200,000 to \$1,000,000 or more.

With the turf industry growing so rapidly, what types of jobs are available in it or associated businesses? What are the special interests, aptitudes, and physical abilities needed for employment in turf occupations? What levels of education, training, and experience are needed for entrance and advancement in such occupations?

¹ Associate Professor of Agronomy and Head and Associate Professor Agr. Educ.

PROFESSIONAL

Individuals in this group may teach, do research or extension work in turfgrass. The professional may do experiments to improve turfgrass quality through breeding, environmental control, and cultural techniques. Other duties may include preparing information leaflets, pamphlets, and bulletins on turfgrasses, or making presentations at professional and educational meetings. In an industrial company the primary jobs are those of conducting research, demonstrations, and/or sales promotion. Individuals in this group should have completed a Ph.D. degree, which requires about seven years of collegiate study.

MANAGERIAL

A golf course or athletic field superintendent supervises and coordinates the activities of workers on the course or athletic field. He is responsible for improving and maintaining the turf without interrupting play. In addition to managing the turf, he is responsible for hiring and training employees; keeping employee records, preparing budgets and reports; purchasing materials and equipment; and maintaining equipment. Much work of these individuals is outdoors. During the growing season, he may work 10 to 16 hours a day. A two-year post-high school course in turf management or a B.S. degree is desirable training for this job. Many men attain superintendent positions after completing 5 to 10 years of practical experience as an assistant. Job possibilities in this field are good, as superintendents are increasingly needed to maintain new courses and athletic fields being constructed.

LANDSCAPE CONTRACTOR

The landscape contractor is usually self-employed. He establishes and maintains turf and shrubbery on various

properties according to the landscape plans. He estimates costs, then bids for the jobs. In his work he supervises and coordinates others who maintain or establish the landscapes around homes and businesses. He may make decisions regarding the establishment of the plants and what cultural practices, such as type of seed, amount and grade of fertilizer and the way to plant and prune shrubbery. He also makes decisions about purchasing equipment, and he must see that the equipment is properly maintained.

During winter the landscape contractor sells his services by renewing old contracts and contracting potential customers. He also may contract for snow removal. Their incomes depend upon their initiative, experience, and ability. A two-year course in ornamental horticulture and turf provides valuable training for such jobs.

TECHNICAL

The assistant superintendent must know how to perform certain jobs himself as well as be able to supervise workers. With the superintendent, he 1) determines work priority, 2) assigns workers to specific jobs, and 3) demonstrates tasks to them. He needs to be skilled in 1) calibrating fertilizer and spray equipment, 2) applying fertilizers and pesticides, 3) operating irrigation equipment, 4) operating standard mowers (rotary and reel types), aerifiers, etc., 5) cleaning and grading sand traps, 6) changing putting cups and tee markers, 7) establishing new sod where needed, 8) top-dressing and syringing (mist sprinkling) the greens, 9) pruning and spraying trees and shrubs, and 10) servicing and repairing all equipment. He helps the superintendent keep records and prepare budgets and reports. His working hours are irregular, as some maintenance must be done in early morning, late evening

(Continued on next page)

(Turfgrass Continued)

or night so as not to interfere with play on the course. The demand is good for this type of capable, responsible man.

Many job opportunities are available as a salesman of turf supplies and equipment. Seeds, fertilizers, insecticides, herbicides, and fungicides are the best examples of such supplies, while mowers, aerifiers, irrigation systems, and small tools are examples of important equipment.

The salesman calls upon individuals or businesses to show and explain his products. He is often involved in sales promotions advertising the product through displays and exhibits. He provides information regarding performance and use, takes orders for his merchandise. He may also instruct the dealer or golf course superintendent in the use of the equipment and supervise its installation. The salesman is usually assigned to a district and may have to travel extensively. Aptitudes for selling and working with people are necessary for this occupation. A high school education and two or more years of formal training are usually required. Experience in working with the products being sold is highly desirable.

SERVICE WORKERS

The service worker prepares the golf course, field or race track for various sporting events. His work is primarily outdoors and directed by a superintendent. He may perform any number of tasks such as 1) mowing the turf with power mowers, 2) operating irrigation equipment, 3) smoothing the areas with power and hand equipment, 4) applying fertilizers and pesticides, 5) aerifying and vertically mowing the turf, 6) marking the field lines with paint or chalk, 7) positioning goal posts and other necessary equipment, and 8) servicing and repairing equipment and facilities. The work requires a knowledge of plants and how they grow; the use of fertilizers and pesticides; and the maintenance of the equipment used on the job. Advancement will depend upon the employee's willingness to accept responsibility and knowledge of his work, which he can increase by enrolling in turf short courses and correspondence courses.

Training for the Future

It has been said that the key to success is to be prepared for opportunity when it knocks; this justifies the need for continuing education. A knowledge of soil fertility and fertilizers is of great value to the turf man of today, as it deals with natural fertility and how it can be improved. The many elements of plant foods are individually studied as to amounts needed by a plant and whether the effects are beneficial or detrimental. Lack of elements either through leaching or depletion by plants can be determined by soil testing. Then the specific plant foods required can be returned to the soil. Why soils fix or hold certain elements and make them unavailable to plants, such as with iron chlorosis, and how to correct this condition is also of interest to turf managers. The managerial and technical groups need to know how to establish and maintain good turf and other plant cover under saline and alkaline conditions.

An understanding of the nature and properties of soils, such as soil classification, pH, bulk density, base exchange, soil microfauna and many other specific details concerned with growth media, is necessary to good plant management. The attaining of field capacity, or the maximum amount of water desired in a soil, is very important in watering practices. Knowledge of that point of reduced moisture in the soil called wilting coefficient is very important to successful turf maintenance. Explanations of how bacteria and other micro-organisms in the soil break down organic matter to humus, evaporation control, the nitrogen cycle and carbon-nitrogen ratios are additional principles of concern to the turf grower.

Soil watering, tile systems, infiltration rates, runoff, design of water hazards, spillways, and irrigation systems are potentially valuable technical skills for the golf course employee as he moves toward management responsibility. Maintenance and trouble-shooting skills are essential to entry for a significant proportion of beginning employees because of the equipment used to maintain the course for play.

Weed identification, spray application and sprayer calibration, phytotoxicity of families of chemical com-

pounds and how they may be modified, harmful effects of the misuse of herbicides, etc., as well as other aspects of weed control are important. Entomology teaches the student how to recognize insects and the damage caused by them. After recognition, one has to know their feeding patterns so that some control can be used. By knowing their life cycles, a person can often use a preventive program and save himself much expense; he can anticipate their actions and thus be prepared. Fungus attacks are a constant concern to turf men. Other worthwhile courses in the training of a well-rounded turf specialist are bookkeeping, accounting and business law. Human relations is another important study area as well as a consideration in counseling young men into the turf industry. The success or failure of most employees in this field depends upon their social skills to a significant extent. The condition of the course is a very serious concern of players and board members. The greens keeper will often succeed or fail, based not only upon his technical skill but also because of his ability to explain the effects of increased traffic and nature's vagueries on the condition of the course.

Successful vocational preparation for the turf industry will require the same kind of school-industry cooperation typical of successful vocational educational programs wherever they are found. The active use of an advisory council is necessary in planning the instructional program in order to gain employment of the students prepared.

Making trained workers available for the first time requires some adjustment in beginning wages and benefits to assure that the students trained will enter the field. The self-selection that occurs for a training program results in workers with higher aspirations than typically found in these entry level jobs. The successful beginning of the vocational program and student recruitment will depend to an extent on how well the vocational educator focuses on student satisfaction as well as employer satisfaction. A thorough understanding of the industry by the teacher and students on the one hand and of the student-worker and his goals by the employers will do much to insure a successful vocational program.◆◆◆

OBJECTIVES—A RETURN TO REASON

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Behavioral objectives have come under increasing attack lately. In the September, 1971 issue of *The Agriculture Education Magazine*, Bill Vice lucidly presented many of the complaints that teachers have against the current proliferation of behavioral objectives.

At the heart of many of the arguments is the problem of specifying every behavior that is to be exhibited by the end of the unit. Teachers protest most bitterly against behavioral objectives when they are forced to write them in such detail and number that the meaning behind them is lost. Objectives which are too specific lose context; when this happens, the teacher begins to write them at lower levels of the cognitive taxonomy. The final set of behavioral objectives is likely to be a set of actions, which when taken *in toto*, reflect little of what the teacher originally had in mind.

For example, a teacher preparing a unit on soils is likely to begin with the hope that his student will be able to understand enough about soils so that, as a farmer, he will use the soil on his farm with maximum efficiency, but not abuse it. Probably, he also will want his students to appreciate the value of soil and to realize that it is a precious commodity that represents part of the delicate balance of nature. But the end result of his specific objective writing is likely to be statements such as, "The student will be able to match soil types with regions of the country with 85 percent accuracy," and "Given a list of procedures, the student will be able to select out, in correct order, the actions that are part of taking a soil sample."

The unfortunate part of this process is that the teacher is now likely to

teach to the specific objectives. After all, this is where the evaluation will come from, and the teacher wants his students to learn the material that will be tested. But the teacher's original intentions for teaching the unit have been lost. A student could clearly perform all the specific objectives and still have come no closer to the real aim of the unit than he was before it was presented.

The reason for this is that the leap from the real intention of the unit to the specific objectives was too great. It is difficult to envision the combination of specific observable actions which will give the right mix and produce an individual who is capable of performing the original lofty aims of the unit. This is invariably true when one is trying to train for categories of jobs rather than one specific task.

The difficulties we face today have come about naturally. The original intention of Ralph Tyler, who generally is considered to be the "founding-father" of objectives, was that objectives should be written to improve the validity of testing programs. He was highly concerned with the generalizability of learning, and saw no problems in dealing with the specificity of objectives.

However, as accountability came into vogue in education, it became necessary to increase the level of specificity at which objectives were being written. This continued because of the success Mager was having in using objectives written in preparing programs of instruction which were used to train adults for specific jobs. His method of task analysis, task detailing and writing objectives which name the act, define the conditions and state the accuracy

(Mager, 1962) works extremely well for the purpose for which it was designed: training programs. However, the approach does not work nearly as well for more general areas of education. This very important point has been lost in the proliferation of this technique of objective writing.

A technique is available, however, which does have much greater applicability for general classroom teachers. The major ideas and the philosophy behind this approach are due to Gronlund (1967).

There are three major steps involved in writing objectives using the Gronlund technique: goals statement, general objectives and specific objectives. Although specific objectives are written, their emphasis and purpose is completely different from the way they are used in the Mager approach.

The first step in writing the objectives for a unit is the careful selection of a unit for which the objectives are to be written. It is best to take a period of time which will permit the training for generalizable skills, yet not so long that several objectives might be lost. Selection of too long a unit will generally result in a list of vague and platitudinous objectives; too short a unit will result in highly specific objectives which generally measure very low cognitive levels of learning. Experience has shown that selection of a unit of 10-20 teaching hours in length works best for most teachers.

After selecting a unit, the teacher must consider carefully why he teaches it. What should the student be able to do when he has finished the unit? How should his life be changed? The teacher should write down, in a few sentences, the impact on the student's performance in the real world that the

(Objectives Continued)

unit of teaching will have. The key here is to view the performance as required in an out-of-school setting. The emphasis is not on what the student will do in the classroom, but what he will be able to do for himself or his employer as a responsible citizen.

The few sentences just written are called a "goals statement." An example of one, for a unit on soils, might be:

The student-farmer will be able to develop a land-use plan that will maximize his long-term profit as a farmer. He will know enough about the importance of soil to understand the value of proper conservation practices.

Note the important point. No mention is made of the student's performance at the end of the unit, or on the school farm or in the classroom. The orientation is totally aimed toward an ability that a successful farmer must have.

Once the goals statement has been written down, the emphasis turns to the general objectives: the goals toward which the teacher will try to bring his students. The sum of the general objectives should come close to matching the goals statement, but with this great difference: the general objectives are written with the orientation of what is to be accomplished at the end of the unit in school, not in the future on the job, as is true with the goals statement. The general objectives are statements of what the teachers really intend to teach, written in his language. For example, from our goals statement, we might arrive at the following general objectives:

- I. The student will understand the relationships between selection of a cropping system and the rate of soil depletion.
- II. The student will understand the effects of soil depletion on the success of a farming operation.
- III. The student will be able to develop a fertilizing plan when given the results of a soil test.

Clearly, these few objectives do not yet cover the goals statement, but they indicate the way that general objectives should be written. The teacher should not be satisfied with the list of general objectives until he believes that a student who could meet all of them eventually will satisfy the goals statement.

A teacher could end his writing of objectives at this point if he did not care about evaluation. The objectives are all teachable. In fact, if written properly, they should relate to the concepts that the teacher will be emphasizing each day in the classroom.

However, if evaluation is to be done, the general objectives are not defined well enough to be particularly useful. For evaluation purposes, specific objectives must be written. Specific objectives should be written to give evidence as to whether or not the general objective has been met. It is not necessary to list every action that relates to the general objective. A representative sample of specific objectives will do. As a general rule, six to eight specific objectives should be written for each general objective. Each specific objective should relate to a different aspect of the general objective. The key is to write a representative list of specific objectives, not a complete one.

To begin writing the specific objectives, write down the first general objective. Consider the various behavior that a student could exhibit to lend credence to the general objective, and begin to list these as specific objectives.

For example,

- I. The student will understand the relationships between selection of a cropping system and the rate of soil depletion. Specifically, the student will be able to:
 1. Select the optimum cropping system for given soils.
 2. Identify crops which take large amounts of phosphorus from the soil.
 3. Select the best cropping system for the following year, given a history of crops grown on a type of soil.
 4. Identify soil types by visual inspection.
 5. Identify the nutrient lacking, given photographs of undernourished crops.
 6. Select the method that will most efficiently increase organic matter in the soil.

The major advantage of this method is that it recognizes that teachers and evaluators have different reasons for

writing objectives. (It is assumed here that the teacher and evaluator are two different people. Of course, it most commonly happens that the teacher changes hats and becomes his own evaluator, but we will make a distinction between these two.) A teacher needs to feel that his list of objectives is complete, because it may well be that the worth of a unit is lost if one major component is missing. An evaluator does not need such a complete list, because the measures he uses are always samples anyway. He needs only a representative sample of behavior.

The Mager approach tries to make one set of objectives do for both the teacher and the evaluator. The teacher needs a complete list of objectives; the evaluator needs objectives that are specific and measurable. The net result when only specific objectives are written is usually unsatisfactory for both the teacher and the evaluator.

The Gronlund technique allows for two sets of objectives: general objectives for the teacher and specific objectives for the evaluator. A complete list of general objectives is much easier to write for a unit than a complete list of specific objectives. More importantly, the teacher is more likely to be satisfied that the list of general objectives, when combined, truly reflect his aim for teaching the unit. The evaluator has a sample of specific objectives which, because they have been categorized under each of the general objectives, is more likely to be representative.

The Mager technique works well when objectives are being written for a specific job. When objectives are being written by teachers for general classroom instruction, however, the Gronlund approach, which allows for general objectives for the teacher and specific objectives for the evaluator, should help to eliminate many of the objections that presently are being voiced by educators. ♦♦♦

Gronlund, N. E. *Measurement and Evaluation in Teaching*. New York: Macmillan, 1970.
Gronlund, N. E. *Stating Behavioral Objectives for Classroom Instruction*. New York: Macmillan, 1970.
Mager, R. F. *Preparing Instructional Objectives*. Belmont, California: Fearon, 1962.
Vice, B. J. Performance objectives — miracle or mirage. *The Agricultural Education Magazine*, September, 1971, 56-57.

FORMER STUDENTS:

To Them You Are Responsible

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R. W. Walker

Become established in the community, is one of the suggestions made to beginning teachers and most successful experienced teachers agree with this advice. A dedicated teacher of agriculture should design an agricultural program to serve the educational needs of all students in the community. As he remains in the community to implement the program over a period of years, an accounting of the effort put forth can be done by observing, talking, and listening to former students.

If you are an experienced teacher one can guess that something similar to the event which follows might have happened to you.

"Hi! Mr. Jones," is the greeting from a young man accompanied by a young woman with a baby cradled in her arms. "Meet Patty, my wife and our new son, Jeff. Patty, this is my agriculture teacher from whom I learned . . ."

This greeting is not an unusual or infrequent occurrence for the agricultural teacher who continues in the teaching profession for several years. Former students come back to visit. Each has lingering memories of instructional activities and other school experiences. School experiences which are recalled to memory at this point in time are now judged by an adult such as the young man standing before his former teacher, shaking his hand and proudly introducing wife and son; perhaps a son who will be encouraged in a few short years to enroll in his classes. Mr. Jones is a teacher who gained the respect of a former student and still has this respect as the greeting indicates.

TEACHERS ARE ACCOUNTABLE

Teachers will account or be answerable to many for their effort in planning and implementing instructional program in agricultural occupations. But the master teacher will be more concerned with the evaluation of their program and teaching performance by adults who were former students.

It is sobering to realize as a teacher of agriculture that the high school students in your class today will be the adult citizens of the community tomorrow. Today they interact with you and fellow class members in an instructional program designed to prepare each for job entry or further education. Tomorrow, former students will be elected to the school board or appointed to your advisory committee. They will continue to interact with you and fellow citizens. Former students will also continue as your current students in adult education programs for young farmers and farm related businesses.

Teachers should reflect frequently and continually on their major assignment in teaching, that is, to help prepare

students for a satisfying life in the world of work. With this major goal in mind, teachers can place emphasis on those instructional activities that focus on helping the students prepare for entry into the occupation chosen by each. The instructional activities for which the teacher can best account are those that are closely associated with the students occupational goal. An activity-oriented program should help each student to gain the technical competencies to perform the job while gaining the ability to satisfactorily relate to other people.

Evaluation to be most effective is a continuous process; the same is true of a good accounting procedure. Since teachers are accountable for the results of the instructional program, it would be feasible to team-up evaluation with accounting and consider both in a system of formal follow-up.

WHAT CAN THE TEACHER DO?

As stated, the established agriculture teacher with years of service to the community can account for his actions over the years by looking to former students. But what can the new teacher do to insure that his effort in program development, teaching and other related activities will withstand the tests of accountability? First and foremost, develop a comprehensive agricultural occupations program to serve the community using all resources, especially human resources. Consider the following "time tested" suggestions which when implemented provide the structure for a program that will withstand most accounting procedures used by school administrations, citizens groups, or former students.

- Become established in the community. Take part in community activities and assume leadership responsibilities.
- Develop an agricultural education program that will serve the educational needs of all students planning to enter an agricultural occupation.
- Involve the community in planning the instructional program. Use an advisory committee.
- Involve students in course planning.
- Recognize that students "learn by doing." Extend

Vocational education in agriculture must make a significant contribution in helping each student to choose, prepare for, enter into, and advance in an occupation.

(Walker Cont'd)

the activity oriented program beyond the classroom walls to the community.

—Involve the parents of your students. Gain their support and assistance in implementing student-centered instructional programs. Visit the student in their home as often as possible.

—Help students to develop long-range vocational and educational plans. Record these plans and refer to them constantly as instructional activities are planned.

—Involve the other teachers and guidance personnel in adjusting the instructional programs so as to be most responsive to students preparing for job entry.

—Assist all students to gain "hands on" experiences in programs located "on-site" in community agricultural businesses. Supervise students to insure that experience which each student planned are acquired.

—Don't overlook the value of the supervised farming program; one of the best motivators of boys and girls who plan to enter into the business of farming.

—Use the FFA. Regard the FFA as an integral part of the instructional program. Develop a program of work responsive to the needs of *all* students. Involve all students in implementing the program of work.

—Work closely with the school administration. Carefully consider established school policy in planning and implementing the agricultural occupations program. Keep the principal or vocational director informed, complete reports and maintain adequate records.

—Keep the public informed. Report activities and achievements of students.

—Follow-up by survey former students at three, five and ten year intervals. Continually remain open for suggestions from former students of ways to improve the program; then with the aid of the advisory committee, incorporate suggested improvement into the program.

—Work closely with other educational programs through which your students pass, such as, the elementary school, area vocational center, community college and others. Help to develop a system for articulating educational offerings in agriculture among the elementary, secondary and post-secondary delivery systems.

In summary, teachers of agriculture must be accountable to former students. Vocational education in agriculture must make a significant contribution in helping each student to choose, prepare for, enter into and advance in an occupation.

Evaluation is a continuous process that follows immediately after the implementation of a plan of instructional activity. Educational activity should be designed to provide the student the know-how for job entry and to help the students develop the ability to relate to other people. When this results, a good accounting can be made of the teacher's effort. ♦♦♦

JANUARY, 1974

(Davis from page 150)

when there is no rain or fog and the wind velocity is less than 10 mph.

5. Project: **Waterfowl Nesting Studies**
 1. Approx. no. of hrs. req.—variable.
 2. Work period—afternoons on weekdays.
 3. Duties: Students will assist refuge personnel in searching nesting cover for duck nests.

6. Project: **Woodduck Nesting Box Evaluation**
 1. Approx. no. of hrs. req.—2-3 hr./observation.
 2. Work period—early mornings and evenings.
 3. Duties: Students will be assigned a number of wood duck nesting boxes within a small area. These will be closely observed during the nesting season for the presence of active nests. Detailed notes will be kept on attendance of the female at active nests, appearance of broods, predator activities, etc.

July through September 15

7. Project: **Waterfowl Brood Count**
 1. Approx. no. of hrs. req.—20 hrs.
 2. Work period—early morning.
 3. Duties: Student will assist the assistant manager in a canoe survey of marshes and lakes to conduct a census of duck broods. Conditions permitting, the count will be conducted in 3 to 4 hour segments on 5 to 6 mornings during a 7-day period.

8. Project: **Summer Public-Use Inventory**
 1. Approx. no. of hrs. req.—2 hrs.
 2. Work period—afternoons, weekends.
 3. Duties: Students will replace leaflets taken from dispensers of the four contact stations, goose pens, headquarters, and nature trail. In addition, a count of vehicles at fishing accesses will also be included. A refuge vehicle will be available for this survey.

September 15 through November

9. Project: **Grouse Bag Check Station**
 1. Approx. no. of hrs. req.—8.
 2. Work period—mainly weekends, some evenings.
 3. Duties: Student will operate a bag check station under the supervision of the Assistant Refuge Manager. He will learn to accurately determine the sex and age of a ruffed grouse and apply this prior knowledge at the check station. Other data will include: number of hunters per party, hunter success (birds/hunter), time spent on refuge, etc.

Throughout their eleven month training program both students complemented their training with nine week classes consisting of Natural Resource Conservation, Forestry Management, and Wildlife Management.

Periodic evaluations were made of the students' progress at the training station by their supervisor and the Vocational Agriculture instructor. A summation and consensus of opinion by those in charge concerning the students' work and progress might well be reflected in this statement by their supervising Assistant Refuge Manager.

The cooperative training program between the Sherburne National Wildlife Refuge and the Vo-Ag Department at Princeton High School was set up on a trial basis with some doubts on my part as to its potential values. After working with the two students, Ron and Dave, for a few weeks, it became obvious that the arrangement would be a success. Both of these boys were hard workers, and their enthusiasm for even the most menial tasks was quite admirable.

Their rural backgrounds made my job as a supervisor considerably easier. Much of the need for training on simple outdoor tasks was unnecessary, although proper safety practices were emphasized.

(Continued on page 166)

(Davis from page 165)

Projects assigned to the boys were hardly busywork. All but a few jobs would have had to be performed by a refuge staff member in their absence. Consequently, from the refuge's point of view, their work was a definite contribution. I feel that Ron and Dave also benefitted from the experience. Ron in particular, since I understand he plans a career in conservation work. Although Dave did not appear to be career-oriented to the job, it certainly was not apparent in the way he performed his duties.

All in all, I would rate the program an overwhelming success in this case. On the other hand, I feel that its success was due in large part to the character and abilities of the two boys involved. With individuals having the motivation and abilities of Ron Johanson and Dave Goetz, a cooperative program of this kind can only be a benefit to the parties involved.

Federal budget cutbacks have precluded further individual on-the-job training programs at the Sherburne National Wildlife Refuge. Ron, one of the students placed there, developed a wildlife photography hobby during his training program at the refuge. In partnership with another Princeton Vo. Ag. student, Ron completed a fine job of devel-

oping a slide picture presentation and accompanying narration on the operations and conservation programs in effect on the refuge as an independent occupational study project during one quarter.

Graduating in 1972, Ron continued his interest in wildlife work beyond high school and worked for six months in Colorado on a wildlife and recreation game ranch. Ron plans on returning to work there again next summer.

The cooperation between this federal wildlife refuge and the Princeton Vo. Ag. Department, came about through discussion with the refuge personnel over the last several years. The success of this particular job training plan resulted somewhat from a situation of perfectly matched student interest and existing local placement opportunity. It was also a product of local community survey work which can and has worked quite successfully with other job training situations as well. ◆◆◆

(Bear from page 159)

m.A.'s which could kill you, the demonstration board in Figure 1 was built by Professor Forrest Bear, University of Minnesota, St. Paul, and a similar instructional unit is used by Professor Espenschied, University of Illinois, Urbana, Illinois.

The components of this board include a service box, 20-ampere circuit breaker, G.F.C.I. protector breaker, duplex receptacles in a handy box and in a weatherproof box, A.C. milliammeter, adapter plug, and an electric drill. The electric drill has an electrical fault or short to the case with a resistor (12k) which limits the flow of current.

DEMONSTRATION PROCEDURE

Step 1. Plug the drill into the duplex receptacle using the adapter plug. Attach the patch cord between the drill and AC milliammeter. Operate drill and note fault current leakage. The circuit is protected by the regular circuit breaker.

Step 2. Plug the drill into grounding type duplex receptacle wired with grounding wire and operate the drill. Note the fault current is carried by ground wire and the circuit is protected by the regular circuit breaker.

Step 3. Plug the drill into G.F.C.I. protected (weatherproof) receptacle.

Operate the drill and the G.F.C.I. opens the circuit. Both the operator and circuit are protected by the G.F.C.I.

Hopefully, you can now better understand the principle of a ground-fault, milliamperes of current flow and the effectiveness of a G.F.C.I. The second G.F.C.I. unit on the right side of the demonstration board can be tested in a similar fashion. The cost of materials for this demonstration board is in the \$75-\$135 range.

The spoken word, pictures and transparencies are all good but the shocking truth is evident with this demonstration board. ◆◆◆

BOOK REVIEWS

FOUNDATIONS OF VOCATIONAL EDUCATION — SOCIAL AND PHILOSOPHICAL CONCEPTS by John F. Thompson. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1973, 260 pp., \$10.95.

Vocational education is at a critical point in its development. Rapid changes in society and education, including the advent of career education, make it imperative that vocational educators have a sound philosophical basis for decision-making. In his book, *Foundations of Vocational Education*, Professor Thompson has examined current practice in the light of past development. Future choices are shown to be dependent upon the assumptions held by practitioners, major emphasis is given to recognition and clarification of assumptions which underlie and facilitate dynamic philosophy. The reader is assisted by a clearly written style, use of strong documentation and many illustrations.

The book is divided into four sections: Development; Interpreting the Development; The President Programs; and The Emergent. The first two sections describe and analyze the social and philosophical context of vocational education. Social forces which have shaped Vocational Education, and the legislative development are treated in Chapters 1 and 2; Chapters 4 through 6 give current philosophical foundations of vocational education, based on a number of assumptions and definitions. Section III focuses on contemporary divisions (service areas) and their respective patterns of curriculum development. Emerging philosophies and dealt with in Section IV; those internal and external forces which promote experimentation and reform (and which should eventually lead to a new social and philosophical basis for vocational education) are explored. In the final chapter, "Occupational Education for All," the reader is challenged to develop his own assumptions/philosophy of vocational education, and therefore, to form a basis of actions to make vocational education more congruent with and responsive to contemporary society.

Dr. John F. Thompson (Ph.D., Michigan State University) is Associate Professor in the Department of Agricultural and Extension Education, University of Wisconsin, Madison. He is a member of the AVA, AATEA, PDK, and the National Society for the Study of Education and was recognized with the Outstanding Teacher Award at the University of Wisconsin.

This book is directed primarily at practicing vocational educators; it would be a useful text or reference in a graduate-level course dealing with the philosophy of vocational education and would make an excellent addition to the professional library of all vocational educators.

Maynard J. Iverson
University of Kentucky

APPROVED PRACTICES IN SOIL CONSERVATION by Albert B. Foster, Interstate Printers and Publishers, Inc., 19-27 N. Jackson St., Danville, Illinois, 1973; fourth edition, 498 pp., \$6.25.

(Book Reviews Cont'd)

The fourth edition of this book is an updating of previous editions, with added features that incorporates some of the more current thinking and technology in the area of soil conservation.

Twenty-one chapters individually describe how-to-do-it procedures in conservation practices. Each well illustrated chapter carefully and explicitly outlines procedures, guidelines, and recommendations for initiating the soil conservation practice. This thoroughness and attention to detail makes the book that much more valuable.

The book provides a sound philosophical base of the exigent need for soil conservation. This need is equated with realistic alternatives and methods for controlling the erosion of our soil. It is applicable to many situations and clientele, whether urban, small farmer, or large farmer. It provides the philosophical thought for those "ecology minded" to make it popular reading, it is technical enough to provide the necessary data to understand the utilization of the practices, and it is sufficiently easy to read to be useful for high school student use. Being one of the few books of its kind in the field, it should also be considered for use throughout the educational spectrum—from junior high school through post-high school programs.

The author has had a wide variety of experiences in soil conservation work, and in the Soil Conservation Service. The experiences he has had working with farmers, and as a public information officer, gives him the down-to-earth know how of how to put the theory into practice on realistic problems.

Larry E. Miller
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IMPLICATIONS OF CAREER EDUCATION FOR TEACHERS' PREPARATION, by Anna M. Gorman, and Joseph F. Clark, Columbus, Ohio: The Ohio State University, 1973, 263 pp., Complimentary.

This publication is the proceedings of the 6th Annual National Vocational Technical Teacher Education Seminar and includes the presentations made by the participants in that seminar.

The keynote address by Joel Smith of Cobb County, Georgia was on the "Rewards of a Successful Career Education Program." Mr. Smith speaks from experience as he is a project director for the Cobb County Occupational and Career Development Program.

The three major topics covered in the seminar were Career Education Foundations, Occupational Clusters, and Teacher Education: Rules, Programs and Changes.

Under Career Education Foundations Rupert Evens and Gordon McCloskey presented "Rationale for Career Education"; Keith Goldhammer presented "The Context of Career Education"; Aaron Miller presented "Career Education Tenets"; Louis Maguire and John Connolly presented "Employer-Based Career Education: The RBS Model." There was a reactor panel consisting of Charles Buzzell, Patricia Kelly, and B. J. Stamps which followed the above presentations and their reactions are included.

Under Occupational Clusters Walter Adams presented "Career Information System for the Comprehensive Career Education System" and Monty Multanen presented "Occupational Career Clusters the Oregon Way."

There was a panel presentation under Teacher Education by Curtis Dixon, Orval Seaman and Duane Richins on "Potential Changes in Professional Roles." Louise Keller presented "Preservice Preparation of Teachers for Career Education; and Harry Drier, Jr. presented "In-Service Preparation: Key to Career Education Delivery." A dialogue in Teacher Education by Dallas Ator, Rutherford Lockette and Helen Wardeberg was also included. This topic was concluded with a summary of the discussions.

The proceedings would be of most interest to teach educators in colleges and universities; however, the materials would also be important for use of college and graduate students.

This publication is available on a complimentary basis from The Center For Vocational and Technical Education, Ohio State University, 1960 Kenny Road, Columbus, Ohio 43210.

James P. Key
Book Review Editor

TORO, DESIGN INFORMATION FOR LARGE TURF IRRIGATION SYSTEMS; by The Toro Company, Riverside, California and Edited by G. Bruce Camerya, Service Co-ordinator of The Toro Company. Copyright-1972, 93pp., \$7.50.

The turf design manual entitled "Toro" is comprised of sixteen sections and is presented in a form suitable for use for the designer, seller, owner and use of irrigation equipment.

Although the contents is of a lightly technical nature, the use of semantics throughout the text is very helpful. We also liked the simplicity of the presentations and the use of underlined key thoughts and terms.

The text uses to excellent advantage graphs, tables, charts, and drawings making the understanding of highly technical material possible.

The text, in our opinion, is a good reference book for the instructor and is best suited for individuals working directly with materials in the field. It is too technical for high school students in general.

It should be pointed out, however, that the many charts in the back of the text would be of significant value in an Ornamental Horticulture or Agriculture program in a local high school or trade school in dealing with irrigation or wiring problems, tank capacities, or conversion of one unit to another unit.

The Toro Company of Riverside, California certainly has shown its capabilities in the field of engineering and in presenting technical product information in a form that can be used by its company employees and to an extent, its customers.

Mr. Bruce C. Camerya, Service Co-ordinator of The Toro Company, has, in our opinions, done a fine job in putting this information together in a useful form.

Joseph J. Miller and
Joseph A. Manda II
Teachers of Ornamental Horticulture
Bergen County Vo-Tech High School

TROPICAL CROPS — MONOCOTYLEDONS 1; TROPICAL CROPS — MONOCOTYLEDONS 2 by J. W. Purseglove. New York, New York: Halsted Press Division, John Wiley and Sons, Inc., 1972, Vol. 1 p. 1-334, Vol. 2 p. 335-607 \$24. (\$12 per volume)

TROPICAL CROPS MONOCOTYLEDONS is actually one book in two volumes for reasons not apparent to this reviewer. Volume 1 contains the list of illustrations, preface and the introduction for both volumes. Volume 2 contains the general references, conversion factors, glossary, appendix and index for both volumes. Both volumes should be acquired together for maximum use.

The author includes in TROPICAL CROPS all areas between the Tropic of Cancer and the Tropic of Capricorn, taking into account all the higher altitude crops that also grow in temperate zones. He also incorporates under crops, all plants grown on a field scale plus some occurring in the wild that yield useful production. This includes plants that are used either locally and/or partly or wholly exported.

The crops are arranged alphabetically by their families, with synopsis of the families and genera to reduce needless repetition. The International Rules of Botanical Nomenclature and the International Code of Nomenclature for Cultivated Plants are used for identification.

It is recognized that the taxonomy of many crop plants is in a very confused state. Purseglove places all of the grain sorghums in one species, *Sorghum bicolor* (g.v.) He tries to take the wider view and to limit the number of species as much as possible while including other conflicting views.

For each crop, the author lists the uses, origin and distribution, systematics, cultivars, ecology, structure, pollination, germination, chemical composition, propagation husbandry, major diseases and pests, improvements, production and trade, and a list of selected references. Both volumes contain a generous number of drawings showing the morphological characteristics of the crops.

These volumes are of the very highest quality and should become the standard reference for tropical monocotyledon crops. They would be an excellent reference for high school or junior college students. They could also be a valuable text or reference for advanced and post graduate courses in tropical agriculture and botany. Anyone interested in or active in tropical crops production would find much of practical value in these volumes.

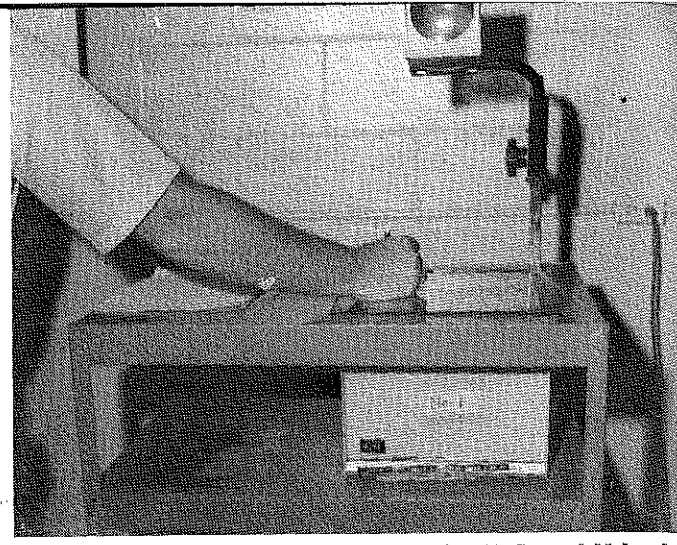
The author, J. W. Purseglove, B.Sc., A.I.C.T.A., F.L.S., has over thirty years of experience as an agriculturist and botanist throughout the tropical world. He has also many years experience in research and university teaching. In 1968 he published a two-volume work TROPICAL CROPS DICOTYLEDONS. These previous works, together with those just published, cover all the angiosperms that are grown as crops throughout the tropics.

This reviewer highly recommends these volumes to anyone interested in tropical crops and agriculture.

G. David Whitmore
University of Connecticut



SUPERVISED EXPERIENCE REQUIRES ON-FARM-INSTRUCTION. Ord, Nebraska Instructor, Jack Morse and Student Teachers, Randy Kramer and Steve Schmit check feed tag. Danny Pokorney, center is Learning by Doing. (Photo by Richard Douglass)



A TIP TO MAKE LIFE MORE ENJOYABLE. Several Nebraska Instructors have custom-fit their overhead projectors into an audio visual cart. Credit goes to Ray Becker, Dennis Cetak and Wayne Oberg, Nebraska Educators. (Photo by Richard Douglass)



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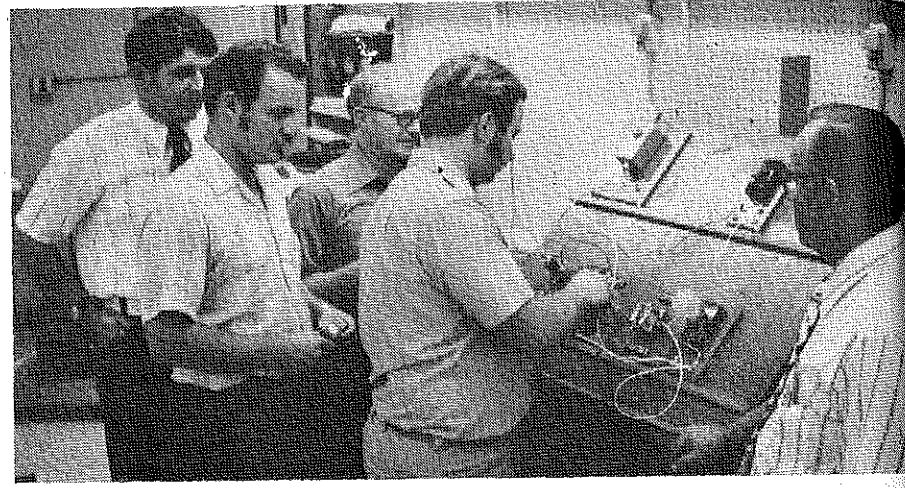
Agricultural Education

February, 1974

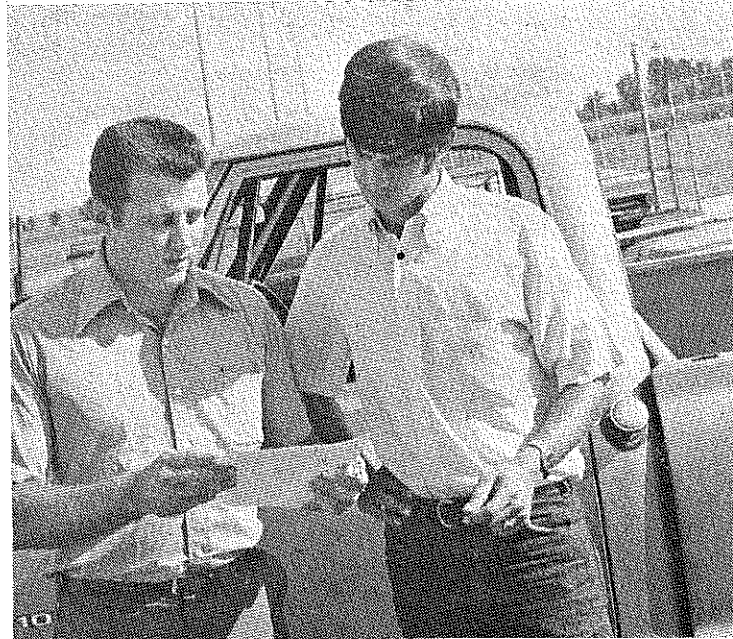
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Stories in Pictures

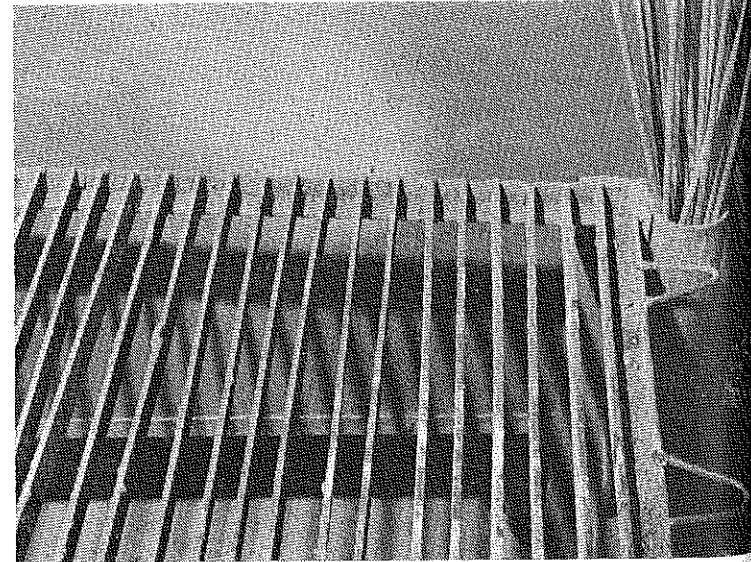
by Richard Douglass



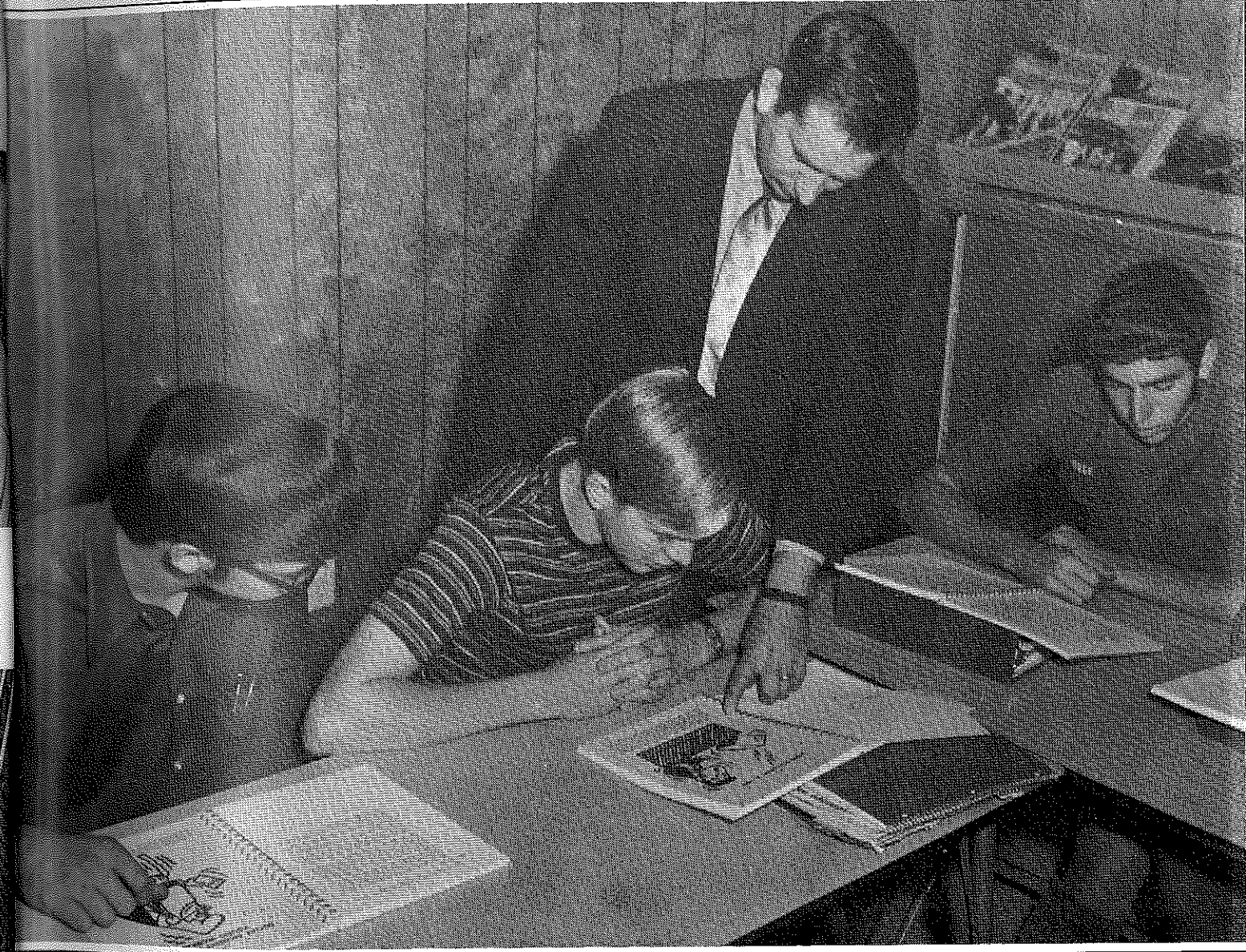
INSTRUCTORS ALSO LEARN BY DOING. South Dakota State University Staff member, Gary McVey provides lots of hands-on in-service practice in the Ag Mechanics area. (Photo supplied by Gary McVey)



Two Indiana Vo-ag teachers check signals for the week's work on Monday morning. Mr. Phillip Schmidt of North Posey High School confers with his student apprentice, Harvey Ricker. Scenes like this are common in Indiana where 14 ag education upper-classmen have been placed for ten weeks of summer experience in the local vo-ag departments in order to learn about the summer program. Dr. W. H. Hamilton, Purdue University, visits each of these apprentices three times during the ten weeks. (Photo from Bill Hamilton)



NON-WARPING WELDING TABLE. This welding table design is being observed in many Vo-Ag shops. It never has to be swept and is always flat. Minimum surface grinding is necessary to restore the surface. A metal deflector is usually installed under the table to protect the welder's cuffs and feet. (Photo by Richard Douglass)



Theme - **STAFFING:**

The Non-degree Teacher