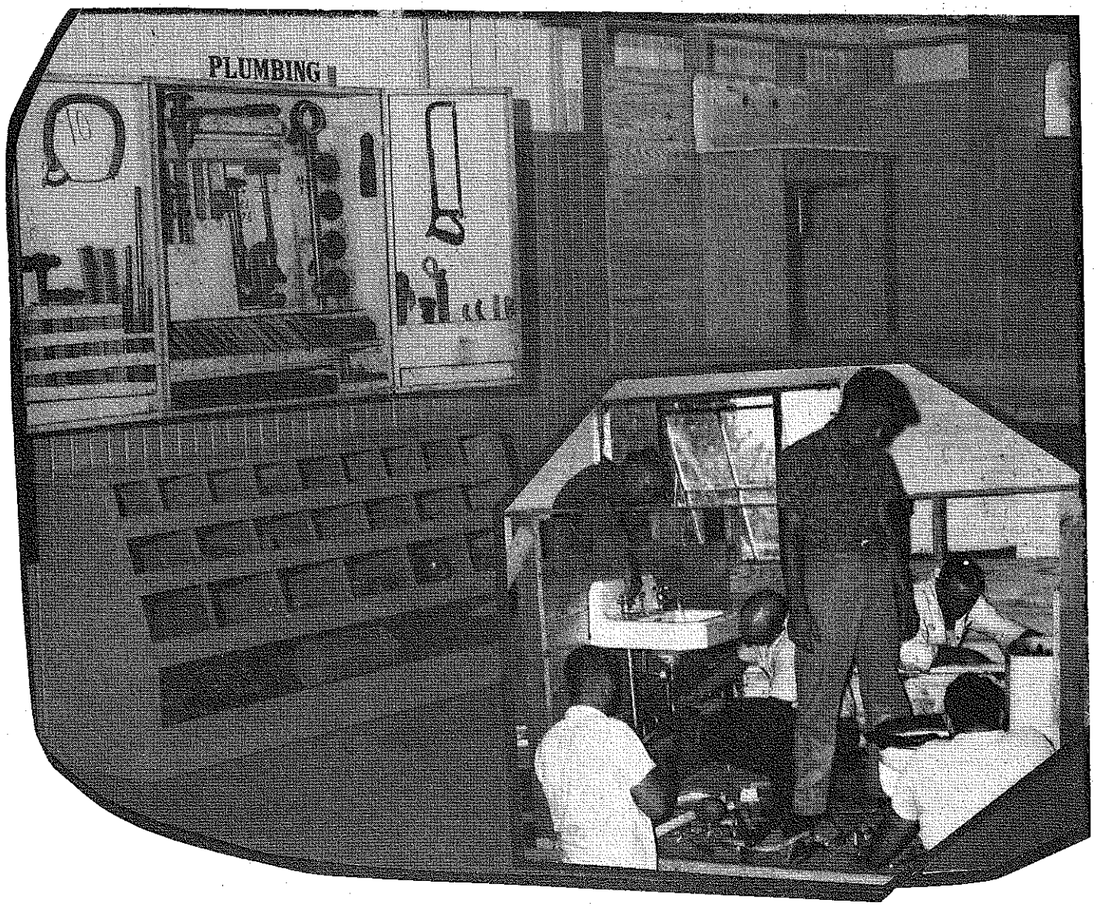
Agriculture instructors received instruction on the actual process of picking tomatoes. Also, how boxes should be laid out and vines handled for most rapid picking and that vines receive proper care so a second and third crop can be obtained. (MDTA Pilot Program, Davis Unified High School District, University of California.)

Stories in Pictures

Gilbert S. Guiler
Ohio State University
Columbus



Basic principles and skills in plumbing are taught in Mississippi Vo Ag shops by the "whole job" approach. In inset, Vo Ag teachers are installing plumbing

Agricultural Education

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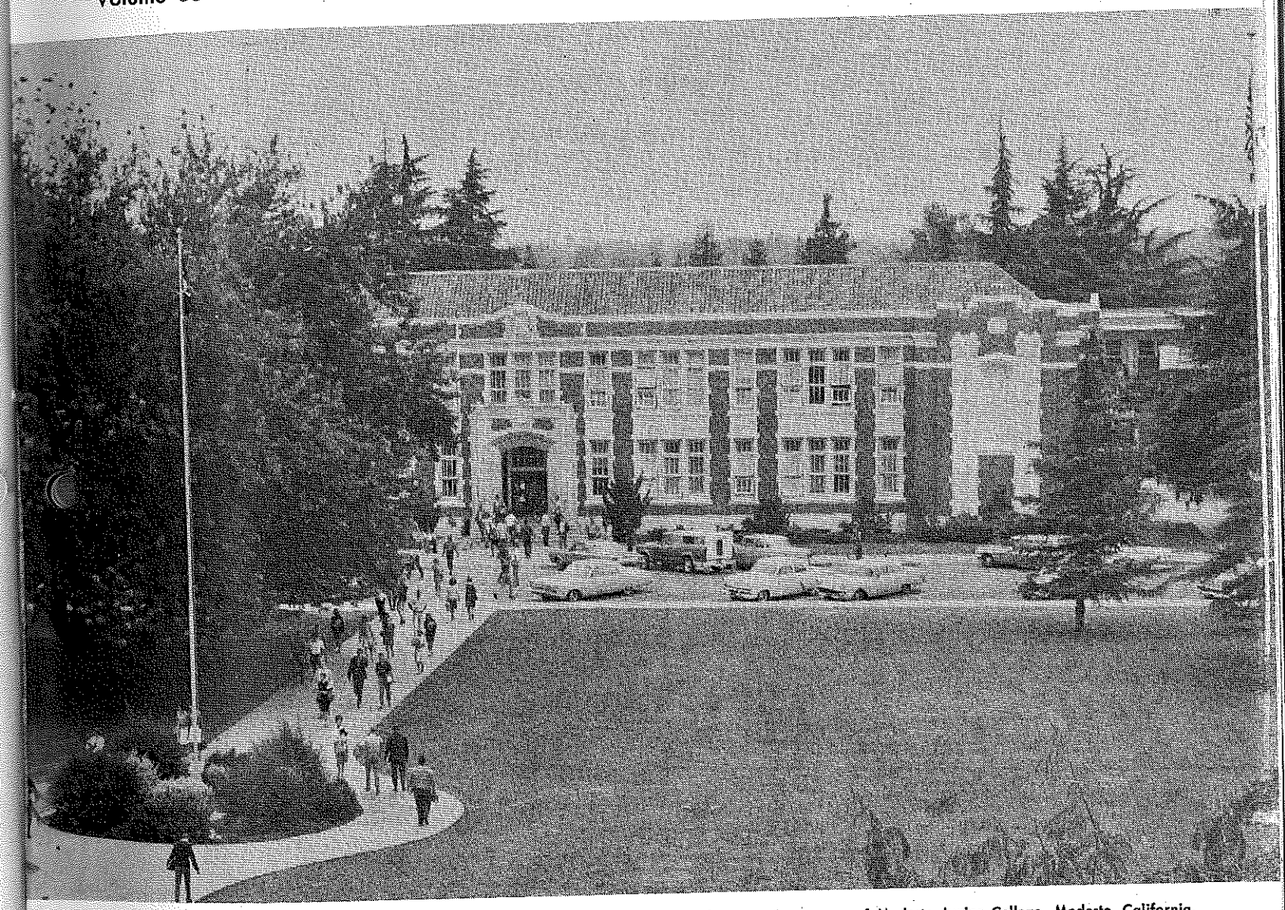

One of the main buildings on the campus of Modesto Junior College, Modesto, California.

Featuring –

Agricultural Education in Community Colleges

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The AGricultural EDucation Magazine

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Editorials

In Between

When the theme for this month's magazine was decided upon, the Editor did not realize the size of two factors involved; that is, the prevailing situation with respect to Agricultural Education in Community or Junior Colleges. These two factors are (1) Scope of programs in agriculture in these institutions, and (2) Lack of any central office or other means of pulling together what is being done in the area of agriculture in these institutions throughout the country.

The scope of programs in agriculture vary from nothing to very elaborate and highly technical programs. The best research we found in this area was Neil Snepp's doctoral study at Ohio State University. Neil is now overseas but agreed to write the feature article for this month. You will find this interesting and informative.

Evidently no one anywhere has the responsibility for compiling information on agricultural programs being conducted in community and junior colleges throughout the country, nor in offering any sort of coordinating services. It would appear that such service would be helpful in many ways. Perhaps a professional organization of leaders in this field will develop. Upon inquiry, the following statement was received from the American Association of Junior Colleges:

> "Changing technology has affected farming as it has all other industry. Mechanization and automation have generated increased demand for men and women better equipped to operate the machinery, carry out the business, manage the operations of the great agricultural industry. New programs of education and training should be developed to provide personnel for this important field.
>
> "The community junior college is ideally suited to provide education beyond the high school that will provide necessary training and education in agriculture. With its interest in the community it serves, its concern for extending education broadly, this kind of institution has the potental for meeting new needs in this field as well as many others."

It would appear that we should exert some leadership in our respective states to keep lines of communication open in at least two important ways. First, from the teachers and leaders in vocational agriculture to the nearby community and junior colleges. Second, from the community college to the 4-year agricultural colleges. It would seem that cooperative efforts in at least these channels will be necessary unless a completely new agency in agricultural education is desirable. This writer agrees that there is a need for such programs in agricultural education in community colleges, but they should develop as "In Between" programs and not in isolation to agricultural programs in the high schools and in the 4-year agricultural colleges.

—Cayce Scarborough

Guest Editorial —

Towards Sophistication in our Research

DOUGLAS C. TOWNE, Research Associate, Cornell University

"Sophisticated Research"—What is it? This is the question put to us by Editor Scarborough (p. 100)* in the November issue of *The Agricultural Education Magazine.* Dr. Scarborough pursued this question and stated that the only identifying characteristic seemed to be 'statistics'. Is this what is meant by sophisticated research? I think not. (In fact, Dr. Scarborough's statement is nowhere near strong enough when he continues by saying: "I am not sure that we want to be sophisticated in our research, unless it means more than statistical treatment of data.")

By one definition statistics is merely a language (a language by the way which does need greater understanding and greater application in agricultural education research), and yet surely, we do not equate sophistication with a particular language usage. According to a more general definition, statistics is a branch of scientific method which deals with the data obtained by counting or measuring. If this is what is meant by statistics then why is it that the other "branches of scientific method" are not applicable to sophisticated research? Other definitions of statistics would include statistics as part of decision theory or statistics as a set of mathematical techniques for making data more useful.

* All page references will be to the November 1965 issue of *The Agricultural Education Magazine.*

(Continued on next page)

Cayce Scarborough

Theory *and* Practice

This editor and this magazine are not the only ones concerned with terminology. A recent issue of *Saturday Review* had an editorial, "What is Sex Education?" It's 1966 and we still don't know?

Notice that the Guest Editorial this month answers my editorial question on these pages in November, "What is Sophisticated Research?" Doug Towne, Cornell, uses some of your articles in that issue to make his points. You may not agree with his answer, but you will agree that he has some views on what he read in the November issue. That makes getting out a professional magazine seem worthwhile.

Congratulations to Jim Durkee, Laramie, Wyoming, new president of NVATA. I had the pleasure of working with Jim on a committee a few years ago and found him to be a good thinker and doer. The April issue of this magazine will feature the NVATA.

Special note to teachers: I hear by the old reliable grapevine that some of you want more articles by teachers. Good idea. Me too. Make your articles of more than local interest. Here's a good test to give yourself: *If this article was written by a teacher in another state, would I read it?* Names of FFA officers or members of an adult group, the heart of a local article, are of little value in a national publication. What is the *key idea* you want others to get?

Agriculture is more than farming. This statement has been used so much until it has become a truism —at least to many of us. But, are we willing to add that agriculture is more than vocational agriculture too?

Theory and Practice

(Continued from page 195)

Someone sent me the following sermonette on a card:

God grant me this courage to
Change the things I can change,
The serenity to accept those
I cannot change, and
The wisdom to know the difference.

That's better than Dial-a-Prayer Service.

Neville Hunsicker added a little different twist to our terminology problems when he said that he was talking about an "Honest-to-goodness Vocational Agriculture Program." What kind of program is that? Once more, I expect that we are talking about a concept rather than a definition.

Edwin Love, Editor of the Arkansas Service Bulletin, gives the *Ag Ed Magazine* nice plugs in most every issue of his nicely printed publication. THANKS.

Speaking of nicely done publications reminds me to say that the Nov-Dec issue of *The Ohio Future Farmer* was one of the most colorful I've seen. Congratulations to Editor Earl Kantner.

The Editor got a copy of this 100% letter.

Mr. Wilfred Oakes
Inter-State Printers & Publishers, Inc.
Danville, Illinois

Dear Mr. Oakes:

We are enclosing a check for the amount of $609 to cover subscriptions to the Agricultural Education Magazine for next year. Please find a list which gives the names and addresses of all teachers. This check and list represent 100% participation from the South Carolina Vocational Agricultural Teachers' Association.

Sincerely yours,
Frank R. Stover

No one ever volunteered to explain how "module" differed from resource unit, so I found a detailed definition. This is seen elsewhere in this issue. However, it still looks like the old unit idea to this old professor.

Your communications are most

Guest Editorial

(Continued from page 195)

Each of these definitions of statistics can be considered as a useful and desirable part of sophisticated research. However, none of them warrant the use of statistics as the unique characteristic of sophisticated research. There certainly must be more to sophisticated research than merely the use of statistics!

What it is Not

One profitable approach to clarifying a particular term is to state what is *not* included in the use of the term. Let us critically analyze some of the statements which appeared in this same issue of *The Agricultural Education Magazine*, the theme of which was "Research", in an attempt to clarify what I consider to be non-sophisticated research. (The authors writing on the topic of research included eight teacher educators, two graduate students, one agricultural education researcher, and one representative of the United States Office of Education. They represented six states and the District of Columbia. This, to be sure, is not a representative sample, but we may safely conclude that Scarborough has shown judgment in his selection of the best articles submitted.)

Let us begin at the beginning. The caption of the cover picture is "Discussing plans for a program of research and development that will support a continuing program of vocational agriculture in Kentucky." The words "that will support" illustrate a non-sophisticated approach to research. It indicates first that there is no question as to whether or not vocational agriculture should be continued in Kentucky. This is not too difficult to accept with our background in agricultural education, but is it equally palatable to those looking in from the outside? To many of those on the outside this is the question we must answer, not assume.

The agricultural educator should be concerned with the implication that we are designing a program of research which will have as its stated goal the providing of data for justifying our existence. It implies that perhaps we have accepted some Madison Avenue tactics and are seeking propaganda which, when stated properly, will create a desire on the part of the consumer to consume. It implies that perhaps we are not concerned with whether the consumer should consume, but rather that the consumer must consume in order that we may continue producing our product, needed or not.

Most staunch agricultural educators will disagree with this interpretation and claim that this not the the meaning of the statement at all. They would maintain that what it really means is that "we are designing plans for a program of value-free research, and that the findings of the research will be used to develop a continuing program of vocational agriculture." This interpretation is easier to digest and yet still creates some misgivings. The misgivings arise from "a continuing program of vocational agriculture." Do we mean the program as we know it today? No, of course not, it will be the new program resulting from our research and developmental efforts. Then, if this is the case, how do we justify calling a thing yet to be developed by the same term which is used today to represent a specific existing program? Perhaps the unborn would be misnamed if it were to be called vocational—perhaps the research and development will result in agriculture becoming a mandatory study for all students—thereby fitting more properly in the category of "general" or "liberal" education.

Another possibility which arises is that it might be misnamed if it were to be called agriculture. (See p. 118, "Staking Claims"). We are certainly seeing many possibilities of combining vocational areas such as distributive education and agricultural education. Kansas, for example, is experimenting with combining *all* vocational areas at certain levels.

The point of belaboring this one sentence is that it is a basic characteristic of non-sophisticated research and will also apply to much of the remaining content. The contention here is that sophisticated research is not research which decides upon a "finding" first and then devises ways and means of justifying that finding. Sophisticated research searches for the truth—it searches for the truth and accepts the risk of finding that the truth may result in great discomfort for some. Sophisticated research is not written in fuzzy, imprecise, easily misinterpreted language. Sophisticated research strives for preciseness in language. Terms are defined, both conceptually and operationally, as precisely as possible. (This issue also will apply to much of the remaining content.)

Editorial on an Editorial

Let us move now from the analysis of a single sentence to the editorial by Dr. Scarborough, "Will Research Solve Our Problems?" (p. 99). Here Dr. Scarborough has helped to clarify the term "sophisticated research" which he subsequently presented on the next page (p. 100) of the magazine. The first sentence, "Finally, there are dollars available to actually support research and researchers in agricultural education," illustrates one aspect (though certainly a trivial one) of the need for sophistication in our research. This aspect is that at last people have accepted that research is a worthy endeavor—it is worthwhile enough to warrant the expenditure of great amounts of money and effort. This is certainly encouraging, but is justifiably tempered by Dr. Scarborough's warning that we are expecting too much of it. Our present society expects research to be of the nature of a panacea. We must accept the fact that the pendulum will swing back, and research will eventually lose this aura of perfection. The speedy return of the pendulum will certainly be hastened by nonsophisticated research

Agriculture Programs in Community Colleges

NEIL O. SNEPP, Visiting professor, West Pakistan Agricultural University, Lyallpur (Washington State University)

Neil O. Snepp

Teachers of vocational agriculture are well aware of the tremendous changes that have taken place in recent years. Indeed, some of the change has been the result of their work. Change in any area generates new problems and agriculture had been no exception. As agricultural business and technology has grown and become more complex, a need for more and varied training programs for agricultural workers has become apparent.

Agricultural leaders and educators have been concerned with the ways and means of meeting these needs for a number of years. One type of institution that has been suggested as capable of providing post-high school training in agriculture has been the public community of junior college. The terms are used interchangably in this article.

As a result of this expressed interest in community colleges as vehicles for agricultural training, a study of agricultural programs in community colleges was conducted in 1963.[1] An attempt was made to identify selected aspects of existing programs and to secure opinions of persons engaged in agricultural programs at community colleges regarding the most desirable programs in agriculture at community colleges. The major findings are given in succeeding paragraphs.

Four Types of Programs

Generally, four types of agricultural programs existed in community colleges, these being the pre-professional or transfer, technical, vocational, and adult education programs. A fifth type, that of the agricultural technician, was a recent addition in a few schools.

The majority of the junior colleges listing agriculture offered pre-agriculture courses consisting of basic general education courses. Transfer and terminal-technical programs were the most common type of agricultural program, enrolling over 80 percent of the agricultural students, Enrollment in these two programs was about equally divided. Generally, programs were available on a full time and a part time basis. Adult education programs in the junior college were practically nonexistent.

Some Programs Dropped

Low enrollment and urbanization were the reasons listed by a number of colleges for discontinuing agricultural courses. Low enrollments could not justify the expense of necessary staff and facilities. The majority of junior colleges with agricultural programs reported enrollments of less than 50 students. These same schools averaged less than one full time and one half part time agriculture instructor. Thus one teacher taught in several areas, making specialization difficult.

Conversely, 25 percent of the colleges had agricultural enrollments of over 100 students. Colleges with 201 to 300 agriculture students averaged 15 full time agriculture instructors. In addition, the most comprehensive programs were found in these colleges. Generally they had a wider range of facilities available to them.

Recruiting

A number of means were used by most colleges to secure agricultural enrollment. It appears reasonable to believe that several factors may have influenced any particular student. Present and former students were the most effective means of recruiting prospective students. College staff members and high school vocational agriculture teachers were rated next in terms of effectiveness. There were indications that vocational agriculture teachers could be even more effective in the future in guiding prospective students to junior colleges. The nature of the vocational agriculture program is such that these teachers should know the students' capabilities, and interests better than any other teacher. They can also do much to keep high school guidance personnel informed as to programs and requirements of the junior colleges.

Usually agriculture students had to meet the same admission standards as other junior college students. Normally they were high school graduates of equivalent and took various placement or proficiency tests. A few colleges required students to have a farm background. Over three-fourths of the students had farm backgrounds although a few colleges with enrollments of over 100 agricultural students stated that less than five percent of these students had farm backgrounds. In each instance students were enrolled in all three types of programs.

Prospective students who were not high school graduates were usually considered as individual cases. Age was not a factor as such. The main criteria was the students' ability to profit from the instruction.

One of the advantages frequently listed for community colleges is that students can live at home, thus reducing expenses. The majority of agriculture students commuted to school usually less than 20 miles. Those students who lived on campus generally attended larger colleges which served a larger area. There were indications that the concept of community size is expanding and more compus housing would be available in the future.

Teaching Staff

Qualifications for the teaching staff were normally determined by the local institution, although state requirements were reported by some colleges. Two-thirds of the colleges required a Masters degree for instructors. The other required a Bachelors degree. Advanced degrees were held by 75 percent of

(Continued on page 206)

[1]Neil O. Snepp, "Agricultural Offerings in Community Colleges in the United States," Ph.D. dissertation, The Ohio State University, Columbus, 1963.

The Birth of a Program

HAROLD F. ENGELKING, Supervision, Springfield, Illinois

Place: *Canton Community College, Canton, Illinois*

Date: *September 8, 1965*

Participants: *Forty young men starting a two year post-high school training program in farm implement mechanics.*

The above statistics tell the vital facts, but like any other birth announcement, they fail to disclose the months of planning necessary to start a program. This, then, is the story of the many steps taken in the months prior to September 8.

Our story begins in December of 1964. During this month, the Canton Board of Education approved a course in Farm Implement Mechanics, starting in September 1965. Following this action by the Canton Board of Education, the Canton school officials contacted Mr. Ralph A. Guthrie, Chief, Agricultural Education, Springfield for help in planning the new program. Representatives from the Agricultural Division of the State Board of Vocational Education and Rehabilitation met with the Canton school officials and recommended that they organize an advisory council to help with the new program. An advisory council was organized and was made up of representatives of most areas of the farm implement industry. The Canton Advisory Council is composed of a farm implement mechanic, a farm implement salesman, an owner of a farm implement business, an agricultural engineer associated with a major farm implement company, a member of the Canton Board of Education and a dealer-development manager of a major farm implement company. The first advisory council meeting was held January 11, 1965. Regular monthly meetings have been held since this date. A review of the minutes of the advisory council reveals some interesting, thought provoking and "thorny" problems that were discussed at the meetings. A brief resume of some of the problems discussed follows:

1. *The need for farm implement mechanics; local, state and nation.*
2. *The kind of instructors to employ for this program.*
3. *The qualifications of prospective students.*
4. *Setting up training stations for the supervised experience program.*
5. *The size and type of building needed for this program.*
6. *The tools needed.*
7. *The course outline.*

Our story will reveal how the advisory council and the Canton school officials solved the above problems and others of like nature.

The Need for Farm Implement Mechanics

A local survey indicated that practically every implement dealer needed at least one more mechanic. Approximately 500 farm implement mechanics are needed in Illinois, and it has been estimated that 15,000 are needed nationwide. The average age of the farm implement mechanic in the labor force today is 49 years.

Instructors

The very rapid increase in hydraulic systems on new farm machinery clearly indicated the need for an instructor that was a specialist in this area as well as in diesel equipment. Consequently, the decision was made to employ two instructors who had had recent and adequate experience as farm implement mechanics and two instructors who were outstanding vocational agriculture teachers, especially as their instruction related to farm mechanics. The names and work experience of the four instructors conducting this program are as follows:

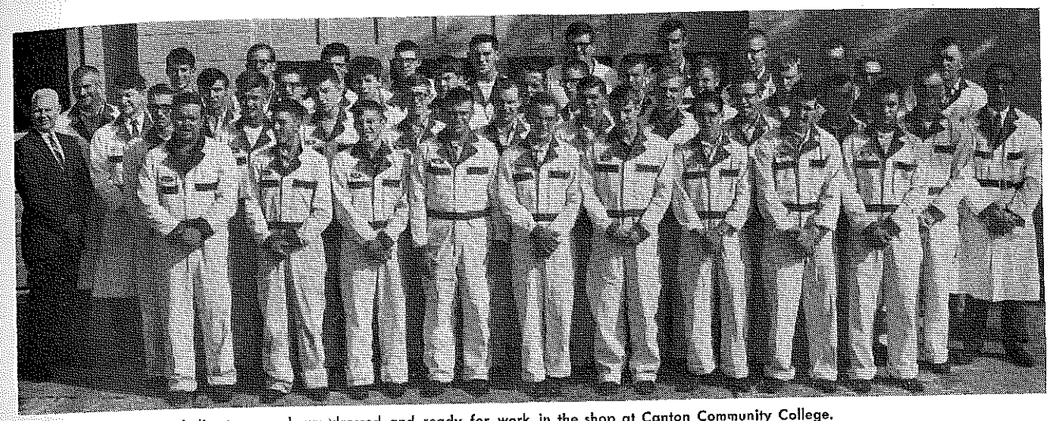
1. *Paul Hillis—M.Ed.—17 years experience as a vocational agriculture instructor.*
2. *Edward H. Kaiser—4 years experience as a heavy equipment and diesel instructor for U.S. Army Engineers. He has had 15 years experience as a mechanic specializing in hydraulics.*
3. *Harold Huber — M.S. — 12½ years experience as a vocational agriculture instructor.*
4. *J. E. Bradshaw—14 years experience as a farm implement mechanic and 10 years experience as the owner of a farm implement business.*

The Qualifications of Prospective Students

All students accepted were required to take a comprehensive mechanical aptitude test and be recommended by their vocational agriculture instructor or guidance

(Continued on next page)

Edwin Fitzgibbon, right, Director of Vocational and Technical Education discusses matters with Supt. Harold Swartzbough, left, and Dean Phillip Osborne, in the shop at Canton Community College.



Students, instructors and director are shown dressed and ready for work in the shop at Canton Community College.

Harold F. Engelking (Continued from page 198)

counselor. Over 170 interested students made inquiries regarding the program and from this group forty-four were accepted for the training program.

Training Stations

Information relative to the new program was disseminated by the Illinois Retail Farm Equipment Association and others. At present, over fifty farm implement dealers have indicated they would like to be selected as a training station. This phase of the program does not start until March and securing adequate training stations will be no problem. The problem is selecting the best ones from those dealers that have indicated an interest in the program.

The Building and Equipment

This program is conducted in a building with two classrooms, library, conference room, office, toilet facilities, partsroom and a large shop.

Every student has been given the option of paying cash, renting or using the monthly payment plan for the purchase of their own tools. The tools and the tool box were offered to the students at the school cost of $155.90. Five students are renting their tools, nine are buying on the installment plan and twenty-six students paid cash for their tools on the first day of school. The shop is well equipped and compares favorably with a modern farm implement shop. In addition to this type of equipment, fourteen tractors have been purchased by the school for the instructional program.

Every student spends five hours each day, five days a week in the classroom and shop on units included in the above course outline. In addition to this, courses are offered each semester in farm implement mathematics, agriculture communications, farm implement accounting and farm implement sales.

Conclusion

This program has made an excellent start. This good beginning is due to:

1. A wise-minded school administration.
2. An effective and active advisory council.
3. The selection of superior instructors.
4. Careful and long range planning by all people concerned with the program.

The program at Canton is under the direct supervision of Mr. Edwin Fitzgibbon, Director of Technical and Vocational Programs. Mr. Fitzgibbon says.

"In a free society, adults, even young adults, may refuse to participate in programs in which they are not interested, or that are incompatible with their life goals, or in which they may expect to be unsuccessful. All around us we see vast numbers of young adults exercising this choice regarding the so called "regular" curricula of post high school education. Assuming that our young adult has acquired the minimum cultural and citizenship skills in high school, he should have a reasonably wide choice of curricula—from art to welding. And if he elects welding, his curriculum should be planned with care and thoughtfulness. It most certainly should not be a haphazard collection of academic and vocational odds and ends thrown together as an afterthought."

THE COURSE OUTLINE

First Year

1. Orientation — Sept. 9 and 10 (2 days)
2. One-cylinder engines — Sept. 13-17 (1 week)
3. Tractor mechanics — Sept. 20-Oct. 1 (2 weeks)
4. Tractor overhaul — Oct. 4-Feb. 11 (16 weeks)
   - Cylinder head and component parts
   - Piston rings
   - Short block
   - Governors and carburetors
5. Farm Machinery Assembly (assembling and handling) — Feb. 14-March 25 (6 weeks)
6. Supervised work experience with assigned farm implement dealers—March 28 through June 17 (12 weeks)
7. Parts department training and A and H work on combines and picker heads—June 21-Aug. 8 (7 weeks)
8. Vacation—Aug. 9-Sept. 5

Second Year

9. Supervised work experience with assigned farm implement dealers—Sept. 6-Oct. 29 (8 weeks)
10. Complete overhaul of power train—Oct. 31-Dec. 23 (8 weeks)
11. Complete overhaul of tractors (including diesels) and agriculture machinery organization and management—Jan. 3-Feb. 25 (8 weeks)
12. Electric motors; the adjustment, maintenance and repair of soil tillage equipment—Feb. 28-Apr. 22 (8 weeks)
13. Agriculture equipment salesmanship; trouble shooting; and the adjustment, maintenance and repair of grain harvesting equipment—Apr. 25-June 4 (6 weeks)

The Testing Laboratory, a Valuable Aid for Training Ag Technicians

G. ALLEN SHERMAN, Dean of Agricultural Science and Home Economics
Mt. San Antonio College, Walnut, California

G. A. Sherman

Today it is difficult to name any agricultural product which is not subjected to testing. Grades, standards, and quality have become a vital part of our complex marketing system. Training students in the understanding and use of such procedures is now an important part of the agricultural technician program at Mt. San Antonio College.

The Approach

In order to develop such a training program, it was necessary for the staff to spend a great deal of time in determining a good educational approach to the subject. The first consideration was the extent of the need for such training. The growing need for technicians to aid in both government and commercial testing agencies and laboratories is obvious. But, how concerned is the farmer? The fact that the majority of the testing is done after the product leaves the farm does not mean that this matter should not concern the farmer. It is getting more and more difficult to distinguish between the farmer and the processor. In many of today's integrated farming set-ups, both are the same person or firm. Farmers growing crops or other products under contract are closely supervised on such matters as soil preparation, type and time of seeding, irrigation practices, and harvesting time and methods. More on-farm processing is being developed.

The farmer today needs to know and use many of the tests and procedures as they vitally affect the price he receives for his product. Knowledge of the results of such testing also can be very useful in planning and running his farming operation. With many of his products being involved in interstate commerce, it is necessary for him to know grades and standards in the other states where the marketing is done.

Another group needing such training would include buyers or technicians who work with buyers of farm products. Many products are now ordered by phone and shipped across the country without the buyer having to see the product. Buying power is becoming more concentrated with fewer buyers, such as those employed by large chains, buying in huge quantities. These buyers are interested in a uniform product for their various stores. Over a period of time, they will buy where they can get the assurance they will receive the standard or quality of product they require. It is doubtful if our nation's marketing structure could have progressed as far as it has without the use of the various testing and grading procedures which have been established.

Facilities and Curriculum

After determining the extent of the need, the next consideration in the establishing of the training program was the planning of the facility and curriculum. Many visits were made to commercial labs to see what tests are used and the equipment that is necessary. Only those machines and devices which were considered to be practical from the standpoint of cost and education were listed for purchase. In some cases, groups of machines were obtained in order to demonstrate principles or concepts. We fully realized that machines will change and be improved with time, but many of the concepts will not. We feel that students should learn the reasons and concepts of the use of the machines and the practice of systematic procedure, as well as the actual manipulative skills of operation. Follow-up and reporting of the test results is also a vital part of the training.

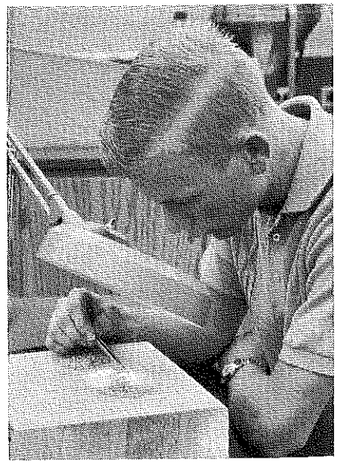
The laboratories at present contain a wide variety of equipment. They include oil testing equipment to test oil content of soybeans, flax or castor-beans. The Udy protein analyser is used to check protein in grain, hay, and feed and gives a direct protein reading. Black lights are used to test for filth and rodent damage in grain, and the ash test for rock or sand.

Students are taught the use of colorimeters to determine fruit maturity as well as refractometers for sugar content. The concept of acids and bases or ph is developed by using titrations, dyes, and direct reading ph meters.

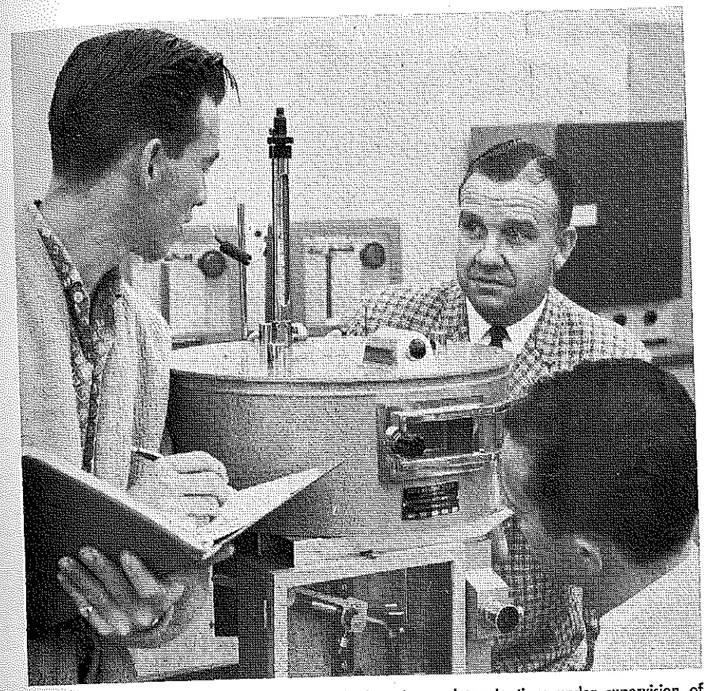
The concept of measuring and weighing is taught by use of different scales and balances. Drying ovens are used to remove moisture, and several types of moisture testers are used to show the various principles and techniques.

Various types of equipment are included in the soil lab, such as drying ovens and mixing devices. Soil test kits are used to determine soil fertility and soil characteristics are determined by use of sieves and hydrometers.

Naturally, one of the common pieces of equipment is the microscope. Several types are included so they can be used for bacteria, insects, parasites, and others. We believe that the microscope will be used more on the farm of the future.



Ken Watje, Mt. San Antonio College student, in the seed lab.



Ag Students Dave Wilson and Ed Bernard check moisture determinations under supervision of Instructor Harold Peck at Mt. San Antonio College.

Since the college has a school farm laboratory, it is now possible for students to follow products from production through processing. For example, students can plant test plots, use various rates of fertilizer or pesticides, check yields, thresh the grain, run tests on bushel weight, dockage, moisture, insect and pest damage, and a sedimentation test for milling quality of wheat. The vitascope now can be used to check germination rates in ten minutes, where it used to take about seven days.

Our agriculture facility has been planned to include labs for certain subjects, but has been kept versatile so that labs can have multiple uses. One lab is planned primarily for use of acids and includes soil and dairy testing equipment. Storage is provided so equipment can be put away and the lab used for lecture classes. Other labs are used for plant and animal science and have adjacent preparation and storage rooms. The instructors' station includes a mobile section that can be wheeled into a preparation room, and used for preparation while another class may be in session in that particular lab. When it is time for the lab to begin, the instructor can wheel this section into the room and it becomes part of his demonstration table, with the needed equipment ready for use.

The testing and grading devices and facilities mentioned here are the results of our first three years of study on the program. No doubt, others will be added as the need arises. The mechanical end of farming has not been included, as this will be part of a new shop-laboratory still in the planning stage.

Our experience thus far has strengthened our first conclusions concerning the need and value of this type of training. The testing laboratory is proving a most important aid in effectively training the farmers and agricultural technicians of the future. As the result of testing, we are now able to improve production to control nearly everything except the weather.

Ag Mechanics Tops Publications List

States submitted reports on 150 available publications to the AVA-sponsored committee on professional information. These will be listed under 12 categories in the new annual publication. The numbers of publications in each category are as follows:

Agricultural Mechanics	27
Plant & Soil Science	24
Curriculum Development	22
Guidance	18
Teaching Aids & Materials	10
Farm Business Mgt & Mktg	12
Adult Education	6
Supervision and Teacher Ed	5
Future Farmers of America	3
Facilities for Departments	2
Supervised Practice	1

E. C. Lattimer, State Department of Education, Albany, New York, is chairman of this committee,and M. J. Clark, Southern University, Baton Rouge, Louisiana, is secretary.

More Back Copies Needed

Bob Taylor, Director of Center for Research and Leadership Development for Vocational Education, Ohio State University, Columbus, needs the back issues of the *Ag Ed Magazine* indicated below to complete the file. Your cooperation is solicited.

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Volume 35	No. 7,	February	1963

Lloyd J. Phipps

Universals and Unique

Competencies Needed by Ornamental Horticulture Workers*

By ROY DILLON, Morehead State College, Kentucky and
LLOYD J. PHIPPS, University of Illinois

Roy Dillon

In designing courses of study for workers in ornamental horticulture businesses, it is important to ascertain the universals, knowledges and skills needed by all workers employed as general directors, salesmen, supervisors and field workers, and the unique knowledges and skills needed for each of these jobs.

To obtain evidence relating to the "universals" and the unique knowledges and skills needed, a random sample of eighty workers in licensed nurseries and eighty workers in licensed ornamental horticulture businesses were interviewed.**

After analyzing the data obtained, it appears that both basic courses or units, and specialized courses or units, are needed for the general directors, salesmen, supervisors, and field workers in licensed nurseries and licensed ornamental horticulture businesses. The basic courses or units to be recommended contain content needed by all the persons preparing to enter horticulture jobs, and the specialized courses or units contain content needed by workers in one, two or three job titles, but not needed by all workers in licensed nurseries or licensed ornamental horticulture businesses.

The courses or units recommended are organized so that a person who aspired to hold a general director's position in a licensed nursery or in a licensed ornamental horticulture business could begin with basic courses and later enroll in the advanced and specialized courses, if qualified as a result of successful coursework, job placement, job experience, or promotion. The curriculums also permit a person to enroll in basic courses and some of the specialized courses designed for certain jobs such as salesman, supervisor, or field worker, if the person's goal was one of those jobs.

The length of the courses or units would vary with (1) the amount of content, (2) the teaching method followed, (3) the frequency of class meetings, (4) the amount of time devoted to job placement experience. Some basic courses might be taught over a period of one year, while other basic units might be grouped together for a one-semester course. Many advanced courses and specialized courses or units might be from ten to thirty hours in length, while others might be a semester in length.

Basic Courses

The basic courses or units may be offered in the 11th or 12th year, and are for persons aspiring to positions of general director, salesman, supervisor, or field worker in a licensed nursery or in a licensed ornamental horticulture business. Following completion of these courses, a person should be qualified to take a position as a field worker in a licensed nursery or in a licensed ornamental horticulture business in the geographical region of study. The courses or units are Basic Horticulture I, Basic Horticulture II, Basic Agricultural Chemicals, Basic Soils.

Four advanced basic courses or units are recommended for persons aspiring to the higher level positions of general director, salesman, or supervisor in a licensed nursery or in a licensed ornamental horticulture business. After completion of these courses or units, and the previous basic courses or units, a person should be qualified for an entry position as a supervisor in a licensed nursery or in a licensed ornamental horticulture business. These courses or units are Horticulture II, Agricultural Chemicals II, Floriculture, Soils II.

Three advanced basic courses or units are recommended for persons aspiring to positions of salesman or general director in a licensed nursery or in a licensed ornamental horticulture business. After completion of these courses or units as well as all the foregoing basic courses or units, a person should be qualified for an entry position as a salesman in a licensed nursery or in a licensed ornamental horticulture business. These courses or units are Horticulture III, Floriculture II, Soils III. These three advanced courses would probably be taught in the 13th or 14th years.

Two advanced basic courses or units are recommended for persons aspiring to the position of general director in a licensed nursery or in a licensed ornamental horticulture business. Following completion of the preceding courses or units listed, these advanced courses or units, and appropriate on-job experience, a person should be qualified for an entry position as general director of a horticulture business. These courses or units would probably be offered in the 14th year, or as in-service courses for appropriate persons employed in a licensed nursery or in a licensed ornamental horticulture business. These two advanced courses or units are Advanced Horticulture, and Advanced Soils.

*Data and recommendations abstracted from:
Dillion, Roy D., "Comparison of Certain Abilities Needed by Workers in Licensed Nurseries and Licensed Ornamental Horticulture Businesses," Dissertation, Ed.D., Library, University of Illinois, Urbana, Illinois, 1965, 255 pp.

**For detailed information regarding the content of the basic and specialized courses or units recommended in this article the reader is referred to the monograph: Roy D. Dillon, "Comparison of Certain Abilities Needed By Workers in Licensed Nurseries and Licensed Ornamental Horticulture

(Continued from page 202)

Specialized Courses or Units

Two specialized courses or units are recommended as supplementary to the basic courses for persons desiring employment as a field worker, supervisor, salesman, or general director in a licensed nursery. These courses would probably also be offered as adult education for employed workers in licensed nurseries. These courses or units are Specialized Horticulture I, and Specialized Soils I.

Two specialized courses or units are recommended for persons desiring employment as a field worker, supervisor, salesman, or general director in a licensed ornamental horticulture business. These courses would probably also be offered as adult education for employed workers in licensed ornamental horticulture businesses. These courses or units are Specialized Horticulture II, and Specialized Floriculture I.

Two short specialized units are recommended for persons desiring employment as supervisors in licensed nurseries. These units would probably also be offered as adult education for persons employed in licensed nurseries. They are Specialized Horticulture III, and Specialized Floriculture II.

Two short specialized units are recommended for persons desiring employment as general directors, supervisors, or salesmen in licensed ornamental horticulture businesses. These units would probably also be offered as adult education for persons in licensed ornamental horticulture businesses. They are Specialized Horticulture IV, and Specialized Floriculture III.

Two specialized units are recommended for persons desiring employment as field workers in licensed ornamental horticulture businesses. These units would probably be offered in the 13th or 14th year, or as adult education. They are Specialized Horticulture V, and Specialized Floriculture IV.

DEVELOPING SPECIAL CURRICULUM GUIDE

Shown at a recent planning session for the development of a curriculum guide for the grain, feed, seed and farm supply industry are (left to right):
Neville Hunsicker, Chief of Agricultural Education, Office of Education, HEW;
Dr. Raymond Clark, Project Coordinator

News and Views of the Profession

Harry M. McDonald, formerly state supervisor of agricultural education in Maryland, is serving as a lecturer in agricultural education at the University of Maryland during the spring semester 1966.

He is directing a graduate seminar and a seminar for seniors in agricultural education. He is also working with teachers in the state on inservice education.

Mr. McDonald was state supervisor from 1948 until his retirement in 1963. Prior to becoming state supervisor, he was for many years principal and teacher of vocational agriculture at Sparks High School, Baltimore County, Maryland.

Dr. Milo Peterson, Head, Agricultural Education, University of Minnesota, received AATEA Distinguished Service Award for 1965.

E. J. Johnson retired at the end of December after nearly 25 years service to the Office of Education. Mr. Johnson, who joined the office in 1941, served as program specialist in agricultural education for the Pacific Region for many years. He has been a member of the National Board of Directors of the Future Farmers of America organization since 1941.

H. N. Hunsicker met with representatives of the National Association of Grain and Feed Dealers and its consultant committee to discuss the content of a curriculum guide for technician training in the area of Grain, Feed, Seed, and Farm Supply. This National trade organization recently has been awarded a contract to prepare a curriculum guide for technician training, and it has employed Dr. Raymond Clark of Michigan State University, to serve as coordinator and developer of the project. Dr. Clark was granted a six month leave of absence from Michigan State University beginning January 1, 1966.

During this period, Ray will continue as Book Review Editor for the Magazine.

Teacher Adoption of a New Concept

TEXTON MILLER, N. C. State University, Raleigh

An educational system must adapt continually to the new needs and demands of society. Of course, this is easier said than done. For the most part *educational* change has come about slowly. "The mills of the gods grind slowly, but they grind exceedingly fine." This mythology might be used to describe educational progress and, by some, to justify its speed. But these are times of accelerating patterns of change in all of society, and there is a tremendous incentive to speed up the change process in education.

New and expanded efforts are being channeled to the study of change, the process of idea adoption, and the factors associated with change. Witness the recent national project on *Strategies for Educational Change* seeking a systematic approach to the study of planned change.[1] Much is yet to be learned about the process and procedures of change and this knowledge is of far more than academic interest.

It is in this framework of concern and interest about the change process that in 1965 a research study was made of teacher adoption of a new educational concept. The specific purposes were (1) to discover the extent to which teachers of agriculture in North Carolina had adopted a new concept of supervised practice, and (2) to determine whether certain factors were related to the adoption levels reached.

The Adoption Level Instrument

A special instrument was developed to measure the *levels* of teacher acceptance of the new supervised practice concept. Adoption-level theory was the basis for the design. Recognized authorities contend that adoption of any practice is a *process* with identifiable stages generally classified as (1) awareness, (2) interest, (3) evaluation, (4) trial, (5) adoption. This theory is important because such researchers as Beal, Bohlen, and others have shown that the *effectiveness* of communication media and change agents varies with the *stage* of *adoption* of the practice by the recipient.

New Concept Defined

The new concept of supervised practice was developed by a joint committee of state supervisory personnel and teacher education faculty.[2] It emphasized a modern definition of agriculture. It stated that students should be encouraged to select their supervised practice activities from the broad field of agriculture, rather than be limited to production agriculture only. Second, the new concept asserted a responsibility for the teacher and school to provide some needed, and appropriate, supervised practice opportunities at the school. Third, it insisted that every student have the opportunity to gain supervised practice in each major learning area in which he studies. Upon these three elements of the concept, the study was centered.

Summary

The following condensed summary provides a quick picture of the evidence obtained by personal interview of 47 individuals, a random representative sample of 465 teachers of agriculture in North Carolina.

1. Within a period of only 17 months, two thirds of the teachers were identified in the "evaluation" stage of adoption with 50% of these ready to begin the "trial" stage. (See figure 1.)

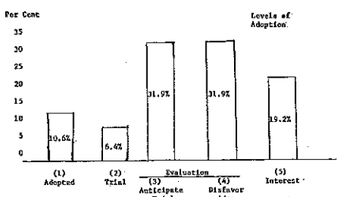

Fig. 1. Percentage Distribution of Teachers by adoption levels reached in Acceptance of New concept

2. An additional 17% had made further progress, reaching the top two "levels" of adoption. (Figure 1)
3. A significant regional difference was noted in teacher acceptance of the new concept.
4. Of ten variables tested for relationship to adoption level, only "teaching practices" showed a correlation value considered significant. (Figure 2)
5. Factors of age, experience, and "overall" attitude toward vocational education tended to correlate with adoption level. (Figure 2)
6. Tendencies toward *negative* correlation were noted between adoption level and (a) size of school, (b) student home opportunities, (c) teacher attitude toward vocational education other than vocational agriculture. (See Figure 2)

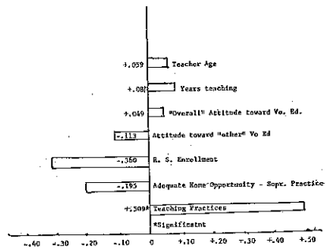

Fig. 2. Correlations Between Selected Factors and Teacher Adoption Level of New Concept

Conclusions

In broadest terms, the conclusions reached were these:

1. Teachers were making remarkable progress in adopting a new concept considering the fact that educational change of this type usually requires many years.
2. The third element of the concept was identified for special implementation efforts, particularly in the mountain region.
3. Because teachers were generally classified in the evaluation stages of adoption, further progress in the implementation of the new concept is not likely to occur with the use of mass media communication means. Research indicates that group discussions, study groups, and pilot programs will be the most effective approaches to use.
4. The significant relationship found between a list of selected "teaching practices"[3] and concept adoption-level reached by the teachers suggests further use of this list with teachers. It would seem highly important to provide opportunities for teachers, in groups, to gain an understanding of these teaching practices with the aim of developing modifications and additions for individual teachers.

[1]National Conference, Washington

[2]"Improving Supervised Practice in Vocational Agriculture", State Department of Public Instruction, No. 361,

[3]Instruments may be obtained by writing directly to the author. Copies of com-

Work Experience Programs

By L. A. ACHIMON, Teacher of Voc Ag, School for Deaf and Blind
Talledega, Alabama

As the needs and demands of our educational systems change, teachers and administrators wonder just what type of educational program to pursue with high school students. This is a problem in academic programs as well as vocational programs.

As relating to vocational education, particularly vocational agriculture, teachers and supervisors have spent many hours seeking the best methods possible for relating job skills to students. The work experience program has emerged as one of the best teaching methods yet devised in this area. In our system where vocational education is highly emphasized, a great deal of effort and expense has been placed on work experience programs.

Generally, the program is geared to the needs and desires of the student, as related to available employment within our area. This means that a great amount of evaluation, planning, and development of new and existing programs must continually take place.

One of our prerequisites for a vocational program is that a work experience laboratory be available. For example, we would not attempt to teach a student how to work in a greenhouse unless we had a greenhouse available for evaluation and work experience.

We believe one of the first phases of a vocational program should be evaluation of the student to determine his abilities and desires. This is done through written examinations, tryout experiences, and counseling with the individual. After a student is determined as suitable for training in a particular area, he is then placed in a program consisting of both classroom and shop work, in the field chosen. This program, generally, would begin in the ninth grade and continue until high school graduation.

As completion of the course nears, efforts are begun to find employment for him. After employment is secured and the student goes to work full time, a follow-up program is begun. This involves periodic conferences with the employer and the student to determine weaknesses in the training the student received, and to determine other ways and means of improving the program.

This program, up until recently, was confined to a very small group of farm and off-farm occupations. However, with new legislation that has made the voc-agriculture program much more flexible, we are finding many new areas that have possibilities for vocational training that were previously unavailable.

One problem that remains is the placement of students in part-time jobs, after school hours. Most of the jobs that would be practical for vo-agricultural students are held for trade and industrial education students. We feel, however, that this problem can be gradually worked out with T & I departments. We hope that in years to come, and as new areas of training are developed, we will be able to train many more students in a wider range of agricultural related fields.

This briefly is the system used in our school. It has been in operation for many years and has apparently been quite successful. Many boys and girls are employed throughout Alabama today in agricultural as well as non-agricultural fields as a result of this type program.

The Alabama Institute for *Deaf* and Blind was established by the Alabama Legislation in 1858, to provide training from grades one through twelve, for the deaf and blind children of Alabama. It has been in continuous operation since that time.

Operating under a board of trustees appointed by the Governor, the Institute consists of four separate schools. These are, School for Deaf, School for Blind, Adult Training Center for Deaf or Blind, for people who are beyond high school age, and the Helen Keller School for children who are both deaf and blind.

Administrative offices consist of the President, who has supervision of the entire Institute, principals, and directors who are responsible for the various schools.

Approximately 300 people are employed at the Institute including administrative, teachers, maintenance, and houseparents.

The Institute is state supported. Children come to the Institute from all sixty-seven counties of Alabama. Most of them remain until they have been thoroughly trained in a vocation and are ready for full time employment.

Texton R. Miller

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Here It Is

The word "module" is borrowed from the field of electronics. It is an assembly of wired electronic components performing a specific control function. Modules are prefabricated and can be quickly inserted or removed to alter a machine's operation, thus making unnecessary the time-consuming rewiring of whole circuits when machine failure occurs. An instructional "module" by analogy, is conceived as a complete instructional package containing all necessary trainee, instructor, and audiovisual materials for a short unit of instruction. If designed according to a basic pattern, these instructional modules can be used interchangeably in many programs to adapt them for special purposes or for specific trainee needs without necessitating development of a complete new program whenever special needs must be met.

U. S. Office Publication OE-13029, P. 41.

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the teaching staff. Teaching certificates were required by three-fourths of the colleges and "suitable occupational experience" by some. There appeared to be a trend toward having all instructors hold advanced degrees.

In most cases, the faculty had heavy teaching loads averaging over 25 class hours per week. The student teacher ratio ranged from 15:1 to 50:1. Those colleges which reported the highest class load per week and the highest student teacher ratio were those with low enrollments and the fewest staff members.

Curricula Available

A wide variety of agricultural curricula were available to students. There were 28 different curricula reported under transfer programs which was greater than that indicated by the college catalouges. There were 29 terminal-technical and 25 vocational curricula reported. All of the curricula required courses in general education, with transfer curricula consisting of approximately 75 percent general education. Terminal-technical curricula consisted of 40 percent general education and 60 percent agricultural courses.

The newer agricultural technician curricula were highly structured, highly specialized, and contained practically none of the usual animal science and crop production courses.

Typical curricula provided almost no choice of electives for the student. Transfer programs usually provided the most opportunity for electives for the student. These were often coordinated with the lower division requirements of the state university.

Work experience in the students' major field was a typical requirement. Credit was usually given for this experience.

Facilities and Outlook

The kinds of facilities used by junior colleges to teaching agriculture were what one would normally expect—classrooms, library, shops, laboratories, land and livestock. The majority of the colleges indicated that available facilities were ducted. It should be noted however, that some schools reported all facilities as inadequate. These had agricultural enrollments of less than 50 students. Those which indicated all facilities were adequate had enrollments of over 150 agricultural students.

It was expected that enrollments in agricultural programs would increase during the next five years, and in some instances there had been an increase of 15 to 25 percent per year. Existing facilities would be over crowded in some cases in a few years. About two-thirds of the colleges indicated plans for adding or expanding the capacity of various types of facilities which would assist in accomodating larger enrollments. It is significant that very few planned to add new staff members even though many had only one staff member at the time.

Financing

Eventually one must consider the financial aspects of any program. Since agricultural programs are a part of the total educational program of the institution offering them, an attempt to determine methods of financing is in effect determining the methods of financing the entire institution. The administrative organization within the state and the state master plan affected the methods of financing used. Usually the division of fiscal responsibility was specified in appropriate legislation of in rules and regulations promulgated by a state agency which had been delegated these powers.

Capital costs were usually divided between state and local funds. State funds were used to meet capital costs by 90 percent of the junior colleges with 60 percent receiving from 50 to 100 percent of capital costs from the state. In order to provide local funds the governing body of the majority of junior colleges had some taxing powers. It seemed significant that very few colleges used federal funds for capital expenditures even though the National Defense Education Act of 1958 made some provisions for the use of such funds.

Operating expenses were met by funds from several sources or combination of sources. The source most frequently listed was a combination of state and local funds plus student tuition. The proportion of funds from each source varied considerably with the most common being equal amounts from each source. The next most common distribution was 50 percent state and 50 percent local and tuition.

Responsibilities and Relationships

The responsibility for the development, revision, and expansion of agricultural programs was normally vested in the head of the agriculture department. In many instances however, the responsibility was shared with others and it is probably more accurate to say that the department chairmen was responsible for providing the leadership for program development. Meeting the needs of the community was the factor most frequently listed as determining changes in agricultural programs and was in keeping with the basic philosophy of the community college. Needs may be diverse in any community and in effect, community needs includes the needs of students, of industry, and opportunities for employment within the industry. The use of an advisory committee was a common practice, especially in the development of terminal technical programs.

There appeared to be a gray, hazy area in the matter of relationships between agriculture departments in junior colleges and state directors of vocational education. There were obviously matters of common interest but there was uncertainty as to what relationships should exist and how they should be established. The primary relationship that existed was that of the state directors' office being available for advice and consultation upon request. There were various relationships existing within different states but there was considerable difference of opinion as to the extent they were satisfactory. Further study is needed in this area.

Some Problems

Any undertaking has its inherent problems and these problems have varying degrees of difficulty. The most difficult problems in establishing agricultural programs in junior colleges according to the college staff were those of securing suitable facilities, adequate financial sup-

Neil O. Snepp

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port, enrollment, expansion and public understanding in that order. State directors of vocational education listed financial support and acquiring public understanding as the most difficult, followed by securing faculty, facilities, enrollment, and expansion in the order listed. The implication here seemed to be that if public understanding is acquired, financial support will be for the coming and faculty, facilities and students will follow in turn. The problems of operating an agricultural program after its establishment were generally the same but presented less difficulty.

Most Desirable Programs

Opinions of persons who had experience in conducting agricultural programs in junior colleges were solicited concerning the most desirable programs. It was recognized that the most desirable practice in any given situation may not be the most desirable in all situations, and may in fact be unattainable.

The concensus was that transfer, terminal-technical, vocational, and adult programs in agriculture should all be offered in the community college. These programs should be comprehensive in nature and serve a broad spectrum of the community. It was also reported that the programs should be developed in the order listed although the closeness of the ratings suggested that it would be acceptable to develop terminal technical programs first in some areas.

Separate classrooms, laboratories, and farm mechanics shops were considered as essential facilities for agricultural instruction with land, livestock and poultry being listed as desirable. Several alternatives were suggested to a school farm. Other facilities such as green houses and forests were considered essential for particular programs.

Diverse opinions were received concerning who should set certification standards for the staff. The local institution was most frequently mentioned followed closely by the state board of education. Since state agencies did not set standards for most of the colleges reporting, the most desirable practice may be for the local institution to develop standards in cooperation with appropriate state agencies. Two-thirds of the respondents listed the Masters degree as the minimum academic qualification for staff. The remainder were equally divided between requiring a Doctorate and a Bachelors degree. Some preferred majors in agricultural education with high school teaching experience in addition to the advanced degree. Nearly all would require a regular or special teaching certificate.

A maximum teaching load of 16 class hours or less per week was considered desirable by the majority of respondents. The student teacher ratio should not be more than 25:1 with the average response being 20:1.

Opinions concerning desirable admission standards for students were essentially the same as those in practice—i.e. high school graduates or equivalent with exceptions to be considered as individual cases.

There was some reluctance to express opinions regarding finances. Those expressed indicated the state should bear at least 50 percent of all capital costs and 33 percent of all operating costs. Governing bodies of junior colleges should have some taxing powers or authority to provide the remainder of capital costs. The remaining operating costs should be divided between local funds and student tuition. A slight majority preferred state funds to be provided by some type of state foundation program rather than by special appropriations of the legislature.

Conclusions and Guidelines

On the basis of the data received certain additional conclusions were made and guidelines formulated.

1. The junior or community college can provide the type of educational programs needed by a rapidly changing agriculture.

2. These programs should be formulated and coordinated on a state wide basis. The curricula should be developed on the basis of the needs of agricultural industry and business, the community, and the students. Advisory committees consisting of leaders in agricultural business should be used to assist in program development, especially in the area of terminal-technical programs. Transfer programs should be developed in cooperation with the senior agricultural colleges of the state.

3. Agriculture programs in community colleges should be organized as separate departments with a department head or chairman. The department head would have the major responsibility for program development and should consult and cooperate with other agricultural education agencies in the state. Cooperation in a way street.

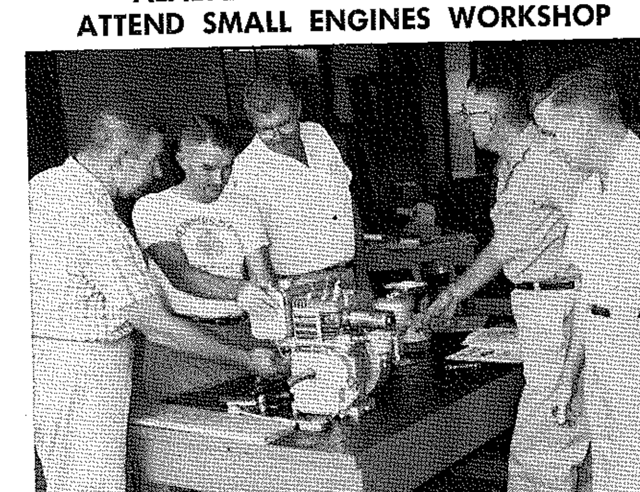
4. The agricultural staff should consist of at least six full time instructors for a comprehensive program. Staff members should have a masters degree or higher and had previous teaching experience.

5. The minimum number of full time equivalent agriculture students enrolled should be 120. This is a controversial figure but there is ample evidence to indicate that small enrollments, small staff, and inadequate facilities are related and often result in unsatisfactory programs.

6. State funds for operating expenses should be available for adult education programs. Additional fees should be charged students residing outside the college district or state.

7. An organized public information program should be organized and maintained in order to acquire public understanding of the role of agriculture in the community college.

ALABAMA VO AG TEACHERS ATTEND SMALL ENGINES WORKSHOP



L-R, are Alabama Vo Ag Teachers Walter Minor, Earl Gardner, D. P. Whitten, P. M. Wilder and R. O. Dennis. (Photo — Bottoms)

Guidance or Recruitment? Some Reinterpretations

J. ALEX HASH, Teacher Education, Clemson University

J. Alex Hash

One in the agricultural profession hears a great deal about the shortage of college graduates in agriculture these days. Since the general public has a misconception of the vast number of people the total agricultural industry employs, it is becoming increasingly difficult to interest young men in an agricultural career. The *problem* appears to be one of improper communication between colleges of agriculture and local high schools where the raw material or potential lies. However, in this day of space exploration and rapid advances in science and technology, the glamour and eye-catching appeal seems to reside in the fields of engineering, science, and mathematics.

Method of Attack

First, enlist the cooperation of the high school guidance counselor and teacher of vocational agriculture. This is easier said than done. Primarily because a poor relationship exists between these two individuals in many of our high schools today. The agriculture teacher may suspect the guidance counselor of advising every good student to bypass vocational agriculture in favor of college preparatory subjects. Although this may be true in some cases, we in agricultural education must share some of the blame for this situation.

For example, the guidance counselor is interested in helping each capable student meet the requirements for college entrance. We in agricultural education must share this interest. With today's emphasis on higher education, we cannot expect any boy in the ninth or tenth grade to make an irrevocable decision which would deny him admission to any university curriculum whether he has reached a vocational decision to farm or what have you. Donald E. Super reported in his longitudinal study that orientation to choice was the normal stage in vocational decision-making for ninth-grade boys.

What does all this mean? Simply that a boy of college caliber cannot be expected to take vocational agriculture *unless* he can get his college preparatory subjects at the same time. This can usually be done if the boy will take five subjects each year, especially the last two years in high school. The agriculture teacher should take the initiative in arranging for a conference with the guidance counselor and administrator to draft plans whereby this may be accomplished. It may necessitate single periods for vocational agriculture where double periods have been traditionally used, but it is doubtful if any other alternative exists which can be scheduled. A special handbook published by the vocational agriculture department or a section of the total high school handbook should provide different sequences of college preparatory courses including vocational agriculture.

If the teacher of vocational agriculture is successful in attracting college caliber students into his classes, he is in an excellent position to provide guidance in agricultural careers through special units on the broad field of agriculture. His role is to provide an overview of the vast dimensions of agriculture and counsel with his students on educational and occupational planning in a non-directive way. If proper rapport exists with the guidance counselor, the teacher can serve as a consultant during Career Days or Group Conferences. In this way, he can reach students which he is unable to reach through his classes.

Providing Occupational Information

From the observations and experiences of the writer, there appears to be a dearth of "good" occupational information on teaching agriculture and agricultural careers in general. There have been concerted efforts from time to time by different organizations and agencies to correct this deficiency but the need is still great.

Many times the members of our profession wonder why guidance counselors do not use the occupational information that is supplied to them on agricultural careers. The answer is quite simple—the majority of the material on agriculture is not occupational information at all but merely recruitment literature under the guise of occupational information. It portrays agricultural professions as glamourous jobs vastly needed without mentioning any disadvantages. The response of the guidance people has been to reject this barrage of biased material as propaganda, but more tragically they have overlooked the truth contained amidst the high-pressure salesman approach. Of course, agricultural professions are entitled to some glamour but we must remember that the guidance counselor's job is not to recruit for agriculture or any other field. His primary responsibility is to present various alternatives to his clients and let them make the final decision depending on his counseling philosophy. The capable guidance counselor evaluates occupational information before passing it on to students and always attempts to present actual facts when counseling on educational planning and vocational choice.

Therefore, it seems obvious that agricultural education and other agricultural occupations are in need of some unbiased occupational information that paints a realistic picture free of propaganda and frills, which can be endorsed by guidance counselors everywhere as authentic and reliable. In preparing future occupational information, we should take some cues from occupational monographs published by Science Research Associates regarding format. All occupational monographs and information should pass the critical test of *authenticity, objectivity,* and *recency.*

In 1958, the Association of Land-Grant Colleges and State Universities published a pamphlet stating that 15,000 graduates were needed annually in agriculture and approximately 7,000 graduates were available each year. These figures have been used frequently in publications and speeches since 1958. There is a definite need for more research on job opportunities in agriculture which can be substantiated and a breakdown of employment opportunities in a much clearer fashion than 15,000 in the United States.

J. Alex Hash

(Continued from page 208)

Perhaps each land-grant college or university could prepare a report on the positions taken by its graduates in agriculture and the demand in certain fields that exceeded the supply. A chronic shortage in certain fields would certainly alert guidance counselors throughout the state and adjoining states to bright career opportunities. This information could also be compiled on a regional and national basis but it would be much more meaningful for a prospective professional agricultural worker to know the needs in various fields and geographical areas. Of course, it must always be pointed out that agriculture is a broad field and training in almost any field can be used in another.

In addition, occupational information concerning agricultural education per se should make it clear that vocational agriculture and the agricultural education curriculum is not a one way street. Great numbers of agricultural education graduates and experienced teachers initially or subsequently accept positions as science teachers, guidance counselors, school principals, superintendents, foreign agricultural advisers, county agents, soil conservationists, FHA supervisors, ASC office managers, breed association representatives, agricultural products salesmen, state supervisors, and college teachers. Consequently, the prospective agriculture teacher can rest assured that he can shift to occupations other than teaching, if he desires, without loss of experience in almost every instance. Of course, we do not want to encourage teachers to leave the profession but these facts depict a broad base on which to build an occupational future which is consistent with sound guidance principles. Furthermore, they provide some glamour which can also be documented.

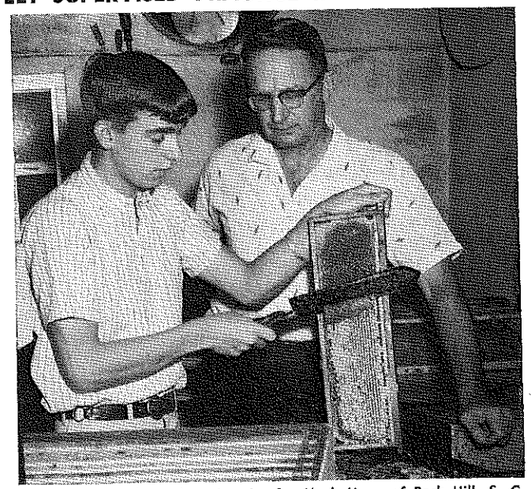
Summary

The following steps are suggested as a partial solution to the current problem of insufficient enrollment and graduates in agricultural curricula:

1. To make occupational information in agriculture more palatable to guidance counselors, include representatives from the National Vocational Guidance Association on publications committees as consultants.
2. Make sure all occupational information intended for use by guidance counselors meets the criteria of *authenticity, objectivity,* and *recency.* Check for proper format, style, and suitability for intended age group. Give advantages and disadvantages.
3. To orient high-school guidance counselors to the facts, provide current and projected employment opportunities in agricultural occupations annually which are substantiated by quantitative data—number of promotions, placements, vacancies, shortages, et cetera. The best way to offset adverse publicity is to provide factual, irrefutable evidence of an unbiased nature.
4. Emphasize multiple opportunities and breadth of training in agriculture which permit graduates attractive alternatives when selecting their first or subsequent jobs.
5. Provide sufficient flexibility in high school vo-ag course offerings to allow for scheduling college preparatory subjects.
6. Point out that farming and agriculture are not synonymous terms. The increase in job opportunities in off-farm agricultural occupations has more than offset the decrease in on-farm employment.
7. Strive to develop and maintain harmonious working relationships with the guidance people. Take advantage of their services by obtaining psychological data on agricultural pupils and through student referral for special counseling or remedial work.
8. Obtain suggestions from guidance counselors and administrators when revising curricula and/or expanding course offerings in vo-ag at the local level.

It is believed that these steps, if implemented, will pay dividends in providing an interdisciplinary approach to solving the shortage of college graduates in agriculture. If we must use recruitment in the interim, let us conduct it ourselves and call it recruitment instead of trying to dress it up and call it guidance. We have accused guidance counselors of equating farming and agriculture in the past. Have not we been guilty of using guidance and recruitment interchangeably without really being conscious of the difference?

SWEET SUPERVISED PRACTICE IN SOUTH CAROLINA



Bee keeping is the main enterprise for Mark Hepp of Rock Hill, S. C. Mark is in partnership with his dad in honey production. Here he is with R. P. Smoak, Vo Ag Teacher, uncapping honey. (Photo, Wilbur McCartha)

Adult Farmer Training in M.D.T.A.

LLOYD KUYKENDALL, Supervisor (Agricultural Specialist)
Manpower Development Training Program
Jackson, Tennessee

In July, 1963, the first Farm Management Program under the provisions of the Manpower Development and Training Act began at Yorkville, Tennessee.

Twenty small and medium sized farm owners were enrolled in the program which was to run for one year. All had dependents, and all showed less than $1200 net farm income on their 1962 income tax returns. The program was restricted to land owners, though some did not own enough land and had to rent some to make a practical farming operation.

The course of study began with a study of the factors which affect farm income and how they applied to the situation of each man in the class.

Surveys were made to determine what each man had to work with and how it could best be used.

Soils were studied intensively and soil maps were secured with the cooperation of the Soil Conservation Service. Field trips were made in groups, and maps were studied until each man knew what soils he had on his farm and what crops they were best adapted to produce.

With the aid of the S.C.S. farm planner and the instructor, each man made a long range farm plan to fit his own farm. Then, when the land use plan had been determined, a livestock program was planned to fit it.

Estimates were made of the cost of all changes to be put into effect, and these, with the estimates of probable income, gave each man an indication of his approximate net income from his revised farm plan. Production goals were set up for each farm, and fertilizer and lime requirements were calculated to reach these goals. Almost all the soils were tested by the state soil's laboratory or other testing agency.

The most up-to-date methods of insect and weed control, cultural methods, varieties and other factors affecting production were studied and adapted to each man's own situation.

Livestock feeding and management, disease control methods, pasture management, and efficiency factors were studied, and several changes were put into operation in the livestock programs as a result of this study.

Farm business studies included record keeping and analysis, income taxes, social security, credit, installment buying, insurance and many other personal problems which the men had.

Machinery maintenance and care was another item of major interest. Some were over-mechanized while others needed some machines which they did not have.

Classes met ten hours per week, and thirty hours per week were spent on each man's home farm or in small groups under the supervision of the instructor. Many of the methods studied in the classroom were put into actual practice on these visits, and it appears to have been one of the most effective features of the entire program.

Close contact with the program was maintained by the State Department of Education personnel and by the Department of Employment Security. Other agencies that were helpful were: Soil Conservation Service, Agricultural Stabilization and Conservation Service, Farmers Co-op, Farmers Home Administration, Vocational Agriculture, Production Credit Associations, Agricultural Extension Service, Tennessee Valley Authority and Gibson County Electric Membership Corporation and others.

When farm plans were completed, the State A.S.C.S. Committee allocated some additional funds through the A.C.T. program to help put the land use programs into effect.

A partial list of practices carried out the first year follows:

183 soil tests made on 1524 Acres.
1296 tons of lime applied on 532 Acres (2.4T./A.)
373,910 lbs. of fertilizer applied on 1558 Acres.
215 acres legumes seeded.
219 A. of cotton, 60 A. of corn and 91 A. of soybeans treated with herbicides for weed control.
1763 rods of new fence built.
18 buildings repaired, 2 new ones built.
2920 feet of diversion ditches built.
3900 feet of new ditches dug.
8000 feet of terraces re-worked.
6000 feet of parallel terraces built.
8 acres of gullied land leveled and seeded.
1¼ miles of fence rows cleared with a bulldozer.
255 acres of pasture fertilized and reseeded.

The average net worth of each man increased $3,170 in the period 1962-1964.

The average investment in farming for this group was $30,000. The average net income was 6.16%.

The men had an excellent attitude and were very conscientious about the program. Class attendance averaged 97.4%, and five men did not miss a meeting during the entire year. On man sold his farm and had to be dropped. Nineteen finished the training.

The program seems to prove that adult farmer education can improve income and raise the standard of living enough to enable these people to stay on the farm. Many of these men have worked in town but prefer to live on the farm if they can make a decent living. Here is a real challenge to the Vocational Agricultural programs of the nation. How will we meet it?

Records taken from 1962 and 1964 income tax returns show the following for the entire class: *

	1962	1964	Increase
Gross farm income	$89,841	$153,182	$63,341
Farm expenses	72,405	101,749	29,344
Income less expenses	17,436	51,433	33,997
Depreciation	10,912	16,207	5,295
Net farm income (TOTAL)	6,524	35,226	28,702
Average net income per man	343	1,854	1,511

*(One man sold his farm and dropped out. Totals are for 19 men.) Fourteen men had more than 100% increase in net income over 1962. Eight reached $1800 net or more. This was the goal of the class. Eleven made more than $1200 net in 1964.

Examination Time? — Some Suggestions

By ALLEN C. CHRISTENSEN, California State Polytechnic College

Over the years teachers of agriculture have prided themselves in the use of a most effective method of teaching, problem solution. The problem found in life situations and particularly in the supervised farming activities caused thinking and eventual decision making by the pupil. Yet, at the same time, many teachers who have used this excellent method to teach have returned at examination time to pure recall of isolated facts. In returning to memory work during examinations, an excellent teaching opportunity is lost. This paper is written as a suggestion as to how teachers might make best use of the examination as a teaching aid.

Suppose, for purposes of discussion, that we are presenting an instructional unit in the animal science area. Such topics as breeding, feeding, management, and diseases of livestock have been covered. The students will have learned to recognize problems and, hopefully, upon consideration of all facts and alternatives make a satisfactory decision as to the course of action to be taken. Now the teacher is ready to measure the progress of his students. It is here that some teaching programs show glaring weaknesses. To evaluate the student, the instructor then might use questions similar to the following:

1. What is the gestation period of a sheep?
2. Which of the following vitamins is not synthesized in a cow's stomach?
   a. Vitamin A
   b. Thiamine
   c. Riboflave
   d. B_{12}
3. Bangs disease will cause your cow to abort in the fifth to eighth month.
   True or False

These questions are easy to grade and allow the teacher to sample a large area of student knowledge. However, they are memory questions.

Recall questions have some merit; however, in agricultural education we have had in the past an occupationally oriented philosophy. Why not let this philosophy carry over to our class testing time? For example, in the case of the preceeding three questions the student could be put in a job type situation. Consider question one. It might be asked this way:

> You are a registered Suffolk breeder and have provided ram service for high school students as a public relations gesture. Your stud ram that you use for this program died on the 15th of October and it was the 5th of November before you replaced him. You have been turning the ram into the ewes in a fenced pasture. One FFA boy, who owns a registered suffolk ewe, brought his ewe to be bred in mid-September. His ewe dropped twins, one ram and one ewe lamb, on April 9. He is applying for registration. As owner of the ram you must sign and certify as to the sire. Which of the two rams is the sire. Explain.

This question requires the same knowledge to answer as the first. In this case, however, the boy is required to use the 147 day gestation period to determine the sire. In other words, we have required an application of knowledge rather than just recall of such. At the same time you could bring to mind the whole registration procedure by asking "What problems might occur in the registration of these twins as versus a single lamb?"

The second questions might be similarly handled. This might be a good question:

> Suppose you have purchased a beef cattle operation in Western Nevada just south of Reno. It has been a severe winter. One cold spring morning in the middle of calving you are approached by a field representative for a large feed processing concern. He feels you should purchase some riboflavin, thiamine, and vitamin B_{12} to increase cow vitality and milk production. He reminds you milk is quite high in riboflavin. You feel your trace mineral feeding is probably profitable. As owner-manager this is your decision. Which of these nutrients are you going to buy and why?

Exactly the same information is required to ansker this question as question two. However, you caused the student to make an on the job decision. An unnecessary expenditure means less net return and this becomes motivation to the profit-minded student when you proceed to farm management.

These are two examples of problem questions for examinations that can be answered very briefly. Thus ease of grading is not lost. Brief answers, however, becme a definite limitation if used to an extreme. The so-called essay type question gives, in contrast, a chance for written expression of concepts and ideas. This, too, is very important as an ingredient for success in society today. For example, question three could be asked as follows:

> Describe a program that you might implement in your dairy herd to control abortion in the fifth to eighth months.

This question requires the recognition of Bangs disease as the probable cause but then allows much freedom for creative thinking. These questions are more difficult to score. Since we are teaching the whole student, they should be graded for English construction and spelling in addition to subject matter content. This will strengthen all students, especially those who are college-bound, both in skill with and attitude toward language usage.

Questions of this type are more difficult for students. Therefore, only a few might be used at the first. They do not, as a rule, readily occur to the teacher. It would, therefore, be well for him to write up and file questions of this type as they come to mind. The author's personal experience indicates problem questions requiring principle application result in thinking and discussion after the examination which provides for further teaching opportunity. In addition, they cause the student to be analytical in his thinking in facing a problem which requires an immediate solution. A successful performance while under the emotional pressure of the examination can be a very reassuring experience for the student. These two features could be most valuable in contributing to occupational success.

Labor Market Failing to Meet Job Needs

City employment needs continue climbing but farm youths usually lack necessary training in fight for jobs. The labor pool among youths is increasing as the postwar baby crop matures but teenage unemployment stands at 15 per cent.

The American labor market has too many square pegs failing to fit into round holes.

In an average week last year, almost 3.9 million people were looking for jobs—and not finding them. Another 2.5 million had to settle for part-time work.

At the same time, the demand for repair services, home maintenance and hospital and other community services, for example, often goes unmet because trained workers and efficient firms to provide services are in short supply.

The situation is clear that the people and the jobs don't match. But the solution isn't so clear, particularly on the farm scene.

Unemployment among farm workers is more prevalent than it is among other groups in the national labor force. In 1959 about one farm worker out of four reported being without a job for 17 weeks of the year.

Underemployment also plagues rural areas more than it does the city. The intermittent, seasonal farm worker earns much less than the national average for comparable manual work.

There are several federal, state and local programs trying to cope with the problem of the untrained worker and the unfilled job. The task is enormous in rural areas because educational levels are generally low. Jobs must be sought in the cities, and few of the job seekers have the training for off-farm work.

Nor can the rural worker expect any automatic solution to the job problem, despite the expected increase of one-fourth in 1975's manpower requirements. The averages just don't apply to agriculture. On the contrary, agricultural employment should continue to decline during the period.

Though the agricultural worker in general is having his difficulties, even worse odds are being faced by teenagers, including those of rural areas. The national rate of unemployment, for example, dropped nearly 1 per cent to 4.8 per cent by the first quarter of 1965 during a period of little more than a year. But the unemployment rate for teenagers early this year stood at 15 per cent.

The situation is aggravated by the now familiar problem of the dropout, the youth who generally starts out poor, never gets education, remains forever untrained and must face ever stiffer competition.

The boy who never gets through high school faces twice the risk of unemployment as the graduate. Today there are about 7 million people between the ages of 16 and 21 who are out of school. Three million of them never made it through high school. There is another million in this age group with an education limited to the elementary grades or even less.

The large postwar baby crop is now coming into the critical employment stage—the late teens and early twenties. They now chart the course of their lives with present educational and employment decisions.

Only minor increases are expected in the over-25 brackets during the present decade. But nearly 50 per cent increases are expected in the 14-24 age group between 1960 and 1970.

High School Diploma Gains Value As White Collar Jobs Continue Increase

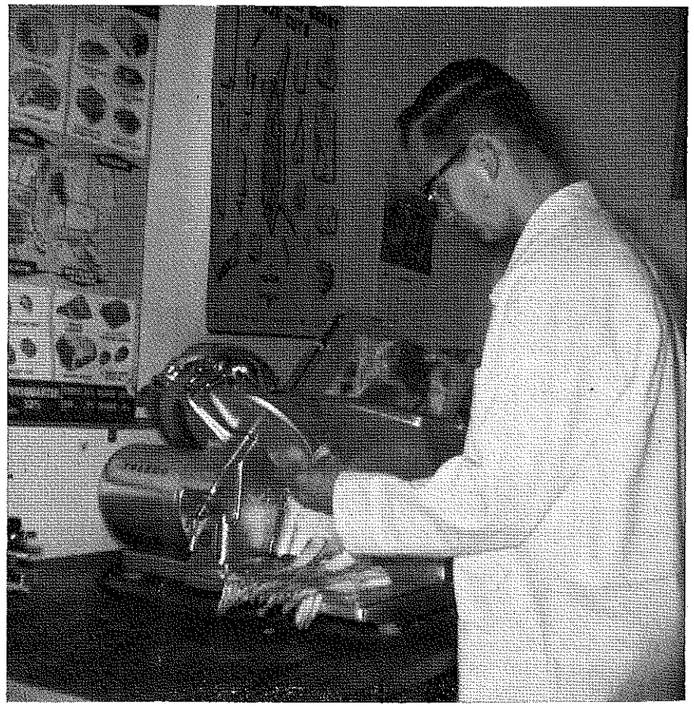
Riding the wave of the future? Or ending up on the economic rocks?

For today's youth, the different courses are written on the high school diploma.

More and more, jobs for the manual worker are drying up. The number of factory workers, for example, decreased by a million in just one year, from 1960 to 1961. On the other hand, the number of white collar workers increased by 1.5 million.

In 1960 white collar workers

(Continued on next page)



Agri-Business Student in local meat market, Northport, Alabama, where he is gaining work experience under the supervision of the manager and J. A. Ray, teacher of vocational agriculture

Labor Market

(Continued from page 212)

made up 42 per cent of the working force. The figure is expected to reach 45 percent by 1970. Blue collar jobs are expected to decrease slightly from 37 to 36 per cent in the same period.

The high school degree is, in fact, becoming the bare minimum for a job seeker. College or some other special training is increasingly important. The major increase in the labor force today is in the college-trained professional field. There were 4.5 million professionals in the nation in 1952. Today there are about 7.5 million—about a 65 per cent increase. This is a much faster rate of growth than for the total labor force.

In spite of these needs for the more educated person to fill jobs, the country has a massive group of adult illiterate and semi-illiterate. For example, there are 2.7 million adults who have never been to school, and there are 23 million adults who have never finished grade school.

The illiterate is at a disadvantage in jobs because he often cannot handle ordinary tasks. For instance, many illiterates cannot follow instructions for industrial machinery, take telephone messages, add up a bill at a corner grocery store or sign a personal check. Often he is incapable of absorbing training which requires educational skills.

A lack of education is a twofold problem: The individual worker is trapped in bare subsistance jobs, and he adds to the social costs.

For example, inadequate education is a factor in the high costs of welfare and similar programs, many of which are directed to the poorly educated.

A recent study in Chicago indicated that nearly two-thirds of those on welfare rolls had less than a sixth grade education. In New York one-half of the family heads receiving general assistance had completed only six years of schooling. In Arkansas 89 per cent of all persons on welfare rolls had less than a fourth grade education.

The rate of unemployment among illiterate city adults runs to 50 per cent; among the semi-literate, 25 per cent. The over-all national rate of unemployment is less than 5 per cent.—*The Farm Index*

Guest Editorial Douglas C. Towne

(Continued from page 196)

The editorial continues by stating that ". . . Direction-Finding is not a research problem," and that "these matters are more in the realm of philosophy than in research." This, then, is another characteristic of sophisticated research—the combining of research and philosophy—for research devoid of philosophy is certainly not sophisticated research and as Dr. Scarborough mentions, "Surely, research will likely be needed to furnish some food for thought in seeking and finding the most promising directions . . ."

The second warning of the editorial is that "Research cannot supply the answers to most of the specific problems we face in our work," and that "Making decisions is a human matter, even if the facts used in arriving at the decision come from computer." (Scarborough apparently equates philosophy with making decisions as a human matter and research is equated with computer use. These "equivalents" have obvious shortcomings, but will not be discussed here.) The second statement is slightly confusing in that it considers the computer as a separate entity devoid of human matter—this is certainly true of the mechanical aspect—but hardly true of its actual use. The computer is nothing more than a labor and time-saving extension of human capacities. The computer is no better than the humans who have programmed and designed it.

The first sentence relating to answering specific problems is hard to analyze without an example of what a "specific problem" is. If a specific problem is: "How many students are being trained in vocational agriculture this year?" then the computer can be used to answer it. However, the collecting, storing, and spewing out of minor data is hardly within the realm of sophisticated research. This is purely a clerical matter.

If the specific problem, on the other hand, is one of the nature of: "How do I relate to Johnny in class, he seems to be in a different mood today?" then we will have to agree and say that research will not help. Research is a long-term proposition and even then must rely on teaching or dissemination in order that its findings be used. The frustrating, or perhaps rewarding, aspect is that if we have found an answer to the above specific problem, and if it is taught or disseminated adequately then it is no longer a problem. Other dimensions then of sophisticated research are that it is long-range and is apt to be frustrating in that the answers does away with the problem and the answer becomes common knowledge. Therefore, why did the researcher waste his time with the "obvious!"

Other Articles on Research

Reference above to a distinction between clerical work and research is in need of greater clarification. Several of the remaining articles in this issue will contribute to the clarification of this piont and at the same time help to illustrate another distinction, that of the use of the findings.

The articles by Baker; Richard and Bass; Williams and Agan; Tom and Scanlon; and Drabick are all examples of normative research. They have each employed questionnaires to determine the present situation (norm) existing in some particular area of concern.

How difficult is it to design a questionnaire, select a sample, administer the instrument, and then analyze the data? The process of designing a questionnaire may be extremely difficult if it attempts to relate an overt expression or response to some underlying variable or characteristic. This construction then requires much work in the realm of measures of validity and reliability. This, however, was not the case. The responses in each case were taken at face value and assumed to reflect the attribute or characteristic intended by the researcher. The questionnaires were used solely to find how many subjects answered one way or another. The researchers assumed the questionnaire to be valid and reliable. (This is, of course, a serious charge against some of the research cited and not so serious against others.) The product of this research, therefore, could equally as well have been brought about by a competent clerk or research technician.

The process of sampling was also shown to be solved in a simple manner. Each sample* was a simple random sample (with the exception of Drabick who uses a systematic sampling procedure not too much different) and Warmbrod (p. 106) illustrated how easily this is accomplished. Again, the clerk or technician conducting such a study could easily appeal to a statistician, answer the proper questions, and come away with his appropriate sampling procedure. In fact, if this were the case, the statistician would most likely have provided a sampling procedure more powerful and appropriate than the simple random sample.

The administration of such an instrument, as any person having conducted such a study will agree, is largely time consuming and clerical in nature The analysis of the data is again clerical or computer problem, at least in the sense of the descriptive statistics presented by these articles. (Baker claimed his was a non-statistical analysis. This I find hard to accept unless he defines statistics in a very narrow sense. The use of the term majority, for example, is one type of statistical analysis.)

Neilsen (p. 102) devoted much of his article to a partial listing of "areas in which additional research and development activities are needed." How many of these are mere clerical, census bureau type, tasks? (e.g., "estimated annual entry opportunities,"

*Tom and Scanlon did not take a sample, but rather surveyed the entire population.

(Continued on next page)

Book Review

Sydney C. James, *Midwest Farm Planning Manual*, The Iowa State University Ames, Iowa, 1965, pp. 212, price $3.50.

This is a concise guidebook which contains much data necessary for computing such things as: livestock feed requirements, farm labor requirements; outlays necessary for farm machinery, equipment and structures; the prices one should pay and receive for goods, costs and returns for crops and livestock; credit and insurance costs and taxes.

The information is presented with step by step instructions for figuring, as well as examples and easy to read tables. Each section is separated and marked so that whatever is needed can be quickly and easily located. A section in the back of the book consists of forms which can be filled out with a minimum loss of time and effort to indicate at a glance how to budget time, money, resources and effort to receive the maximum results.

Much of the data used in the manual is Iowa data. However, similar data from other states is available and could be substituted.

Sydney James is Associate Professor of Economics, College of Agriculture, Iowa State University.

Guy E. Timmons
Michigan State University

Percentage of Fatal Farm Accidents Increasing With Machines Top Killers

The machine helps the farmer in his work but it can be a death trap.

On a percentage basis, fatal farm accidents have been climbing rapidly in recent years. During the 15-year period ending in 1963, the death rate rose 66 per cent, bringing the rate to about 17 a year per 100,000 farm people. It was 10.4 in 1949.

Machinery is the leading cause of these deaths on the farm, accounting for nearly 38 per cent of all accidental deaths during the years 1960-63. In this period machinery killed 44 per cent more people on farms than in all mines, quarries and industrial places

Guest Editorial — Douglas C. Towne

(Continued from page 213)

"projected attrition and expansion," "activities and duties of the employees," "salary and benefits," and "availability of agricultural education programs").

These points then illustrate one other identifying characteristic of sophisticated research—*sophisticated research is not mere clerical work.*

Drawing Conclusions

The second point of clarification illustrated by these articles is that of the use of the findings. What data or information present in the research of Baker (p. 104) lead to conclusion 2, 3, 4, and 5? There was no part of the research which would justify the conclusion that the vocational agriculture departments *should* do this or that. The research was a descriptive study and from these data we may find direction for hypothesizing that perhaps something should be the case, but only in so far as this information related directly with other data and other assumptions and other values. These, however, should be made explicit and presented as such.

The conclusions presented by Richard and Bass (p. 108) also may be questioned to some degree. Would we not expect that the setting in which the questionnaire was administered had influenced the responses? Would the relative ranking of vo-ag programs versus guidance services (by the same sample of students) remained the same if the questionnaire was administered by the counselor in a guidance class? Another reason to hesitate from accepting their conclusions is the relative magnitude of the first choice votes. How important is the influence of a reason, even if it ranks third, when it receives 47 first choices compared to the first and second ranked reasons with 1454 and 310 respectively? It seems that this shows a real winner and then several others which also managed to make it to the "finish line." Neither does this research show that the other reasons were unimportant; for what contributes to "my own desire to continue my education" other than influences of other people and the experiences the student has had? The real meat of the research would be to determine what influenced the student to have this desire to continue his education. (This, however, is not accomplished by having the student state several other reasons.)

The article by Williams and Agan (p. 109) presents an example of another conclusion common to research in agricultural education. These conclusions are based on the assumption that what is common is right. We conduct research to find what most people are doing and then conclude that since most are doing it, it must then be right. This conclusion, of course, has many failings. (For example, if Tom and Scanlon had accepted this assumption, their results would indicate that we must abandon programmed learning in agriculture since very few are involved in it.)

The research reported by Drabick (p. 112) is also somewhat of this nature. His comment that "it is interesting to note the . . ." sums up much of my complaint at this point. The findings are "interesting," but is this all we are searching for?

Tom and Scanlon provide directions if we accept their other assumptions and conclusions. They draw together the findings of various other research and then conclude that this research, along with other data and information, lead us to such and such conclusions. One may well argue about some of the research findings included or some of the other data or assumptions presented, but this argument is healthy and should be encouraged.

Sophisticated research then does not draw findings beyond the scope of the data without showing the other facts or assumptions involved. Sophisticated research does not limit itself only to data obtained either. It uses these data or findings along with other statements to build a chain of reasoning which allows greater application or generalization.

Intent of Research

My last point regarding sophisticated research in agricultural education is the *intent* of such research. This intent is not really a question of research, but rather one of values. Both Phipps (p. 101) and Neilsen (p. 102) present what they feel should be possible intents for research in agricultural education. My disagreement lies with the great emphasis upon the Vocational Education Act of 1963 and its emphasis in turn upon the labor market demands. This I feel to be a misdirection of our efforts. Our concern is with the student, be he an adolescent or an adult. The schools deal with the individual and the improvement of that individual must be the ultimate goal.

The present emphasis upon meeting the demands of the labor market, or fitting students *into* the patterns set by industry or business, is not easy for me to accept. I strongly plead that we continue to direct our efforts to the individual and his needs as we have done so well in the past. In our former emphasis upon training for farming we well recognized that neither all farms nor all students were alike. We, therefore, adapted our program to these facts and devoted our time to working with the individual and meeting his needs.

This, then, is a value judgement on my part. However, the fact that sophisticated research is directed toward specific and well-defined goals is not. This goal is, of course, the result of a value judgement on the part of the researcher, and he has the right to decide what he deems important.

Book Review

Barish, Natalie, *The Gene Concept.* Reinhold Publishing Company, 430 Park Avenue, New York 22, New York. 166 pages. Price $1.95.

Starting with Mendel and closing with the relationship of psychology and genetics is an apt description of the GENE CONCEPT: Between these guidelines, the book explains, in detail, the use of fruitflies in genetic experimentation, RNA, DNA, and different patterns of genetic transmission.

The initial chapter describes Mendel as an individual, working with garden peas, and formulating a milestone in the history of biology. The following chapters describe the use of fruitflies in determining sex-linked alleles patterns of inheritance. The book also discusses natural and artificially induced mutation and their value in plant and animal breeding research. The preceding topics set the stage for a contemporary study of RNA and DNA in the final chapters. A glossary of genetic definitions concludes the five inch by seven inch book.

This book would be a welcomed reference to individuals with a prior knowledge of genetic inheritance and may be of value for students enrolled in plant and animal breeding classes on a technical level. However, it may be of little value as a text or reference for students in elementary genetic courses in our high schools.

Natalie Barish is a staff member of Chatham College, Pittsburgh, Pennsylvania.

Jim Hannemann
Michigan State University

Douglas C. Towne, Instructional Materials Specialist, Cornell University, completes the assembly of a display used at the annual teachers' conference and at several county fairs this past summer. The display was designed by Mr. Towne to illustrate how New York's High School Agriculture is "Keeping Pace With Change" by offering vocational education in agriculture in the five areas of; Production Agriculture, Horticulture, Agri-Mechanics Agri-Business, and Conservation.

Themes for the Agricultural Education Magazine June-August, 1966

June – EVALUATING THE YEAR'S WORK
Who, what, when, and where in evaluating programs? Formal or informal. Role of participants in the programs. Principles of evaluating educational programs. Were the "right" people enrolled in the vocational programs? What record is made of the evaluation?

July – CURRICULUM CHANGES IN HIGH SCHOOL VO AG
What major changes have been made? What are the trends? What is meant by Basic Vo Ag? How far can we go in specialization? Can we offer specific training for specific jobs? Do we have 4-year programs? What clientele is the curriculum intended to serve? Relationship to other vocational areas.

August – ORGANIZING PROGRAMS IN MULTIPLE TEACHER DEPARTMENTS
Major differences found in multi-teacher situation. Research in these situations. Trends. Division of responsibilities. How does the multi-teacher situation differ from the one-man departments? Will the one-man departments disappear?

Send your article for any of above issues NOW to the Editor or a Special Editor

Guest Editorial

(Continued from page 214)

In summary I have contended that sophisticated research is:

1. NOT research which assumes a finding and then devises ways and means of justifying that finding. (Sophisticated research searches for the truth.)
2. NOT written in unclear, imprecise language. (Sophisticated research carefully defines its terms and strives to reduce misunderstanding.)
3. NOT devoid of philosophy. (Sophisticated research combines research and philosophy.)
4. NOT short-term nor free of frustration. (Sophisticated research is both long-range and very often frustrating.)
5. NOT a mere clerical task. (Sophisticated research requires scholarly involvement.)
6. NOT presenting conclusions as if the data were their sole support unless this is the case. (Sophisticated research identifies what other reasoning—if any—has been used to justify the conclusions.)
7. NOT limiting our conclusions solely to empirical data. (Sophisticated research uses empirical findings as *one* part of the chain of reasoning in the extension of our knowledge.)

These seven items are certainly far from exhaustive. They do, however, make use of the presentations in the November issue for illustration and provide us with a beginning in the task of defining "sophisticated" research.

Sophisticated research in agricultural education will then involve: searching for the truth, incorporating philosophy and the other appropriate sciences in our research, precise use of language, and long-range scholarly endeavor designed to build a strong and appropriate chain of reasoning applicable to our goal—which in my value framework is the development of the STUDENT! !—*Douglas C. Towne*

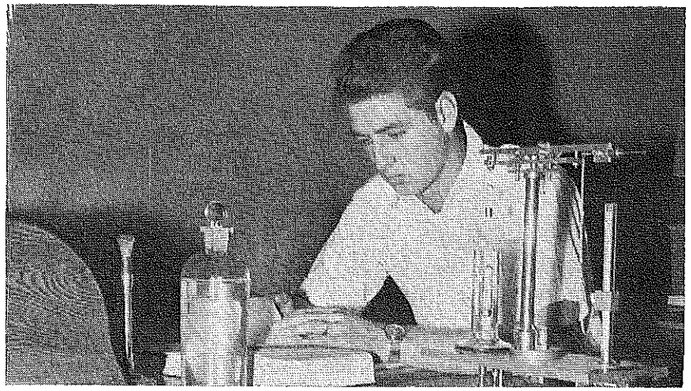
FOR VO AG TEACHERS ONLY

Have you mailed your letter on "What I Expect From My Professional Magazine"? A $1 bill will be sent to the top 10, the best ones published in these pages.

—*Editor*

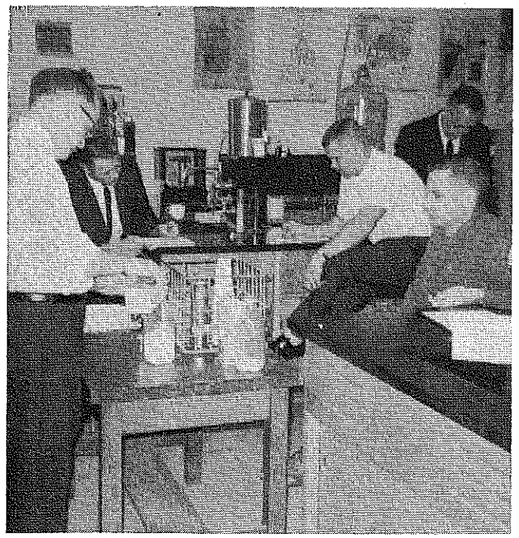
Stories in Pictures

Gilbert S. Guiler
Ohio State University
Columbus



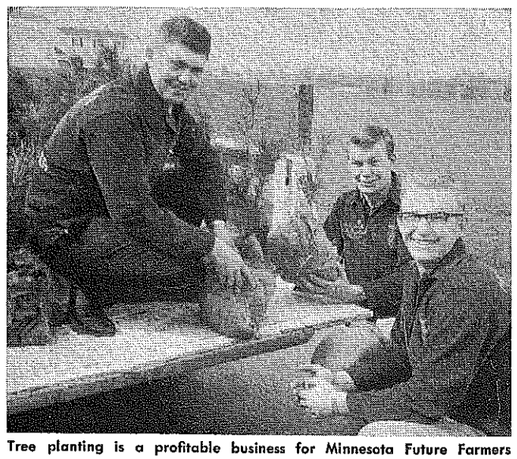
Dennis Kamstra
Modesto

Science and mathematics go into training today's Agriculture Technician. Basic to many technical fields is the accurate use of scientific instruments. Modesto Junior College includes all of these in its technical training program.

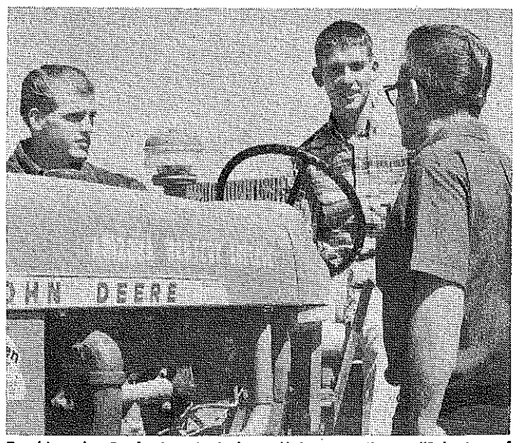


In-Service work for teachers on preparing dairy product samples for scoring is provided by Dairy Science Department of South Dakota State University.

Proper student selection of high school program of studies keeps doors open to advanced education in agriculture. (Falls Village, Connecticut)



Tree planting is a profitable business for Minnesota Future Farmers



Teaching the Production Agriculture Majors a unit on "Selection of Farm Machinery" is included in the Arizona Western College Curriculum.

Agricultural Education

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