Table 2. Location and Frequency of NACTA Annual Convention by Regions and Types of Host Institutions 1955-1987

Type of Institution	Southern Region	Central Region	Western Region	Eastern (U.S.)	Eastern (Canadian)	Total By Type of Institution	Percent By Type of Institution
Land Grant	2	5	2	1	1	11	.33
Four Year State and Private	8	6	3	1	1	19	.58
Two Year State and Private	0	0	1	2	0	3	.09
				(4)	(2)		
Total and Percent By Region	10 (31%)	11 (33%)	6 (18%)	6 (18%)		— —	— —

Source: Records of Murray Brown, NACTA Secretary, Sam Houston State University, Huntsville, Texas.

rotating meetings among the different types of institutions. The executive committee has however recognized this as desirable when appropriate invitations were available. The committee has also been committed to meeting on the campuses of host institutions.

Some dividends to NACTA from this order of meetings through the years may have been:

Maximum Attendance at Conventions. Any US or Canadian member has been within reasonable travel distance to a national meeting three out of every four years. Stated in another way there should never have been more travel distance than half the breadth of the US for the members from the Central and Southern Regions and further only one out of four years for members from the Eastern or Western Regions. The relatively large numbers of members from the Central and Southern Regions should not be necessarily attributed only to location but also to the proportionately larger number of higher agricultural institutions in those regions.

Membership Promotion. Records show that a meeting on a given campus stimulates new memberships — at least some of which are sustained. These new members would often establish that institution as a NACTA flagship in that region as the result of individual leadership and indirect financial support in earlier years. A quick review of the proceedings and Journal will easily identify some of these institutions from all three types.

Influence of Organization. The distribution of NACTA members throughout the US and several provinces of Canada gives the organization significant status as viewed by prospective members, government entities and the general public.

First Hand Exposure to Unique Regional Agricultural Production. On campus meetings of NACTA in different regions have been a broadening professional experience for most members. This has permitted observation of new enterprises. They have also benefited from mutual exchanges with other professionals in the different agricultural disciplines related to these different agricultural specialties.

IDEA SHARING SESSION

Oral Presentations

The University and Ag in the Classroom

Douglas A. Pals
Associate Professor
University of Idaho

The "Ag in the Classroom" concept was initiated in 1981 by Secretary of Agriculture, John R. Block. Each state was challenged to develop Ag in the Classroom (AITC) programs to provide basic knowledge and an awareness about agriculture to kindergarten through high school students.

Why is it important that Colleges of Agriculture be a part of this exciting program? The University of Idaho, College of Agriculture became involved for the following reasons:

1. **Influencing the Image of Agriculture** — Many individuals think of agriculture as only farming and ranching. The scope of agriculture needs to be conveyed to the public. The Ag in the Classroom programs can provide an avenue for knowledgeable faculty to impact the agricultural image.
2. **Recruitment** — Colleges of Agriculture are suffering large decreases in student enrollments. The AITC provides exposure to non-traditional audiences which could help attract more qualified students to agriculture.
3. **Curriculum Development** — Much of the AITC activity currently underway in the states centers on curriculum development. Colleges of agriculture faculty have the technical subject matter expertise and through Agricultural Education Departments have the curriculum development competence required to write effective curriculum materials.
4. **Accuracy of Information** — Incorrect information can be damaging when circulated as fact. College of Agriculture faculty can

ensure that the information used in AITC curriculum is accurate.

5. **Ag Faculty Awareness** — If the College is involved with the AITC program, it is more likely that the agriculture faculty will be aware of the AITC program and its objectives.
6. **Opportunity for Ag. Ed. Faculty** — The AITC program allows Ag. Ed. faculty to receive outside agency funding to be used in developing and implementing curriculum. There is also opportunity to formally test the AITC materials for effectiveness.

Ag in the Classroom activities make an important contribution to the process of informing the public about agriculture. Agriculture leaders in Idaho are excited about the contribution AITC will make. I encourage all Colleges of Agriculture to get involved and support the AITC effort in your state.

The College Professor and Agriculture in the Classroom

Max E. Benne
Western Michigan University

Most elementary and secondary students have little or no contact with production agriculture. "Agriculture in the Classroom" is a movement to acquaint young people with agriculture in a positive and accurate manner.

Agriculture faculty of institutions of higher education can play a role in this program. Since elementary and secondary teachers are professionals in terms of how to teach at their respective grade levels, what they need are the ideas and sources of information to successfully include agriculture in their lessons. Agriculture faculty members can fill this need even if they are not familiar with elementary and secondary teaching.

An example is a course offered by Western Michigan University entitled, Agriculture for the Classroom Teacher. It is a one credit class that has been conducted in an off campus agricultural setting. The primary clientele for the class are elementary teachers.

One of the essential steps to market the course successfully was to get the course approved for use by teachers in acquiring the credits they need to satisfy certification requirements. Another marketing feature was to offer the course in a compact manner that met the desires of elementary teachers. Therefore it is normally scheduled from nine in the morning to four in the afternoon on two days. Consecutive Saturdays can be used during the school year.

The students are introduced to the tremendous amount of help and material they can receive from agencies and organizations by resource people from those groups. The Soil Conservation Service and District, the Cooperative Extension Service, the Farm Bureau, and the vocational agriculture program are examples.

The Ag in the Classroom office of the United States Department of Agriculture will provide material that will offer ideas for lessons and contacts for public and industry sources of material.

The need for the general public to have a knowledgeable outlook on agriculture is great in terms of the establishment of public policy, being wise consumers, and for encouraging people to consider agricultural vocations. Working with the teachers of young students is one method that college professors in agriculture can use to play a significant role in this regard.

Product Evaluation to Determine Needs of Students and Alumni

David Drueckhammer
Assistant Professor at Agricultural Education
University of Southern Louisiana

Evaluation of instructional programs for the purpose of updating and improvement is done by most, if not all, educational institutions. These evaluation systems are generally based upon peer evaluation, student evaluation of instruction, and outside evaluation teams. In my opinion these important evaluation methods should be used with an additional evaluation strategy, product evaluation. Product evaluation is generally the most difficult and time consuming to conduct but, if conducted properly, may be the most useful of the evaluation strategies. This emphasis of product evaluation means that we need to look at former students of the educational programs to determine what effects the programs had on them. The use of a follow-up study is one of the most informative methods used to conduct product evaluation.

I have been involved in several follow-up studies of graduates of agricultural instructional programs. Through this experience I have come to recognize several items that need your careful attention to assure quality results. Among these are:

1. Careful development and field testing of your questionnaire. Find other questionnaires that have been used in this type of study for assistance.
2. A high response rate. Code questionnaire so that one or more follow-up mailings can be made to non-respondents.
3. A carefully worded cover letter should be included in your mailing to assure the confidentiality of the information. If possible, have a person that the graduate was familiar with (their advisor, dean, etc.) provide a signature to the letter.
4. Print your questionnaire on colored paper. A higher response rate can generally be expected.
5. Provide an addressed postage paid return envelope.
6. Be sure to collect all the information you need, but keep the questionnaire as short as possible.

Information secured through the use of product evaluation might include:

1. Determining the relationship of the graduates' degree earned and their area of employment since receiving the degree.
2. Determine the adequacy of training, counseling and job placement assistance received by graduates.
3. Determine adequacy of instructional facilities and equipment.
4. Determine the level of influence selected factors and people had on the graduate's decisions to earn a degree in agriculture at your institution.
5. Determine starting and present salary levels of graduates, for use in advising and recruiting of students.

You may have additional areas of concern that you will want to include in your study.

I hope that your institution will take on the task of product evaluation. Your results will be very useful and in some aras surprising.

Faculty-Industry Experience Program

Roger D. Walker
Associate Professor
University of Minnesota Technical College at Waseca

Many agricultural faculty members are expert teachers and have formal training in technical areas; however, most have not formally experienced the technology that they teach. Their job is teaching, not farming, mechanics, veterinary medicine or selling agricultural products and services. Also, as time goes by, the technical training faculty have received becomes out of date, prompting a hectic struggle to keep up with technical advances. Clearly, then, in order to maintain program credibility, attract quality students and produce confident, well trained graduates, faculty must keep up with the technology of their area and have a better "feel" for industry conditions.

The University of Minnesota Technical College at Waseca has developed the Faculty-Industry Experience Program that allows faculty time off to work in an industry that relates to their area of specialty. Faculty are updated to new developments in the industry, but more importantly experience the conditions within which their graduates will be working.

Faculty who have been on the 2 to 12 week program have been able to put their technical knowledge to work in an industry such as farming or veterinary medicine. Also, unknown areas of weakness in training emerge and the faculty member is able to fill in those gaps and is also free to share knowledge with the employer.

Back in the classroom, the newly acquired technical material can be shared with the students along with personal anecdotes, thus giving a great deal of credibility to the material. Faculty are able to draw upon more resources for classroom material and are able to discuss topics with more confidence because they have actually experienced them. The end result is graduates who are better trained and confident as they enter the industry.

Occupational Choices of Midsouth Non-land Grant Agricultural Students

Danny E. Terry
Central Missouri State University
Warrensburg, Missouri
Robert C. Kirst
University of Arkansas at Monticello
Monticello, Arkansas
Lew E. Brinkley
Arkansas State University
Jonesboro, Arkansas

A study was conducted to examine background characteristics and occupational choices of agricultural students in Arkansas' and Missouri's non-land grant universities. Surveys of freshman and senior agricultural classes at nine state-supported institutions offering four-year degrees in the basic agricultural sciences were completed in the Spring of 1987. While 74.3% of the 604 agricultural majors lived on farms, only 57.3% enrolled in vocational agriculture courses while attending high school.

Over 35% of surveyed agricultural students indicated their major to be Agribusiness, while 17.9% and 12.9% majored in Animal Science and Agricultural Economics respectively. Over 75% of the students reported selecting a major in agriculture because the "area seemed interesting." Approximately 60% indicated selecting an agricultural major because of job opportunities.

Most popular among occupational choices was farming, with 50.3% of all students identifying this career as "very interesting" or "extremely interesting." Managing an agribusiness was second in popularity, with "very interesting" and "extremely interesting" responses obtained from 44.5% of those surveyed. Least popular among the 58 career options presented were agricultural librarian, peace corps volunteer, supermarket manager, and statistician. Twenty-three percent of the freshmen expected to farm immediately after graduation, while only 18.5% of the seniors saw this as a viable alternative. Surprisingly, almost 17% of the seniors were undecided as to their profession, while another 12.2% expected their career to be in "sales." Sixty-six percent of the 604 students surveyed planned to farm in the future, with 25% expecting to earn their entire income from production agriculture.

The diversity of occupational goals of agricultural students is reflected in the flexibility and variety of curricula offered by the departments and colleges of agriculture. However, the relatively large proportion of students who desired or expected occupations in production agriculture does not reflect the shifting structure of the industry. Fewer individuals are directly involved in the production process, but many play a

role in supporting the farmer in such areas as dissemination of information, technical assistance, marketing services, and the provision of inputs. With increasing farm size, many students will not obtain their livelihood from production agriculture. Our teaching programs must adequately reflect the shifts in needs. Success in this endeavor will necessitate new and innovative teaching techniques, as well as a continued reevaluation of all agricultural curricula. We must present career information concerning the scope, breadth and dynamics of the agricultural industry. We must stress the new discoveries and new technologies, and provide information on the competitiveness of salaries and career upward mobility. We must train students, and retrain instructors, in such a way as to meet demands of future agriculturalists and the agricultural industry.

Campeche Agricultural Mechanics Educational Project

Victor A. Bekkum
Associate Professor
Iowa State University

A tractor preventive maintenance course based upon the modeling approach to teaching was delivered to 272 ejiditarios. The course was a joint project of Iowa State University, the Bank of Mexico and PROSERCAM (Promotora de Servicios Rurales de Campeche), a Mexican governmental Agency that provides machinery services to the cooperative farms in the State of Campeche.

The project began in March, 1987 with a needs assessment tour of PROSERCAM facilities and cooperative farms by Dr. William Edwards, Mr. Herschel Weeks and myself. A proposal detailing the perceived needs was submitted to Dr. J.T. Scott, International Agriculture Programs office at ISU. The proposal which led to the development and implementation of an agricultural mechanics educational project in Campeche, Mexico in August, 1987 was partially financed by an anonymous benefactor.

Fifteen persons consisting of mechanics and high school teachers were identified by PROSERCAM to participate in the first phase of the project. The format of the three week course was as follows:

Week 1 — Iowa State University personnel taught the entire machinery maintenance course to the lay instructors demonstrating appropriate maintenance methods and procedures; as well as teaching methods.

Week 2 — The lay instructors developed instructional materials and practiced teaching each other selected portions of the course.

Week 3 — The top eight lay instructors were selected to teach the preventive maintenance course to 25 ejiditarios brought in from the cooperative farms.

The second phase of the program involved the eight lay instructors teaching a total of 272 ejiditarios as of December 1, 1987.

The Iowa State University personnel involved in the project included:

Director: Herschel Weeks, Agricultural Engineering Department

Co-Coordinator: W. Wade Miller, Agricultural Education Department

Co-Coordinator: Victor Bekkum, Agricultural Engineering Department

Translator: Heberth Obando, Graduate Student

Student Interm: Jon Gulick, Agricultural Mechanization Curriculum

International Agriculture Office: J.T. Scott, Agricultural Administration

Even-Toed Joe: A Better Way to Teach the Concept of Range Management to Young Students

L.L. Larson
and P.A. Larson
Assistant Professor, Rangeland Resources Dept.
Oregon State University
Forester, LaGrande Oregon

Even-Toed Joe is a 3 foot tall papier-mache model of a Hereford bull. The model was conceived as a means to attract and maintain the attention of seventh-grade students during the annual Natural Resource Day activities held in Union County, Oregon.

The objective of the day long activity was to introduce seventh-grade students to natural resource management. Even-Toed Joe provided a focal point by which to integrate the role of the ruminant in the rangeland ecosystem. The model has an opening on its side that stores an inflated rumen. The rumen can be removed to discuss the symbiotic relationship that exists between the rumen microbes and ruminant. A cow skull was used to emphasize the process of grazing and the subsequent growth response of plant species to forage removal. The landscape and outdoor setting were used to discuss soil/watershed characteristics and the role of range management in maintaining a quality home for Even-Toed Joe.

Contests are held each year that utilize the information gained during the day-long activity. For example, Even-Toed Joe was the winning entree selected from a 'name the cow' contest. The name, Even-Toed Joe, refers to ungulate classification.

35th Annual NACTA Conference
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University of Tennessee
Knoxville, TN

Typing Tutors in Introductory Computer Classes

Alfred R. Conklin, Jr.,
Donald Chafin
Monte Anderson
Wilmington College
Wilmington, OH

Wilmington College Agriculture Department is integrating computers into the curriculum. This necessitated development of an introductory computer course. A major problem is that students entering the program have few typing skills. To overcome this problem we have investigated the computer assisted instruction (CAI) use of a typing tutor (specifically Typing Tutor III by Kriya Systems, Simon and Schuster). The objective was to increase student familiarity with the key board not to increase their typing speed. Our finding is that a typing tutor can increase students facility with the keyboard.

Two methods of using Typing Tutor were compared. Structured, forced use aimed at achieving a certain level of typing skill and nonstructured ad libitum use where students were encouraged but not forced to practice. Structured use resulted in an average of 3 words per minute (wpm) and nonstructured use an average of 12 wpm increase in typing speed. Using the structured format four students had a decrease averaging 4 wpm.

Statistical analysis shows no significant difference between samples. Because samples were not random, small numbers of students were involved and typing practice obtained by taking the class will effect the outcome, this study must be taken as tentative. However, we believe that this data is helpful in deciding on the most effective use of Typing Tutor. We would hope that other colleges with larger numbers of students carry out similar studies so that definite results be obtained.

Negative results from forced use indicate that this use of Typing Tutor is not acceptable. The authors wonder how many forced educational activities have a negative effect on learning? We must hasten to say that not all forced learning can be avoided, but where it can it should!

Agricultural Electronics — Are Students Prepared?

Duane T. Schindler
Assistant Professor
University of Minnesota Technical College of Waseca

The purpose of this study was to investigate the need for additional electrical training for mechanized agriculture students by determining the type, quantity, and serviceability of electrical components incorporated into planting and harvesting equipment. A survey was developed and mailed to the service department managers of eight major agricultural machinery manufacturers, of which all were returned.

The data reveals large numbers of electric components, ranging from two to sixty-four functions per machine (tachometer, solenoid valves, motor controls, etc.). Manufacturers expect approximately one-third of these electrical components to be repaired at the retail level and the balance to be replaced or returned to the manufacturer. To troubleshoot and repair component failures, one-sixth require special test equipment (unique instruments designed to test modules/circuit boards), one-third require complex test equipment (V.O.A. meter and continuity testers), and the approximate one-half remaining require basic test equipment (test lights). The knowledge levels necessary to troubleshoot and service these electrical components are: one-twelfth require a high knowledge level, i.e. understanding AC-DC circuits, wiring diagrams/schematics and basic electronics; over two-thirds require a medium knowledge level, i.e. understanding Ohms law, the correct use of a V.O.A. meter, correctly reading diagrams/schematics, and a superficial knowledge of semi-conductors: the remaining one-fifth require only superficial knowledge, i.e. understanding basic DC circuits, the use of continuity testers, and the ability to read basic wire diagrams/schematics. It would be nearly impossible to expose students to the necessary curriculum to achieve the "medium level knowledge" and the "high level knowledge" required by industry in a typical two or three credit DC electric course, clearly showing a need for advanced electrical coursework.

Improved Instruction Through Individualized Problem Solving Using Electronic Spreadsheets

Douglas E. Johnson
Department of Rangeland Resources
Oregon State University

Electronic spreadsheets are a powerful new tool for teachers of agriculture. They can encourage students to use rationale and logic in decision making. A series of spreadsheet models has been employed for several years at Oregon State University by students enrolled in an International Range Management class. Because they are spreadsheet based, models are flexible and can be easily adapted to individualized situations. This is especially valuable for foreign students or those with diverse backgrounds. Students are shown a model format then asked to create a spreadsheet for a specific situation, generally for either their home country or for a developing country. In each case the underlying logic of the analysis is of primary interest. Complex calculations that were formerly tedious and time consuming are relegated to secondary importance. The use of these models in the classroom has improved the student's skill and working familiarity with micro-computers while increasing the applicability of the coursework. Models include population dynamics, costs of forages on a nutritional basis, nutritional demand calendars, forage production calendars, and the financial calculations for annual rate of return and international rate of return. A model

format that includes a sequence of assumptions, calculations and conclusions is used in each of these. Several examples of useful models are provided.

Guidelines for Successful Community College Recruiting

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Assistant to the Dean, Special Programs
Sherri A. Noxel
Recruitment Coordinator
College of Agriculture
Institute of Food and Agricultural Sciences
University of Florida

On campus interviews with community college administrators were conducted to establish principles for successful community college recruiting. It was found that the unique environment at community colleges will require great changes in attitudes and recruiting techniques on the part of colleges of agriculture.

Colleges of agriculture need well planned, aggressive recruiting strategies. A written plan including the roles of departments is necessary. Recruiting competition is keen. It was found that the average Florida community college was visited by 20 or more institutions at least once per year. Many institutions visited the community college campus more than once annually.

Agricultural college faculty and recruiters need to develop better presentations. While most universities tend to talk about academic programs nearly exclusively, they should sell many other benefits that young people are seeking such as job security, group belongingness, promotional achievement paths, travel, and leadership training, and a host of other very tangible, life-long assets.

A few of the guidelines derived from this study were:

a. Develop programs aimed at peer groups and parents as well. They have great influence.
b. Make students aware of agricultural applications of high tech areas such as biotechnology, engineering, food sciences, etc.
c. Community college transfer student are more "professionally" oriented and less "discipline" oriented than high school students. Average transfer age is 23.
d. On-site visits are the best tool, however, three to four contacts per year are needed.
e. Visitation schedules should be regular, announced, and should be arranged with the community college vice-president.
f. Ideal visitation times are from 10 a.m. to 1 p.m. on Mondays and Wednesdays.
g. Young alumni are often effective recruiters.
h. Special programs, seminars, and lectures are usually poor methods.
i. Scholarships need to be a minimum of $500 - $1,000 to be effective enticements.
j. Proper techniques vary with the size of the community college population.

Recruiting should be a college function with departments contributing to an overall college plan. Students are seeking answers to many questions that do not relate to curriculum or just careers in a department. The manpower required to give three to four contacts per community college per year is more than most departments could give. The travel cost would be prohibitive for many departments as well. A good team of interdisciplinary faculty promoting a college and all of its majors could generate enough contact time for every department's interest.

A Plan to Reward Effective Teaching With Tenure, Promotion and Merit in a Land Grant University

Leverne Barrett, Associate Professor
Joyce Povlocs, Assistant Professor
Robert Narvason, Professor
University of Nebraska-Lincoln

Introduction

The College of Agriculture at the University of Nebraska at Lincoln has had a long history of efforts to improve teaching. Faculty are encouraged to participate in teaching improvement workshops and monthly seminars sponsored by the college's active Instructional Improvement committee. A full time instructional consultant is available to assist faculty to solve teaching problems. The Dean of the College stresses the importance of good teaching on a regular basis.

In spite of these efforts, some faculty perceive that teaching in the reward system is not equally recognized with research. As an outgrowth of a 3 year faculty development project funded by FIPSE (Fund for Improvement of Post Secondary Education, U.S. Office of Education). An idea was generated that could solve the problem of adequate rewards for teaching.

The authors developed a proposal for FIPSE funding that included the Colleges of Agriculture and Arts and Sciences. The union of a professional college with a liberal arts/science college was designed to demonstrate to FIPSE the broad application of the concept being proposed. If these two diverse Colleges would demonstrate that effective teaching could be recognized with tenure, promotion and merit, the plan could be used in any other land grant institution. The Fund accepted the plan and grated funding.

The Plan

To solve the problem of adequately rewarding teaching requires a plan that involves all areas of the university system from faculty to administration. Planners recognized that if this national problem was to be solved, it could not be done by top down edicts or from bottom up efforts, but only through a combined effort.

Two groups were established with representatives from both colleges. The first group to meet was the

Leadership Team. It's charge is to develop the overall plan to improve the reward system for teaching and to oversee its implementation. The Leadership Team is comprised of a "vertical slice" of university personnel: associate vice-chancellor, dean, department head, senior faculty and untenured faculty. This team is responsible to implement the following objectives:

1. Clarify principles and practices that result in effective teaching within and across disciplines.
2. Design an implementation plan for rewarding effective teaching and carry it through to completion.

A faculty group is the second part of the plan. Each semester a group of 14 faculty (1/2 each college) is organized. Their focus is on the nature of classroom teaching. The specific objectives of the teaching groups are:

1. Develop consensus regarding the importance of and rewards for effective teaching within and across disciplines and colleges.
2. Determine means of measuring and documenting effective teaching compatible with pedagogy in the various disciplines.
3. Identify means of assisting individuals to improve teaching.

Results

Results at this stage are only tentative but significant positive signs are evident. From information obtained from a study of faculty perceptions of teaching importance in the reward structure, efforts of the leadership team and project staff, positive signals have been received that the university administration is interested in solving the problem.

We have come to several tentative conclusions. These are:

1. Scholarly activity is a given at our university, regardless of the assignment.
2. Research is perceived by faculty to receive more rewards than teaching.
3. Teaching would receive more rewards if better data were available.

We are optimistic that the model we propose will solve the problem of rewarding teaching equally with research and service. We also believe that the solutions we devise will be transferable to other similar institutions.

IDEA SHARING SESSION
Poster Presentation

Student Learning Teams: Agronomy Students Become Active Participants

Roger Pennock, Jr., Professor
Department of Agronomy
Penn State University

Edgar P. Yoder, Associate Professor
Department of Agricultural and Extension Education
Penn State University

"I think I understand the information, but I don't know how to use the information." "I don't see how this course is going to be useful to me." "If you take good notes and memorize you'll get by." These represent students' comments we all may have heard from our own advisees or other undergraduate students. Some would say such comments reflect students' involvement in college classes where "business is going on as usual." This is, college classes wherein we find a teacher-centered environment dominated by the traditional lecture.

Undergraduate classes don't have to reflect such a business-as-usual environment. We can have relatively large undergraduate classes wherein we find a student-centered environment in which students are actively involved in synthesizing information and developing solutions to problems. Students need not be passive receptacles into which we attempt to pour information. Boyer (1978, p. 114) in **College: The Undergraduate Experience in America** indicates:

> If faculty and students do not see themselves as having important business to do together, prospects for effective learning are diminished. If students view teachers as distant and their material as irrelevant, what could be a time of exciting exploration is reduced to a series of uninspired routines.

We agree with Adler (1982) that learning is an active process. As faculty we have a responsibility to actively involve students in a learning process described by Adler (p. 23) as "a process of discovery in which the student is the main agent, not the teacher."

Learning Teams — How They Work

To create such a student-centered environment in Agronomy 200, cooperative, student learning teams consist of three individuals working together in developing a land-use plan for a 400 acre site. The three individuals respectively assume the role of land owner, planner and environmentalist. This requires the team to develop a group solution which considers the problem from the perspective of owner, planner and environmentalist.

Concepts developed in classroom and laboratory instruction and through readings provide the basis for learning teams to develop potential land use solutions. Throughout the semester the learning teams develop their solutions to the problem. Time is spent in class to work on solutions, and teams work together outside of class. The learning activities in the classroom and laboratory take on new meaning as concepts are developed which will be essential to developing the team's solutions.

The learning teams then present their solutions to the entire class via both an oral presentation and a written report. This provides an avenue for a lively discussion regarding the feasibility of various team solutions.

Key Concepts Taught in Classroom and Laboratory Activities

Classroom Instruction Concepts

- Identify soil characteristics which influence land use
- Drainage class differences
- Slope
- Land use capability subclasses
- Parent materials
- Septic system suitability
- Suitability for various types of development
- Forest productivity
- Agricultural Productivity

Laboratory Instruction Concepts/Skills

- Determine slope
- Measure soil color
- Identify soil horizons
- Measure infiltration and percolation
- Identify land forms and their relation to soil development and land use

Results of Using Learning Teams

Obviously the use of cooperative learning teams has provided **all** students an avenue for them to be active participants, with faculty, in the learning process. Students' comments provide strong support for the continued use of learning teams in Agronomy 200. Learning teams work so well because each student becomes active and visible in a problem-solving mode, resulting in a high degree of student interest and motivation.

To us it seems the real value of the learning team technique for teaching in a technical major is its contribution to developing the total student employers of agronomy graduates are seeking. We believe the following abilities characteristics desired by employers in college graduates (McCoy, 1983) are especially enhanced with the use of learning teams.

- Critical thinking via analysis, synthesis and evaluation
- Communications — oral and written
- Interpersonal abilities to work in group settings
- Leadership and organizational abilities
- Development of ethical values
- Application and use of technical agriculture concepts
- Collaborative problem solving and decision making

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IDEA SHARING SESSION
Computer

"Learning to Formulate Frankfurters: A Computer Program"

Lynn G. Turner
Department of Food Science
North Carolina State University

Microcomputers are widely used in the food industry for processing operations, inventory control, collection of data and product formulation. Surveys of graduates indicate that knowledge and expertise in microcomputers is valuable in their employment; therefore, experience in microcomputing must be provided for future food technologists.

Food products must be properly formulated to meet regulatory specifications, control flavor and texture characteristics and control raw ingredient costs. Formulation calculations are routinely used in the food industry for products such as ice cream and comminuted meats.

This computer program introduces the basic principles of food product formulation and calculates ingredient weights for frankfurters. The formulation is based on a given final product composition and weight, and utilizes available ingredients and standard amounts of salt, sugar, nitrite, spices, color enhancers and flavor protectors. Federal standards for fat and added water are followed and moisture loss during the cooking and smoking process is accounted for. Least cost analysis is not introduced in this introductory program.

Students formulate a frankfurter product in class by two methods: (1) manual calculations presented to them in a handout and (2) the computer program that prompts the student for information. The software is designed to instruct, provide information about each calculation step, accept input, calculate a formulation and print the table of ingredients and weights of each needed. It is "user friendly" and provides "hands-on" experience for students to become familiar with microcomputers. The computer program provides immediate feedback and allows students to see how the microcomputer can make the solution of a problem easier and faster.

Generation of Chromosome Aberrations in the Mouse.

Douglas Jenkins and Terry Ashley,
University of Tennessee, Knoxville
(Presented at 1988 NACTA Conference at Oregon State University by Robert R. Shrode, University of Tennessee, Knoxville).

This computer program was written for use on an IBM or IBM compatible computer. The program is designed to assist students in learning various basic cytogenetics concepts. Keyboard operation requires use of only five keys, the directional (arrow) keys and the "enter" or "return" key. The diagrams displayed on the computer screen are based on the standard

karyotype of the laboratory mouse and are adapted from the diagrams of Searle and Beechey, MAPS OF CHROMOSOME VARIANTS, pp 362-365 in GENETIC VARIANTS AND STRAINS OF THE LABORATORY MOUSE by M.G. Green. The diagrams presented in this program are consistent within approximately 2% with the Searle and Beechey presentation. Prerequisite to use of the program is only a familarity with the following concepts: chromosomes, centromeres, G-banded chromosomes, mitosis and meiosis. Aberrations covered in the program are: duplications, deficiencies, polymorphisms and reciprocal, insertional and Robertsonian translocations. The user of the program simply designates, by means of the cursor, the type of rearrangement to be displayed, the chromosome(s) involved and the breakpoint(s) involved. Following designation of the type of rearrangement to be displayed, a verbal definition of that type appears on the computer screen. Then the user simply responds to the prompts given by the program, and the designated rearrangement will be displayed on the computer screen. If the computer is equipped with a GRAPHICS card and a printer, the screen display may be printed. The program has not yet been published, but arrangements for publication will be made, and information concerning purchase may be obtained from Dr. Terry Ashley, Department of Zoology, University of Tennessee, Knoxville, TN 37996.

CATLAB, a Computer Program Designed to Help Students Learn Basic Mendelism Using Coat Colors of Cats.

Judith Kinnear,
Melbourne State College, Melbourne, Australia.
(Presented at 1988 NACTA Conference at Oregon State University by Robert R. Shrode, University of Tennessee, Knoxville).

This program was written for use on the Apple II with minimum configuration, Applesoft in ROM 48K, DOS 3.3. Prerequisites for use of the program are a working knowledge of introductory-level genetics and some familiarity with common coat colors and patterns in the domestic cat, which is provided by descriptions in the manuals and a set of color slides which accompany the program. Operation of the program is quite simple, consisting only of following instructions displayed on the computer screen. The user may specify matings to be made and simulate the production of litters containing a total of as many as 100 cats. The student manual contains descriptions of various sample investigations involving hypothesis testing and formulation of genetic models for predicting the outcome of proposed matings. Several exercises in developing such models are described in the student manual. Cats involved in matings and kittens produced are displayed graphically on the computer screen (somewhat stylized, but quite recognizable). The program may be purchased from CONDUIT, P.O. Box 388, Iowa City, Iowa 52244, for $75.00. The purchaser receives the diskette containing the program, a student manual, an instructor manual and a set of color slides depicting cats with various coat colors and patterns.

Bitnet

Victor A. Bekkum
Iowa State University

BITNET is an electronic computer network which connects university mainframe computers across the nation and world. Approximately 1900 computers at over 400 institutions are electronically connected to BITNET. In this idea-sharing session I will demonstrate how-to-use BITNET and apply it to instruction.

AWARDS BANQUET

NACTA DISTINGUISHED EDUCATOR AWARD

J. Wayland Bennett

J. Wayland Bennett is the Charles C. Thompson Professor of Agricultural Finance and Associate Dean for Industry Relations at Texas Tech University, Lubbock, Texas. He earned his bachelor's degree in 1948 from Texas Tech and served on the faculty for two years before going to Louisiana State University for his advanced degrees. He rejoined the Texas Tech faculty in 1953 and has served the University as Assistant Vice President for Academic Affairs, as Head of the Department of Agricultural Economics, Acting Dean of the College of Agricultural Sciences, and as Acting Chairman of the Department of Agricultural Engineering. In 1977 Wayland was made Associate Dean for Industry Relations. He was named the first Charles C. Thompson Professor of Agricultural Finance at Texas Tech in 1979.

Wayland has served on both the University and College of Agricultural Sciences College Course and Curricular Committees. He was a member of the statewide Committee on Higher Education in the Agricultural Sciences. He is currently Manager of the Texas Tech University Foundation Farms and Director of the Texas Agricultural Cooperative Council.

Wayland has been active in Alpha Zeta, Alpha Chi, and was a charter member of the Texas Tech Chapter of Phi Kappa Phi. In 1975 Dr. Bennett was presented the Certificate of Recognition by the National Association of State Universities and Land Grant Colleges. He was awarded the Outstanding Teaching Award by the Texas Tech Student Agricultural Council in 1979 and the Distinguished Service Award by the Texas Tech Ex-Students Association in 1984.

Wayland continues to be active in NACTA. He served as a member of the Outstanding Teacher Selection Committee and as Vice President and President. Wayland and his wife, Betty, have one daughter, Marilyn.