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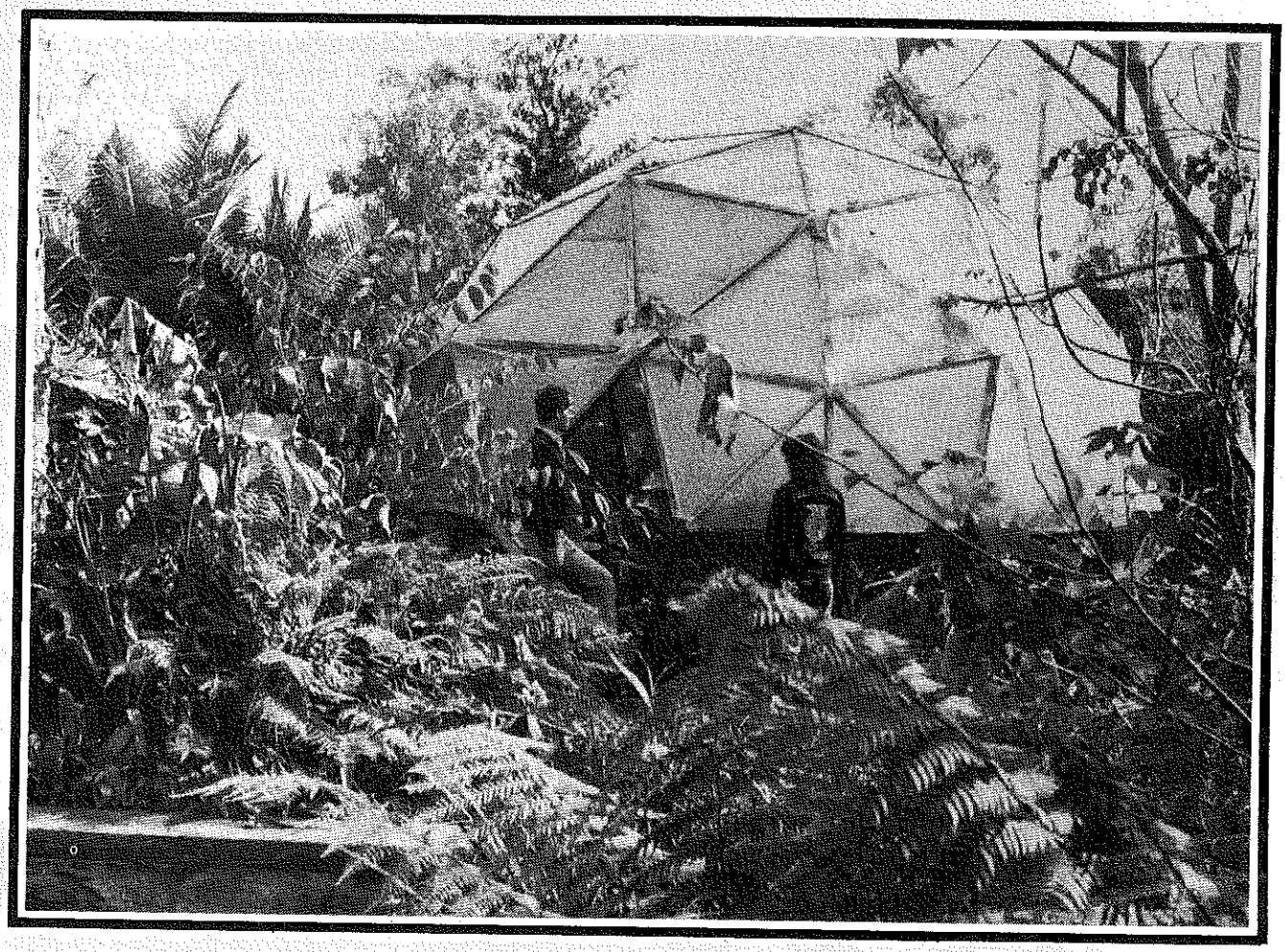

THEME: Horticulture Programs

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ARTICLE SUBMISSION

Articles and photographs should be submitted to the Editor, Regional Editors, or Special Editors. Items to be considered for publication should be submitted at least 90 days prior to the date of issue intended for the article or photograph. All submissions will be acknowledged by the Editor. No items are returned unless accompanied by a written request. Articles should be typed, double-spaced, and include information about the author(s). Two copies of articles should be submitted. A recent photograph should accompany an article unless one is on file with the Editor.

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EDITOR'S PAGE

Can Vo-Ag Educators Speak Up?

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

Do vocational-technical educators in agriculture have strong feelings about their profession? If they do, are they allowed to speak? Freedom of speech is an important principle in the United States. Two aspects of freedom of speech are relevant to our profession: expressing one's own personal beliefs and being tolerant of the beliefs of others.

Speaking Out Is Healthy

Increasingly it appears that vocational-technical agricultural educators are unwilling to or do not care to express themselves about their profession. The health of a profession is related to the literature and dialogue about it. Of course, all dialogue must be offered and received in good faith whether we agree with it or not. Substantive dialogue will certainly improve what we are about.

The quality of the articles, letters, and other communications in vocational-technical agriculture education needs improvement. Only a small number of members of the profession currently participate in such dialogue. Dialogue must not just advocate the status quo, but serve in observation and adversary roles. Some controversy is beneficial. It helps to refine personal philosophies and causes us to search our inner most selves for what we really believe. Our profession needs more scholarly attention to our reason for existence and future directions. Except for a few isolated examples, there is a great lack of substantive dialogue about vocational-technical agricultural education.

Avenues for expressing opinions and experiences include professional meetings, journals, books, and pamphlets. An individual who does not use these means of expression is abdicating to those few individuals who do. Individuals who do not speak up on professional matters should not complain about the direction taken in the profession.

Stifling is Unhealthy

Dialogue by professionals is healthy. Substantive dialogue by scholars in the professional is essential. Attempts by members of the profession to stifle substantive dialogue are unfortunate. When such attempts occur, is it because those who are trying to stifle dialogue are insecure and protective of their personal vested interests? It also says that those who attempt the stifling don't have any better professional contributions to make.

We need more people who are willing to listen to new ideas. We need to listen to those who question some of the practices in our profession. Not listening may ultimately result in our extinction. And we certainly don't want our profession to become extinct!

Education in Horticulture:
How Much Is Enough?

Horticulture education has grown to enroll a sizeable proportion of students in secondary and postsecondary vocational-technical agriculture programs. Funds have been used to construct facilities and employ teachers. Students have given up other courses in order to enroll. Are the efforts in horticulture education needed and do they represent wise investments? It is time to assess where we are in horticulture education.

The Mission

The first consideration is the mission of instruction in horticulture. Most of the programs use vocational education funds and, therefore, should be developing specific occupational competencies of less than the baccalaureate level for gainful employment in horticulture occupations. Some of the instruction appears to have little emphasis on employment needs. The instruction may be more avocational than vocational.

Horticulture instruction is a part of vocational-technical education in agriculture program. It is not a separate program. Many times it appears that horticulture teachers want to split away from the vocational-technical agriculture program. Evidence of this in some locations is found in their establishment of separate teacher organizations. Their failure to join the professional organizations in vocational education is noted in some locations. Their lack of interest in preparing students for participation in appropriate FFA activities is frequently obvious.

Who is out of step? Is it the horticulture teachers or the other teachers in vocational-technical agriculture? In some cases the situation may be a product of the overall program not adjusting to the new elements within it.

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Education in Horticulture: How Much is Enough?

(Continued from Page 3)

The Quality

Horticulture instruction needs to be efficiently provided. Adequate funding and facilities are essential. Well-trained, professional teachers are needed. Supervisors, administrators, and teacher educators need to understand the uniqueness of horticulture. Several areas are in need of attention.

Funding effects program quality. Good instruction can be provided on a meager budget and poor instruction can occur when a rather large fund allocation exists. Should students construct instructional laboratory facilities? If the citizens (taxpayers) do not support horticulture education by providing facilities, do they really want such instruction in the schools? If the budget provides insufficient funding to buy supplies and plant materials, do the citizens want horticulture education? There are more questions than answers.

Teachers of horticulture need to be well qualified. They need professional preparation to teach horticulture. It is important to know how to plan and deliver instruction, develop personal skills, and provide supervised occupational experience. Instructional time needs to be efficiently used, even in long periods. (The writer suspects that there is a relationship between length of instructional time and efficiency of instruction. Inefficiency of instruction increases as the length of the instructional time increases. Stated another way, short (1 hour) class periods are more efficiently used for learning than long (3-4 hour) class periods.)

The Quantity

How many individuals are needed with horticulture education? Instruction in horticulture should help students develop job skills. It also keeps them from enrolling in other classes which may lead to better jobs. Typically, beginning horticulture jobs are at the minimum wage level. Of course, employment is better than unemployment but how many students would have faired better if they had taken their areas?

Adding instruction in horticulture because of the glamour tendency is unfortunate. Adding such instruction because students who are enrolled in it can help maintain the school grounds or provide flowers for school functions is educationally unsound. Instruction must be based on employment opportunities and the competencies needed to be successful.

Keeping in Perspective

Instruction in horticulture is needed. An assessment of employment opportunities and needs is a prerequisite to relevancy. A proper balance must be maintained in all vocational-technical education in agriculture. Traditions must be altered to allow for new areas and to support their success. All areas of instruction must be based on helping individuals achieve gainful employment.

This Month

The theme for this issue of THE MAGAZINE is Horticulture Programs. Jan Henderson, previously a horticulture teacher in Ohio and now a graduate student at Mississippi State University, has obtained a variety of articles on providing education in horticulture. Her assistance as Theme Editor is appreciated.

The Cover

Horticulture instruction must include the efficient use of laboratories. The cover photograph shows North Hollywood, California, students involved in using their school's laboratory. (Photograph courtesy of Richard M. Hylton, California Polytechnic State University, Pomona, California.)

THEME

Essential Elements for Program Growth

If asked to name the requirements for plant growth, most of us would quickly list light, water, minerals, and growing media. These requirements may vary among specific crops, but each would generally be recognized as essential for plant growth. Could we just as quickly identify the requirements for the optimum growth of a vocational education program? What essential elements are needed to yield a quality program in horticulture?

BY JAN HENDERSON, THEME EDITOR

Editor's Note: Ms. Henderson previously taught horticulture in Ohio. She is currently a graduate student in the Department of Agricultural and Extension Education, Mississippi State University, Mississippi State, MS 39762.

Philosophical Roots

Providing students with opportunities to acquire occupational skills and competencies is one of the primary goals of vocational education. Upon program completion, individuals should be able to enter an occupation in their area of vocational training. Horticulture programs must continually strive to maintain the vocational aspect of instruction. Occupational skills consistent with the horticulture industry should be a basic element of all horticulture programs. Avocational instruction that emphasizes the "hobby" or "creative arts" nature of horticulture is not appropriate in vocational education. Both student and instructor should recognize that one of the prime objectives of vocational horticulture instruction is to prepare individuals for entrance into or advancement in the horticulture industry.

Parts of the Program

Quality vocational horticulture programs can be developed and maintained by insisting that all program components contribute to occupational skill training. Classroom instruction should provide up-to-date technical information and utilize curriculum materials and references suitable for the intent of the particular horticulture program. Laboratory activities must be designed to allow students to practice specific horticultural tasks. Although program scope may vary, facilities and equipment should reflect current conditions in the horticulture industry. Continued occupational skill development is one of the purposes of supervised occupational experience (SOE). Out-of-school experiences appropriate for horticulture students could include placement in a local garden center or ownership of a bedding plant production project or landscape business. Vocational student organizations also have opportunities that promote occupational skills, such as horticulture judging contests and proficiency awards. The different parts of the total vocational program should help develop the occupational competencies needed for a career in the horticulture industry.

Additional Supports

Supplemental assistance from the community can directly benefit the vocational horticulture program. Utilizing available resources will encourage local support and involvement. Program growth and vitality can be enhanced as the public participates in program activities. Community support could include donations of equipment and plant material, guest speakers, or work stations for job placement. A persisting effort to use accessible community resources will result in a quality instructional program.

Pruning Techniques

To insure continued growth, program evaluation may indicate instructional elements that need to be modified or removed. Adapting to changes in the horticulture industry may result in an adjusted course of study and new job placement stations. Particular units of the instructional program, such as horticulture mechanics, may require expansion or revision. Different recruitment techniques and approaches may be necessary to attract new students. Entrepreneurship possibilities may need to be explored as alternatives to conventional employment. A quality vocational horticulture program must be flexible enough to allow for instructional improvement.

Requirements Recycled

What are the essential elements for a quality vocational horticulture program? An instructional philosophy that emphasizes the occupational training of vocational students, an integration of program components that encourages horticultural skill development, a commitment to community involvement, and an adaptable approach to program improvement are required. The proper combination of these elements will yield individuals prepared for a career in the horticulture industry.

A student enrolled in horticulture at Buckeye Joint Vocational School, New Philadelphia, Ohio, is shown developing skills in plant care in the school laboratory. (Photograph courtesy of Jim Scott, New Philadelphia, Ohio.)

1983 THEMES

The Agricultural Education Magazine

January	Achieving Quality Classroom Instruction
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The Orange Glen Story . . .

Getting a Horticulture Program Moving

When the horticulture program was started at Orange Glen (California) High School, the facilities consisted of a shade house, vegetable plots, and flower beds. During the past five years, the facility has grown with the addition of three greenhouses and a nursery area. Students built the structures during class time and received some excellent hands-on learning.

Construction of Facilities

The first greenhouse was constructed from Boeing 747 fuselage frames and fiberglass glazing. A bottom heat system, utilizing a household water heater and galvanized pipe, was installed on bench tops to aid in propagation. This greenhouse is 17 feet x 24 feet and contains seedlings and cuttings which supply all of the plant material needed for the various horticulture classes.

The second greenhouse was a commercial kit, 36 feet x 50 feet, and an educational experience for the students to erect. Once the posts were in place, the structure went up like a giant erector set. As soon as the sidewalks were poured and the plants were moved in we realized that the size could have been larger.

The third greenhouse was framed using nuts, bolts, and galvanized tubing. The tubing was chainlink fence top rail material. The students made a jig in the parking lot using nails and string to layout, bend, cut, and drill the sectional frames. This greenhouse is 25 feet x 45 feet and is covered with a double layer of poly material for energy conservation. It was built in three weeks.

The students also constructed soil bins and bedding plant and potting benches for the facilities. They are presently converting the bottom heat system to a solar heating system. Concrete curbs have been poured around the vegetable plots.

The construction of the facilities was an ideal opportunity from several points of view. First of all, the school district could not afford to build all the structures, as many districts face a difficult financial situation today. Secondly, the experience and skills developed by the students was extremely valuable in that no one can legally hire a non-eighteen year old and give that person the same experience. The third beneficial aspect derived from the students' effort is a pride in their facility. The fact that they built the greenhouses will instill a special desire to keep the area and buildings up and protect their work. This is an attitude the rest of the campus does not enjoy.

Industry Considerations

It is important to talk with local industry people to determine what they are looking for in employees. This step is very important in developing and maintaining a quality and relevant program.

By Don Martin

Editor's Note: Mr. Martin is Vocational Agriculture Teacher at Orange Glen High School, Escondido, California 92027.

First of all, the input provided will give a program direction and keep the curriculum up-to-date. Secondly, it shows local nursery personnel that you want your program to prepare skilled and knowledgeable potential employees. The ones you talk to may be the ones who hire students who complete your program.

Contacts with nursery personnel may lead to increased support for your program. Visit local irrigation suppliers, agricultural chemical dealers, and other horticulture industries to acquaint local businesses with the needs of your program.

SOE Programs

The supervised occupational experience opportunities in horticulture are many in most communities. If an inventory of the local industry has been made, the teacher is ready to start helping in the placement of students. One point should always be remembered: never send out a student you are not sure about or don't really know. As long as employers receive well-trained students they will continue to look to the vo-ag program for employees.

Another way to provide SOE is to have plant sales utilizing plants raised by students and the classes as a whole. Plant sales provide a vehicle to teach merchandising, selling, and money handling. A real bonus is the additional monies generated for the program or FFA. In the horticulture program at Orange Glen High School, plant sales pay for fertilizer, seeds, bulbs, other supplies, and field trips. Any remaining funds go into the FFA account.

Horticulture instruction may involve learning activities in a land laboratory.

Community/School Involvement

There are numerous activities outside of class time and off campus for the students to sharpen their horticultural skills. Probably the one event that generates the most enthusiasm is the landscaping competition at the San Diego County Fair. There are 8 to 10 schools involved and the premium money is enough to cover material costs. Another aspect of the county fair is a plant booth. All of the cooperating FFA chapters contribute house plants and student time. This is a good opportunity for students to develop sales experience and raise FFA funds. Several times a year the ag department constructs educational displays in shopping malls and at the San Diego Wild Animal Park.

The training of horticulture judging teams gets a student ready for employment in retail sales. If a student prepares for judging contests, then he or she will have a greater knowledge of plant material than most people do when they start out in the horticulture industry.

Course Offerings

All students are encouraged to take plant science their first year in horticulture. In this class, they learn about plant physiology, soils, fertilizers, plant nutrition, and plant propagation. About 50% of the time, students are at the school farm putting into practice what they have learned in the classroom. Between the vegetable gardens and greenhouses, the beginning students can try their hands at growing plants in the ground and in containers.

After plant science the students are encouraged to take landscaping. They are taught design, installation, and maintenance in the classroom. During the design phase, the students learn to select the types of plants that will achieve various desired effects in landscapes. They also learn how to design sprinkler systems. The construction phase usually entails doing some work on the school campus. At the present time, the students have converted the entire campus from manual to automatic sprinklers using 60-two inch valves, 10 miles of wire, and 3 digital irrigation clocks. The students are currently landscaping around a new ag building. This latest project includes dealing with drainage problems that must be solved prior to placement of any plant material. The last part of the landscaping class is maintenance. Most campuses have plenty of areas that could use maintenance, and most administrators and custodial staff appreciate assistance.

The last class offered in horticulture is nursery practices. In order for a student to get into the class, he or she must have passed a year of plant science with a "C" or better. This class addresses true production horticulture. The class is divided up into teams and the horticulture facility into areas, with each team responsible for an area. Each team is in an area for 4 weeks, and then rotates to a new area. By the end of the year each team will have been responsible for every area. While in each area, the teams must maintain all the plant material in a healthy state of growth and maintain a written log of their area. In the log, both long-range and short-term goals must be identified, then a solution for accomplishing each goal must be prescribed. In addition to running the nursery, this class is taught specific crop practices in propagation, soils, nursery sanitation, and facility maintenance.

Publicizing the Program

Public relations is a constant, on-going effort. When starting a new program, place a few plants throughout the school. Have students take plants to secretaries, librarians, nurses, and school office areas. Provide fresh-cut flowers in the board room for school board meetings, along with a little note saying courtesy of the ag department. If there are no rose bushes on the campus, buy some and put them around your classroom. This will brighten up your image plus give you a source of cut flowers.

There are many opportunities to provide vocational horticulture skills and knowledge. Horticulture facilities must be used to their fullest extent. The vocational agriculture teacher must take advantage of everything available to the program and success will in all probability follow.

BOOK REVIEW

Greenhouse Operation and Management, 2nd ed., by Paul V. Nelson, Reston, Virginia: Reston Publishing Company, Inc., 1981, 563 pp., $16.95 (list price), $11.96 (secondary school price).

The book presents a comprehensive coverage of the topic of establishing and managing a floriculture business. Emphasis has been placed on business management concerns as well as current production concerns, such as energy-efficient greenhouse coverings and designs and alternative heating and cooling systems.

It is a well organized book, following the anticipated decisions a person makes when entering the floricultural production business. The book is divided into 16 chapters covering the following areas: origin and growth of the greenhouse industry; greenhouse construction, heat and cooling; root media and pasteurization; watering; fertilizing; carbon dioxide fertilization; light and temperature control; post harvest handling; marketing; and business management.

Each chapter has a summary of key points and a list of references for further reading. This book also contains a glossary of terms.

The book was written by Paul Nelson, currently serving as Professor of Horticultural Science at North Carolina State University. It would serve as an excellent text for secondary and postsecondary horticultural programs. It would also be a very good reference for high school vocational agriculture programs.

Susan F. Everett
Iowa State University
Ames, Iowa

THEME

Using Community Resources in Horticulture Instruction

By Reed Franz
Editor's Note: Mr. Franz is Vocational Agriculture Teacher at Countryside High School, Clearwater, Florida 33519.

One of the vocational agriculture teacher's greatest assets and challenges is involvement in the community and the utilization of community resources. Numerous opportunities to enhance learning become available as one gains great knowledge of the community and develops the available resources. New teachers, as well as those who are established, should seek opportunities for using community resources.

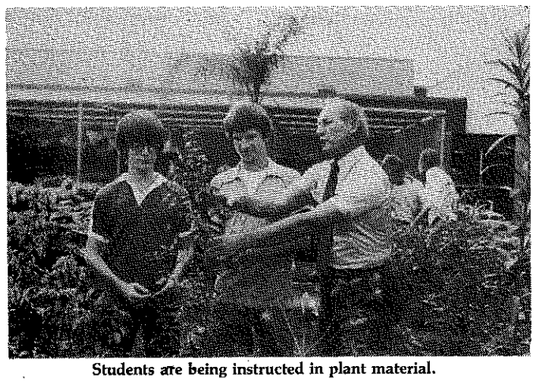
Each school and community is unique and will have human and material resources not usually found elsewhere. Talents of the community should be tapped by the agribusiness program through individuals, advisory committee members, and organizations. The agriculture instructor needs to recognize opportunities in the community to benefit his or her program.

Community Concerns

Learning will be enhanced if teaching is relevant to what is going on in the community. Questions brought to the horticulture teacher about insect damage, weed control, or selection of plant material are usually questions many others in the community may have. The question asked by a colleague is probably asked several times of the student employed at the garden center. Alert teachers can use this kind of information as a motivator to get students involved in useful and practical learning activities. Class discussion, research work, student reports, guest speakers, and other teaching techniques may be used to get answers. Instruction is then applicable to community needs and educates students, builds student confidence, and increases visibility of the horticulture program.

Human Resources

Teachers should seek people with special skills to assist as volunteers in the program. These people may range from judges for FFA contests to experienced mechanics to help with equipment repair. Often suppliers and nursery personnel will present programs or serve as resource persons on new products. Local growers often express an interest in having students visit their facilities on field trips. They may offer plants for cuttings and identification purposes. Graduates of the horticulture program who are presently employed should be invited back. Students can often relate better to these young people and can visualize achieving similar employment.



Students are being instructed in plant material.

Professional and Business Resources

In today's horticulture industry, no teacher can be an expert in all areas and keep up with new information. Help is available through the Extension Service, Soil Conservation Service, local forester, Division of Plant Industry, and other agencies. Product suppliers, nursery personnel, and others working in specialized areas are aware of new developments in their specialty. The teacher who communicates with these local professionals and business personnel has a ready source of information. An example is the growing of poinsettias as a Christmas season production project. A local grower will:

- know the best varieties for the community
- be able to recommend sources of plant material and needed chemicals
- plan a schedule of lighting and shading to control date of flowering
- anticipate insect and disease problems
- recommend a pinching and disbudding schedule
- advise on the use of growth retardants

The teacher who tries to seek out all this data on his or her own will probably find it too time-consuming and discouraging. An added interest is the comparison of results between the school and the commercial grower. Most growers welcome this involvement and cooperate extensively. Students also have an opportunity to become acquainted with prospective employers.

Obtaining Plant Material and Supplies

Budget limitations can be supplemented by community resources. Often plant materials for production plants or for specimens and identification are available in the community. The class nursery can be increased by having students bring in plants not presently in the nursery in exchange for a plant the students would like to have. People in the community may be pleased that they can contribute to an educational program in this manner. Cuttings, seeds, and volunteer plants are frequently available and, with a little planning, can be developed into a free source for the entire production of some varieties. Naturally, one must be selective and not overproduce or use diseased and inferior stock.

When new plant varieties are introduced, the supplier will often be happy to donate stock plants or samples. For example, Seville — a new variety of St. Augustine grass — was advertised and sold in our community. The local garden center donated samples to our program. Students in our program propagated additional specimens and planted the grass in the land lab. One student used this new introduction for an FFA public speaking topic. Seville is a patented grass and, naturally, we honor the owner's rights and do not sell any. In addition, employment opportunities have become available for several students who can sell, advertise, install and maintain this new grass variety.

Used plant containers from landscapers, memorial parks, and homeowners can be obtained. New containers should be purchased for wholesale production projects so all plants are uniform and make a nice appearance. However, by using returned pots for specimen plants and varieties to be upgraded at a later date, dollars can be saved.

School and Community Interaction

Many opportunities exist for school and community involvement in the horticulture program. Our students participate in the landscaping, interiorscaping, and general appearance of the school. This type of work could be overdone, and I am aware that many consider working on school grounds a burden. However, preparing athletic fields, planting annuals around the school, and providing plants for special indoor events are all educational experiences for our students. Our plants are frequently borrowed for National Honor Society Programs, award nights, open house, class plays, graduation, and many other activities held at the school. We ask only that recognition be given to the agriculture students for the use of these plants, as similar acknowledgments would be expressed for materials borrowed from any other source.

These students are preparing to distribute trees for Arbor Day planting.

Organizing and completing a mass planting for a memorial park, country club or business gives experience in production projects, sales, installation, increases the visibility of the program in the community, provides money-making activities for the FFA, and leads to employment opportunities. Local fairs, parades, field days, and study trips are all opportunities for community involvement and develop support for local horticulture programs. Advisors and FFA chapters should also review the community opportunities available in BOAC, safety programs, and Food for America presentations.

Involvement with organizations can be beneficial to both the horticulture department and the community. Parent-student-teacher associations, civic and service clubs, horticultural associations, and agricultural cooperatives usually have a youth committee or sponsor some type of youth activities. Often these groups look for opportunities to help.

Each community will have many resources which can be utilized for more effective teaching. Involvement of these community resources can provide relevancy in the horticulture program. Involving local people will increase community interest and the visibility of the program.

Utilizing community resources is a continuous process which involves considerable time and energy. The results and rewards of community participation and involvement are worthy of the effort.

BOOK REVIEW

Floral Design and Arrangement, by Gary L. McDaniel. Reston, Virginia: Reston Publishing Company, Inc., 1981, 261 pp., $16.95.

Floral Design and Arrangement is full of everything you need to know about the techniques of floral design for the new, as well as the experienced designer.

The nine chapters are as follows: A History of Floral Design, Principles and Elements of Floral Design, The Mechanics of Flower Arranging, Basic Floral Arrangements, Corsage Construction, Dried and Everlasting Design, Holiday and Seasonal Design, Wedding Designs, and Funeral Designs.

Each chapter gives excellent step-by-step instructions for creating numerous arrangements from the basic to the intricate. The selection of flowers and foliage, the care and conditioning of cut flowers, the selections of floral containers, stem supports and wiring. The photographs and art work in this textbook provides excellent supplemental help to the reader and student.

At the end of each chapter are selected references, terms to know, study questions, and suggested activities for the student. A glossary is provided in the back of the text.

This is an excellent textbook or reference for high school students in vocational agriculture.

Hebron Smith
Gackle Public Schools
Gackle, North Dakota

THEME

The Johnstown Story . . .

Horticulture Is A Working Experience

By John Bierbower

Editor's Note: Mr. Bierbower is Vocational Agriculture Teacher, Greater Johnstown Area Vocational-Technical School, Johnstown, Pennsylvania 15904.

The horticulture program at Johnstown (Pennsylvania) Area Vocational Technical School (AVTS) can be divided into four areas: technology, landscape development, nursery production, and mechanics. The emphasis in the program is on the simulation of work experiences for the students in these four areas.

The best way to simulate work conditions is through the use of a land lab facility. All areas of the land lab have been, or are presently being, developed in a manner so that the students are in a variety of situations similar to those encountered on the job.

Land Lab Features

The land lab consists of 50 acres with a number of improvements. Centrally located in the land lab is a golf course. This 3-hole golf course has shots of 150 yards, 425 yards, and 320 yards. All greens and tees are of various sizes and shapes. The course is irrigated by a Rainbird System. When completely installed, the system will be fully automatic. On the golf course, the students learn proper care of turfgrass by mowing the various areas, applying pesticides and fertilizers, and other important turfgrass culture techniques. This area is also used for teaching landscaping by providing natural settings in which to design and layout landscapes.

Another vital part of the land lab is the nursery area. This is made up of two sections, a production area and a specimen area. The production area is presently being changed from 10 foot x 10 foot blocks that were maintained by students to a more efficient and practical row planting system. With the increase in plant material it has become necessary to make row plantings so more mechanized procedures can be followed. Approximately 10,000 liners and transplants have already been put into rows. At the present time the material is being placed on two foot spacings. The container stock has, in the past, been kept along the greenhouse in a fenced area. With the size of the material and the need to spread them out, a 50 foot x 80 foot area has been leveled and will be covered with black plastic to serve as the container stock area.

The specimen section of the nursery contains various plant materials with three samples of each selected variety. Using the specimen nursery, the student learns to judge material, prune, take cuttings from named varieties, and, in general, compare materials used in landscaping. The rows are mulched with grass walkways so they can be used regardless of weather conditions and for easy maintenance.

Learning Activities and Skills

Through the use of the land lab, the student can develop many important job skills. Students cannot learn to plant liners or B&B trees if they are not frequently involved in this experience. Repetition is important if a student is going to remember a skill well enough to perform it properly in a job situation. The program is being developed so that the student's exposure to pruning, for example, is not limited to a one-day experience. Rather, the student is provided with a chance to prune a variety of plant materials.

While performing these skills, students must be able to see their progress. This is being accomplished through a competency-based curriculum. This allows for the instructor to develop an individual-type learning system to fit each program. Packets for each of the four horticulture areas contain information, activities, and tasks that the student can proceed through at their own pace. This competency-based learning system will allow students, who wish to specialize in their senior year, to master the competencies in their selected areas. By accomplishing all tasks and developing maintenance and production schedules for the various areas in the land lab, the student will become proficient in specialized areas.

Plant Materials

In the past four years, the nursery has grown to 20,000 pieces of stock, ranging from liners to marketable shrubs. This includes about 30 varieties of field stock as well as container stock. Most of this material is still in the liner stage. A rotational plan is presently being established.

The goal is to operate the nursery as a commercial business. Several of the advisory committee members have expressed interest in purchasing plant material on a wholesale basis. Since the school is not permitted to sell to the general public, this provides a vital outlet for marketable material. Also much of this stock is destined to be used in landscape designs around the school, some will be sold within the school, and some will be planted into Christmas tree plots.

This may seem to be a rather large operation for a school, however, in order to simulate actual nursery situations, a program must be able to set up an operable nursery at least on a small scale. Students cannot become competent in horticulture unless they become actively involved in the everyday aspects of a business.

Obtaining Plant Materials

Many programs fail to have sufficient plant material due to the lack of funds. The simplest method of overcoming this problem is to propagate the plant material readily available in the area. The start of the nursery at my school was by this method. Much of the plant material was started by taking cuttings from the school area, requiring students to bring in cuttings, and collecting and planting seeds. Through marketing of excess material, plants from local wholesale nurseries have been purchased, allowing for many named varieties of plants to be grown.

Depending on the age of the liner, production time for most plant materials is at least 3 years. This gives the students good experience in long-term production. In many cases they never see the plant reach marketable stage. To maintain interest and to give students an opportunity to take a crop from start to finish, short season crops are also used. These include roses and hardy garden mums. Roses are bought in early spring, potted, maintained, and sold as a spring crop. Mums are started from seed, carried through the summer, and marketed as an early fall crop. Different varieties of perennials are being explored to determine the possibilities of using them as a crop.

In order to propagate, grow, and produce quality nursery stock, it is necessary to have the appropriate facilities. Many of these can be constructed by students as a learning experience. Within the land lab at Johnstown Vo-Tech, the following structures are utilized: greenhouse, wintering house, hot bed, seed and transplant beds, and a storage building.

Community Involvement and Participation

Community involvement has become a significant element of the horticulture program. Community support promotes the program as well as provides students the opportunity to take pride in their work. Students become very enthused when given the chance to "show-off" their skills in the public eye. The following are just three of the community projects that are included in the program.

Arbor Day Demonstration. What better time to promote horticulture than on Arbor Day? The program does just that as an annual project in conjunction with a local elementary school. The horticulture students spend the day at the elementary school planting several trees in the landscape and giving demonstrations to the younger students. It is surprising how quickly students become teachers when given a chance to use what they have learned. About 2,000 tree seedlings that have been raised in the nursery are given away.

Students are taught how to plant seed for bedding plant production. (Photograph courtesy of David Agnew, Mississippi State University.)

Field Trips. In addition to trips that are taken to view certain facilities, the students also become involved in "working field trips." The latter includes trips to advisory committee nurseries, golf courses, and businesses. During these "working field trips" the students are given a tour of the facility and then do hands-on work. This gives practical experience as well as assistance to the members of the advisory committee.

Landscape Maintenance. Several years ago the horticulture program had the opportunity to renovate the landscape of the Community Veterans Memorial Park. In addition to re-designing the landscape, the program donated and planted nursery stock. In the spring of each year, the students do maintenance work and plant flower beds. Students learn landscape maintenance on a practical basis, and the public enjoys an attractive park.

Future Additions

In order to keep improving the program, the following additions are being developed.

Turf Plots. These plots will be used to do studies in fertilizer rates, mowing heights, and identification of varieties.

Rose Garden. This will be a landscaped area approximately 60 feet in diameter. The roses will be contained in the outer edge in raised beds. The inside area will be planted in grass with benches placed in a landscaped park setting.

Sales Area. Here the students will learn how to arrange stock for sale, grade and price material, and prepare it for market. The students will be assigned to this area to obtain experience in marketing of nursery stock on a practical basis.

Wintering-Lath House. This quonset-type structure will be constructed of conduit pipe. Lath will be attached to the inside of the pipe so that it will provide shade through the summer months for young nursery stock. With the lath to the inside, there is no interference with the plastic that will be put on for winter protection. This will allow for total utilization of the structure throughout the year.

Christmas Tree Plantation. As the evergreen tree material matures in the field area and needs transplanted, this area will be utilized as a place to contain Christmas trees. These trees will be planted in blocks according to varieties. Here the students will learn the cultural care and management for growing Christmas trees.

Even when the above features have all been accomplished, the horticulture program at Johnstown AVTS will not be complete. It will continue to grow by offering new and updated training materials. As in any vocational training program, the first and foremost concern of the horticulture instructor is to train the student for a career. In order to do this we must develop quality programs that not only offer the technical training, but also provide facilities in which the student can gain valuable hands-on work experience.

Horticultural Mechanics: An Unanswered Need

By Richard Makin

Editor's Note: Mr. Makin is Vocational Agriculture Teacher at Admiral Peary Area Vocational-Technical School, Ebensburg, Pennsylvania 15931.

The horticulture industry is undergoing many changes. Labor-intense operations are becoming increasingly mechanized. Entry level workers are expected to maintain and operate a wide range of agricultural tractors and nursery-related equipment. Basic mechanics skills in horticultural structures are needed to insure quality environmental control. The use of small gasoline engines is unprecedented in the horticulture industry of today. In short, mechanization has changed the nature of horticulture.

Horticulture teachers need to include these changes in their classroom and laboratory instruction. Should horticultural mechanics become a more integral part of the curriculum? If so, what competencies should students develop prior to entering the work force?

Needed Instruction

Interest in horticulture mechanics is by no means new. During the past decade numerous researchers have conducted task analyses in a variety of horticultural occupations. The majority of these works have resulted in a common finding. Employees in the horticulture industry are often expected to perform tasks of a mechanics nature. Nursery/landscape, greenhouse, turfgrass, and even retail floriculture workers need varying degrees of mechanics skills. Recommendations have long been made that mechanics instruction be included as part of the horticulture curriculum. Unfortunately, many full-time horticulture programs are still not involved in teaching mechanics skills and their application to the horticulture industry.

Competencies to be Taught?

What competencies should students develop prior to working in the horticulture industry? As a horticulture teacher, you are best able to answer this question specifically through involvement with your advisory committee and prospective employers in the area. A grassroots survey will quickly answer this question in any given locale.

However, some generalities can be made in deciding what mechanics areas should be taught. Due to the nature of the industry, the operation and maintenance of spraying and spreading equipment is a high priority. So, too, is the operation and maintenance of agricultural tractors and nursery-related equipment.

In a study in Pennsylvania (Makin, 1981), representatives of horticultural businesses indicated that 15 of 171 mechanics competencies were "most essential" to their particular enterprise. Thirteen of these were from two mechanics groupings — spraying and spreading equipment and tractors. The important principles of operation and maintenance were continually stressed.

The mechanics groupings from which many mechanics competencies were classified as "essential" were plumbing and water systems, electricity, and horticulture construction. These included tasks such as installing a solenoid valve, wiring an on-off switch, and interpreting blueprints and sketches.

Other mechanics groupings that warrant varying degrees of instruction were fitting and repairing horticultural tools, environmental controls, soils, irrigation, and sprinkling systems.

Teacher Proficiency

Clinton Jacobs, professor of agricultural engineering at the University of Arizona, stated that "a successful product is usually equaled with a relevant program and an instructor who has superior competencies to teach and direct the program."

The horticulture teacher is often regarded as knowledgeable about soils, plants, flowers, and little else. Competence in the area of mechanics is questioned and often ridiculed. In the past, problems with rotary mowers, injector pumps, or electric motors meant additional work for the agricultural mechanics teacher. In the future, the horticulture teacher should plan to use these situations in the horticulture laboratory.

Instruction in horticultural mechanics can no longer remain optional. Teachers of horticulture must:

- recognize the relevance of mechanics in the horticulture industry,
- identify mechanics competencies needed by workers in horticulture,
- improve and demonstrate proficiency in horticultural mechanics, and
- include horticultural mechanics instruction as part of the curriculum.

With these objectives in mind, horticulture teachers can better prepare students for the world of work.

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Entrepreneurship in Horticulture . . . Should I Start My Own Business?

By Travis Phillips

Editor's Note: Dr. Phillips is owner of Phillips Garden Center in Starkville, Mississippi 39759 and Professor in the Department of Agricultural Economics at Mississippi State University.

A relatively high proportion of students with agricultural interests have a strong desire to go into business for themselves. This interest in owning a business is growing among students who are enrolled in horticulture programs.

The purpose of this article is to explore some of the facts of starting an ornamental horticulture business. A business in the horticultural field might consist of a production operation such as a nursery producing shrubbery and trees or a greenhouse operation producing foliage plants or floricultural crops. The retail counterparts are retail nurseries or garden centers and retail florists. The experts suggest that one should specialize in either production or retail sales rather than mix the two.

Since this article cannot address all of these aspects of the horticulture industry, the garden center was selected for purposes of illustration. Garden centers are distinguished from retail nurseries by the wider variety of merchandise sold other than shrubbery and trees. There are many ways to address the question of whether students should start their own garden center business. Perhaps one of the more meaningful ways is to look at the major requirements for a successful business: (1) a market potential for the business, (2) managerial skills, and (3) adequate finances.

Market Potential

Those who want to start their own garden center should locate in an area where there is an adequate market. The last Census of Business-Retail Trade indicated that in 1978 there was an average of 32,000 people per garden center in the United States. If there are not sufficient potential customers for the new businesses, costs per unit of merchandise will be so high that profits are not possible. A new business operator should not expect to be able to push existing businesses out and take their customers. In short, the consideration of going into business should begin with a feasibility study.

Management Skills

An important ingredient for success is managerial skills. A majority of new businesses fail within the first five years. Research indicates the major cause of failure is poor management.

The functions of management are planning, organizing, directing, coordinating, and controlling a business. The manager is responsible for making plans, organizing both people and the physical layout of the business, directing or providing leadership, coordinating both people and physical activities, and controlling the business by setting goals and checking the performance of the business. An additional activity involves assessing the needs for personnel and staffing the business. Management is not "bossing," but it is the providing of positive leadership.

Financial Considerations

The third requirement for a successful business is money. Unfortunately, too many think of financing as the investment capital for real estate, fixtures, and merchandise. Often few funds are made available for operating or working capital. Inexperienced business operators often think they only need sufficient operating capital for making change for the first few customers. In recent years, lack of adequate cash flows has been the major downfall of many potentially profitable businesses before they ever really got started.

Where can a young person secure adequate funds to start his or her own business? For many, without careful planning and saving over time, funds are unobtainable. The usual source of money is borrowing from commerical banks often guaranteed by the Small Business Administration. The individual must have some of his or her own funds to invest and have a carefully laid-out, detailed plan for the proposed business.

Getting Started

Rather than attempt to start a business from the beginning, a much safer approach is to often begin by getting experience in an established garden center. If the individual has the ability to own a business, he or she should be able to move up in management and gain valuable experience. By careful selection of an employer, students may be able to find an owner looking for a younger person to take over. Frequently, the original owner sells the business to the employee and provides most if not all the financing. In this case the seller is interested in making terms which the younger buyer can meet. Trade associations and magazines are good sources of locating businesses which may be purchased this way.

Advantages and Disadvantages of Ownership

Why should an individual want to own a business? Most

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Entrepreneurship in Horticulture . . . Should I Start My Own Business?

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people dream of being their own boss. Owning the business means that all the profits accrue to the owner. People are rewarded for their contribution. Ownership carries with it the flexibility of making changes desired by the owner.

Ownership is not without its disadvantages. If ownership gives all the profits to its owner, so go losses. Income is variable for ownership while salaries are fixed. Funds must be located for the investment. Borrowed funds may be difficult at times to repay. Unexpected economic conditions, competition, unfavorable weather, and many other conditions may make finances difficult to handle. Being responsible for all aspects of management often is not nearly appealing as it may have appeared. Failure to give proper attention to some aspects of management may be disastrous. While ownership may provide some degree of flexibility, it allows less flexibility in other ways. The owner is locked into the given situation and is responsible for making the best of it. As an employee, one can move when the situation is unacceptable. As an owner, an individual may be locked into undesirable conditions.

Preparing for Entrepreneurship

What should a student receive in school to help manage his or her own business? Studies in which established business leaders are asked what skills new employees should possess place business training and communication skills at the top. There are many aspects to business training, but two stand out. Some knowledge of bookkeeping, even though someone else will keep the records, is absolutely essential. Financial management is equally important. Skills in selling and merchandising are needed. The ability to communicate with employees, customers, buyers, and the general public is necessary. Competence in verbal and written expression is also highly desirable.

The manager must be a leader. Leadership must be based on respect and demonstrated knowledge of how to manage the business. Most of this demonstrated ability is manifested in planning ability. The manager should always be looking ahead and be willing to share with key employees what he or she sees in the future.

Prospective garden center owners should visit with several garden center managers about going into business. Of course, these managers should not be those who may be future competitors. Visiting garden centers in the area which are considered to be successful is invaluable. Talking to management of these businesses is well worth the time.

Many horticulture students dream of owning their own business. Only those who properly prepare themselves and plan ahead will be successful. Locating in an area with the potential for another business and having adequate finances are necessary but being properly prepared as a manager is most important.

THEME

The Buckeye Story . . .

Considerations in Horticulture Programs

Success in a local horticulture program can be achieved if the instructor will apply certain principles in planning and carrying out the program. At Buckeye (Ohio) Joint Vocational School, we have learned from our experiences.

This article will discuss several areas of concern: laboratory layout and design, plant materials, learning activities, and supervised occupational experience (SOE).

By Jim Scott

Editor's Note: Mr. Scott is Vocational Agriculture Teacher at Buckeye Joint Vocational School, New Philadelphia, Ohio 44663.

Facilities

The characteristics of the laboratory facilities have a direct influence on instruction. The teacher in an existing horticulture program should follow four basic steps when improving the laboratory. First, evaluate the effectiveness and efficiency of the present facilities. Secondly, a five-year plan should be developed with realistic goals for improvements and/or additions to the present facilities. The third step is to implement this five-year plan, with the fourth step being to evaluate progress on an annual basis.

In establishing new horticulture programs, consider the above steps along with community needs. The planning process should include surveying the community to find out what types of horticultural businesses are in the area and what the employment outlook will be. These surveys should indicate the specific areas to include in the curriculum and the facilities needed.

A suggested list of facilities for a horticulture program may include the following:

- greenhouse
- headhouse/potting room
- floral design room/sales area
- related classroom
- cooler/display window
- nursery
- golf green
- polyhouse
- lathhouse
- office area
- orchard/vegetable gardens
- arboretum/turf plots
- coldframes/hotbeds
- locker/shower area
- adequate in/outdoor storage areas
- athletic fields/lawn areas
- sufficient supplies, hand tools and equipment

Plant Materials

Students who have a good working knowledge of plant material identification will have an advantage in their jobs. Plant materials can be taught in a variety of ways. An arboretum on the school grounds and dry-mounted leaf collections are excellent in teaching plant identification.

For example, in teaching floriculture plant materials, I designate a specific area of the school greenhouse for specimen plants. I also have students collect color photographs of plant materials from seed catalogs, old magazines, posters, and flyers. The students mount the photographs on paper and identify the plants by common and scientific names. Throughout the school year the students add cultural information to the paper on which the photographs are mounted. Approximately five plants per week are discussed.

Often it is not feasible either due to limited space or economics to have a large collection of plant materials in the laboratory. Local horticulture industries often have an unlimited variety of plant materials which they are willing to share.

SOE Considerations

SOE is beneficial in developing horticulture skills. Placement, ownership, and directed laboratory programs may be developed for students. I have found home visitation to be an effective tool in the development of quality SOE for each student. We require a minimum of three home improvement projects per year, one production project over the two year period of enrollment, and participation in county and state fairs.

Through SOE participation, students develop essential job skills in the summer months while school is not formally in session. Our students are required to have 24 hours of summer instruction. The horticulture students at Buckeye JVS are placed in various horticultural businesses for a half-year if they meet grade and attendance requirements. Accurate records are kept of each student's progress using record books and skill charts.

Adequate plant materials and facilities are essential for a quality program.

Students need opportunities to practice a variety of job-related skills.

The students at Buckeye JVS participate in directed laboratory experiences. For example, the students design all of the floral pieces and decorations for a wedding. The purpose is to acquaint the students with wedding details both from the florist's viewpoint and from the customer's viewpoint. Students gain valuable experience in floral design. Plans are being made to hold a mock funeral in order to study the different viewpoints taken by the funeral director, surviving family, and florist in the techniques used in constructing funeral pieces. The personal and human relations skills taught through the wedding and funeral simulations are very beneficial to our students.

In planning, we must consider students with special needs. Two handicapped students in our horticulture program at Buckeye JVS were deaf and mute. The learning of sign language was a challenge! One student worked in a flower shop and performed many of the basic entry level skills in floral designing. The other student is presently employed by the City of New Philadelphia and works on the landscape maintenance crew for the City Cemetery.

Program Effectiveness

Educators need to evaluate the effectiveness and efficiency of horticulture programs. Consideration needs to be given to the insuring that the training prepares individuals for success. The quality of the horticulture program will have a direct effect on the quantity and quality of skills developed by the students.

ARTICLE

Building a Horticulture Program

By Len Harzman

Editor's Note: Dr. Harzman previously taught vocational agriculture in Abilene, Kansas. He is presently Head of Agriculture Education at Western Illinois University, Macomb, Illinois 61455.

An increasing number of teachers of vocational agriculture are teaching horticulture. A major plus for teaching horticulture is that the instruction is valuable for both boys and girls, special needs students, rural and urban students, vocational and non-vocational students, and adults. In addition, incentives and awards are provided in horticulture proficiency areas through the FFA at the local, state and national levels.

Steps in Developing a Program

While teaching vocational agriculture at Abilene High School, the following steps were taken by the author to develop and successfully establish the horticulture program on a sound basis:

Step 1: After consulting with the principal, a brief survey was made of the students in the freshman and sophomore English classes to determine if sufficient interest existed. The English classes were chosen because they included all students at that level. The results of the survey revealed a very high degree of interest among the students.

Step 2: Various resource books were used to determine which units of instruction should be taught, and in what sequence. A course outline was then developed.

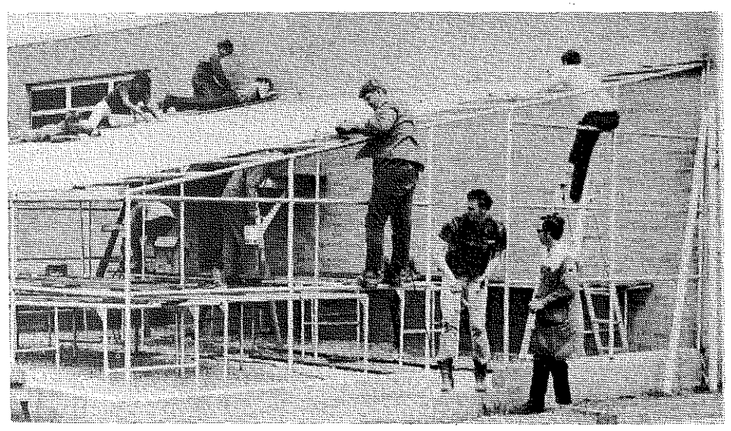
Step 3: An advisory group was established to obtain ideas and recommendations for the program. The group consisted of three persons who operated horticulture businesses in the local community. The advisory group revised the course outline and provided many ideas needed to successfully conduct the horticulture program.

Step 4: Using the course outline as a guide, a list of materials, supplies, and equipment, and a budget were developed which would result in effective instruction in the classroom and laboratory.

Step 5: From the ideas and recommendations of the advisory group, a lean-to style greenhouse was chosen as the laboratory. It was decided that the students in the vo-ag construction class would construct the 25 foot x 30 foot greenhouse.

Step 6: After making a scaled drawing of the greenhouse and organizing the information, the proposed horticulture program was presented to the board of education.

Step 7: Upon arrival of the Board, which was almost immediate, the plans were carried out. The greenhouse was constructed during the same school year by very enthusiastic students in the agriculture construction class. The greenhouse was constructed by using a 1¼" pipe framework set on a concrete foundation. The framework was made rust-free by using several coats of aluminum paint. The shell of the greenhouse was made of 5 oz. clear corrugated fiberglass.



Step 8: The following school year, there were 18 students enrolled in the course. There has been approximately the same maximum number of students each year since the program was started in 1973.

Students in the horticulture program receive instruction and experience in the areas of plant identification, growing media, plant propagation, floral design, disease and insect control, gardening, lawns and turf, landscaping and greenhouse operation and management.

Gaining Practical Experience

To prepare for teaching the course in horticulture, the author worked during the summer at a local wholesale greenhouse operation. In-service instruction was received at Kansas State University during the summer and in evening classes throughout the next several years.

As a result of quality horticulture programs at the secondary level, students are presented with many of the competencies needed for such occupations as greenhouse operator, nursery operator, florist, greenskeeper at a golf course, landscaper, horticulture teacher in technical programs, and horticulture therapy — an emerging occupation. Students who plan to progress in the field of horticulture need to obtain additional training and experience at a postsecondary school or university. Through a quality instructional and experience program taught by an enthusiastic and well-qualified teacher, students will continue to obtain satisfying gainful employment in the wide variety of occupations in horticulture.

ARTICLE

Standardized Testing in Horticulture

By Charles C. Drawbaugh

Editor's Note: Dr. Drawbaugh is Professor of Agricultural Education at Rutgers University, New Brunswick, New Jersey.

As a teacher or administrator of vocational and technical training in horticulture, you can assess the benefits of a standardized test to you and your position by answering these questions: Do your students need to demonstrate their level of competence on a standardized test and use the test results as a credential for employment or advanced standing in educational programs? Is there pressure to provide objective means of grading students and to improve, update and validate curriculum for maximum student achievement? And, are you interested in documenting teacher effectiveness through student achievement and competence? If the answer to one or more of these questions is a resounding "yes," the Student Occupational Competency Achievement Test in Horticulture may be an invaluable resource for you.

About the Test

For your information, the Student Occupational Competency Achievement Test in Horticulture (SOCAT-HORT) consists of two parts — written and performance. The written part, prepared in a multiple-choice question format, covers factual knowledge, technical information, plant science principles, and problem-solving exercises related to the horticultural enterprise. The performance test, administered in an appropriate laboratory setting, consists of work assignments designed to sample the manipulative skills required in the occupational area. The test enables horticultural students to demonstrate proficiency in competencies which horticulturalists with many job titles employ in their daily work. In addition, a mental aptitude test is available as a part of the complete package for administration at the secondary level if those utilizing the SOCAT-HORT request it.

The SOCAT-HORT is broader in scope than ornamental horticulture as set forth and described in the Agricultural Education Taxonomy. Nearly one-half of the written test is based on an Arboriculture/Landscaping/Turf cluster; one-third is prepared from an Oleoriculture/Small Fruit/Tree Fruit cluster; and the remainder is written on the Floriculture/Floristry/Greenhouse cluster. The validated written test contains more than one hundred questions in each of two forms.

The performance part of the test samples the student's ability to perform nine jobs judged to be critical and important to the horticultural industry. The jobs are performed in a work setting or work simulation environment as realistic as possible. Each job is standardized in terms of (1) procedures for doing it; (2) tools, equipment, and machinery necessary and appropriate for the job; (3) set up for the job; and (4) time allotted to complete it.

The performance evaluation key for each job includes at least four process criteria and at least four product outcomes. Each of the eight or more evaluative measures were awarded weights which reflect their importance in accomplishing the overall job. Using the performance evaluation key with the list of weighted measures, an evaluator rates the student's work on a scale of from 1 to 5 for each process and product and also records the time required for the student to complete the job. The total score for the job reflects the weightings, ratings, and time constraint.

Preparation of the Test

The written and performance parts of the test were generated by a team of specialists which included a teacher of agriculture, a county agricultural agent, a representative from the horticulture industry, a professor of ornamental horticulture, and an agricultural teacher educator. The team was guided by a six-member advisory committee. The composition of the test was influenced by such horticultural resources as the National Ag Occupations Competency Study, the V-TECS Catalogs of Performance Objectives, the Task/Activity and Occupational Analysis Instructional Materials from The Ohio State University, and the Guides prepared by the Florida Department of Education. Drafts of the test were submitted to the National Occupational Competency Testing Institute (NOCTI) for pilot testing.

NOCTI gathered validity data on the test in several ways. The test was piloted in secondary and postsecondary schools throughout the United States. Additionally, a validation team from a six state area was assembled to review the written test items on such things as biases relative to geographical areas, climatic conditions, plant material selection, cultural practices, and technical language.

The performance part of the test, as revised, is valid and representative of the horticultural competencies to be performed; relatively unbiased in terms of geography, climate, plant materials, and cultural practices; fair in terms of time allotments for completing each job in the three-hour test; and reasonably inexpensive to administer. Such statistical functions and procedures as item analysis, calculating test reliability, and generating normative data were very much a part of the test development exercise. A concerted effort was made to develop a test that meets general standards for educational and psychological testing and will be commonly used by the educators in the horticultural programs.

Pilot Test Reveals Programs

Three general observations about instructional programs were made as a result of the pilot testing. First, many of the present horticulture programs at

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Standardized Testing in Horticulture

(Continued from Page 17)

the secondary level are very narrow in their offerings to students. The offerings are often limited to nursery management and operations or landscaping or greenhouse management and operations or floral arrangement. Ornamental horticulture is broader than the four areas combined because it also includes the arboriculture, floriculture, and turf areas as well.

Horticulture is even more encompassing than ornamental horticulture in that it includes all of the above and also vegetable crop production, small fruits, and tree fruits. Hopefully, the all-encompassing horticulture test will cause teachers and administrators with limited offerings to rethink the comprehensiveness of their horticulture programs. Training too narrowly can be training for unemployment.

Secondly, some of the pilot testers in the field reported that insufficient time was allocated to complete the job assignments in the performance part of the test. An automatic response is to question if students in horticulture training are being taught to work efficiently. In addition to doing a job properly, students who will become entry-level workers must be able to work fast enough to turn a reasonable profit. Productivity on the job may require practice in the learning environment to meet the job standard. And, too, perhaps attitudes about work and working need to be stressed and reinforced more in school.

Thirdly, it was reported from a few of the pilot test sites that supplies and materials sometimes were not available to set up the specified jobs for the performance part of the test. It seems reasonable to assume that if supplies and materials were not available for testing, that they probably were not on hand for instruction. Adequate supplies, materials, equipment and facilities are basic to both instruction and testing.

Testing and Test Results

The SOCAT-HORT is designed to be used by individual teachers or schools and can be administered in school as a part of an on-going program. After the tests are administered, they are mailed to NOCTI for scoring. Printouts of test scores are returned to the school. A one-page printout will be provided for each student. It reports aptitude along with written and performance scores and subscores on the competency test. These scores can be used diagnostically to determine student, class, or school strengths and weaknesses. Students also receive data which indicate their standing in relation to their school, state, and consortium of participating states. Teachers receive detailed printouts with student and class scores for the school, state, and consortium.

The SOCAT-HORT package can be of help to your students as an employment credential or for gaining advanced standing in future educational programs. It can provide an objective means for grading your students and improving your curriculum. It can document your effectiveness as a teacher through student achievement and competence. The Student Occupational Competency Achievement Test in Horticulture can be an invaluable resource to you and your program.

Note: The National Occupational Competency Testing Institute (NOCTI) is a nonprofit educational corporation organized in June, 1973, which provides teacher and student competency tests to the vocational education community. The Student Occupational Competency Achievement Testing (SOCAT) program was conceived as a specific program area within the NOCTI organization. A group of State Directors of Vocational education have taken the leadership in the development of the SOCAT program. Most of the tests prepared to this point are in the Trade and Industrial service area. However, tests have been initiated and constructed for the other vocational education service areas. The Horticulture Test was the first produced for the Agricultural Education service area. If you would like more information on the SOCAT-HORT, please write directly to NOCTI, 45 Colvin Avenue, Albany, New York 12206.

ARTICLE

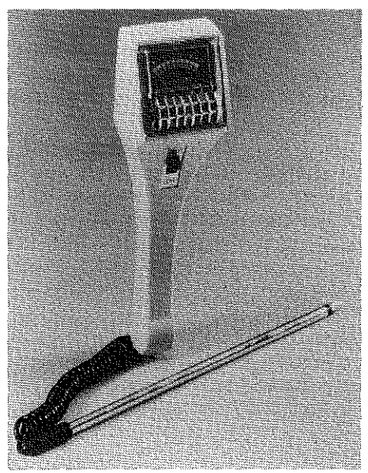
Light and Moisture Meter

The new Micronta Light & Moisture Meter helps insure proper care of plants. It is a hand-held tester with a metal probe for soil moisture measurements and a solar cell for light-level measurements. A switch selects whether light or moisture measurements are being taken, with results clearly visible on the face of its built-in meter. The moisture probe is connected through a coiled cord that permits easy testing of hanging and hard-to-reach plants. The tester is completely self-powered, requiring no batteries ever.

By Martin B. Winston

Editor's Note: Mr. Winston is Director of Publicity for the Tandy Corporation, 1800 One Tandy Center, Fort Worth, Texas 76102.

The Mocronta Light & Moisture Meter for Plants comes with a fact-filled instruction manual that includes plant-care hints, plus suggested optimum light and moisture meter readings for hundreds of plants. The meter is available through Radio Shack.



ARTICLE

Planning A Field Trip

By Rick Foster

(Editor's Note: Dr. Foster is Assistant Professor, Department of Agricultural Education, University of Idaho, Moscow, Idaho 83843.)

Field trips can either be the perfect supplements to an effective instructional unit or unnecessary and unplanned events carried out at the whim of an instructor for no apparent educational reason.

A field trip is generally defined as taking a group to a specific place for a specific purpose. Usually the outing is of short duration, 1-3 hours. The primary purpose of a field trip is to observe situations, actions, or practices that cannot be brought into the classroom. It may also provide opportunities for students to actually develop new skills. The important consideration remains that it be an educational experience that fits well into an instructional program.

Field trips can be most effective by following basic planning steps and by keeping the primary purpose of the field trip in mind.

STEP 1: Define the purpose of the field trip.

Just as we need objectives for our daily lessons, so do we need objectives for our field trip. To go out to a nearby farm with no idea of why your class is going is to waste your time, student's time and your host's time, as well as some very valuable educational opportunities. Write down the objectives and activities you wish to accomplish before any contact is made with your resource person. Have your act together!

STEP 2: Make arrangements with the field trip host.

Several items must be discussed with the field trip resource person. Your host should know in advance the number of students attending, the planned arrival and departure time and the activities expected. There may also be special arrangements that need to be made regarding safety or sanitation. It is extremely important that both students and the host are prepared for a worthwhile educational experience.

STEP 3: Plan the field trip so it comes at the appropriate time in an instructional unit.

Remember, the field trip must add to classroom instruction and not be just an easy alternative to an unplanned lesson. Discuss the field trip as it relates to your unit prior to leaving the school.

STEP 4: Prepare the class for the trip.

Prior preparation of students is essential. Students should be advised of all necessary arrangements and expectations of them during the field trip. Proper dress and actions should not only be encouraged, but required. Student interest and good behavior can be assured if they are expected to accept some responsibility. This can be accomplished in a variety of ways, including:

Using students to help arrange the field trip and to help summarize and evaluate the activities.

Providing students with a list of field trip-related questions to answer.

Involving students in the actual field trip activities.

Using the field trip and subsequent conduct as the basis for a daily grade.

Using field trip information as a reference for a quiz.

Above all, appropriate student conduct must be maintained during transportation and at the field trip site. Irresponsible student behavior can make your field trip host extremely hesitant about inviting your class back.

STEP 5: Arrange for transportation.

Transportation should be arranged at least two weeks ahead of the scheduled date. Usually school sponsored transportation will have appropriate insurance, however, liability coverage should be confirmed prior to leaving on the trip.

Caution must be exercised in allowing students to provide their own car transportation. In fact, the safest policy to adopt is that no student transportation will ever be used.

STEP 6: Arrange for payment of field trip expenses.

If there are costs associated with the field trip, determine how they should be handled at least two weeks prior to the field trip date. If students will have to assume some of the costs, both they and their parents should be advised of the costs associated with the field trip. Hopefully, the trip expenses will be borne primarily by the school district.

STEP 7: Thank the host.

Showing appropriate appreciation is extremely important. A letter of appreciation to the host is a must. Such a letter should be sent shortly after the activity and stress the educational benefits received by the students. A newspaper article providing an overview of the field trip and emphasizing both student benefits and the role of the host is an appropriate follow-up activity as well.

STEP 8: Summarize and evaluate the field trip.

Keeping the purpose of the field trip in mind, summarize the activity to ensure that your students received the most from their experience. Evaluate the field trip so that you'll know if a similar activity would be appropriate in the future. Evaluation questions to ask include:

Did the field trip meet the objectives?

Could prior arrangements be improved?

Was the field trip site conveniently located?

Was a safe atmosphere provided?

Did the field trip host provide the cooperation and assistance needed?

If you receive positive responses to these questions, you probably will want to use the same resource for future field trips. It is wise to keep an active file of field trip possibilities.

The field trip is an excellent instructional method because it shows application of classroom learning to real life situations. With proper planning, it can be both a meaningful and educational activity for your students.

IDEAS UNLIMITED

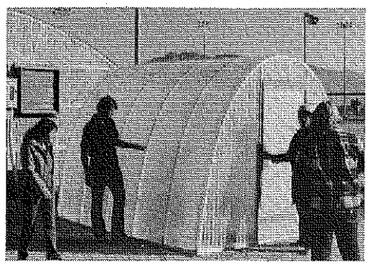
Constructing a Fiberglass/PVC Greenhouse

By Michael E. Henry

Editor's Note: Mr. Henry is Vocational Agriculture Teacher at Flowing Wells High School in Tucson, Arizona 85705. This article is based on his entry in the Ideas Unlimited contest sponsored by the National Vocational Agricultural Teachers Association.

Developing good supervised occupational experience programs for students enrolled in horticulture is sometimes a problem. At Flowing Wells High School (Arizona) some of the students' experience programs are conducted in the school laboratory. Horticulture laboratories can provide many experiences for students, but if SOE programs are going to advance and expand, some capitol investment should be made. Because the cost of buying greenhouses, a plan was developed for the construction of an inexpensive facility.

Over the past four years, we have developed a greenhouse plan that lends itself to the needs of the students in developing a strong occupational experience program in horticulture.

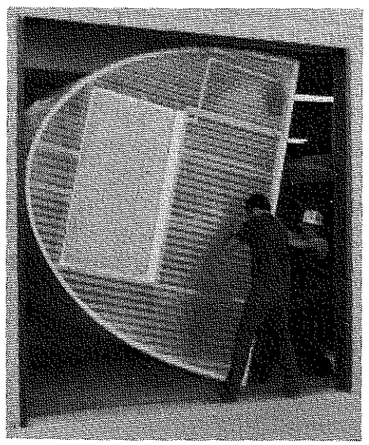


Many changes can be made to this basic greenhouse design. Wooden 2 x 2's are used in framing the door and cooling pads.

The first attempts at constructing greenhouses included a frame consisting of redwood lumber. This type of construction was quickly discarded because of the advanced wood working skills required to complete this project, the amount of time and money required, and the heavy weight of the 10′ x 10′ greenhouse when completed.

The next attempt at building a greenhouse frame was to use six 20 foot lengths of 1¼ inch PVC (poly vinyl chloride) pipe. This type of frame seemed to be the solution to the problems related to the wood constructed frame. PVC pipe is inexpensive, durable, and easily accepts a sheet metal screw, for the fastening of the corrugated fiberglass sheets. By using PVC pipe, anchored at ground level by a 2″ x 4″ base, the students are able to build the greenhouse frame in one afternoon. The finished greenhouse is portable, since the weight of the entire 10′ x 10′ greenhouse is about 200 pounds. Four people can easily load it on a trailer.

Of all the advantages of PVC pipe framing, the most important is the quality of the finished product. You will enjoy helping your students build this greenhouse and be satisfied with the quality of the finished project.



The greenhouse can be completely constructed in the shop and is portable.

ARTICLE

Using Simulation in Floriculture Sales Training

By Theodore G. Layton

Editor's Note: Mr. Layton is Vocational Agriculture Teacher at Caesar Rodney School, Camden-Wyoming, Delaware 19934.

Sales training is important in many horticulture occupations. To help develop skills in selling, students need hands-on experience. The classroom in our floriculture program resembles a small flower shop, including design tables, telephone, ribbon racks, and 10′ by 10′ area set aside for displays and sales training. Students create displays that are appropriate and aid with sales of individual student projects. Major display times include Thanksgiving, Christmas, Valentines, and Easter.

The display includes an area for hanging baskets and potted plants, a sales counter, a glass display case, and a solid wall for displaying advertisements or for hanging items such as decorative brooms or wreaths.

Sales are limited to the employees of the school district. With good planning and an informative sales program (developed by the students), the sales are more than adequate to give the students the needed experience in designing and merchandising.

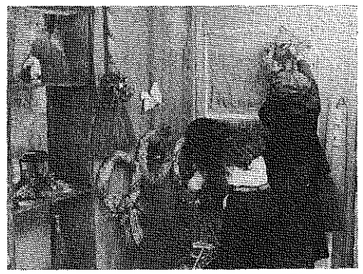
Students gain experience in customer relations by taking orders for arrangements, plants, and other items by phone or by visitors to the classroom.

A few examples of the types of materials we promote are:

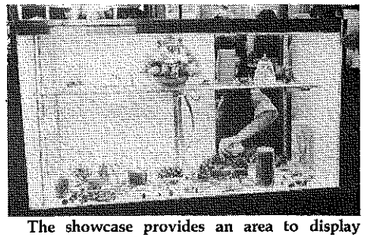
Fall	Dried arrangements
Thanksgiving	Fresh flower centerpieces
Christmas	Wreaths (live and artificial) Decorated brooms (live and artificial) Centerpieces (live and artificial)
Valentines	Bud vases Bouquets Corsages
Easter	Silk flower arrangements
All year	Plants from the greenhouse

Each season offers the opportunity to teach something new. By the end of the year the students have had varied experiences in retail floral management.

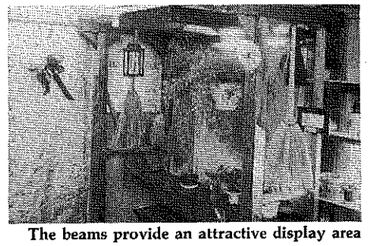
Advantages of the display and sales of student projects include building student confidence in themselves, giving the less fortunate a chance to design arrangements without a direct cost to them, and providing training that can be used in many horticulture occupations.



Students are working on our Christmas display.



The showcase provides an area to display smaller items and serves as a service counter.



The beams provide an attractive display area for our baskets.

ARTICLE

Entry-Level Skills in the Farm Equipment Industry

By James M. Garrison

Editor's Note: Dr. Garrison has been Instructor of Agricultural Education at Virginia Polytechnic Institute and State University, Blacksburg, Virginia 24061.

The importance of the farm machinery area of study is obvious to any vocational agriculture teacher. Without competent agricultural machinery service personnel the industry of agriculture would be hampered. But, what should that person know to be a competent agricultural machinery service worker? Exactly what should be included in the course of study to enable the student to have entry level skills when he/she completes the program? What do the potential employers say is needed from these employees about to enter the job market? These and other concerns led to the development of a study among the Virginia Farm and Industrial Equipment Dealers Association. The findings of that study are summarized in this article.

Purposes and Procedures

The overall purpose of the study was to determine the entry level skills needed by employees in the Virginia Farm and Industrial Equipment Industry (VFIEI). The industry included dealers in Virginia who were members of the Virginia Farm and Industrial Equipment Dealers Association (VFIEDA). All 155 Virginia members listed in the 1981 Association Directory were surveyed. The procedures used were as follows:

Developing the survey instrument. The instrument used in the study was developed through a review of the literature. Sources included the Vocational-Technical Education Consortium of States (V-TECS) catalogs, state department of education curriculum guides for agricultural education, and the National Agricultural Occupation Competency Study. Through a refinement process of the skills gleaned from these sources, a final two-part instrument was developed. Part one was designed to obtain biographical information about the dealer. Part two contained a listing of entry level skills which was divided into four sections: service department, sales department, office department, and parts department. The dealers were asked to check whether each particular skill was essential, desirable, or not needed for entry level employment.

Survey the dealers in the state. The survey instrument was mailed to the dealers with a cover letter asking their assistance and explaining the purposes of the study. The first mailing resulted in a returned survey instrument from 89 dealers (57.4 percent). A post card was sent as a reminder to those dealers who had not responded two weeks after the original mailing. After a follow-up phone call, survey instruments were returned from 98 dealers (63.2 per cent).

Analyze the data. The data were analyzed to determine the frequency of dealers checking the three categories of essential, desirable, or not needed for each entry level skill. In addition, the percentage of dealers who responded in

(Continued on Page 22)

Entry-Level Skills in the Farm Equipment Industry

(Continued from Page 21)

each category was computed.

Review the curriculum guide. The agricultural machinery service curriculum guide for Virginia was reviewed upon completion of the data collection to determine whether the guide followed a plan to teach those entry level skills as determined by the potential employers (VFIEDA) of graduates of the program.

Selected Findings

All of the 157 skills listed on the survey instrument were rated by at least 15 dealers as essential for entry level employment. It is interesting to note that the less technical skills tended to be ranked as essential more often by the dealers than did the more technical skills. For example, 77.3 percent of the dealers felt that changing oil and oil filters on diesel equipment was essential, while only 24.2 percent felt that water testing cylinder heads was essential. Manual skills, such as removing debris from equipment and steam cleaning equipment, received a high rating as being essential for entry level employment. Ten percent of the skills that received the highest number of essential ratings are shown in Table 1. Ten percent of the skills that received the lowest number of essential ratings are shown in Table 2. These were selected from all four sections of the skills list on the survey instrument.

Implications

It is important for teachers of vocational agriculture to know whether or not the curriculum content is meeting the needs of the industry. This study revealed that those teachers teaching agricultural machinery service in Virginia and those that follow the recommended curriculum guide are teaching what the industry expects.

A typical vocational agriculture program includes the teaching of leadership skills, speaking skills, and proper attitudes during the course of study. According to the dealers responding in this study, these aspects of an instructional program are vital for entry level employment. To illustrate the point, the dealers in the study were given an opportunity to list additional skills they felt were essential for entry level employment in the VFIEI. Those listed centered around the following: to be very honest, good housekeeping, maintain neat office space in a professional manner, pride in work, and have a desire to learn.

Aspects of communication skills, honesty, and hard work need to be stressed by the teacher in addition to teaching technical skills to potential employees. As shown in Table 1, good communication skills were essential for employment according to 90 (92.8 percent) of the machinery dealers. Another seven (6.2 percent) felt that good communication skills were desirable for entry level employees.

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TABLE 1

Ten Percent Highest Rated Entry Level Skills in the Virginia Farm and Industrial Equipment Industry

Skill	Number	Percentage
1. Have good communication skills	90	92.8
2. Read and obey safety precautions provided on equipment	88	92.6
3. Use price list to determine prices	90	91.8
4. Follow shielding rules on equipment	88	91.7
5. Follow an accepted procedure in case of an accident	86	89.6
6. Make out sales slip	85	89.5
7. Make correct currency exchange after sale	85	88.5
8. Receive new shipment of parts based on packing slip	85	87.6
9. Sell parts over the counter	85	87.6
10. Use the telephone properly for business transactions	84	86.6
11. Compute sales tax	83	85.6
12. Maintain clean and orderly customer and parts area	83	85.6
13. Start engine using jumper cables	81	83.5
14. Store parts according to established locations	81	83.5
15. Add oil to equipment	80	83.3
16. Inspect for damaged parts on new shipment and contact parts manager	80	82.5

TABLE 2

Ten Percent Lowest Rated Entry Level Skills in the Virginia Farm and Industrial Equipment Industry

Skill	Number	Percentage
1. Retap spark plug threads	29	30.9
2. Replace windshield wiper blades, motors, and control switches	29	29.9
3. Calibrate hydraulic system	28	29.5
4. Repair manual or automatic chokes	28	28.9
5. Keep lost-sales records when using card file systems	27	28.4
6. Keep daily fuel, oil and hydraulic fluid consumption logs	27	28.1
7. Repair tire by patching or plugging	26	27.1
8. Cut, form (bend, shape) metal for repairing equipment using an oxyacetylene torch	26	27.1
9. Water test cylinder heads	23	24.2
10. Maintain and service air conditioners	22	23.2
11. Install and adjust chain on chain saw	20	22.5
12. Adjust carburetor on chain saw	19	21.3
13. Keep lost-sales records when using computer file systems	17	18.3
14. Sharpen chain saw	16	18.0
15. Replace winch line	17	17.1
16. Maintain and calibrate field sprayers	15	15.5

IDEAS UNLIMITED

Election of FFA Officers

By DON LIEBELT

Editor's Note: Mr. Liebelt is Vocational Agriculture Teacher at East High School in Green Bay, Wisconsin 54301. The article is based on his entry in the Ideas Unlimited Contest sponsored by the National Vocational Agricultural Teachers Association.

Numerous methods are used to elect FFA Chapter officers. Many vo-ag teachers have remarked that they don't feel that their best qualified members always become officers. Over the years I have tried many systems and I now feel that I have a system which is fair and results in the election of the best candidates. It has these advantages:

1. Fair and eliminates virtually all railroading and clique-type voting.
2. Allows close to 100% of chapter members to vote.
3. Succeeds in retaining the top candidates as officers. There is no loss of good candidates due to competition.

Method

1. In March of each year we distribute an FFA officer tabulation form to all eligible members. They must turn in applications within one week.
2. The graduating or senior officers examine the applications and certify all eligible and suitable candidates.
3. A ballot is prepared listing all candidates alphabetically. Ballots are handed out at beginning or close of a normal class period and students who are members vote for the 8 candidates whom they consider to be the top candidates. (They do not select a specific candidate for each office.)
4. The ballots are tallied at the close of the day and the top 8 vote getters will become the new officers.
5. The 8 new officers then meet with the president and advisor after school and vote among the 8 candidates for the respective officers, beginning with president.
6. Any one or all 8 could declare for president, but only one will be elected. In this method you won't lose your next best candidates, as they will be elected to one of the other offices.
7. If we have two of eight candidates who declare for president, we have each give a 3 minute impromptu "Greenhand Inspiration" speech. We also have them introduce a guest in front of the candidates. A written exam is also given to the eight candidates and the scores posted. These items will give all eight candidates a good idea of how each can handle these important functions and what their FFA knowledge is.
8. After the new president is elected we proceed on to the vice-president and so on until all are elected to their respective offices.
9. This method results in the election of your eight best candidates, eliminates unfair campaigning and railroading, allows all members to vote for the 8 officers, and results in no complaints.

Every member had a change to apply, run, and be elected, but the final selection to the respective offices is voted by the eight top candidates, who should know best of all, which of them is best qualified for each office.

LETTERS

"Letters to the Editor" is a feature to encourage dialogue among readers of THE MAGAZINE. *Selected letters will be printed without comment or editing. Your letter will be welcomed! (Send letters to: Editor,* THE AGRICULTURAL EDUCATION MAGAZINE, *P.O. Drawer AV, Mississippi State, MS 39762.)*

Editor:

I want to congratulate you on the fine job you've done as Editor of THE AGRICULTURAL EDUCATION MAGAZINE. The increase in the number of articles by instructors is of particular interest to me.

There is one issue that I'd like to throw into the hopper for your consideration. Throughout the nation there are, according to the 1982 Directory for Two-Year Postsecondary Programs in Agricultural Education, 534 two-year postsecondary institutions with 2,049 full-time instructors teaching 68,171 students. In California alone there are 56 institutions, 258 full-time faculty, and 21,181 students. This is a sizable group of agricultural education professionals to which THE AGRICULTURAL EDUCATION MAGAZINE might consider increasing the focus on this group. In California this might also assist CATA in attracting more community college instructors into the professional associations.

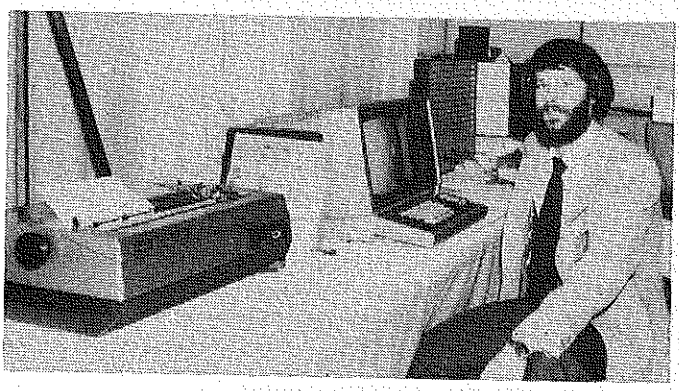
There is a number of high quality two-year agricultural programs throughout the country. My suggestion would be to select a program director from a community college or two-year technical institute, which is not formally a part of a four-year college, to serve on the Editing-Managing Board. This person might play a useful role in including one article on two-year postsecondary programs in each issue. The article would address the established monthly theme. Most, if not all of these articles, in my judgment, ought to be prepared by program directors and instructors.

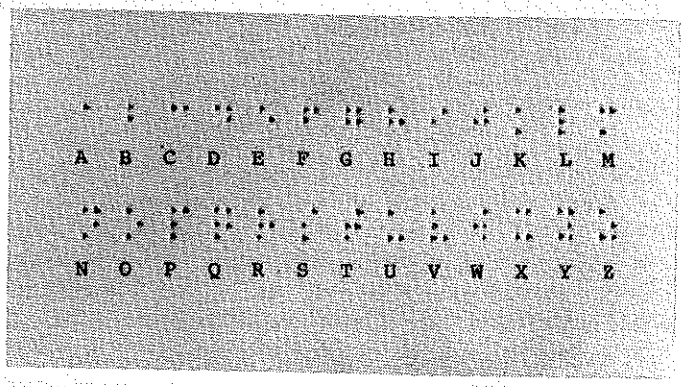
The coordination of securing such articles from California could be performed by the CATA Vice President, Community College Division, and/or myself.

I'd appreciate your thoughts on this idea.

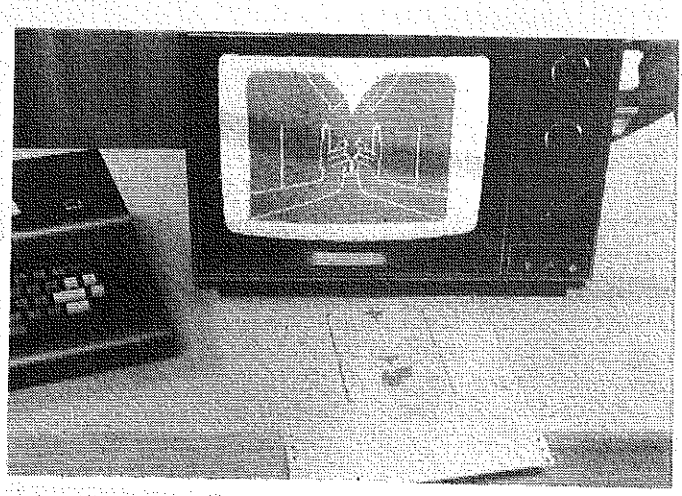
Sincerely,
Ralph E. Matthews, Specialist
Agriculture/Natural Resources
California Community Colleges
Sacramento, California 95814

Computer Update





Randy Dipner of Colorado Springs, Colorado, has developed a system to produce Braille using a microcomputer.



Daniel Johnston of Frostproof, Florida, has developed a computer program that teaches hand-sign language (finger spelling) for communication with the hearing impaired.

(Photographs courtesy of Martin B. Winston, Tandy Corporation, Fort Worth, Texas.)