

A Changing Production Agriculture Labor Force Presents New Educational Needs

James W. Legacy,
William B. Richardson,
and David L. Howell

Abstract

One of the most important aspects of technical agricultural education programs is that the education provided meets the needs of production agriculture as well as other areas of agribusiness. Persons who plan and conduct agricultural education programs must consider the manpower needs of agriculture.

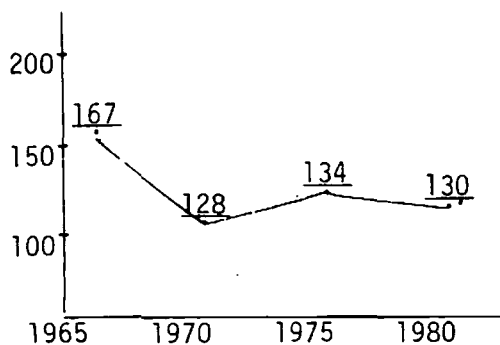
This article reports the results of a study of the manpower needs of Indiana's production agriculture and provides recommendations for meeting the educational needs of production agriculture.

Declining Farm Numbers

Farm production in Indiana and across the nation is being accomplished each year by a declining proportion of the total work force. In 1960 for example, 8.7 percent¹ of the nation's population lived on farms; by 1976 this percentage was reduced to 3.9 percent¹. In 1965, 167,000² workers were employed full time on Indiana farms; by 1975, the number of full-time farm workers was 134,000². This trend toward fewer full-time farm workers is continuing. Figure 1 illustrates the steady decline of Indiana full-time farm workers.

Two other important patterns are part of today's Indiana farm labor picture. The number of full-time hired farm workers is increasing, and the number of part-time farmers is growing.

Figure 1. The Number of Full-Time Farm Workers in Indiana, 1965-1980*



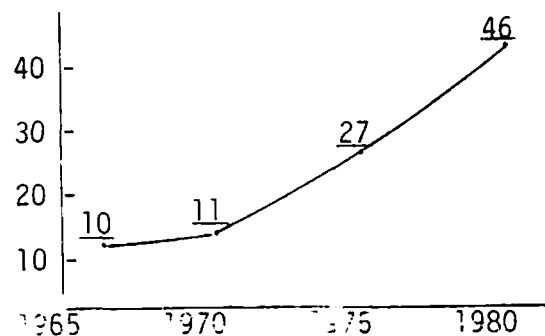
*Estimate based on sum of Figure 3 and Figure 4

Legacy is assistant professor at Southern Illinois University, Richardson is associate professor at Purdue University, and Howell is assistant professor at Penn State University.

More Full-time Hired Farm Workers

The hired farm labor trend in Indiana is not consistent with the national pattern. Data for the United States indicates a decline in the number of hired farm workers. In 1960, there were 3.7 million¹ hired farm laborers in the United States; by 1970, 2.8 million; and in 1975, 2.7 million. In Indiana a reverse from the national trend has occurred. Figure 2 reports that in 1965 there was an annual average of 10,000² hired farm workers; by 1970, 11,000; and by 1975 this number had grown to 27,000.

Figure 2. The Number of Full-time Hired Farm Workers in Indiana, 1965-1980*

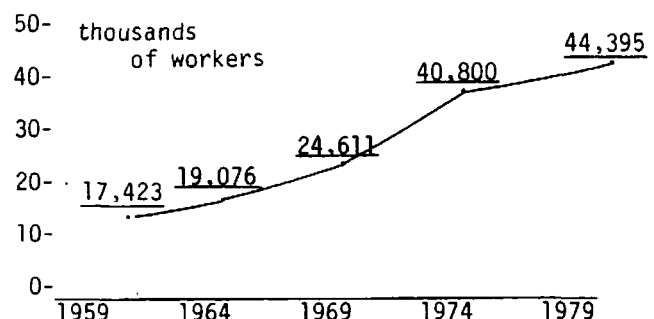


*Trendline estimate is arrived at by least squares method.

More Part-time Indiana Farmers

The number of part-time farmers in Indiana has increased dramatically between each of the past four agricultural census periods. The 1959 agricultural census reported 17,423 part-time farmers in Indiana. A part-time farmer is a farm worker whose principle occupation is other than farming. Figure 3 reports part-time farmer numbers from the four most recent agricultural censuses. Based on this data from the past fifteen years, Figure 3 estimates 44,395 Indiana part-time farmers by 1979³.

Figure 3. The Number of Part-time Indiana Farmers 1959-1979*



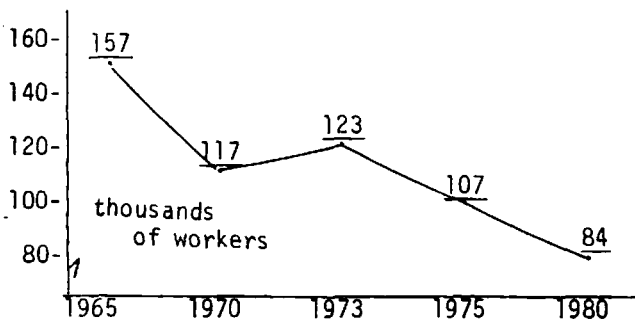
*Trendline estimate is arrived at by least squares method.

Projecting Labor Needs on Indiana Farms

Projections of future labor needs for Indiana farms are based on the historical trends of farm labor. The number of family farm workers is expected to continue to decline. The number of full-time hired farm workers is expected to continue to increase. Also, the number of part-time farmers is expected to increase. Change within each of these three farm labor categories is the basis for estimating the total labor needs of Indiana's farms to the year 1980.

First, a projection of full-time family farm workers was calculated. The full-time farm worker figures for Indiana, Figure 1, were reduced by the number of full-time hired farm workers, Figure 2. The net result labeled "Full-Time Family Farm Workers" is presented in Figure 4. Figure 4 illustrates a "bump" in the long-time historical trend toward fewer full-time family farm workers. This short time "bump" (increase) in family farm workers which occurred in the early 1970s may be attributed to the end of government farm production controls and to a world-wide food shortage. Excepting future interruptions such as occurred in the early 1970s, the trend toward fewer full-time family farm workers is expected to continue.

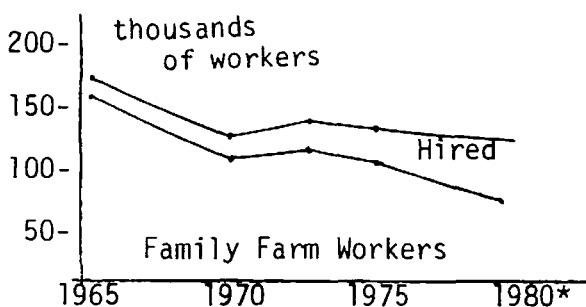
Figure 4. The Number of Full-Time Family Farm Workers in Indiana 1965-1980*



*Trendline estimate is arrived at by least squares method.

Figure 5 summarizes the 1980 projection of full-time manpower needs for Indiana farms. An increasing proportion of full-time farm manpower needs will be met by the hired farm worker sector of farm manpower.

Figure 5. Source of Indiana Full-Time Farm Workers 1965-1980*



*Estimates from least squares derivation in previous figures.

Agricultural Education For Farm Manpower

Farm manpower trends in Indiana are clear. Modern farm production technology will be applied by a larger number of part-time farmers and full-time hired farm workers.

Whether existing programs are sufficient to meet the agricultural education needs of this labor force is not so clear. Several characteristics of farm manpower and technical agriculture development may provide direction to agricultural education programs for future farm manpower: 1) The rate of agricultural production technology change is increasing at a time when the life span of farm workers is increasing⁴. 2) Much of the new agricultural production technology will be developed at 4-year institutions of agriculture. 3) Part-time farmers and full-time farm workers' access to the 4-year universities' research and development activities will facilitate prompt application of the most appropriate agricultural production practices. Currently, there are middlemen with several kinds of activities to provide such access for part-time farmers and full-time farm workers. Extension and vocational agriculture personnel have used demonstrations, meetings, information bulletins, and other methods to disseminate approved practices and new techniques to adults. Conversion of new technology to content for these methods consumes time. As the rate of technological development is compounded, the amount of actual change per time unit increases. Time therefore becomes critical, particularly the time needed to prepare middlemen and materials for delivery. Two remedies can be considered. First, inservice programs of agricultural educators, extension, and vocational agriculture teachers can be given priority. Second, farm manpower can be provided direct access to research and development staff.

Direct Delivery of Technical Agricultural Education

The number of research and development staff in agriculture is increasing⁵ as total farm manpower numbers decline. This combination reduces a supposed student/teacher ratio of farm workers to university research and development staff. Another factor which effects the feasibility of a direct delivery system of agricultural technology is the increased specialization of farm manpower labor. Today, a greater number of specialized research and development personnel could more easily provide fewer specialized producers with immediate access to new technology. For example, Purdue University's winter short course in agriculture has met with recent success. The short course is an eight-week, intensive technical agricultural education program designed for individuals such as part-time farmers and full-time farm workers who cannot leave the farm for a 16-week semester.

Recent success of this program, with enrollments of 200 plus, indicates a need for direct technical agricultur-

al education. It also suggests that Indiana's farm workers will respond to the opportunity to learn directly from research and development staff.

Other forms of educational delivery may be useful in meeting the educational needs of Indiana's farm manpower. Non-credit adult education programs⁶ have documented success of weekend educational classes, topic specific audio and video self study programs, and other forms of delivery which met specific client needs. Agricultural education's clientele characteristics are changing. Educational delivery forms which better meet this new client's needs should be investigated.

SUMMARY

The study of farm manpower reported an increase in the number of part-time and hired farm manpower.

To meet the educational needs of farm production manpower, agricultural education program planners need continually to be aware of the trends of farm labor. The trends toward fewer full-time family farm workers, more full-time hired farm workers, and an increasing number of part-time farmers may require new approaches in college agricultural education programs. To meet the educational needs of a changing production agriculture labor force, it is recommended that 1) further efforts be directed toward determining the post-secondary education needs of each of the three groups of farm manpower, and 2) information about strategies or models which are effective in providing direct educational experiences for part-time and hired farm manpower should be developed.

Literature Cited

- (1) *Handbook of Agricultural Charts*. 1976. Agricultural Handbook No. 504. U.S. Department of Agriculture, Washington, D.C. 20250.
- (2) *Annual Crop and Livestock Summary*. 1975. Statistical Reporting Service, Bulletin A76-1, U.S. Department of Agriculture, Washington, D.C. 20250.
- (3) *1974 Census of Agriculture, Preliminary Report: Indiana*. September 1976. U.S. Department of Commerce, AG 74-P-18-000, Washington, D.C. 20233.
- (4) Joe P. Bail and Harold R. Cushman. 1976. *Teaching Adult Education Courses: The Business Management Model*. Information Bulletin 98. Cornell University, Ithaca, New York.
- (5) *Professional Workers in State Agricultural Experiment Stations and Other Cooperating Institutions*. Published since 1889. Agriculture Handbook No. 305, Cooperative State Research Service, USDA, Washington, D.C. 20402.
- (6) *Adult Leadership*. Adult Education Association of the U.S.A., 1225 19th Street, N.W. Washington, D.C. 20036.

CURRICULA

Current Trends In Animal Science

C. E. Stufflebeam

Abstract

Animal science curricula of 40 universities were examined and compared to curricula of 10 years before. Information was obtained from bulletins of 20 land grant and 20 non-land grant institutions. Decreases were noted in the number of hours required in animal science courses, natural sciences, mathematics, and general education. The decrease in the natural science and mathematics requirements averaged approximately 25 percent for all universities. The hours of electives increased; however, the total hours required for the bachelor's degree decreased from the total required in 1968.

A number of changes have occurred in the past ten years in characteristics of agricultural students. Two of the most dramatic changes have been the increase in the number of women students and the increase in the number of students without farm backgrounds. Chamberlain and his associates¹ at the University of Tennessee found that the freshman course in animal science consisted of 30 percent women and that 52 percent of the students had no farm background. In the freshman animal science course at Southwest Missouri State University the percentage of women increased from only four in 1972 to 29 in 1976⁵. By 1978, the percentage of women had increased to 33. The percentage of students without farm backgrounds increased from 29 in 1972 to 37 in 1976. In 1978 this figure was 36 percent.

Changes also have taken place in agriculture and the general society since the sixties. The population has increased, the number of farms and farmers has decreased, and the size of farms has increased. Methods of handling and processing agricultural products have undergone some changes, and revisions have occurred in government policies and programs. The purpose of this study was to determine if changes have taken place in animal science curricula in the past ten years to accompany the changes observed in the student population, agriculture, and society.

Sources of Information

The procedure for collecting data was similar to that used in the preparation of a similar report ten years ago⁴. Information was obtained from the current bulletins

The author is professor of Animal Science at Southwest Missouri State University at Springfield.