

The
**Agricultural
 Education
 Magazine**

December, 1990
 Volume 63
 Number 6

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THEME: Developing Entrepreneurship

THE AGRICULTURAL EDUCATION MAGAZINE



December, 1990

Volume 63

Number 6

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Table of Contents

EDITOR'S PAGE	Page
Change, Change For What? Phillip R. Zurbrick	3
THEME: Developing Entrepreneurship	
Agripreneurs Layle D. Lawrence	4
Getting Students to Mind Their Business John W. Cullen, Jr.	7
Opportunities for "Rural" Entrepreneurship Adam J. Sponaugle & Hobart L. Harmon	9
Bullish on Capitalism Mike Gillispie & John Mulcahy	12
Entrepreneurship Education Western Style William A. Hamilton	14
An Award Winning Program Stanton Gartin & Tony Foster	16
Entrepreneurship in Rural America Robert M. Schneider	18
Encouraging Entrepreneurship Gene Coulson & Donald L. Michael	22
FEATURE COLUMNS	
Computer Technology Resources Don R. King & W. Wade Miller	5
Software Sampler Jeffrey A. Wood	17
International Agriculture Gary White & Janet L. Henderson	23
STORIES IN PICTURES	24

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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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Change, Change for What?

Is it little wonder that agricultural educators are in a constant state of confusion? They are continually lambasted by those who harangue them over the need to change and resort to name calling to get attention. They are called traditionalist, hidebound individuals who are incapable of making decisions unless it is tried and true. In defense of the poor agricultural educator, it needs to be pointed out that such an individual is a bastard to begin with coming from the field of agriculture on the one hand and the field of education on the other. These fields are perhaps as different as any two professional fields imaginable.

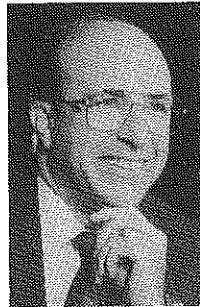
Education tends to hold to the philosophy that nothing is good unless it is different. Thus, education is forever attempting to create new programs and new ways of delivering the product. Perhaps this is due to the fact that those in leadership positions don't want to be held accountable for the quality of the product they offer. By constantly changing what is offered and wrapping it in a new banner, an illusion of progress and being up-to-date is radiated. When problems arise the administrator can point out that the program in question is no longer offered or it has been significantly altered to meet the needs of our modern society.

Agriculture tends to be diametrically opposed philosophically and in practice to education. It is commonly recognized that the most conservative faculty members on a college campus are located in the college of agriculture. This is expressed in several ways such as their dress, the courses they teach and the beliefs they hold. One editor of a national magazine was even advised in a very serious manner about the inappropriateness of having his picture published in the magazine wearing of all things a western hat! This was not professional and far too radical for an agricultural education publication!

Is it any wonder that at one minute an agricultural educator feels like a conservative individual protecting and perpetuating an essential and nationally recognized, high quality, educational program and the next a babbling radical throwing stones at those who would lead the profession out of the dark ages and into the glorious sunlight of the information technology era?

Now that the profession has emasculated the FFA organization; eliminated "vocational agriculture"; expanded the mission of agricultural education and substituted Supervised Agricultural Experience for Supervised Occupational Experience all in the name of progress and positive imagining, it is time to reveal our true grit and propose some real significant changes. It is, after all, time to change the name of the program from agricultural education to some thing more respectable such as Applied Agripreneurship Education. This should be a two year program so as to be compatible with other technological education programs (never use "vocational education").

Heaven knows, it is impossible to deal with programs at the state level that are not exactly the same. It really fouls up the procedures for funding programs and, after all, every



BY PHILLIP R. ZURBRICK, EDITOR

(Dr. Zurbrick is Professor, Department of Agricultural Education, The University of Arizona.)

program must be treated the same. Further, because of all of the new graduation requirements, this educational effort should not be considered a program. Many students are unable to schedule "The Class" during the regular school day, so an open-entry, open-exit seminar taught by guest instructors as an alternative to the traditional vocational education program in agriculture is needed.

This educational effort needs to use sophisticated technology in its delivery. It is proposed that interactive video be extensively employed in the delivery mode using communication satellites and computer technology. Each school will of course need up-link and down-link satellite technology so as to bring the real world into the seminar lounge. (Classrooms are old fashion and must be replaced!) Research scientists could be fitted with wireless microphones and mini-cameras so the student could observe first hand the revolutionary discoveries being made in the high technology laboratories. The student could even talk to the scientist as he/she carries out this fascinating true life drama.

Extensive student activities developed through the collaboration of teachers and scientist using computer technology, SUPER FAST PLANTS and MINI BOTTLE ECOLOGY will be extensively employed. Imagination and creativity will be the watch words for this Applied Agripreneurship Education. Students would develop an appreciation for the capitalistic system by such innovative things as preparing a newsletter in which they could sell advertising to scientists. Such advertising would be paid for through the scientists' nationally funded research projects. Other students could work as junior research scientists during the summer months.

In order to serve those students who attend schools not offering Applied Agripreneurship Education, the video tapes could be taken home and viewed on the students' VCRs and the computer programs completed at the same time. Thus, all a perspective American FFA Degree awardee would need do is send in his or her money for dues and complete the application. In schools not having AAE programs, any teacher in the school could sign the application or if that is too much of a problem, the parents could sign for the FFA advisor.

(Continued on page 6)

Agripreneurs

From all indications, the first entrepreneurs on earth were engaged in agricultural pursuits — agripreneurs, if you will. Cain and Abel, some time after their parents were evicted from the Garden, became livestock and crops producers according to Biblical accounts. There's no hint as to their marketing strategies, but obviously each of them was producing more than was needed for his own survival. Perhaps it is from this very beginning that the universal urge to own and manage a business of one's own has come about.

Centuries later, when this country was founded, the nation was built on the backs of its agripreneurs. The fur trade, rich soil for tobacco and cotton, vast prairies suited for ranching . . . these were the resources that drew people from Europe, Asia and the Middle East. America was indeed the land of opportunity. Interestingly enough, for the most part, those who settled rural America had not come from the farms of the settled world. Most were city people, and as such were not steeped in the traditions and methods of old-world farming. Many historians attribute the American farmer's innovativeness and progressiveness to his forefather's inexperience in agriculture and, thus, his willingness to accept or develop new practices.

In the early part of the twentieth century, vocational agriculture was founded upon the idea that, through knowledge and application of science, technology, and business management offered through formal schooling, a boy could become a more successful farmer. For nearly 50 years, vocational agriculture's thrust was to develop agripreneurs in farming. Was the idea successful? Moreso than was ever thought possible. If development of a society can be measured by the number of workers released from agriculture to perform other useful work, vocational agriculture was a smashing success!

As the number of farmers decreased, numbers of people engaged in off-farm occupations which required agricultural knowledge and skills increased. Strangely enough, when vocational agriculture, in the mid-60s, adjusted to meet the newly-discovered need in off-farm occupations, the approach that had made vocational agriculture great was largely ignored. Instead of continuing the successful technique of involving students in entrepreneurship in order to grow into a business, most efforts were expended in creating employees of students. Only recently has the profession made serious attempts to encourage students to consider possibilities in off-farm agripreneurships during their high school years.

Are there opportunities? Indeed there are. Opportunities abound in businesses which combine managerial skills and agricultural knowledge and competencies. Some are depicted by the signs which make up the photomontage on the cover of this magazine. According to the U.S. Commerce Department, during the past decade, nearly 600,000 new businesses opened their doors each year. At the present time, there are about 20 million (that's 20,000,000!) small businesses in the



BY LAYLE D. LAWRENCE, THEME EDITOR
(Dr. Lawrence is Professor and Chair,
Agricultural Education, West Virginia University.)

country. At the start of the 1980s there were only about 13 million. Small business is the nation's leading employer, and has kept the nation's economy viable for the past ten years; the 90s hold even more promise. There is room for thousands of small businesses in which agricultural knowledge and skills are required. Students in secondary agriculture programs may be limited only by their imaginations and the encouragement offered by their teachers.

The high school years are undoubtedly the ideal time for an individual to start his or her own business, particularly if that person happens to be enrolled in a secondary agriculture program. At this stage of life, the student is generally fed, clothed, and housed by his or her parents. There is not yet the responsibility for supporting a family. The student can afford, therefore, to take calculated risks. And of great importance, the student has the guidance and counsel of an intelligent, concerned, educated adult — his/her agriculture teacher — whose job it is to provide instruction which will help assure successful entry.

Some may think it's easy to own and operate a business. It's not. Business ownership is one of the most difficult tasks one can undertake. But millions of people will tell you it's worth the effort. Vocational agriculture has been dealing with it for years in the farming game. Why not in off-farm agriculture? There's no better time to be an agripreneur. That's why Congressman John LaFalce (D-NY), head of the House Committee on Small Business, recently declared the '90s the "Decade of the Entrepreneur".

About the Cover

Opportunities to establish and operate entrepreneurship which require agricultural knowledge and skills (agripreneurships) abound for agriculture students, as depicted by photographs of business signs assembled into a montage. Assistance of Michael Kridle, drafting specialist in West Virginia University's Cooperative Extension Service, in photomontage design is acknowledged and appreciated. (Photographs by Layle D. Lawrence)

Computer Technology Resources

Why Use AgriData?

Time is a valuable, but limited resource for most individuals, but particularly so for teachers. It takes time for teachers to search for, learn about, and to prepare subject matter. In agriculture, much of the subject matter is constantly changing. Teachers of agriculture teach a wide range of subjects in the new and emerging agricultural sciences and technologies, and it has become increasingly difficult for these teachers to keep abreast of the new technologies in agriculture. One potential solution to this problem is to use electronic database systems (also known as agricultural information services). In the United States, many teachers subscribe to the AgriData Network System, a computer database of agricultural information based in Milwaukee, Wisconsin. Some states have state or regional network database systems, however, AgriData is the only national network available at this time.

The AgriData Network is an agricultural information and communications network designed for use by everyone with an interest in agriculture, from farmers, agricultural bankers and agribusiness to agricultural teachers, broadcasters and government officials. The services offered by AgriData are:

- **Informational Services**
 - AgriScan, Business Information Service
 - AgStats, Agricultural Statistics Service
 - Used Equipment Service
 - Product Information Center (PIC)
 - AgriGuide, Production Encyclopedia Service
 - What's New, Additions to AgriData Network
- **Communications Services**
 - StarGram, Electronic Mail Service
 - Online File Service
- **Education Services**
 - Ag Ed Network

AgriData Network's Information Services provide powerful tools developed to keep the user aware of current events and information from around the world. The AgriScan service contains up-to-the-minute agricultural news and business reports for everyone with an interest in agriculture. Individuals can find information on cash and futures prices, market advisories, market analysis and reviews, crop and livestock reports, financial markets and weather. AgriScan provides more than 40,000 reports with current information delivered electronically.

Statistical information is important when individuals need to know the numbers supporting current claims or to do one's own research. The Agricultural Statistics Service provides this type of statistical information. Agricultural classrooms can use statistics as an educational tool, while producers can use it to compare their farm, county, or state with others in the United States. U.S. Census Bureau reports are also available covering information collected during the



By DON R. KING AND W. WADE MILLER, SPECIAL EDITOR

(Mr. King is Research Assistant, Department of Agricultural Education and Studies, Iowa State University.)

(Dr. Miller is Associate Professor, Department of Agricultural Education and Studies, Iowa State University.)

last two agricultural censuses. Included in these data are the number and types of farms, types of crops and livestock, and average expenses. These reports are divided by nation, state, and county.

The Used Equipment Service and the Product Information Service (PIC) are designed to assist the user with the purchase of agricultural products. In the Used Equipment Service, subscribers will find specifications, approximate retail prices and wholesale prices of most makes and models of tractors from 1967 to 1987, while the PIC offers overview information on agricultural products such as chemicals, herbicides, pesticides and so on.

AgriGuide, the Production Encyclopedia Service, offers more than 4800 hog, dairy and dairy goat reports that provide information on breeding, housing, management, nutrition, as well as disease symptoms, prevention and treatment.

What's New gives the subscriber a fast and easy way to discover the new and different happenings on AgriData Network. What's New includes new information sources, new services and reports, or price changes — anything that can affect the user.

AgriData Network's Communications Services provide the user with a personal electronic mail center where individuals can send and receive mail. From a computer terminal, individuals can communicate easily with any AgriData Network member by using the StarGram Service.

Through an agreement with the National FFA Organization, AgriData also provides a service known as the AGED Network. The AGED Network is capable of providing a wide range of agricultural information for teachers to use as resources in improving the quality of their instructional

programs. Over 800 lesson plans for high school agriculture programs are available on the AGED Network, all of which are periodically reviewed, and new lesson plans are continually being added. These lesson plans have been developed by a variety of the leading agricultural education institutions nationwide. Some states have their entire agricultural education curriculums on this network. In addition, more than 300 world wide agriculture information resources and/or data banks are also available to the subscriber. This service allows instructors to bring real life situations instantly into the classroom.

The Ag Ed Network is America's first online agricultural education network that's designed for use both in the home and in the classroom, as it contains many different types of information:

- Marketing lessons for producers
- Correspondence courses for adults
- Curriculum lessons
- State Developed Curriculum Materials from California, Colorado and Montana
- An online dictionary of agricultural terms
- Computer Software Review Service
- An online Educators' Directory
- Idea Exchange Center

High school students will find any of these instructional units useful in developing the techniques needed to become successful in agricultural business and industry. Teachers of agricultural education can use this system to access, via the telephone, the latest technical information in agriculture. The teacher is supported in his or her instructional efforts with online agricultural information that, when viewed, helps to create a "real" learning experience for their students. Actual price, weather and advisory reports bring to the classroom the same information producers use to make their daily marketing and production decisions — students are put in the same decision making environment. Clearly, the use of AgriData Services in its entirety, can expand the educational opportunities for students and teachers alike.

What we have explained in this article is a national agricultural computer network; a technological resource that you, as an educator, may want to look into. You may also want to explore the possibilities of utilizing a state or regional network that will be more specific to your area and/or needs. This type of educational technology can assist you in classroom instruction and provides up-to-date information at the press of a button. If you're interested, you can directly contact AgriData Resources, Inc., at 330 E. Kilbourn Avenue, Milwaukee, WI 53202.

Change, Change for What?

(Continued from page 3)

The primary purpose of the FFA Organization is leadership, citizenship and cooperation. These are such noble and wonderful callings that every young person should be a member of the FFA. It is the duty of every agricultural educator to assure that every American youth and at least half of those in foreign countries are dues paying members of the FFA. Leadership skills are so essential that membership should be extended, not only to those in junior high school, but also to all elementary and kindergarten students as well.

The National FFA organization needs to come up with new products to encourage membership among this new clientele. An example might be a high technology diapers in blue and gold with the new emblem emblazoned in the appropriate location. This needs to be a biodegradable product that will not contribute to the desecration of our environment. Further, efforts should include the development, at public expense, of a national magazine for all elementary school members of the FFA. This might take the form of an electronic magazine because students in the future are not going to be able to read the written word.

How can all of these activities be realistically financed? A logical solution is to use the FFA in this regard. Members of the local FFA Chapter could provide instruction to elementary students about agriculture. This would save the school district from having to in-service current teachers on agriculture. These same students could provide instruction about science so the teacher could work on more important activities. While at the school, FFA members (at least those who paid their dues) could provide instruction about leadership, cooperation, citizenship and collect FFA dues from all of the students in the elementary school. Perhaps the FFA Development Specialist could come up with a dues payment plan where students could turn their lunch money over to the FFA for two or three months each year. This would make them card-carrying members of the National FFA Organization.

With this expansion of membership, any thing is possible and the FFA could really serve the "World's youth"! However, the FFA will need to change its name and rid itself of the Applied Agripreneurship Education program as the image may prevent some kindergarten student in Japan from paying dues.

FFA'S FUTURE, IS THAT WHAT THIS IS ALL ABOUT?

Getting Students To Mind Their Business

The education profession gravitates toward trendy terminology. The current trend is focused on the development of entrepreneurial skills. Honestly, this writer didn't even know how to spell the word entrepreneur twelve months ago. First, the writer attended a TI-IN Network workshop on entrepreneurial skills. During the work-sessions, an issue of the *Vocational Education Journal* was devoted to teaching entrepreneurship skills. Next, the *Agricultural Education Magazine* expressed interest in publishing articles on entrepreneurial teaching. These three situations sparked an interest to discover better methods of course instruction to motivate students to mind their own businesses.

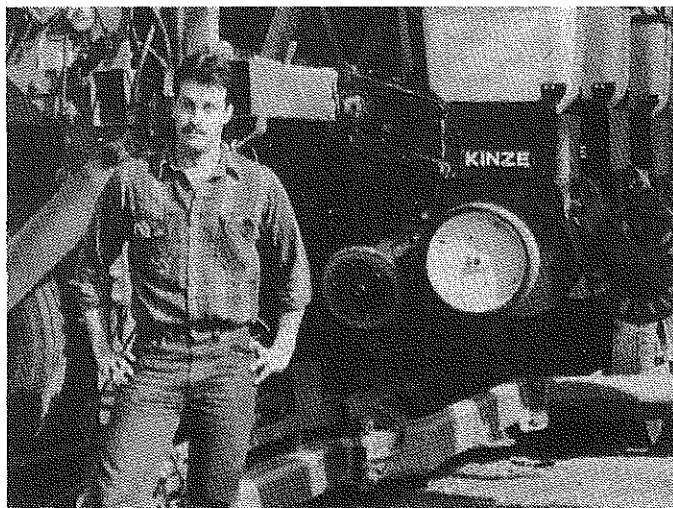
Questions were developed for a two page survey of former vocational agriculture students who had graduated at least ten years ago from high school. The students surveyed are either sole proprietors, or partners in agricultural occupations. The entrepreneurial insights of four are the basis of this article: Kevin Campbell, a nurseryman; David Holmes, a landscaper; Michael McLain, a grain farmer; and Larry Galliher, a dairyman.

These young businessmen give a cross representation of both farm and off-farm agribusinesses. Furthermore, they are established in their particular occupations long enough to provide quality information which can be used to encourage vocational agriculture students to explore the possibility of minding their own businesses.

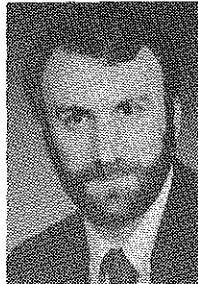
The following is a sample of some of the survey questions and the responses from the individuals.

CULLEN: When did you realize this was what you wanted to do?

MCLAIN: Since the first time I was old enough to drive a tractor, I have always dreamed of farming on a large scale.



"I try to stay up to date with the latest technology to help give me a competitive edge. I understand the mechanics of all my equipment." Michael McLain (Photo by John William Cullen, Jr.)



BY JOHN WILLIAM CULLEN, JR.

(Mr. Cullen is Agriculture Teacher, North Iredell High School, Olin, North Carolina.)

HOLMES: When I was a freshman in high school, I realized there was a need for landscapers and there were not enough of them around to do the work.

GALLIHER: I lived on a farm all my life and enjoyed helping on the family farm while I was younger. Then in the eleventh grade, I got a job on a bigger dairy (enrolled in cooperative training). I worked there for several years before going out on my own.

CULLEN: Describe some of the characteristics, skills, and talents you possess to run your business well.

CAMPBELL: The plants and trees that I grow I know very well. I know their characteristics and habits very well. I also feel like I deal with customers well. You have to help the customer.

MCLAIN: I try to stay up to date with the latest technology to help give me a competitive edge. I have always been a good equipment operator, and I understand the mechanics of all my equipment. I try to keep close records of my operation.

HOLMES: I'm good with plants and equipment. I am reliable, dependable, and a hard worker.

CULLEN: Where did you learn these qualities?

HOLMES: . . . from my family, also from class and work in vocational agriculture.

MCLAIN: A lot of it was just hands-on experience. I also realized that you never know all that there is to know about your business. There are always new things (to learn).

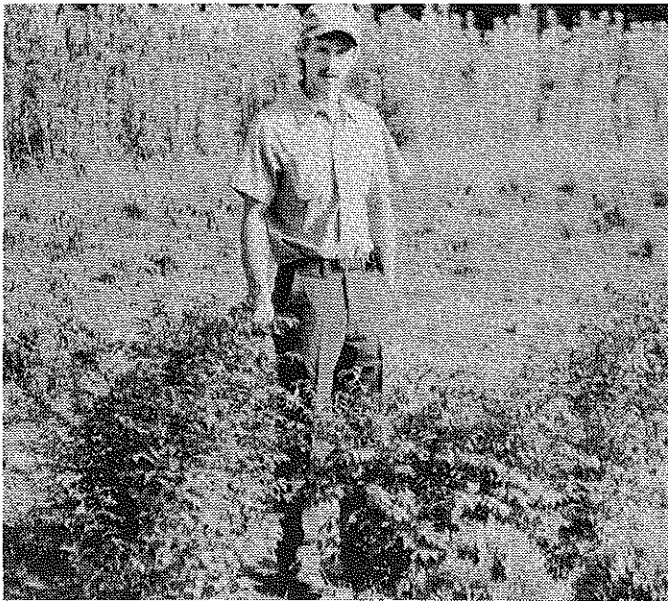
CULLEN: How did high school vocational agriculture play a role in getting you started?

MCLAIN: Working with my crop program in ag. coop. (agriculture cooperative training) helped me understand the importance of keeping accurate records.

GALLIHER: . . . tool identification, land judging, cattle judging, welding . . . had to maintain job records over the summer months to show income and expense.

CAMPBELL: My agriculture teachers gave me the incentive to start my own projects. They were a big help also in my record keeping . . .

HOLMES: Vocational agriculture gave me confidence in myself.



"The plants and trees that I grow I know very well. I know their characteristics and habits very well." Kevin Campbell (Photo by John William Cullen, Jr.)

CULLEN: Based on your experience, what were the deficiencies in the vocational agriculture program as they relate to your business?

HOLMES: . . . not enough training on plants and identification of plants.

CAMPBELL: At the time none of the agriculture instructors had any first-hand experience working on a nursery.

MCLAIN: I can't remember anything wrong with the program.

CULLEN: What type of records do you keep?

GALLIHER: We do our own bookkeeping. The cows are on Dairy Herd Improvement Association (DHIA) and computer records.

HOLMES: I keep records of maintenance on equipment, and on jobs I do and how long it takes to complete them.

MCLAIN: . . . computerized financial records and field history records pertaining to fertilizer and yields.

CAMPBELL: I keep sales records mostly. I do keep records on various types of chemicals and fertilizers that I use to best determine what results occur.

CULLEN: Is there a large enough market in the area to maintain a profit and be competitive?

CAMPBELL: There are many new nurseries popping up in our area. Many tobacco farmers are switching from tobacco to trees or shrubs. We do not have the local population to carry a wholesale or retail market for all of us. However, we are very near Interstates 77 and 40. We all need to concentrate some sales efforts to outside sources. Also, we must not all duplicate each other by trying to grow the same things or catering to the same market.

MCLAIN: We have several feed mills and dairy farmers in our area that purchase our products at fair prices.

CULLEN: Identify some of the major risks you have undertaken.

MCLAIN: . . . whether or not to invest in irrigation equip-

ment and borrowing money on large scale to purchase equipment.

GALLIHER: . . . to start from scratch and try to build a profitable operation in a time of declining milk prices and higher operating costs.

HOLMES: . . . financial, chemical, operating equipment.

CAMPBELL: I am a bit conservative, maybe too conservative. The biggest risk was starting my own business because you can't do this overnight.

CULLEN: Where do you want to be five years from now?

CAMPBELL: I would like to have a very successful wholesale and retail business, be self sufficient, not have to depend on outside sources for some of my plant needs.

HOLMES: I would like to have a larger business. I also would like to have several employees working with me.

GALLIHER: I would like to have a 20,000 pound herd average and to have most of the equipment paid off.

MCLAIN: I would be happy at the same size operation I have now, but I would like to be debt free. Most of my equipment will be paid for at this point, so I feel my goal is attainable.

CULLEN: Are you familiar with the Small Business Administration?

MCLAIN: Yes, I am, but I have no dealings with them.

HOLMES: Yes.

CAMPBELL: Not really.

GALLIHER: No.

CULLEN: Where do you turn to for help in solving business problems?

MCLAIN: The agriculture extension service helps greatly and also other individuals who may have encountered the same difficulties.

CAMPBELL: I turn to the agricultural extension service or other nurserymen who are friends of mine.

HOLMES: . . . to other people in the business.

GALLIHER: . . . mainly other dairymen and the local agricultural extension service.



"Five years from now I would like to have a 20,000 pound herd average and to have most of the equipment paid off." Larry Galliher (Photo by John William Cullen, Jr.)

(Continued on page 11)

Opportunities for "Rural" Entrepreneurship

Economic development has emerged as the most pressing issue for small cities and rural areas in America. The "rural renaissance" bubble of the 1970's burst in the 1980's. Rural communities that attracted branch manufacturing plants in the 70's saw the plants close or greatly reduce their number of employees in the 80's. Companies moved their operations overseas in search of lower wages or replaced human labor with machines. Downturns in agriculture — the Farm Crisis — mining and energy, and manufacturing left widespread rural decline of national proportions (Rural Economic Development, 1987). This article describes how agricultural education programs might help revitalize rural America through opportunities in "rural" entrepreneurship.

The USDA defines rural as nonmetropolitan America. Of the more than 3,100 counties in the United States, about 2,400, or 77 percent, are nonmetro. Roughly one-fourth to one-third of the U.S. population lives in rural counties. Two-thirds of all school districts are located in rural America.

State governmental and educational leaders are seeking collaborative remedies to the problems of rural economies. Major changes in both domestic and world economies have altered the conditions under which rural areas must compete. Consequently, education, especially vocational-technical education, is receiving much attention as states search for new strategies to revitalize local economies.

Current thinking about rural development focuses on strategies that put local communities in charge of their own development, with the goal of developing competitive rural economies. Reid (1989) suggests that "self-development" strategy requires communities to identify areas in which they have real opportunities for developing comparative economic advantages and for fully using local resources. Self-development strategies usually involve community efforts to promote the creation of new, locally-controlled businesses. Rural entrepreneurship may be the key to revitalizing many local rural economies.

"Rural" Entrepreneurship

Economic development and entrepreneurship are closely interrelated. One may also assume that rural development includes both economic development and rural entrepreneurship. Definitions of rural entrepreneurship, however, vary widely in the literature (Frederick & Long, 1989). The definition by Wortman (1989, p. 75) has applications for agricultural education programs: "Rural entrepreneurship is the creation of a new organization that introduces a new product, serves or creates a new market, or utilizes a new technology in a rural environment." Wortman suggests:

In this definition, rural entrepreneurship could include new organizations that: (a) introduce a



BY ADAM J. SPONAUGLE AND HOBART L. HARMON

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new product from an agricultural product — the utilization of cornstarch in biodegradable plastics; (b) serve or create a new market — bacteria which retard spoilage in silage in silos (although this essentially is also a new product); and (c) utilize a new technology — use of bacteria (instead of pesticides) to protect the plant against insects. (p. 76)

Opportunities

Agricultural education programs have a long tradition of giving students opportunities to develop entrepreneurship skills. "Home projects" on the farm, under the close supervision of the vo-ag instructor, placed the student in the "ownership" role. The student applied basic science and business principles taught in the classroom in his or her home production project. This entrepreneurial experience continues to be an integral component of the modern-day agricultural education program.

Modern programs, however, have expanded the scope of the traditional home production project to also include other types of supervised agricultural or occupational experiences such as off-farm placement in a business and directed laboratory experience at the school. These changes have been necessary to serve "non-traditional" students with interests in agricultural occupations. These changes also hold much promise for helping local communities build stronger economies, while allowing the agricultural student to apply the "Learning to Do" and "Doing to Learn" parts of the FFA Motto. The supervised agricultural/occupational experience program and FFA are natural avenues for students to develop entrepreneurship skills and help facilitate rural development in their communities.

The National Association of Towns and Townships has identified seven proven strategies for building a stronger

local economy in small towns (Stark, 1987). Each of the strategies is highlighted in a video entitled, "Harvesting Hometown Jobs," which is available for free loan to Cooperative Extension Service staff. Teachers of agricultural education programs should see the seven strategies as opportunities for strengthening the entrepreneurship skills of students, and further demonstrating the value of the agricultural education program to the community. Let's examine the seven strategies and their potential for developing students' entrepreneurship skills.

• **Reduce Retail Leakages** — The local community needs to prevent dollar flow out of the local economy. Leakages result when local residents make purchases at regional shopping centers, vacation away from home, invest in out-of-town businesses and real estate, or pay wages to commuting workers. Students enrolled in the local agricultural education class could conduct a survey to find the "leaks" in the community, especially for those dollars which could/should be spent on local agricultural goods and services. The exercise would enable students to meet entrepreneurs in local agribusinesses. Students also would get to practice public speaking skills as they present findings of the survey to local business and government leaders. The survey results might also reveal the need for a new business, which the class or a student entrepreneur could establish. The class might also encourage local agricultural businesses to employ former or current students.

• **Encourage Survival and Expansion of Existing Businesses** — The agricultural education class might develop and implement a promotional campaign encouraging community residents to buy local agricultural goods and services. In the process students would learn marketing and promotional skills needed to be successful entrepreneurs. Also, the class, in cooperation with Cooperative Extension Service personnel, could plan and sponsor seminars on entrepreneurship topics for current and prospective business owners in the community. Students could improve their entrepreneurial skills by attending the seminars and learning from experienced business persons. Agricultural education departments with appropriate land labs or other facilities could serve as pilot sites to explore new types of enterprises needed to diversify local farms. Many diversification ideas have been publicized at the ADAPT 1 and 2 conferences sponsored by "Successful Farming Magazine."

• **Promote Creation and Expansion of New Small Firms** — The agricultural education department could work closely with the local Chamber of Commerce, town officials, and/or other community organizations to spread the "good news" about business opportunities in the community. All prospective new businesses need knowledge of local financial resources, labor, land and facilities, and technology. Agricultural students could conduct an inventory of these items and provide the information in a brochure, department newsletter, town bulletin board, local newspaper, and/or to persons in the community who are formally involved in local economic development activities. Of course, select students might decide to start a business, invest in a current business, or the agriculture department might establish a school-based enterprise.

• **Encourage Start-up of Home-Based Businesses** — Many persons in rural areas find their home to be the most profitable and logical location for a business, if local govern-

ment zoning regulations permit such a business. In most instances, a farmer lives and works in the same location. It is becoming more common for members of the farm family to establish other types of businesses on the farm. Bed and breakfast businesses are second incomes to some. A person who works full-time in an agribusiness may also choose to work at home in a part-time business related (or not related) to agriculture. Some farmers choose to repair agricultural equipment, sell seed and fertilizer, or perform other part-time business activities in addition to working as a full-time farmer. Technological innovations (e.g., hydroponics, aquaculture, biotechnology) promise to open the door for entrepreneurs to establish consulting businesses or own and manage specialty agricultural businesses.

• **Capitalize on Area's Agricultural Resources** — Value-added agricultural businesses should become more commonplace in the 1990's as rural economies rebound from the Farm Crisis. Producers of agricultural products are looking for ways to carry the production cycle several steps further. Finding new uses for existing raw materials, processing raw agricultural products close to the community where grown, and marketing locally grown and produced items to consumers are ways to create added value needed to revitalize local rural economies. Opportunities will exist for students to work in or own value-added agricultural businesses.

• **Support Job Training and Retraining** — An active and well-informed advisory committee is essential to keeping the agricultural education program focused on preparing students with appropriate entrepreneurial skills. Many value-added agribusinesses will require owners to have "ownership" skills somewhat different from those required to own and operate a farm. In addition to strong basic academic skills also required to manage a farm enterprise, most agribusiness entrepreneurs will need well-developed people skills. They also must have the ability to actively seek out risk-taking opportunities needed to keep the business attuned to changing consumer preferences. Modern agricultural education programs must reinforce basic academic skills and graduate students with the appropriate attitude for being lifelong learners.

• **Invest in Area's Tourism Potential** — Perhaps no single youth activity holds more potential for enhancing tourism than the FFA Building Our American Communities (BOAC) program. For example, the Marion County, West Virginia FFA Chapter restored an old round barn into a tourist attraction as a BOAC project. The restored barn has contributed greatly to the community's efforts in attracting tourists from outside the local area. The FFA Chapter also won the national first place BOAC award for the project. Community service has been a hallmark of the FFA and the agricultural education program.

Cooperative ventures with other community groups should help the FFA chapter target community service projects that will give maximum return for expanding the local tourist industry. This expansion may result in businesses owned by agricultural entrepreneurs who cater to tourists.

Summary

Rural entrepreneurship may play a major role in revitalizing local rural economies. Traditionally, vocational agriculture programs, the Future Farmers of America organization,

and "farm projects" were designed to prepare rural entrepreneurs. Times have changed and so has traditional vocational agriculture. Modern-day agricultural education programs, with a comprehensive FFA organization and a multifaceted supervised agricultural/occupational experience program, hold much promise for giving students the leadership and entrepreneurship skills needed to revitalize rural America.

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Getting Students to Mind Their Business

(Continued from page 8)



"Vocational agriculture gave me confidence in myself." David Holmes (Photo by John William Cullen, Jr.)

Now that we have completed the survey, what conclusions can be drawn from the data? Each started at an early age to dream of a business occupation where he would be on his own. Cooperative training was helpful to two of them. Hands-on experience was noted by each as a very important part of developing his enterprise. Furthermore, record keeping plays a major role in each one's business. Two indicated that basic skills, such as plant identification, were either not taught or learned by the student in the local vo-ag training.

The young entrepreneurs didn't seem to know much about the Small Business Administration. Information pertaining to the SBA is valuable to students interested in running their own businesses. A basic understanding of the SBA will familiarize students with general functions of the SBA such as guidance in marketing research and data, business planning, access to the SBA's toll-free hotline and publications, and assistance with financing.

Three of the four agri-businessmen named the agriculture extension service as a place to turn to for problem-solving information. The extension service in this county is very strong with four agents specializing in different areas of agriculture. Nevertheless, the number of current students who are familiar with the agricultural extension service is unknown. All students need to know about the information and services available from the local extension service. They need to know its functions such as soil testing, marketing of feeder calves, general farm management, weed and pest identification, and garden clinics. Also a broad number of university developed publications are on hand for community service.

Since each of these entrepreneurs had been exposed to his particular area of business by the time he was in high school, early identification of those students with entrepreneurial interests would allow teachers to encourage them to use agricultural cooperative training as an opportunity to either develop their interests toward business ownership or determine that their business ideas are suitable for other careers. Two of the agri-businessmen in this study did use ag co-op to develop their ideas. The writer believes that students can learn to mind their own business if they are identified, encouraged, and challenged to be entrepreneurs.

Bullish on Capitalism

The goal of agricultural education programs at secondary and postsecondary levels is to train students for careers in agriculture. In order to affect this goal, the curriculum for such programs should focus on preparing entrepreneurs. That is, students exiting agricultural education programs should possess the competencies necessary to manage a business. The focus should not be on entry level positions.

This concept is not new and will strike most readers as a simple restatement of the obvious. However, experience suggests that the majority of agricultural education programs, particularly at the secondary level, do focus on entry level jobs. Further, most agricultural educators would judge as ludicrous the goal of having the majority of our students own and operate a business upon graduation from high school.

As ludicrous as it may seem, that is precisely the goal of agricultural education at Peoria High School. The best type of occupational experience program for accomplishing this goal is an ownership program. Every student should experience the "risk" associated with owning and operating a business. In short, the agricultural education program at Peoria High School is bullish on capitalism.

"But why?"

Recognition is given to the fact that not all of our program graduates will continue as entrepreneurs once they have graduated. Many will forsake their comparatively non-lucrative businesses for higher paying positions with other firms. Nonetheless, their experience and training as entrepreneurs will prepare them to be better employees and to climb the career ladder more quickly. Entrepreneurs simply have a better understanding of two essential components that make all businesses click: profit and risk. The desire to make a profit and to take calculated financial risks in an effort to make that profit are best taught when students are required to risk their own capital. What better way is there to accomplish this mission than by encouraging all students to start their own business?

"But how?"

It begins in the classroom. Whether through the agriculture classes or in concert with the business department, it is critical that students receive instruction in several areas. Typically, these areas include business organization, feasibility studies, income statements, costs, finance, legal responsibilities, recordkeeping, human relations and marketing. Several curriculum guides are available to assist the teacher in developing units of instruction on these topics. One particularly good one is available from the Department of Agricultural Education at the University of Arizona. While recordkeeping and human relations may be taught earlier in an agricultural curriculum, it is more effective if the other subjects are taught once a student has identified a potential business which he or she would like to start. Generally, this arrangement provides students with the motivation necessary to pursue these subjects with diligence.



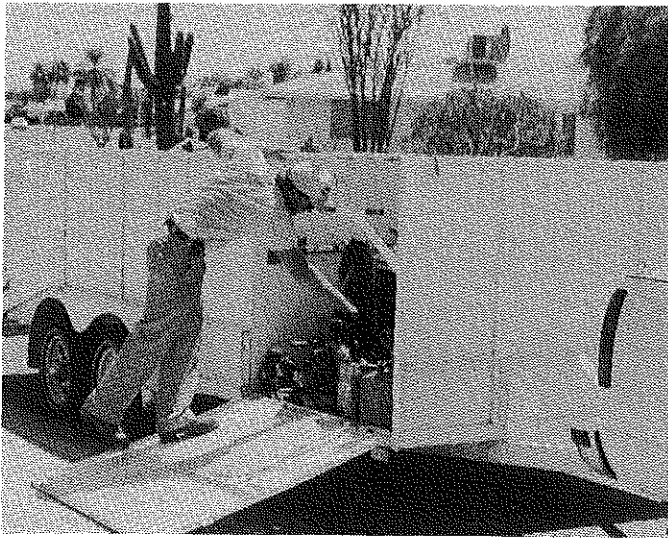
By MIKE GILLISPIE AND JOHN MULCAHY

(Mr. Gillispie and Mr. Mulcahy are both Agriculture Teachers, Peoria High School, Peoria, AZ.)

The real force behind a solid entrepreneurship program is occupational experience. Every student needs to have a solid supervised occupational experience program. Further, ownership type programs should be considered the "capstone" supervised occupational experience program. All seniors should have an ownership program. This may be in addition to a placement program. Beyond this, it is important that these ownership programs are quality programs. "Fair projects" generally will not suffice because they teach students very little about the real world. In most cases, animals which are raised for the county fair are sold at inflated prices thus creating a false impression of what the business world is really like. A quality occupational experience program should: 1. teach students the competencies they need for a career in agriculture; 2. require a capital investment; and 3. have the potential for increase in size and scope.



Western Region Star Agribusinessman (1990) from Peoria, AZ, Brian Bingham, prunes a palm tree. He owns his own landscape business. (Photo by Gillispie & Mulcahy)



Brian Bingham making a house call. (Photo by Gillispie & Mulcahy)

Getting students started with a business of their own can be difficult. Some students lack a sufficient amount of capital. Several ideas may be used in helping students to get over this stumbling block. A number of agricultural programs have equipment lend/lease programs. Such programs lend or lease equipment to students, often for a nominal fee. The reader will quickly identify several problems with this concept. First, it raises some complicated liability questions. Secondly, unless the student is charged a fee, some of that "real world" risk is significantly reduced. Nonetheless, in most cases it does help students get a start. It is important, however, that they be weaned from this program at the earliest possible opportunity.

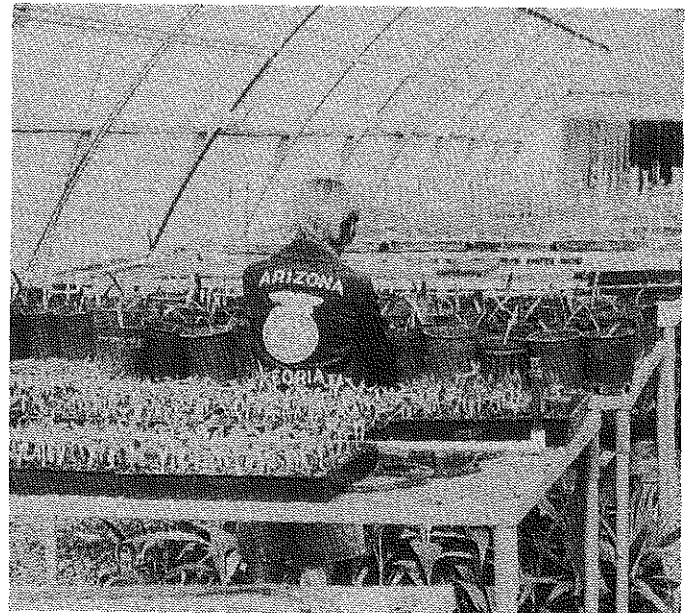
Of course, the ideal solution for a student with limited capital is a business loan from a lending institution. Some programs have even experimented with using the FFA organization as a lending institution. In some states, students might even be able to obtain loans from state agricultural education/FFA foundations. An article on this particular topic would be a useful contribution to the literature on teaching entrepreneurship.

Two other aids used to assist students in starting their own businesses may seem frivolous, but the authors have found them to be particularly successful. The first is business cards. As insignificant as it may seem, helping students to draw up and print their own business cards is often a key motivator. Additionally, having a chapter business directory with the students' businesses listed in it is often a motivator in itself to start a business. Before going any further, understand that these businesses need not be large. They can include lawn maintenance, seed collection, ornamental plant production, pruning, and a host of other services and products. Again, the critical point is that the students need to own and manage these businesses.

The Peoria Story

Many of the foregoing ideas have been instituted at Peoria High School in Peoria, Arizona. A claim of 100% success cannot be made. However, the concept of focusing on entrepreneurship is a sound one and has had some success.

Classroom instruction encompasses teaching all the units listed above and more. However, not all of these topics are being taught in the agriculture department. Three years ago the business department was asked to develop a one semester entrepreneurship course for seniors. The course covers most of the previously listed topics. Further, every student in the class is required to have their own business. This arrangement has at least two advantages. First off, it is a requirement. Every student must take a course in free enterprise to graduate from an Arizona high school. Unfortunately, in most high schools, these courses are directed more toward economic theory as opposed to real entrepreneurship. Secondly, the agriculture department needs all the instructional time possible to provide students with the technical instruction needed to develop agricultural competencies. This class could easily be taught through the agriculture department, but the business department has done a good job. Further, the arrangement has accomplished two objectives: 1.) Students receive the required credit they need for graduation; and 2.) students receive valuable instruction in entrepreneurship.



Paris, AZ, FFA member Robbie Chiarini raises plants in the school greenhouse. (Photo by Gillispie and Mulcahy)

Encouraging students to start their own businesses has been an uphill battle, but a successful one. Beginning at the freshmen level, ownership occupational experience is emphasized. Every freshman in our program is required to propagate, raise and market 100 plants. A local plant broker assists with this process and continually updates students on the quality of their product. Spaced throughout the agricultural education curriculum are one or two day lessons on how to get started with a business in a particular subject area. For example, the pruning unit is immediately followed with a lesson on bidding a job and another lesson on customer satisfaction.

Aside from these ideas, the FFA chapter practices what is preached. The Peoria FFA Chapter owns and operates a nursery. The nursery is managed by the students and a busi-

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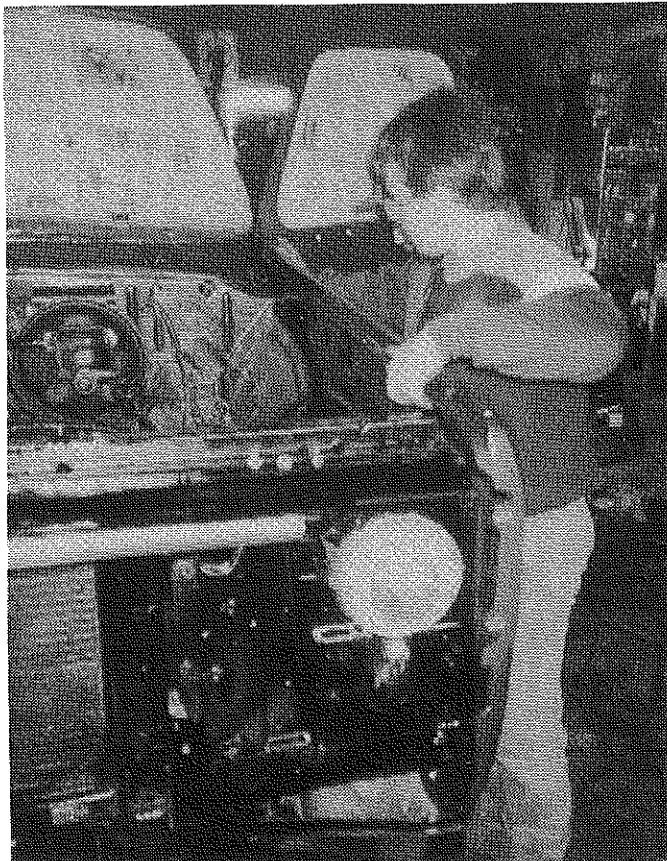
Entrepreneurship Education Western Style

An Award Winning Program

This article is about an award winning program and how it developed over the past few years. First though, we want to develop the need for entrepreneurship or specialized economic education within an agricultural education program.

Currently experts place the percentage of new jobs created by small businesses at 80%. With this degree of emphasis, we need to do a better job of teaching about small businesses as a major portion of entrepreneurship and how to start these enterprises.

What is entrepreneurship? Some describe it as a state of mind. Entrepreneurs are risk takers, not wild eyed gamblers but rational individuals who consider their knowledge and skills as dramatic risk reduction elements. Their efforts augment their money resource with mind and muscle, their primary resources. Research indicates that the traditional high percentage of beginning business failure is greatly reduced for entrepreneurs who have had entrepreneurship instruction on a formal basis.



Ron Orem wrote his business plan as a student in Don Connelly's first class, now he is successfully rebuilding cars and trucks. (Photo by William H. Hamilton)



By WILLIAM H. HAMILTON

(Dr. Hamilton is Associate Professor, Agricultural Education, Purdue University.)

Teaching the elements of a business plan and the essential management practices needed for a successful start in a specialized economic situation is well within the range of agricultural education programs. No teachers have taught more entrepreneurship than agriculture teachers. We have traditionally taught enterprise budgeting, recordkeeping and market planning. We just haven't taught these skills under the title of entrepreneurship.

Entrepreneurship is a current "buzz word", but unlike other such words this one is likely to stay with us longer since it is a "real world" experience rather than a "fad".

When does an entrepreneur start? With a supervised agricultural experience? Sometimes. We as teachers can give the little push that gets an enterprise going. Many young entrepreneurs start with some activity such as lawn mowing, baby sitting, car washing or even the proverbial lemonade stand. I believe it starts in the home training at an early age when children are taught to do their chores.

Now to the award winning program. Donald Connelly of Western High School at Russiaville, Indiana, has just been awarded one of the Freedom Foundation's prestigious Leavy Awards carrying a \$7500 cash award for education in entrepreneurship. These awards have been presented since 1977 to outstanding economic educators, most of whom have been at the university level rather than secondary.

Don, the agricultural education teacher at Western, has received two competitive grants and tied for second in the Indiana Olin Davis Award for economic education. A third award entry is in the judging process.

How did Don get into competition for these grants and awards? First, his background of experience included ownership of an insurance agency. When he decided to return to his first career of teaching, he came back to Purdue to renew his teaching license. After completing his work, he signed up for a graduate class and as a class project wrote a unit in entrepreneurship for use in one of his agricultural classes. He integrated the unit in the spring with a good deal of student interest. Because of his interest, I sent whatever materials on entrepreneurship that crossed my desk out to

his school. Among the items was the announcement for mini-grants for economic education. I helped Don with the behavioral objectives for the grant. He received \$800 to buy resource materials and taught a year-long course the following year.

His efforts have been described in Indiana in the *Kokomo Tribune*, the *Indianapolis Star*, and the *Lafayette Journal Courier*. At the national level, the program has been chronicled in the *National Future Farmer*, *Prairie Farmer*, *Successful Farming* and *USA Today*.

Don has acted as a consultant in Kansas as they developed entrepreneurship education in their state. An Ohio vocational school has had the benefit of Don's experience and several schools in Indiana have worked with him as they look at an entrepreneurship class.

The first grant for resource material failed to turn up a book Don thought fitted his school's need. As a result he convinced two Purdue professors to help write the textbook for the class. As each chapter was written Don field tested the material with his class and the chapters were rewritten to reflect the experience. A high school text, a teacher's manual and a student workbook grew out of that first class experience.

The class was well received and during the spring a video tape was put together to explain the program. The school administration cleared the way for a second year of entrepreneurship education at the recommendation of the Western agriculture advisory committee.

What are the elements of this program? Dedication and hard work are the keystones. Content areas start with chapters dealing with a first look at entrepreneurship. In these chapters, Don takes the class through the advantages and disadvantages of working for yourself or someone else. He then moves the class through the start of a business plan to goal setting, business organization, the advantages and disadvantages of buying a business or starting one from scratch. The class moves on to the study of business resources, competition, marketing and promotion.

In the third portion of the class, accounting and records are the focus. After the section on accounting, the class focuses on management items from legal and tax concerns to location, facilities and pricing. Also in this portion of his course, Don deals with hiring others and managing human relations in the business field.



An FFA member starts the record keeping process; she ear notches a litter as her younger sister looks on. (Photo by William H. Hamilton)

Business use of computers is studied and hands-on practice is provided for selected business applications. A chapter on managing business growth, one on selling the business, a review of entrepreneurship and a self evaluation for entrepreneurship complete the course.

Why not get in touch with Don and take a look at a high interest class that has brought new students to Don's department!

Bullish on Capitalism

(Continued from page 13)

ness person who works with the program about 15 hours per week. The students earn shares in the business and help in maintaining records and in making management decisions. Profit, risk, marketing, break even costs, ad infinitum, are topics which are discussed with students every day.

Conclusion

The focus of agricultural education at both the secondary and postsecondary level should be on agricultural entrepreneurship. By doing so, we will not only prepare excellent agricultural entrepreneurs, we will also prepare outstanding employees, all of whom are "bullish on capitalism".

Entrepreneurship in Rural America

For decades, agricultural educators have worked with individuals whose desire was to own their own farm, ranch, or agri-business. In most cases, we divided up these young students into those who would return directly to the family farm, those who didn't have a farm to return to would go to work for someone else, and those who excelled in school were expected to go to college.

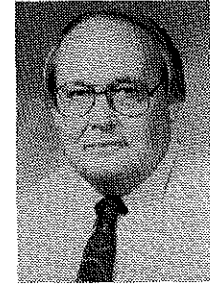
Boy, how times have changed. There are fewer and fewer farms to return to, the farm economy of the 1980's left fewer ag employers with whom to find jobs, and many parents encouraged their sons and daughters to go to college, but heaven forbid, don't major in agriculture.

Yes, times have changed and so has the agricultural educator and his/her ag curriculum and program. We see more and more evidence of our curriculums emphasizing the science and business aspects of our industry. Thus, we are seeing fewer and fewer technical skills being taught. Maybe, just maybe, we are encouraging our students to become entrepreneurs.

Our vocational programs have often centered around teaching entry level skills; but at what point does someone decide that they want to be their own boss, own their own business? Where do they turn for help? Whose responsibility is it to teach entrepreneur skills? Is it the high school, the community or junior college, the four year university, or do we let them go it alone? In many cases, the community or junior college will be a likely choice. They offer their faculty an opportunity to specialize and they may be more aware of informational and technical resources available to those seeking to start their own business. In addition, they are closer to the people than their counterparts at four year universities. Thus they are more apt to serve as liaisons for those seeking assistance.

It takes more than a creative idea and a desire to start your own business to succeed. Do our graduates know how to conduct a feasibility study which might include filling out Small Business Administration forms, evaluating the competition, finding a location, checking zoning regulations, deciding whether to build or remodel, developing a marketing plan with plans for advertising and promotions, finding reliable suppliers and outlets, arranging financing, managing a staff, hiring and firing, dealing with accounting, taxes, and liability concerns? The list could go on and on, but we think we've made our point. The detail that is involved in establishing a new business venture can be overwhelming. Thus it is probably best suited for the college level.

Not only have curriculums changed, but the students have changed too, especially at the community or junior college level. It is common to see non-traditional aged students sitting in the classrooms. And why are they there? One reason might be because they found it impossible to move from the labor to management segment of business. They are highly



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focused and very demanding of themselves and their instructors. They have taken instructional accountability to another level.

It once was common to think that hard work, long hours, calloused hands, and a sore back were the ingredients for success. That is not the case today. It will still take hard work and long hours, but the other ingredients have changed.

Furthermore, don't be fooled into believing that all entrepreneurs are young, college educated, and financially independent. Some may fit that description, but more realistically, they are of all ages, with varying degrees of experience and education. According to the Internal Revenue Service, there are 18.6 million small businesses in the United States. They employ 58 percent of the work force. Nearly 70 percent of small business owners are not college graduates. Approximately 40 percent of them only have a high school diploma and about eight percent are high school dropouts.

Rural areas are usually dependent upon agriculture, lumber, oil, and mining for their stability. Thus, they exist in a boom-or-bust pattern of economic chaos, and most rural areas have a scarcity of "good paying" jobs. They are more likely to have a higher percentage of service-oriented jobs, and even though these tend to be lower paying positions, they lend themselves well to new opportunities for individuals who desire to strike out on their own. The National Federation of Independent Business reports that nearly 45 percent of small business owners developed their ideas for business ventures from previous jobs. A real estate agent who once spoke to my class indicated that she decided to get involved in the real estate business because she didn't like the way the realtor handled selling her house. She felt she could do better. Thus, she obtained her real estate license and started her own agency.

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Software Sampler

Computerized Wiring Program

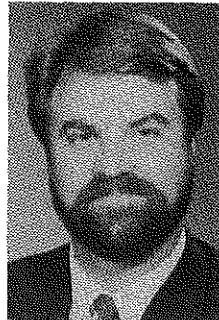
One of the most potentially dangerous and costly lessons to teach is electrical wiring. It is often a difficult subject even for the most skilled instructors of agriculture, not to mention those beginning teachers who have little or no practical experience with electricity and electrical wiring. The inherent dangers associated with this subject matter often lead to a minimized lesson or perhaps it is entirely omitted by some. Also, the expense of properly equipping learning stations for numerous students is often cost prohibitive in many programs of agricultural education.

An instructional package is available for teaching electrical wiring through the National Food and Energy Council. Their package titled **Computerized Instructional Wiring Program: Learning Guide (CIWP)** is a self-contained instructional unit which is very comprehensive in scope. It is a learning tool that will help all students understand the basics of safe and properly installed electrical circuits. It is composed of computer software containing color graphics and interactive exercises, a Learning Guide which helps the user comprehend valuable background information, a Teacher's Supplement for the instructor, and three resource publications which provide additional information on essential concepts in electricity and wiring. The supplemental resources include the **Agricultural Wiring Handbook, Understanding and Using Electricity and Electrical Wiring Systems for Livestock and Poultry Facilities.**



A Computerized Instructional Wiring Program written for IBM or compatible computers which are equipped with at least EGA graphics capability.

The computer program is divided into four sections, namely, "Understanding Basic Electrical Terms and Relationships", "Simple Circuit Connections & Procedures", "Installing Circuits on a Farmstead", and "Show Sample Graphics". The program is menu driven and has three distinct advantages over traditional forms of instruction con-



By JEFFREY A. WOOD, SPECIAL EDITOR
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cerning electrical wiring. Those advantages include the interactive capability of the program which allows the user to make decisions related to a given problem, graphics capability which enables the user to visualize the entire wiring system of a farmstead or within a specific building, and a savings in time and money through the simulation of wiring applications as compared to purchasing and installing actual wiring hardware.

The CIWP is not intended to serve as a stand alone source for electrical wiring instruction. Rather, it is designed to supplement instruction in electrical wiring and serves nicely as a self-paced tutorial or may be useful for small group instruction. With the necessary hardware (microcomputer and overhead projector hookup) the CIWP may also be effectively used for large group instruction.

The documentation is very clear and well written. It has sections on using the CIWP, using other teaching aids, selection and use of technical resources, understanding basic electrical terms, simple circuit connections, and installing circuits. Appendices include sections on computer hardware requirements, loading and running the program, troubleshooting, additional resources, and quantity prices on selected components of the CIWP.

A teacher's supplement is included in the package which details specific teaching aids and features to be utilized only by the instructor. Two main features provided as part of the software are readily accessible "answer keys" and a method for teachers to monitor and evaluate student performance on computer exercises. These features are especially useful to the instructor who requires a mechanism for displaying the answer to a given problem on the computer screen and to access student data files for information such as monitoring how many times it takes a student to answer a selected question, to print out an individual student file, to obtain a listing of all student files, or to remove data files periodically.

(Continued on page 21)

Entrepreneurship and the Environment

The management and disposal of urban waste has become a major problem for many cities. Landfills have come under intense scrutiny as existing landfills reach their capacity. New landfill sites are becoming increasingly difficult to establish and some older landfills have developed surface leakage and groundwater pollution problems. Some states have passed laws to prevent certain degradable solid wastes from being deposited into landfills in an effort to reduce the landfill volume. In addition, landfill dumping fees have escalated in many locations to the extent that some sites are charging more than \$100 per ton. All of the above factors are causing interest in alternatives for the disposal of urban solid waste.

A study of the composition of urban solid waste has determined that yard waste, consisting of leaves, grass clippings and shrub clippings, represents nearly 20% of the total volume of urban solid waste. All of these products are quite biodegradable and, under proper conditions, can be worked into agricultural soils or processed into compost. This compost can be incorporated into agricultural land or sold as mulch for gardens and landscaping.

Recycling yard waste, either by land farming or composting, requires considerable land space for storage and processing, heavy equipment to handle the large volume involved and much time and labor. In addition, this project needs to be located away from heavily populated areas as considerable truck traffic will be generated and some odor may be produced. This combination of factors may make the project well adapted for aggressive agricultural entrepreneurs.

Land Farming of Leaves

The incorporation of crop residue is a practice farmers have been carrying out regularly for centuries. However, the handling of leaves as a product for incorporation into



Industrial type front-end loader used to move and stir leaves and mulch. (Photo courtesy of Robert M. Schneider)



By ROBERT M. SCHNEIDER

(Dr. Schneider is Professor, Agricultural Mechanization, Western Kentucky University.)

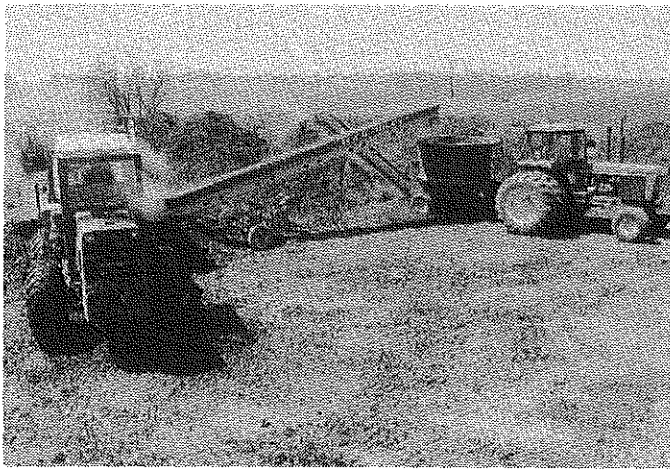
the soil will generate new problems. First, leaves normally must be stockpiled as city crews will deliver a large quantity over a few weeks. It may be necessary to establish some technique to prevent the stockpiled leaves from blowing away or blowing onto surrounding property. Natural windbreaks may be used for this or fencing may be used. Some form of equipment will be needed to stack the leaves into windrows larger than obtained through direct dumping from trucks. A standard farm tractor with a front-end loader can serve this purpose. However, larger equipment will reduce the time required.

Several different approaches have been tested to spread the leaves on the land for incorporation. In a study by Cornell University, leaves were applied at the rate of 1.5" (6.4 tons dry or 20 tons wet per acre) and 3" (12.8 tons dry or 42 tons wet per acre).⁽¹⁾ This was accomplished through the use of standard farm manure spreaders. However, this was a very time consuming process, requiring from 2.5 to 9.0 person hours per acre, varying with application rate and size of manure spreader. In this study, the leaves were incorporated with a moldboard plow.

Dr. A.E. Peterson, Soil Scientist at the University of Wisconsin, Madison, has conducted similar studies on leaf application and incorporation.⁽²⁾ Dr. Peterson also experienced difficulty in leaf distribution. After testing dumping and spreading with a front-end loader, side discharging manure spreader and rear discharging manure spreader, he concluded that the rear discharging manure spreader was the best machine tested. However, he found that spreading leaves through this process was very labor intensive.

For incorporating leaves into the soil, Peterson tested several farm tillage machines. After testing chisel plows, off-set disks and a rotary tiller, he concluded that the rotary tiller served this purpose best. The rotary tiller is not a standard piece of equipment on most farms, thus the purchase of a rotary tiller might constitute an additional expense for the entrepreneur wishing to undertake such a leaf project.

When incorporating tree leaves into agricultural land, one must give consideration to the impact these leaves may have on future crop yields. Leaves tend to be very low in the primary nutrients of nitrogen, phosphorus and potassium;



Complete system of front-end loader, conveyor and tub grinder processing leaves to make garden mulch. (Photo courtesy of Robert M. Schneider)

ranging from 0 to 2 percent of each element. Because of this low fertility value, one needs to consider leaves more of a soil conditioner than a fertilizer. However, leaves tend to have a high carbon:nitrogen ratio, ranging from 40:1 to 80:1. Most rapid decomposition of the leaves will take place at a much lower ratio of approximately 30:1.

As incorporated leaves decompose in the soil, some of the soil nitrogen normally available for plant growth may become tied up in the decomposing leaves. This may create a short-term yet critical deficiency of nitrogen and, in order to maintain normal yields, additional nitrogen may need to be applied to fields receiving large quantities of leaves. However, as the leaves continue to decompose, the "tied-up" nitrogen is released.

There has been concern about buildup of heavy metals and other undesirable materials as leaves are applied to agricultural land. While this may need to be monitored, both the Cornell study and the University of Wisconsin studies found all tested metals to be extremely low and far below the state and federal requirements for the land utilization of these wastes.

In summary, land farming of urban leaves appears to have a potential and may fit into the agricultural entrepreneurs' plan. However, leaves have an extremely limited fertilizer value and, although they may serve as a soil conditioner, their value may be exceeded by the cost of application, spreading and incorporation. Therefore, it appears that, in order for this practice to be economically sound for the farmer, some compensation must be paid by the municipality wishing to dispose of the leaves. This does not appear unreasonable when compared to the cost of other methods of disposal.

Mulch Production from Leaves

A second option for the disposal of urban leaves is to process the leaves into mulch. This mulch can then be spread and incorporated into agricultural land or sold to urban residents for garden and landscaping use. As with the land farming of leaves, this practice may be well suited to the agricultural entrepreneur. More storage and processing area may be needed for composting than for land farming as the leaves will need to be turned or aerated several times during the composting process. Additional space will be need-

ed for the grinding or shredding process. If composting is to be continued beyond 12 months, a practice used in some projects, enough space will be needed for a two year supply of leaves and mulch.

As leaves are received at the site for composting, they will need to be stacked into windrows. Windrows that are eight to ten feet high and approximately twenty feet wide appear to work well.⁽³⁾ This provides enough volume to allow buildup of heat during the composting process and prevent excessive drying without being so large as to exclude too much oxygen.

The most expensive and labor intensive step in the composting process is the grinding or shredding of the leaves. The grinding can be carried out upon receipt of the leaves in the fall or be delayed for several months. However, grinding exposes more surface area for microbial growth, accelerates the composting process and produces a more uniform product.

An advantage of delayed grinding is that there will be less volume to grind after some composting has taken place. Another advantage of delayed grinding is that the grinding process will serve as one aeration of the leaves. This will reduce the number of times the product will need to be handled. In addition, the rapid delivery of the leaves in the fall may exceed the grinding capacity of the project. Due to this option of grinding upon delivery or grinding at a later date, the farmer may be able to fit many leaf composting activities around other farming tasks.

One of the more standard machines used for grinding leaves is a tub grinder. This is the same machine some farmers have for grinding large round bales of hay for livestock. A tub grinder large enough to process large quantities of leaves will cost \$20,000 or more and will require a tractor of 70 to 140 horsepower. Because of this investment and horsepower requirement, the grinding of leaves is an expensive process which should not be taken lightly in calculating total composting costs.

Although most grinders can handle some foreign materials such as tennis balls and aluminum cans, pieces of iron may damage equipment and pose a hazard to the operator. Bottles are also very hazardous as the splintered glass will remain in the mulch and can cause injury to those working in the gardens in which this mulch has been used. Therefore, the process of collecting the leaves from the yards and streets is extremely important. A vacuum type pickup system, properly supervised, will tend to produce a product much more free of foreign material than leaves picked up with front-end loaders. This is a safety factor and needs to be stressed to those supervising the urban leaf pickup.

For best composting the moisture content of the leaves will need to be between 40 percent and 60 percent. If the moisture level is less than 40 percent, little composting will take place. Water can be added or the leaf windrows can be constructed to have an open or concaved top to accumulate rain water. Moisture levels above 60 percent may lead to anaerobic activity and the production of undesirable odors and leachate. Some excess moisture can be removed by turning or aeration of the windrows. Windrows should be designed so no ponding of water takes place along the sides of the windrow.

Oxygen is needed for proper bacterial action within the windrow. The construction of excessively large windrows or large stacks may exclude too much oxygen. Oxygen levels should not go below 5 percent for optimal composting. Turning or aeration of the windrows may be necessary to maintain this level of oxygen.

As the composting takes place, heat will be produced. While some heat is desirable for optimal action, excessive heat may retard further composting. When temperatures approach 140 degrees F., aeration by some means is necessary.

The level of acidity (pH) of the compost is important and is also an indicator of any problem in the composting process. Proper composting will normally maintain a near neutral pH of approximately 7. However, the absence of oxygen or oxygen levels below 5% may encourage anaerobic bacteria growth which may reduce the pH levels, producing acid type mulch. This is undesirable and can lead to the production of undesirable odors.

The composting process requires the handling of the product several times. Although the typical farm tractor with front-end loader may serve this role, it would be desirable for this tractor to have 4-wheel drive. In addition, the frequent changes in direction of travel and excessive clutch slipping can lead to high repair costs. A much more desirable machine is the larger industrial type front-end loader with some type of hydrostatic transmission.

As mentioned earlier, leaves tend to have a carbon:nitrogen level considerably higher than what is optimal for most rapid composting. This ratio can be reduced through the addition of nitrogen. If leaves are to be stored in windrows several months prior to grinding, this nitrogen can be added as the windrows are formed. If the leaves are to be ground soon after delivery, the nitrogen can be added during the grinding process. However, the addition of nitrogen increases the cost of mulch production through the purchasing of nitrogen as well as for extra labor. In addition, the concentration of supplementary nitrogen in a rather restrictive composting site can increase the danger of leachate contamination to surrounding areas. Due to the relative low value of the composted mulch, some operators prefer to keep expenses to a minimum and simply allow more composting time rather than adding nitrogen.

Sewage sludge, grass clippings and livestock manure have lower carbon:nitrogen ratios than leaves and can be mixed with the leaves to reduce the carbon:nitrogen ratio. However, the addition of any of these materials creates an entire new set of concerns. For general public use, pure leaf mulch may have a much greater appeal than mulch containing other materials.

The marketing of the end product from a leaf composting project is important and an area in which many farmers have had limited experience. Some projects simply provide the mulch free to the public. Other projects use a significant part of the product in normal city landscaping and developmental projects. Another approach is to sell the mulch at a nominal fee in bulk quantities, such as pickup or truck loads, directly from the composting site. In some instances the leaf mulch from a composting site is mixed with other materials, bagged and sold through normal retail outlets. Regardless of procedure, some marketing plan needs



Another load of mulch for someone's garden. (Photo courtesy of Robert M. Schneider)

to be developed and implemented as no composting site should develop into becoming nothing more than a repository for urban solid waste.

As a leaf recycling project tends to be very sound environmentally, one can capitalize upon this concept in a marketing strategy. Civic clubs, garden clubs, youth groups, and similar organizations can serve as dissemination agents for the marketing of the mulch. Because of the public service nature of the project, some free publicity can be developed through T.V., radio stations and the printed media.

Summary

The recycling of leaves and other yard waste, in either a land farming project or a composting project, can be very environmentally sound. In addition, when considering the other options available for the disposal of these wastes, a recycling project can also be very sound economically. However, it may require the rethinking of the standard practice of paying for the incoming raw product to being paid to receive the incoming raw product.

After considering the basic needs of space, equipment, labor and, to an extent, isolation, such a project may fit into existing farming operations and thus provide supplementary income for enterprising agricultural entrepreneurs. However, due to the multitude of environmental controls and regulations, shortage of research data and limited number of existing projects from which to glean practical information, anyone contemplating a recycling project should proceed with caution. Due to the magnitude of the problem of urban solid waste disposal, many municipalities are willing to provide their assistance and guidance. Recycling of urban solid waste is important and, under proper coordination, can become an income producing enterprise for the aggressive agricultural entrepreneur.

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Software Sampler Computerized Wiring Program

(Continued from page 17)

The CIWP was written for IBM or compatible computers which are equipped with at least EGA graphics capability. Most computers prior to about 1985 were equipped with CGA capability and will not be able to run the CIWP, but may be upgraded to process EGA graphics through the addition of a card. Even greater graphics capability may be demonstrated by CIWP if your machine has VGA capability. This capability is a standard feature of most higher levels of computers such as the IBM PS/2 Model 50. The CIWP is available in two formats, including 5 ¼" or 3 ½" diskettes. In all cases, hard disk drive storage capability is required to run the program. The program requires approxi-

mately 6 megabytes of free storage space thus requiring a sizable hard drive.

The CIWP is available to National Food and Energy Council members and educators for \$170 per package. Additional purchases after three sets are \$145 each. The package may be obtained by writing the National Food and Energy Council, 409 Vandiver West, Suite 202, Columbia, MO 65202, (314) 875-7155.

The program is expensive and requires a very sophisticated array of hardware with ample memory. But, the graphics are superb and the package is very comprehensive. It would easily fit into any program of agriculture as a self-paced tutorial or for group instruction in electrical wiring. If you have the hardware required to support this program, it would be worth your time to consider adding it to your instruction in electricity and electrical wiring.

Entrepreneurship in Rural America

(Continued from page 16)

Many small communities are "chasing smoke stacks". They hope to attract a large company to their community that will bring dozens or even hundreds of jobs . . . jobs that will probably pay slightly more than the minimum wage and lead to many still living below the poverty level. In reality, large manufacturers prefer the availability of cheap labor overseas. Rather than putting all of their eggs in one basket, rural communities should be seeking to attract and establish more homegrown businesses, which lend to a higher degree of economic stability.

According to the Small Business Administration, over 90 percent of the nation's businesses have 20 employees or less. Therefore, it seems that the most favorable economic growth for rural America will come from small businesses rather than from trying to attract large corporations.

Are today's entrepreneurs any different than those of a decade ago? Probably so. They're different in the skills they possess. Many are armed with a more business-like attitude, computer skills, and an understanding of risk management; but those things alone won't secure them a loan for a new business venture. No, the banks are still interested in securing loans with collateral, not heart and desire. Many of the rural lenders are still feeling the affects of the 1980's and have become more conservative. Yet, with a verifiable business plan and an in-depth feasibility study, lenders will feel more comfortable and confident in sharing the risk associated with a new business venture.

Entrepreneurs are more than those few individuals who come up with an idea of improving one's life-style by filling a small niche in the marketplace with a new invention. These are the ones who get all the press and exposure, mainly because their success is tied to the size of their building, the number of employees they have, the fact that they raise capital by selling stock on the stock exchange, and the new

home they built near the country club. Even though a few of these come to mind, let's not stereotype and exclude those that may work out of their basement or garage, provide all levels of management and labor themselves, and struggle to pay the bills every month.

A high percentage of new business startups fail within the first year or two. The reasons for failure are numerous. Some failed to plan all phases of the operation before start up. Great ideas, products, and services still need to be marketed. Yet, many of these operations may have been salvaged had they taken advantage of the resources that are available to assist them.

So, are our curriculums designed to meet the needs of these individuals? Courses in management principles, accounting, marketing, finance, economics, and salesmanship are common in most two and four year colleges; yet, most individuals won't return to college to obtain a degree before they attempt to start their own business. Some of them may seek to take an evening course or two, but most will be more apt to participate in a condensed learning experience consisting of a series of weekend or evening workshops or seminars.

Many agencies offer assistance and no single agency or institution may have all of their answers, but we feel the community or junior college should be among their first stops. The need is there and we as educators must strive to educate and/or re-educate those who need our services. Maybe we can make a difference and do our part to assist the economic development efforts in rural America.

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Encouraging Entrepreneurship

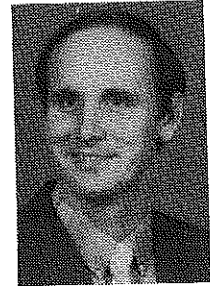
As a group, they are optimistic, resourceful, and persistent. They feel that they control their own destinies, not believing in fate or luck. They have a strong work orientation and are goal setters and achievers. They are well organized, yet flexible. They are strongly influenced by family role models.

This is a description of the American family farmer, a rapidly shrinking segment of today's workforce. However, it is also a description of people who are entering the rapidly-expanding field of entrepreneurship. As secondary agriculture students graduate and begin looking for employment opportunities, we know that many cannot support themselves by returning to the family farm; but they do have the characteristics described above and they do know agriculture. In West Virginia, we are implementing a wide range of projects in entrepreneurship education that will give our agriculture students the knowledge and experience necessary to create agriculture-related enterprises in their communities.

For years, the West Virginia Department of Education has conducted frequent inservice activities to address new and emerging technologies and teaching methods. These update sessions have encouraged our teachers to maintain progressive attitudes toward new developments and instructional techniques. We have built on that progressive attitude and knowledge base to move, philosophically, from an emphasis on agricultural production to a recognition of production as only part of the entrepreneurship process. We have implemented several projects — some new, some traditional — that will broaden the agriculture career options of West Virginia's agriculture students.

Recently, the state department agricultural education staff worked cooperatively with the marketing education staff to provide our teachers an extensive inservice opportunity to increase their awareness of entrepreneurial success factors. Such topics as research, marketing and promotion, legal issues, taxes and business records, and personnel issues were covered in 13 weekly sessions which were broadcast via satellite to dozens of sites statewide. Three on-site group meetings reinforced the material presented during the broadcasts.

In order to emphasize the advance planning that must occur within any successful undertaking, several local agricultural education departments have conducted feasibility studies and utilized the findings to develop entrepreneurial ventures that meet verified market needs. Student experience programs resulting from these efforts include such products or services as interior plantscaping, landscaping and turf



BY GENE COULSON AND DONALD L. MICHAEL

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management, natural Christmas wreaths, hydroponically-grown produce, truck crops, and the production, sale and brokerage of exotic animals. These activities have provided some excellent experiential training. They have also proved to be quite profitable.

With 70% of our local departments reporting this year, data indicate that students earned \$3,406,098 from their supervised agricultural experience programs, with a profit in excess of one and one-half million dollars. Thirty-one percent of these programs involved farm placement (12.5%) and placement in the agribusiness sector (19.1%). We believe that much of the success of these programs is due to the increased emphasis on the entire entrepreneurial process.

Finally, entrepreneurship education is an area that benefits greatly from cooperative efforts across vocational service areas. Look to marketing education and/or business education personnel for assistance. In West Virginia, cooperative projects have included sharing of speakers with teleconference presentations and team-teaching exercises in local classrooms.

Students of agriculture must graduate with as many opportunities open to them as possible. In the Mountain State, we are aggressively integrating entrepreneurship studies into agricultural education programs so that our students' career options are expanded. While we train students in business creation, we also help the economic development of our state.

International Agriculture

Value of Infusing International Activities

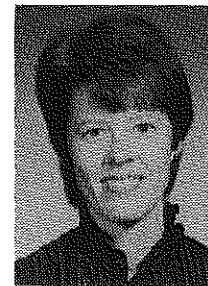
As a practicing high school agricultural instructor, I have discovered some very practical reasons to infuse international activities into agricultural education programs. Expanding agricultural education to include international perspectives has sparked student interest, revitalized the Agriculture Program at North Fayette High School where I teach in West Union, Iowa, and most importantly provided students with a more complete education. For these reasons I would encourage high school agriculture instructors to infuse international understanding into their curriculum.

The infusion of an international prospective into programs will better prepare students for future agricultural careers. International events have a growing impact on USA agriculture and the people who make their living in related careers. To be more thoroughly trained for these careers students must have an understanding of the global interactions of agriculture. Activities which have been infused into the agriculture classes at North Fayette:

1. Study of the significance of import potential and export history are included in Crop and Animals Science Units.
2. Care and importing of tropical house plants are examined in the Horticulture class.
3. The Agricultural Marketing Class includes how international policy changes affect our markets.
4. How changes in foreign currency exchange rates are related to the purchasing power of foreign countries.

International activities will add prestige and inject life into stagnant agriculture programs. Examples include:

1. Cooperating and co-sponsoring activities with the foreign language clubs.
2. Volunteering to chaperone field trips for groups of exchange students from foreign countries.
3. Hosting incoming students through the National FFA programs.
4. Chapter FFA members participating in the Work Experience Abroad (WEA) program.
5. Cooperating with the state university by hosting students from foreign countries.
6. Providing an American cultural experience weekend



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and tour of points of interest in the state for foreign students from the university.

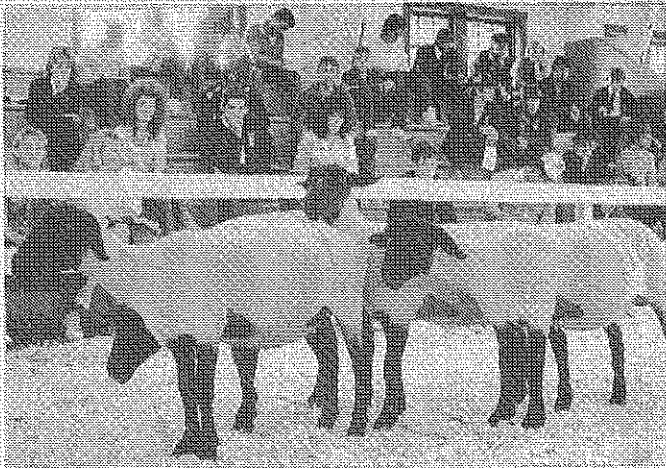
The enrollment in our program has been on a continual increase since we have added international activities:

1. Increased from 86 to 103 students in three years.
2. We initiated 39 Greenhand FFA members this year.
3. Twenty-five families have hosted exchange students from five countries as part of our agriculture program.

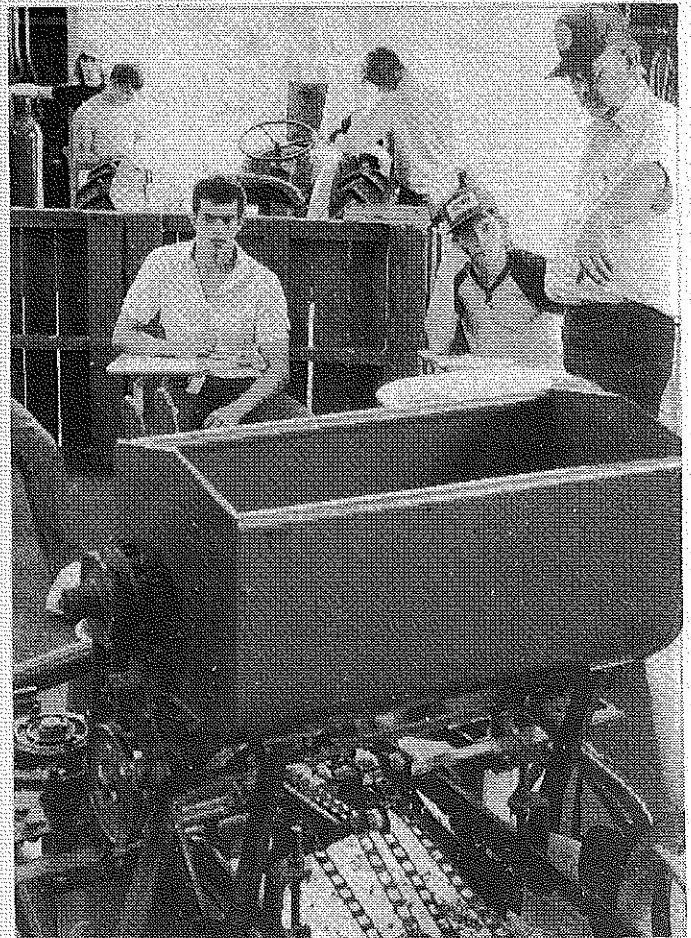
In conclusion, former students have entered higher education with career goals which include international work, our student numbers have increased, and I feel students are more completely educated. Infusing international activities into the agricultural education curriculum is critical.

International agriculture helps our students to understand the importance of international interactions upon agricultural trade, to learn to accept differences in cultures, and to actively cultivate an awareness of international career opportunities. Expanding the curriculum to include international activities increases enrollment and improves the academic capabilities of students. Cooperation between foreign language and agriculture departments has produced harmony and team work within the school. There has also been an increase in administrative support for our agricultural education program.

Stories in Pictures



Production agriculture is the basis for many opportunities in off-farm agripreneurship. (Photo by West Virginia University).



Knowledge and skills in agricultural mechanics can lead to profitable and satisfying agripreneurships. (Photo by West Virginia University).



Competencies acquired in agriculture classes should lead to employment or self-employment in an agricultural occupation. (Photo by West Virginia University).



Mastery of computer technology is essential to success as an agripreneur. (Photo by West Virginia University).