



## PROGRAM ADJUSTMENTS

### for a changing student profile

#### Abstract

*The characteristics of students enrolling as undergraduates in the colleges of agriculture across the country during recent years have been influenced by unprecedented enrollment increases. Although many curricular adjustments have been made during these years to accommodate a growing diversity of student backgrounds, program implementations have developed at a much slower pace. This article describes the effort of Minnesota's College of Agriculture to compensate and to implement its curricular offerings through "in the field" work experience for undergraduate students.*

Dramatic — if not phenomenal — may be the most appropriate expression to describe the enrollment growth among the nation's colleges of agriculture during recent years. The story of escalating enrollments is told in the figures released last November by the Resident Instruction Section of the National Association of State Universities and Land Grant Colleges (NASULGC).

Since 1963 undergraduate enrollments in the 70 NASULGC colleges have nearly tripled, and more strikingly, they have nearly doubled during the past six years! In actual enrollments the figures have progressed from 34,932 in 1963, to 54,348 in 1970 to 98,183 this year. A two percent increase, certain to come in 1977, will bring the undergraduate student enrollment among the NASULGC colleges in this country to the 100,000 level.

At the University of Minnesota enrollment statistics for the College of Agriculture closely parallel the national figures cited above. But, at Minnesota and perhaps other colleges across the country, the enrollment escalation particularly since 1971 has influenced the composition and characteristics of the undergraduate student body. Most identifiable has been a sharp increase in the enrollment of women and a growing interest in Agriculture among students with metropolitan and suburban backgrounds.

Aware of these changes and the impact they could have on eventual placement and performance of its graduates, the college faculty at Minnesota established a study committee in 1974. Two programs, both directed toward "in the field experiences" for undergraduate students were considered and proposed for initiation in the summer of 1975. One of these was the Professional Ex-

Deane A. Turner is professor and coordinator of Career Development and Placement, College of Agriculture, University of Minnesota, St. Paul Campus.

#### Deane A. Turner

perience Program (PEP) designed as an option for junior and senior students. It provided students opportunity to compete for employment for 12 or more weeks of work experience in agri-industry or in government. Ninety-two students were placed in the PEP program in the summer of 1975 with 42 employers and 24 faculty members co-operating. Administration of the program was supported by a Cooperative Education grant from HEW. Students participating in PEP are charged tuition not to exceed \$130 for 6 credits.

The second effort of the college was a pilot project, intended to parallel the PEP program, in which students without familiarization and background in production agriculture would engage in an intensive skills and competencies practice program. The project, which came to be known as the Agricultural Basic Competencies (ABC's) program, was assigned for development to a committee representing the departments of Agricultural Education, Agronomy, Animal Science, Horticultural Science, and the office of the Dean. The project was scheduled for a seven-week period, beginning in mid-June, 1975. No more than eight junior and senior students were to be enrolled. A tuition rate of \$130.00 was established. The program with some adjustments was repeated in the summer of 1976.

The first stage of development of the project involved a faculty planning committee charged with identifying the skills and competencies regularly required in crop and livestock production. The work of the committee resulted in a comprehensive list of more than 100 items which the committee felt should be included in the pilot program. The skills items for each of the two production areas were listed.

#### Basic Crop Production Skills and Competencies

- A. Power unit operation
  1. Operation and maintenance
  2. Tractor driving
  3. Auxiliary engines (large/small)
  4. Electric motors
  5. Self-propelled combines
  6. Self-propelled swather
- B. Seedbed preparation
  1. Plowing
  2. Disking-chiseling
  3. Harrowing, spring tooth
  4. Dragging
  5. Stalk chopping
  6. Soil testing
  7. Contour and slope estimations

- C. Seeding the crop
  - 1. Corn and soybean planting
  - 2. Grain drilling
  - 3. Grass seeding
  - 4. Fertilizer application
  - 5. Seed preparation-treating, inoculating
- D. Weed control
  - 1. Spraying/calibration
  - 2. Chemicals handling
  - 3. Cultivating
  - 4. Rotary hoeing
  - 5. Granule dry chemicals application
  - 6. Identification of weeds and crops
- E. Crop growth maintenance
  - 1. Irrigation
  - 2. Drainage-tiling/waterway construction
  - 3. Pest control
    - a. Herbicide, insecticides, fungicide applications
    - b. Recognizing pest symptoms and damage
  - 4. Observation of environmental damage
  - 5. Tissue testing
- F. Harvesting operations
  - 1. Forages -
    - a. Mowing
    - b. Conditioning
    - c. Raking
    - d. Baling-loose hay handling
    - e. Green dry chopping
    - f. Silo filler distribution in silo
  - g. Additives
  - 2. Grains -
    - a. Swathing small grains
    - b. Grain combining, direct/swath
    - c. Corn picking-shelling
- G. Storage operations
  - 1. Organic acid application to high moisture corn
  - 2. Dryer operation
  - 3. Elevator (flight type/leg type/ auger type/air vacs)
  - 4. Grain system (legs, augers, bins)
  - 5. Moisture testing/sampling
  - 6. Corn cribs, silos, bin use
- H. Transportation and hauling
  - 1. Truck driving
  - 2. Wagons (hoist/unloading apron/auger) operation
  - 3. Trailers (2 and 4 wheel) use

**Basic Livestock Production  
Skills and Competencies**

- A. Livestock identification skills
  - 1. Eartagging
  - 2. Ear-notching
  - 3. Photos and drawings
  - 4. Tattooing
  - 5. Branding
  - 6. Chain/tagging
  - 7. Paint marking
- B. Livestock basic care skills
  - 1. Castration
  - 2. Dehorning
  - 3. Docking
  - 4. Lamb milk battery



Tractor and field equipment operation were stressed at the very beginning of the ABC's program.

5. Nose ringing
  6. Handling (ropes, halters squeeze, slapper, prods)
  7. Clipping
  8. Hoof trimming
  9. Back fat probing
  10. Weighing and measuring
- C. Health care skills
1. Temperature check
  2. Medication techniques
  3. Common diseases and detection
  4. Spraying, drenching
  5. Foot rot control
  6. Bloat control
  7. Birth assistance
  8. Gamma globulin test
  9. Navel care
  10. Iron shots
  11. Clipping teeth
  12. Bleeding - (Blood tests, T.B., Bangs, Lepto.)
  13. Breeding - (Time cycles, techniques)
  14. Vaccination/pill administration
- D. Grooming and showing skills
1. Clipping
  2. Hoof trimming
  3. Washing
  4. Breaking and leading
  5. Blocking
  6. Braiding
- E. Hand tools and equipment use
1. Forks, shovels, brooms, rakes, scrapers
  2. Carts, carriages, trucks
  3. Pens, ties, stalls
  4. Back rub-oilers
  5. Mineral-salt dispensers
  6. Sanitation, techniques-milking equipment, pails and strip-cup
  7. Hormones-implants/feeding
  8. Fencing (Posts, wire, corners)
- F. Machinery and equipment use or operation
1. Feed mixing/grinding-weighing
  2. Self-unloading wagons
  3. Tractor loader/scrapper
  4. Manure spreader/wagon
  5. Loading chutes
  6. Farrowing stalls, maternity pens
  7. Barn cleaner operation
  8. Silo unloader-operation
  9. Feed bunk augers
  10. Automatic waterers
  11. Milking machine operation
  12. Milk handling-pipelines, bulk-tanks

The second stage of development for the ABC's project involved program operations. The faculty planning committee established the following guidelines:

- ...A qualified full-time coordinator would be in charge of the seven week program. The planning committee for the project would serve as the advisory committee to the coordinator.
- ...The primary training site for the program was to be the University's Rosemount Agricultural Experiment Station, consisting of 2700 acres located 30 miles from the college. Students were to be transported daily to the station at college expense. The superintendent of the experiment station would engage crop and plot production supervisors, equipment operators, and herdsmen for demonstration of skills and competencies to be acquired by the students.
- ...An 18-acre tract of land at the experiment station was to be reserved as a machinery and equipment practice area for students.
- ...The cost of supervision, machinery, and equipment was to be charged against the program at regular hourly rates.
- ...The student's and coordinator's workday at the experiment station was from 8:00 A.M. to 4:30 P.M.
- ...Details of program activities, including on-campus orientation, special field trips, and practice at the experiment station, were to be detailed in forenoon and afternoon hourly schedules for each day of the seven week program.
- ...Students were required to have hospitalization and medical insurance and to be tetanus immune. The college would provide any special equipment to meet OSHA requirements.

### How the ABC's Program Helped

After two years of development and pilot experience, the college is satisfied that the ABC's program can provide valuable and motivating experiences for students without backgrounds in production agriculture. The skills and competencies required in crop and livestock production can be taught effectively within a 7-week time span. In addition to providing opportunity for students to engage in skills learning and proficiency practice, the program effectively portrays for students the importance of timely application of these skills to commercial production. Perhaps most important of all, the program develops appreciations and understandings among students of the bio-environmental relationships between crop and livestock production and the important role of management in production agriculture.

There were four key features of the program that led to the apparent success of the program.

1. **Coordinator Qualifications:** The individual appointed to coordinate the program was carefully selected for background experience in farming and for expertise in teaching. In addition to making maximum use of program resources, the coordinator was committed to adapt the program to individual student interests and capabilities.
2. **Program Planning:** Intensive and flexible planning was of paramount importance. One-hour, 2-hour, and half day skill practice schedules were developed to make maximum

use of land, machinery, equipment, and livestock with alternate activities arranged for inclement weather. Different skills practices were scheduled simultaneously to minimize student standby time.

3. **Program Implementation:** Although the design of the ABC's program was to require all students to practice certain basic skills in the production of crops and livestock, it did allow students to devote additional time to special interest skills and competencies practice.

A variety of associated learning activities were incorporated into the program to broaden the understanding of enrolled students. At least once a week, group observation visits were made to near-by family farms, supply stores, machinery dealers, and agricultural loan and finance organizations. One-half day of classroom instruction was given to accent the importance of farm management in crop and livestock production.

4. **Program Evaluation:** Students and the program coordinator, working as a team, were the primary program evaluators. The director of the program and members of the advisory committee periodically observed and participated in field activities.

Student reports of activities were recorded daily and submitted for group review. It was not unusual for the coordinator to "back-track" the program schedule or advance it, based upon the evaluations made by students. A final 3-hour evaluation was scheduled at the end of the 7-week ABC's program. A review of the program was made at that time through visual and audio presentations followed by informal discussion of the strong and weak points of the program.

### What Were the Costs?

The costs of conducting the ABC's program were high, but they were not prohibitive when compared to the ratio of costs paid by students for regularly scheduled courses.

The costs for conducting the ABC's pilot programs for the summers of 1975 and 1976 averaged \$400.00 per enrolled student. The breakdown of the costs was as follows:

<b>Instruction and demonstration</b> .....	<b>\$182.00</b>
<b>Transportation</b> .....	<b>95.00</b>
<b>Machinery and Equipment Rental</b> .....	<b>110.00</b>
<b>Miscellaneous costs</b> .....	<b>13.00</b>
	<b>total \$400.00</b>

Students enrolled in the program paid \$130.00 tuition. This represented 32 percent of the total program costs which compared favorably with the university policy that 28-32 percent of the cost of on-campus

courses be supported through tuition income. It is probable that costs of the ABC program could be reduced 10 percent or more with a full complement of enrolled students.

### What of the ABC's Future?

The ABC's program was originally designed to provide optional "field" experiences for junior and senior students who previously had not had the opportunity to become familiar with skills and competencies required in crop and livestock production. It was anticipated that the program would be most valuable to students majoring in such fields as Agricultural Education, Agronomy, and Animal Science where production agriculture experience is usually required by employers.

After two years of pilot experience and evaluation the advisory committee has recommended that the ABC's program be offered as an optional experience for new students entering the College of Agriculture. Preferably, these students would participate in the program during the summer preceding their first fall quarter of matriculation in the college. Because of the motivating thrust of the program, students encouraged to enroll in the program should not be identified by major fields of study nor by sex. The ABC's program is no longer considered a parallel program to the PEP (internship) program available to junior and senior students in the college.

Tentative plans have been made to continue the ABC's program during the summer of 1977 with an enrollment limitation of 30 students. Later it is anticipated that as many as 60 students can be accommodated by the program each summer by offering 2 successive 7-week training sessions.

The ABC's program is an innovation accenting the interest of the college in offering "field" experiences to students pursuing professional degrees in agriculture. In addition to the understandings and appreciations it develops among participating students, the Agricultural Basic Competencies program contributes to the effectiveness of the college's instructional program, and it will more uniformly prepare graduates for job and career performance.

### References

1. Turner, Deane A., and Gary L. Sheldon, *Teaching the ABC's, Toward Better Teaching*. Vol. 9, No. 2, Spring 1976, University of Minnesota College of Agriculture, pp 5-7.
2. Turner, Dean A. A Year of "PEP", *Toward Better Teaching*. Vol. 9, No. 2, Winter 1976, University of Minnesota College of Agriculture, pp 3-5.