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by

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Those closely associated with agriculture realize that farming is an occupation marked by high investments in physical capital, high risks and irreversible decisions of occupational choice. No tools have been found to predict the success of the young man prepared to enter farming, nor to provide the guidance for the itinerary necessary to lead toward success.

The literature dealing with the beginning farmer is given almost exclusively to describing the economic inputs of the beginning farm business. Beneke and Pond¹ in a study of ex-servicemen starting farming in South-eastern Minnesota, reported farm size to be the most limiting factor in farm success. Other factors such as tenure status, which were also related directly to capital investment, were similarly related to farm success.

Cochran and associates², in a more recent study of the Korean war veterans, reported a similar concern with capital investment. Tenure status was closely tied to available capital, with owners investing almost four times as much capital in the beginning business as tenants. The lack of farm size was frequently cited by beginning farmers as a chief cause of poor financial returns.³

The large capital requirement can be further documented by reference to the farm management record summaries prepared each year by the Department of Agricultural Economics of the University of Minnesota, and the Agricultural Coordinators in the area vocational-technical schools. The most recent summary from the Mankato area reported an average sum capital investment of \$104,590 for the 99 farms included in the report. While much of this capital may be owned by someone other than the farm operator, nevertheless, the problem of secur-

ing adequate capital presents a serious limitation to successful farm operation.

The problems of beginning are further increased by the competition for available land.⁴ Not all land which is for lease or sale is available to the beginning farmer. Often the lack of experience as a farm operator coupled with limited capital leaves the beginning farmer in a weak competitive position. Consequently, many farms that might otherwise provide an opportunity for the young farmer to get established are instead added to existing farm operations.

While no specific projections of the effects of education on farm success can be made, there are some general relationships between education and farm income that would suggest education is an important business input.

The recent study by Cvancara focused on the relationship of continuing education to farm income. His study of 33 matched pairs of farms for the years 1961, 1962, and 1963, attempted to measure the monetary return to added increments of farm management instruction. He reported an added return of about \$500 for each of the three years of instruction studied, but suggested that the diminishing marginal return effect may be operative.

A more general study of the relationship of formal education to income was reported by the U.S. Chamber of Commerce.⁵ About 89 percent of the farms that produced less than \$3000 of farm produce per year were operated by men with less than five years of schooling. As education levels advanced from eight to twelve years, the prospect of producing over \$10,000 of farm produce per year more than doubled while the probability of producing less than \$3,000 of farm produce was reduced by 22 percent.

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None of these studies, however, dealt with the problems of the beginning farmer, nor did they direct attention to the probable substitution effects of the educational inputs for economic resources.

The Objects of the Study

The staff members of the Agricultural Education Department of the University of Minnesota were cognizant of the void in the literature concerning educational investment. Through their combined efforts, they devised a research proposal designed to assess the relationship of the input resources of the beginning farm business to long range farm success. This project, funded by the U.S. Office of Education and directed by Dr. Gordon Swanson, was focused on three major objectives. The objectives were:

1. To describe the conditions that are associated with successful entry into the business of farming, when these conditions are defined in terms of the economic, educational and biographical attributes of the beginning farmer. Successful entry is further defined as continuing operation of the farm business with the degree of success measured by gross income, net income, and average gain in net worth.

2. To further define the effects of the educational components on successful entry into the farm business by considering the independent effects of each educational component in relation to the criterion measures of farm success.

3. To determine the relationship between the success of the farm operator and the aptitude and school achievement of his children.

Procedures

The sample for the study was drawn from among the farmers who had participated in institutional-on-farm training following World War II. Training records were col-

lected from forty schools. These records contained the information necessary to accurately assess the economic investments of the beginning farm operator, and provided some of the biographic and education data included in the study. Further information in the education investment component was obtained from the military personnel records center, St. Louis, Missouri. To assess the progress of the beginning farmers 529 who were currently farming were asked, either by questionnaire or in a personal interview to provide data on the status of their current farm business. The principle questions asked concerned the family (number of children, schooling, etc.) operator participation in continuing education, net worth and farm income. The response to queries about farm capital structure and farm income were used to arrive at the degree of success for each farm operator.

The names of the children were in turn sent to their respective schools to obtain data on pupil aptitude and scholastic achievement. Over 600 responses were obtained to this request.

The major task was to relate the many economic, educational and biographical factors to the various measures of farm success. The variables chosen to describe the beginning farm operator in terms of these attributes were: 1) age at beginning of training, 2) beginning tenure status, 3) total beginning capital, 4) year of business in work units, 5) number of years as a farm operator, 6) months of I.O.F.T. completed, 7) size of business in tillable acres, 8) number of children, 9) highest school grade completed, 10) years of high school vocational agriculture, 11) intelligence test score, 12) mechanical aptitude test score, 13) Ratio: beginning fixed capital to total beginning capital, 14) Ratio: beginning net worth to beginning liability, 15) Ratio: costs of veterans training to total beginning capital, 16) number of adult classes attended past 5 years.

A statistical technique referred to as multiple regression was used to determine the relationship of all factors to the success measures of gross income, net income and average gain in net worth. The purpose of this technique was to devise a formula that would permit one to predict the success of a beginning farmer on the basis of the sixteen factors previously listed.

What did the study find?

All of the variables studied can account for about 30 per cent of the variation in gross income that occurs among farmers. While 9 variables appear to be significant in predicting gross income levels of farmers 15 to 18 years after they were first established, the five most significant are age at beginning of farming, beginning tenure status, total beginning capital, number of adult classes attended during the past five years and the mechanical aptitude test score.

While gross income can be predicted at a significant level, net income for a single year as reported for income tax purposes cannot be accurately predicted by any combination of the 16 variables studied.

Average gain in net worth, a measure of financial progress, is related to age at beginning of farming (with younger men having greater net worth gains), total beginning capital, size of business in tillable acres and the number of adult classes attended. These four factors alone, account for about 20 per cent of the operation in average gain in net worth.

Contrary to the relationship of parental income to children's aptitude and achievement as reported by Epstien⁶ and Sexton⁷, farm business success measured by any of the three criterion studied is totally unrelated to the school performance of farm children. Performance was measured by the Lorge-Thorndike intelligence test and the Iowa Test of Basic Skills.

A large part of the ability to predict the success of a young man about to enter the farm business is still closely bound in the "human factor" and made more obscure by the uncontrollable factors of markets and the whims of nature. Of significance, however, is the fact that some portion of this success can be predicted by those factors which are known at the time the itinerary to enter farming is planned. The important role of capital in this prediction emphasizes the necessity of careful deployment of this resource. Because farm size and tenure status are significant factors, those counseling young men about to farm should be particularly cognizant of the importance of improving the flexibility and manageability of the farm capital resource.

The suggestion of the substitution effect of education for some of the economic investments in the beginning farm business is

an important finding of this study. It is possible that the need for high initial investment in farm capital can be effectively reduced if the itinerary of the beginning farmer includes more participation in formal education prior to farm establishment. Vocational agricultural study at the secondary level may culminate in enrollment in post-secondary programs designed for entry into production agriculture, rather than direct entry into the occupation.

The availability of a suitable training center for continuing post-high school education in production agriculture following formal school education is a major consideration for the young men about to farm. The significance of this factor to farm success, and the possible outcomes of substitution of this factor for other success attributes in the beginning farming stages magnifies the importance of a sound program of adult and beginning farmer instruction in agriculture to the prosperity of the rural community. Young men who are planning to farm, should consider this type of training opportunity an important prerequisite to continued financial success.

Likewise, communities faced with declining affluence of its rural population should give careful consideration to bolstering the probability of farm income improvement through the conduct of a sound program of adult and post-high school education in business management of production agriculture. Particular attention should be given to developing competencies in managing the human resources involved in decision making.

A careful evaluation is needed of the kinds of adult education programs now offered to beginning farmers to determine the type of program which provides maximum economic return to the educational inputs. It is likely that the most profitable program will be one that combines an intensive program of instruction for a limited period of time with long range continuing education.

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America. At home he has been, and still is, chairman of the Board of Education in his home district.

Dr. Marvin will give leadership to a program of teacher education in agriculture. Included in the plans are a two-year program in a junior college sequence and a gradual development into a four-year curriculum in agricultural education. The need for teachers of agriculture is acute in Brazil. There, as here, the lack of teachers impedes program development. In Brazil this will be in the nature of a pioneering effort, one which Dr. Marvin is well qualified to direct.

Mrs. Marvin and their two daughters, Julie and Suzanne, will accompany Dr. Marvin. The Visitor extends a "bon voyage" and best wishes for the success of the project.



DR. MARVIN TO BRAZIL

Dr. R. Paul Marvin, associate professor of agricultural education, has been appointed chief-of-party for the University of Minnesota agriculture teacher education project in Parana, Brazil. The project is supported by the Ford Foundation as a part of the work in international programs of the University. Dr. Marvin assumed his new duties on July 1, 1966.

Dr. Marvin joined the staff of the University in 1956 as an instructor in the Department of Agricultural Engineering. He was appointed to the staff of the Department of Agricultural Education in 1961 after receiving his Ph.D. in 1960. He has served as consultant for the United Nations in Central