

FARMING OPPORTUNITIES FOR VOCATIONAL AGRICULTURE
STUDENTS AND RURAL FARM BOYS WITH IMPLICATIONS
FOR VOCATIONAL AGRICULTURE

By

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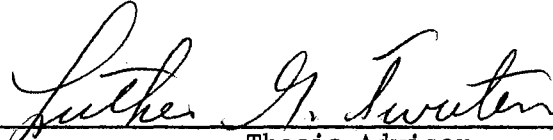
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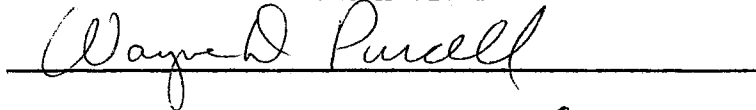
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PREFACE

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TABLE OF CONTENTS

Chapter	Page
I. INTRODUCTION	1
Objectives of the Study	2
General Outline of This Study	3
II. SELECTED CHARACTERISTICS OF THE VOCATIONAL AGRICULTURE PROGRAM AND STUDENTS	5
Introduction	5
Issues and Legislation in Vocational Agriculture	5
An Overview of Expenditures in Vocational Education	7
A Survey of Follow-Up Studies for Vocational Agriculture Graduates	10
III. A CONCEPTUAL BASIS FOR ESTABLISHING WHAT CONSTITUTES AN ECONOMIC FARMING UNIT	17
Economies of Size in Farming	17
Off-Farm Income	20
What Constitutes a Start in Farming	22
IV. FARMING OPPORTUNITIES FOR VOCATIONAL AGRICULTURE GRADUATES AND RURAL FARM BOYS	24
Introduction	24
Procedure	24
Divisional and State Comparisons of Farming Oppor- tunities for Vocational Agriculture Graduates	26
Divisional and State Comparisons of Farming Oppor- tunities for All Rural Farm Boys	29
Hired Laborers	30
V. AN ANALYSIS OF FARMING OPPORTUNITY ESTIMATES IN RELATION TO VOCATIONAL AGRICULTURE	32
Farming Intentions of Vocational Agriculture Students	32
Success in Farming	33
Program Implications	35

Chapter	Page
VI. SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS	37
Conclusions	38
Recommendations for Further Study	39
BIBLIOGRAPHY	41
APPENDIX	45

CHAPTER I

INTRODUCTION

Youth have never been confronted with a wider array of career opportunities. Occupational choice is an especially critical problem for rural youth since entry into farming is becoming more difficult due to high capital and managerial requirements. Whether we are talking of the rural dropout or the rural high school graduate, the issue is frequently how to prepare these youth for an off-farm occupation.

The vocational agriculture program in secondary schools has long trained students for proficiency in production agriculture. The program has played an instrumental role in the modernization of agriculture. Currently, the scope and focus of the program are in question. The rural schools are faced with training those students who will be able to acquire a sufficient amount of land and capital to enter farming and, at the same time, equipping the remaining rural youth with the necessary education and skills to compete successfully with the urban job seeker.

This study provides estimates of the supply of and demand for farming opportunities by state for the United States. This supply-demand information is designed to help farm youth make more realistic plans and help high school administrators, teachers, counselors, and parents to counsel students toward more nearly optimal educational and occupational goals.

Measures of overcapacity in programs to train rural youth for entry into farming can help policy makers, counselors and teachers make needed changes. The responsibility for designing programs to meet the unique needs of individual students rests with vocational agriculture instructors and counselors and lies beyond the scope of this thesis.

This study departs from traditional replacement ratios studies such as those by Stam (1969) and Manderscheid (1963) in several dimensions. In deriving replacement rates, this study considers two groups of entrants: (1) rural farm boys reaching age 20, and (2) graduates of vocational agriculture programs. Also this study departs from the traditional approach in that farm consolidation is allowed and larger farms (gross sales \$20,000 and over) are assumed to constitute an economic farming unit.

Objectives of the Study

The primary objectives of this study are to estimate: (1) the number of farming opportunities that will become available due to death and retirement of farm operators by state in the 1965-74 period; (2) the number of farm boys reaching the age of employment during the period; and (3) the number of rural farm boys graduating from high school with training in vocational agriculture. Estimated replacement rates are presented for each of the fifty states. A secondary objective of this study is to present characteristics of the vocational agriculture program and its graduates as well as implications for the program based on results from the three primary objectives. A portion of this study is devoted to the hired farm work force and the estimated needs in this sector.

General Outline of the Study

Chapter II, a review of selected characteristics of vocational agriculture and its students, focuses on many of the problems and issues faced by the vocational agriculture program in rural America. Follow-up data, goals, aspirations and expenditures for vocational agriculture are presented.

An analysis of economies of size in farming is presented in Chapter III. A conceptual basis for establishing what constitutes an adequate start in farming or an economic farming unit is presented. The importance of off-farm income is noted in this chapter. This chapter ties closely with Chapter IV which contains estimates of the number of farming opportunities.

Potential opportunities for new farm operators are related to the number of potential entrants in Chapter IV. The replacement rates are presented for each of the 50 states and for the United States. The estimated needs in the hired working force also are presented in this chapter.

The intentions of the vocational agriculture graduates toward farming and the success of those who have entered farming are presented in Chapter V. The implications for the vocational agriculture programs are presented in this chapter. The substance of this chapter is the comparison of the number of farming opportunities with the number of vocational agriculture graduates desiring to farm.

The final chapter summarizes findings of the study. Some conclusions drawn in this chapter suggest selected changes in the vocational agriculture programs to prepare rural farm boys for subsequent employment opportunities. Also, recommendations for further study are made,

including a call for estimates of net returns from vocational agriculture training and other vocational programs to be compared and used to determine the optimum mix of investment in the various vocational programs.

CHAPTER II

SELECTED CHARACTERISTICS OF THE VOCATIONAL AGRICULTURE PROGRAM AND STUDENTS

Introduction

This chapter reviews characteristics of the vocational agriculture program and its role in rural America. Issues, problems, and legislation in the vocational agriculture program are investigated.

Issues and Legislation in Vocational Agriculture

At one time the role of vocational agriculture was quite clear-cut. During the early portion of the century the objective of vocational agriculture was to educate present and prospective farmers for proficiency in farming. Technology has created a new era in American agriculture. From 1935 to 1969, the number of farms in the United States declined from 6.8 million to 3.0 million, or by 56 percent (U. S. Department of Agriculture, 1957 and 1970). With this decline in the number of farmers, vocational agriculture is facing a new educational challenge. Training a large number of farm boys for proficiency in farming is no longer sufficient. Subsequent analyses will show that only a few of the rural farm boys are able to return to the farm. The majority must seek off-farm employment. Warmbrod and Phipps (1966), in their review of research in agricultural education, made the following

statement regarding the new philosophy and objectives of agriculture education:

The emphasis of public school education in agriculture has shifted during the past five years away from a program with the stated aim of proficiency for those who have entered upon or are preparing to enter upon the work of the farm or the farm home (p. 1).

Impetus for this shift in emphasis was provided by the Vocational Education Act of 1963. Grant Venn (1969) said this about the Act:

The Vocational Education Act of 1963 brought many changes Most significantly it shifted program emphasis from limited occupational categories to major groups of people in need of training--new entrants to the job market, jobholders ready for upgrading, those in need of retraining and persons with particular problems who find it especially difficult to get ahead in the changing world of work (p. 1).

New programs emerged from the implementation of the Vocational Education Act of 1963. In addition to preparation and advancement in any occupation involving knowledge and skill in agriculture, the Act had objectives that allowed occupational exploration, guidance and counseling, and development of abilities essential for effective citizenship.

It was said that the Vocational Education Act of 1963 was analogous to the Smith-Hughes Act in the following fashion:

Just as the Smith-Hughes Act inaugurated a period which accentuated the education of present and prospective farmers as the primary aim of agriculture education in the public schools, the enactment of Public Law 88-210, the Vocational Education Act of 1963, launched a stage of agriculture education during which broadened and revised objectives are being stressed (Warmbrod and Phipps, 1966, p. 1).

In 1968 additional legislation was passed in support of vocational education. The Vocational Education Amendments of 1968 are the offspring of the Act of 1963. According to Venn (1969) the differences are of degree. He states:

The Vocational Education Amendments of 1968 continue this emphasis on people instead of occupations. Major new

requirements added by this law are annual and long-range planning and procedures for participation and planning, review, and evaluation of vocational and technical education (p. 1).

An Overview of Expenditures in Vocational Education

The above federal legislation has played an enormous role in shifting the focus of funds for vocational education. As shown in the following data, financial support for vocational agriculture has declined relative to other fields. The total expenditures for vocational education in 1967 were 3.5 times greater than in 1962. Most of the gain was between 1964 and 1965 when, largely due to the implementation of the Vocational Education Act of 1963 in 1965, total expenditures for vocational programs nearly doubled (Table I).

Expenditures increased in each program from 1962 to 1967. As a proportion of total expenditures, vocational agriculture and home economics declined while all other programs increased. In 1962, these two programs expended about 54 percent of all funds for vocational education; in 1967, these two programs expended only about 30 percent of the funds.

Although additional funds were made available to vocational programs, the new funds frequently did not reach the small rural school. Most of the money from the new legislation was for implementation of off-farm occupation programs, administrative services, evaluation studies, curriculum development and programs for the disadvantaged. Many small rural communities do not have facilities or training sites for off-farm occupational training due to a lack of agriculture businesses in the school district that are able or willing to participate. Most of the other money was spent by the State Department of Vocational

. TABLE I
 TOTAL VOCATIONAL EDUCATION EXPENDITURES
 BY PROGRAM, 1962-67

Program Expenditures	Year					
	1962	1963	1964	1965	1966	1967
	(\$1,000)					
Total of Programs ^{1/} Expenditures	283,948 (100) ^{2/}	308,666 (100)	332,541 (100)	487,712 (100)	588,002 (100)	753,197 (100)
Agriculture	73,292 (25.7)	74,478 (24.1)	77,474 (23.3)	86,840 (17.8)	88,755 (15.1)	103,447 (13.7)
Distributive	11,406 (4.0)	13,292 (4.2)	14,882 (4.5)	21,592 (4.4)	27,847 (4.7)	47,380 (6.3)
Health	9,659 (3.5)	11,038 (3.7)	12,457 (3.3)	19,704 (4.0)	21,777 (3.7)	33,387 (4.4)
Home Economics	79,898 (28.2)	83,328 (26.9)	89,872 (26.8)	98,409 (20.2)	113,091 (19.2)	125,139 (16.6)
Office	-	-	-	53,673 (11.0)	91,590 (15.6)	132,867 (17.6)
Technical	24,606 (8.7)	32,566 (16.7)	34,907 (10.5)	62,612 (12.8)	59,401 (10.1)	75,432 (10.0)
Trade and Industry	85,087 (29.9)	93,964 (30.4)	102,949 (30.9)	144,882 (29.7)	185,541 (31.6)	235,545 (31.3)

Source: Derived from Digest of Annual Reports by State Boards for Vocational Education, 1959-63 and Vocational-Technical Education, Annual Reports, Fiscal Years 1964-67.

^{1/}Total expenditures do not equal total of program expenditures due to expenditures for administrative supplies and services.

^{2/}Percentage of program expenditures.

and Technical Education in administrative services, evaluation studies and the other services supported by the legislation.

Occupational training opportunities for rural youth in small communities are very limited. In 1968 the Advisory Council on Vocational Education in its evaluation report stated that:

Rural high schools tend to be too small to offer more than agriculture, home economics, and office education. Most of their students will ultimately seek urban jobs but have no preparation for urban life. This deficiency has been particularly serious for rural southern Negroes whose resultant plight can be observed in most large cities of the land (Subcommittee on Education of the Committee of Labor and Public Welfare, 1968).

To many rural youth, vocational agriculture is the only vocational or occupational training offered in the high school due to the financial limitations and size of the school. Some states have implemented the area vocational-technical school concept which opens new vocational training opportunities. But until opportunities are greatly expanded, the local vocational agriculture instructor must be concerned with occupational training opportunities for youth reaching beyond the narrowly conceived boundaries of vocational agriculture (Rogers, 1969). The rural vocational agriculture teacher is being encouraged to expand his program to meet the needs of the student who will not enter agriculture as an occupation. Tart states that:

We need to consider the possibility of bringing into our program some additional ideals not strictly related to agriculture. In small schools we need to expand our vocational agriculture program to include some non-agricultural type occupational skills (p. 111).

Although the small rural schools are often criticized for not preparing the students for the work in the urban centers, the large high schools also are not free of problems. A report of the Panel of Consultants on Vocational Education (1963) for the President stated:

The scope of the typical high school program is narrow in relation to needs of the present day: (a) Rural schools have given little attention to the occupational needs of students who migrate to urban centers and (b) large high schools do not offer vocational programs in relation to probable need; only one-fifth of the students attend a school where trade and industrial education is offered, and only one-tenth attend a school where distributive education is offered.

The discussion now turns from an overview of some of the issues, problems, and legislation that have affected the vocational agriculture program to follow-up studies showing the effects of the program on its students.

A Survey of Follow-Up Studies for Vocational Agriculture Graduates

Numerous studies have been conducted to determine the occupational status of the graduates at different time intervals following graduation. The results of the studies are often conflicting. This can partially be attributed to the data collection method and the subsequent interpretation. To be useful and meaningful, follow-up data should be interpreted in light of two major factors--the length of time elapsing after graduation and the source of information (e.g., teacher or student).

The graduate's first job is unlikely to be his last job. Kaufman (1968) cited literature estimating that the current average 20-year-old worker will change jobs six or seven times during his remaining life. Frequently these job changes also mean a change in occupation. This demonstrates the need for follow-up studies to be conducted at different time intervals.

Results of follow-up studies are often influenced by the source of information. The Occupational Training Information System and the

Oklahoma Research Coordinating Unit each conducted a follow-up of the same group. Sharp differences were found in the information obtained from the occupational teachers compared with the responses of the graduates (Research Coordinating Unit, 1969). A report comparing these two follow-up methods concluded that neither method, student or teacher, produced accurate data. Teacher-reported data has errors in broad categories as well as specific occupational classifications, while students had difficulty classifying activities in terms of relatedness to training.

The report proposed that the inaccuracies in the data were the result of teachers basing their reports on the intention of the students at graduation. Thus, data obtained from teachers were out of date in three to five months when the graduates responded to the questionnaire. A change in terminology was also cited as a possible cause of conflicting data.

National Follow-Up Studies Comparing Vocational Agriculture Graduates to Other Vocational Graduates

The Division of Vocational and Technical Education in its annual report for the fiscal year 1967 included follow-up information for graduates of the secondary vocational programs (Department of Health, Education and Welfare, 1967). The follow-up divided the students into two groups: those available for placement and those not available for placement. Those who have entered the armed forces or continued school full time were considered as "not available for placement." The remainder were considered "available for placement."

Table II illustrates and compares the occupational behavior of the graduates of all vocational programs. Vocational agriculture placed

TABLE II
 STATUS OF SECONDARY VOCATIONAL AGRICULTURAL
 GRADUATES COMPARED TO ALL VOCATIONAL
 GRADUATES IN FISCAL YEAR 1967

	Vocational Agriculture	All Programs
	(%)	(%)
Not Available for Placement		
Entered Armed Forces	19.4	17.4
Continuing School Full Time	77.9	71.9
Other Reasons	2.7	10.7
Total	100.0	100.0
Available for Placement		
Employed in Field Trained/Related	65.2	75.2
Employed in Unrelated Field	26.2	15.2
Employed Part Time	5.1	3.7
Unemployed	3.5	5.2
Total	100.0	100.0

Source: Vocational and Technical Education, Annual Report, Fiscal Year 1967.

65.2 percent of its graduates available for placement in the field trained or in a related occupation. The average percentage for all programs is 75.9. Measured by unemployment, persons trained in vocational agriculture rate very well. The percentage of vocational agriculture trained persons unemployed is 3.5 percent and for all programs is 5.2 percent. Part-time employment for vocational agriculture graduates amounted to 5.1 percent and for all programs 3.7 percent.

In the category of "not available for placement", the proportion of vocational agriculture graduates entering the armed forces was 19.4 percent compared to 17.4 percent for all programs. In the category of continuing school full time, vocational agriculture had a rate of 77.9 percent compared to 71.9 percent for all programs.

Regional and State Follow-Up Studies of Vocational Agriculture Graduates

Several follow-up studies have shown a very low level of unemployment for vocational agriculture graduates. A 1961 study in Maine indicated that only one percent of the graduates of vocational agriculture were unemployed one year after graduation (Elliot, 1961). A two percent unemployment rate one year after graduation was reported by Martin (1963) in Connecticut. Webb (1961) reported a six percent unemployment rate for Mississippi vocational agriculture graduates in 1960. A study in Oklahoma noted that the amount of unemployment for all vocational agriculture graduates was below the national average (Edington and Hill, 1964).

Warmbrod and Phipps (1966) in their review of research in agriculture education cited several studies which revealed that one year after high school graduation one-half to two-thirds of the former enrollees

of vocational agriculture were either employed in occupations requiring knowledge and skills in agriculture or were enrolled in agriculture at colleges and universities or other post-high school institutions. A study in Ohio conducted by Bender (1961) found that 66 percent of the graduates of vocational agriculture were working in agriculture occupations or pursuing advanced study in agriculture one year following graduation. Elliot (1961) excluded former enrollees in the military service and found 62 percent of the graduates in Maine were farming, employed in non-farm agriculture occupations, or in college one year after graduation.

Follow-up studies reveal a reduction in the proportion of vocational agriculture graduates in related occupations as the time period after graduation is extended. Bender (1961) found that only 59 percent of the vocational agriculture graduates were in agriculture activities after five years as compared to 66 percent after one year out of school. A study conducted by Eggenberger (1964) established that 44 percent of the graduates of West Texas high schools who had studied agriculture were working in agriculture vocations after ten years. Thirty-one percent were farm operators, farm managers, or farm laborers. A similar study conducted by Robinson (1964) of graduates of vocational agriculture in Iowa revealed that ten years after graduation 32 percent were owners, managers, or laborers on farms and 13 percent were employed in non-farm agriculture occupations in business and industry. Edington and Hill (1964) in Oklahoma reported that after five years 18 percent of the graduates of vocational agriculture were farming. Eleven percent were employed in off-farm agricultural occupations and 12 percent were enrolled in a college of agriculture.

The Success of Vocational Agriculture Graduates in College

Several studies have appraised the success of vocational agriculture students in college. Research suggests that students who have studied vocational agriculture have done as well or slightly better in college than those who have not studied agriculture. One survey reviewed 32 studies covering the period 1929-1959 (Tom, 1960). An estimated 53.8 percent of the studies showed that the pupils who had studied agriculture in high school had higher grade averages than pupils in the same institution who had not studied agriculture in high school; 36.6 percent of the studies indicated that the former vocational agriculture students did as well as the other students; and 9.6 percent of the studies indicated that the vocational agriculture students did not do as well as the other students.

A study at Ohio State University found that students who had taken vocational agriculture in high school performed as well academically as other students not only in the College of Agriculture, but also in the Colleges of Arts and Sciences, Commerce, Education, and Engineering (Price, 1960). Students majoring in agriculture at the University of Illinois who had vocational agriculture training tended to earn slightly higher average grades than other students (Krebs, 1961). Another study indicated that there was no significant difference in scholastic achievement in mathematics, science, technical agriculture, and total accumulative grade average in the College of Agriculture at Cornell University between students who had taken vocational agriculture and students who had not taken vocational agriculture in high school (Macomber, 1961).

Several studies also indicated that vocational agriculture students remained and graduated from Colleges of Agriculture more frequently than students in the same Colleges who had not enrolled in high school courses in vocational agriculture. Bass (December, 1961), in a study at Virginia Polytechnic Institute, found that 76 percent of the former enrollees in vocational agriculture remained in college for four years, while 65 percent of the students without vocational agriculture remained four years. A study in Wisconsin revealed that 59 percent of the students with four years of vocational agriculture graduated; whereas, only 32 percent of the students who had not taken vocational agriculture graduated (Pumper and Sledge, 1962).

The studies reported above suggest that students trained in vocational agriculture have a high incidence of continuing their education and success in college. This favorable finding may reflect on the leadership training and counseling obtained in the program. On the other hand, the high incidence of higher education and comparatively low incidence of placement in the farm or agriculture-related occupations suggests overcapacity in the vocational agriculture program. The data on farming opportunities and number of vocational agriculture graduates presented in subsequent chapters provide greater insight into the overcapacity problem. How to overcome the overcapacity problem without losing the favorable counseling and leadership opportunities available to vocational agriculture students is a major challenge indeed.

CHAPTER III

A CONCEPTUAL BASIS FOR ESTABLISHING WHAT CONSTITUTES AN ECONOMIC FARMING UNIT

To determine what size of farm constitutes an adequate start in farming, this chapter contains a discussion of off-farm employment and economies of size in farming. These factors are taken into account in concluding what size of farm, measured by gross sales, will provide at least a minimum adequate level of living for persons entering farming.

Economies of Size in Farming

Students in agriculture economics are taught the theory of economies of size. The average cost curve ordinarily is portrayed as "U" shaped in the short run. In the short run, as more output is produced, unit costs decline as variable inputs are used more efficiently on a given size of farm or plant. At one point, the minimum point, unit costs are as low as possible with the given amount of fixed resources. To the right of this point, diminishing returns predominate as more variable resources are applied to a fixed size of plant.

The long-run average cost curve is derived by connecting all the outer points of the infinite numbers of short run average cost curves. Thus, the long run average cost curve is tangent to all possible short run average cost curves. The long run average cost curve in theory also is portrayed as "U" shaped with a minimum which denotes the optimal

plant or farm size. Attention in this chapter is focused on the long run average cost to determine the optimal farm size.

Relevance of the long run average cost curve in determining the optimal size of farm can be questioned. Economic theory suggests that farm firms will tend to settle at that minimum point on the long run average cost curve. Current farm consolidation may be cited as evidence that there are economies of size in farming and that farmers are moving toward that minimum point. Economies of size do not alone explain why farmers expand or contract their farming operations. A target income, health, goals of the farmers, and age are often factors that cause farms to be less than optimal in size. The question that must be resolved by the economist is where do the economies of size begin and where do the diseconomies begin. Empirical data suggest that in farming the long run average cost curve is not "U" shaped, but may decline rapidly, then flatten out and not rise within the range of empirical data available. Madden (1967) gives support to this idea:

Most studies of the economies of farm size have shown that as farm size increases, average cost either (a) decreases, or (b) remains about the same, or (c) on very large farms, increases slightly but still is below average revenue, even for the largest farms observed. This implies that profit increases steadily as farm size increases, and that the largest farms are the most profitable. It would be expected then, that farms would tend steadily toward the largest sizes, and that the size distribution of farms would be shifting accordingly. This does not seem to be so, however. In many areas and for many types of farming, the most rapid increase in number of farms is in the intermediate size classes, consisting chiefly of farms that can be operated by one or at most only a few full-time men, using modern technology and adequate capital. The number of very large farms seems to be increasing only gradually and, in some cases, to be decreasing.

An examination of the area between the average revenue curve and the average cost curve may reveal a profit margin as cited by Madden

(1967). Why then do we not have entry of many very large farms into the industry? This so-called margin profit may actually be the return necessary to hold the resources in production or employment in the face of risk and uncertainty.

Other factors also prohibit the farmer from expanding his operation to achieve greater economies of size. Two types of farming might be examined to illustrate why farmers do not always achieve the optimal plant size.

While diversification of farm enterprises has often been advocated as a precaution against uncertainty, it has inhibited to some extent achieving significant economies of size. Often the limiting factor for a farm with heterogenous output is coordination among enterprises. Limited capital may be spread between enterprises in such a manner that none of the enterprises produce an optimal return, thus making expansion difficult.

The farm producing a single output, while more vulnerable to risk and uncertainty, often can be more efficient in its usage of capital. This type of farm is able to make more intensive use of machinery, buy inputs in ample quantity to achieve a discounted price, and often sell in sufficient quantity by contract to obtain a higher price. While these factors favor expansion of the unit--risk and uncertainty often overweight these factors thus again resulting in a less than "optimal" size unit.

For any type of farm organization, the equity position of the owner, the attitude of the owner towards risk and uncertainty, and goals of the operator influence the size of farm he will operate. Even with sufficient capital, the operator will internally ration capital

consistent with the amount of uncertainty associated with the venture. This helps explain why many farmers stop short of the profit maximization point where marginal cost is equated with marginal revenue.

Tweeten (1970) derived output costs per unit of input in dollars for 1960 by economic class of farm. Economies of size were evident for all classes; however, most of the economies of size appeared to be achieved by Class II farms and per unit cost declined slowly beyond this point. Class I and II farms expended \$.91 and \$.95 respectively to get \$1.00 in output. Class III through VI farms spent \$1.34, \$1.69, and \$2.67 respectively, to obtain \$1.00 in output (Tweeten, 1970). The unit cost curve began to flatten out at the beginning of the Class II farms and the unit cost declined very slowly beyond an output of \$30,000. The unit cost curve has shifted to the right since the above study, but does quite vividly point out that Class I and Class II farms realize the greatest economies of size.

Madden (1967) indicated that for most farm operators, the breakeven point would be well beyond \$10,000 of annual gross sales. Tweeten (1970) indicated that farms with sales under \$25,000 on the average lost money and did not cover all production expenses in 1960. It is interesting to note that a large number of small farms still exist. For many farmers, off-farm income and willingness to accept low returns on farm resources, especially labor, are key elements that allow small farmers to remain on farms.

Off-Farm Income

Although net farm income is quite low for farm operator families with gross sales of less than \$20,000, their total income is at a

reasonable level. Income from off the farm, such as custom work or an off-farm occupation, has enabled many small farmers to remain on the farm and make a reasonable income from all sources. Table III shows the importance of off-farm income in 1969.

TABLE III
INCOME PER FARM OPERATOR FAMILY BY MAJOR
SOURCE AND BY VOLUME OF SALES, 1969

	\$40,000 and Over	\$20,000 to 39,999	\$10,000 to 19,999	\$5,000 to 9,999	\$2,500 to 4,999	Less Than \$2,500
	<u>Dollars</u>	<u>Dollars</u>	<u>Dollars</u>	<u>Dollars</u>	<u>Dollars</u>	<u>Dollars</u>
Realized Net Farm Income	27,503	10,466	6,481	3,630	2,122	1,082
Off-Farm Income	5,464	3,241	3,141	4,488	4,895	7,011
Total Income	32,967	13,707	9,622	8,118	7,017	8,093

Source: Adapted from Farm Income Situation, ERS, U. S. Department of Agriculture.

The increasing importance of off-farm income has implications for rural boys contemplating a career in farming. Minimum resource requirement studies at Oklahoma State University indicate that the capital requirement to obtain a target return of \$5,000 to operators, labor, and management in the Panhandle of Oklahoma range from \$100,000 to over \$200,000 (Conner and Walker, 1965). The capital requirement serves as

an effective barrier to entry into farming for rural boys desiring to farm but short on capital. Additional schooling beyond high school increased the chances for a rural farm boy to obtain a good off-farm job that can supplement his farm income to insure a satisfactory total income.

What Constitutes a Start in Farming

Estimates of farming opportunities vary widely among researchers. The estimates depend upon the assumptions made. In the past the common assumptions made were that (1) only farms with annual sales of at least \$10,000 could be considered as an adequate start, (2) farms grossing \$10,000 or more would continue to increase in numbers, (3) life expectancy rates for the total male population apply to farmers, and (4) all farmers 65 years of age or older will die or retire in the next decade.

Several studies have been conducted to estimate farming opportunities for rural youth through death and retirement of commercial farm operators. Stam (1969) has estimated cumulative farming opportunities created through death and retirement for six classes of commercial farms in the North Central region. Manderscheid (1963) estimated farming opportunities for Michigan farm youth considering only those farms with sales of \$10,000 or more as adequate. The two studies did not take into account opportunities for smaller farms to become economic units through farm consolidation. According to Farm Real Estate Developments, 60 percent of all farm transfers and sales in the United States entailed consolidation with an existing unit (U. S. Bureau of Census, 1969).

In contrast to previous studies, this study considers an economic farming unit, a start in farming, to be grossing at least \$20,000 in

in sales. Smaller farms are allowed to become economic units through consolidation, thus all farms are represented. The \$20,000 base was selected as this is the point where there appears to be a flattening of the unit cost curve. The question might well be asked why \$30,000 or some other large figure was not used. The author contends that even though a \$20,000 unit may not give the operator an adequate farm income, income from other sources can supplement farm income to bring total income to a satisfactory level. One also should not assume that every entrant will be able to acquire immediately a farm that will provide a satisfactory total income. With time, the operator can be expected to expand his unit. Furthermore, the goal of many farm operators is not to reach the minimum point on the long run average cost curve but to achieve a satisfactory net income consistent with risks and needs to meet family living requirements.

The next chapter contains the estimates of farming opportunities for vocational agriculture graduates and farm boys based on farm size norms discussed above. Divisional and state comparisons are presented as well as the estimated needs in the hired farm work force.

CHAPTER IV

FARMING OPPORTUNITIES FOR VOCATIONAL AGRICULTURE

GRADUATES AND RURAL FARM BOYS

Introduction

The vocational agriculture program has since its beginning trained present and prospective farmers for proficiency in farming. During the 1965-67 period an average of about eighty-four thousand boys graduated from high school programs of vocational agriculture each year. Not many have a chance to obtain an economic farming unit--only twenty-one thousand economic farming units are expected to become available each year between 1965 and 1974.

In this chapter, the number of high school graduates from vocational agriculture programs are compared with the estimated number of opportunities for viable new starts in farming on a state basis. Also included is a comparison of all farm youth reaching twenty years of age to the estimated number of farming opportunities.

Procedure

The number of seniors enrolled in vocational agriculture for the fiscal years 1965, 1966, and 1967 were averaged and used as the annual number of entrants into the labor force with vocational agriculture training, as this was the latest data released by state divisions of vocational education. The three year average was used to minimize

random variation in enrollment. The data were obtained from the United States Office of Education (Department of Health, Education and Welfare, 1965, 1966 and 1967).

The issue of whether to regard all vocational agriculture graduates as potential entrants must be confronted. Some researchers separate the group into two components--"available for placement" and "not available for placement" (Braden, Harris, and Paul, 1970). The graduates considered "not available for placement" fell in one of the following categories: (1) entered the armed forces, (2) continued school full time, and (3) other reasons. While it is true that most of these graduates are not available for placement immediately, those returning from the armed forces and school may be considered as potential entrants. These sources of entrants are assumed to be offsetting, and all graduates are assumed to be immediately available for placement in this study.

The number of farm boys reaching age 20 was derived from the 1960 Census of Population, the last population census available. These data were used to estimate the average annual number of farm youth reaching age 20 in the 1965-74 period and this number was then compared with the number of commercial farms made available annually from 1965 to 1974 based on the 1964 Census of Agriculture.^{1/}

The estimates of the farming opportunities are based on the assumption that all farm operators retire or die in the decade after they

^{1/}The estimates are based on figures in the following reports: (1) U. S. Department of Commerce and U. S. Department of Agriculture, "Farm Population of the United States," Current Population Reports, Farm Population, Series Census-ERS, p. 27, No. 36, April, 1966; (2) U. S. Department of Agriculture, "Farm Population--Estimates for 1965," ERS-286, April, 1966; and (3) U. S. Department of Agriculture, Farm Population: Estimates for 1910-1962, ERS-130, October, 1963.

reach 65 and on expected mortality among all farmers. Each farm with gross sales over \$20,000 made available by death or retirement of the operator is assumed to constitute an opportunity for a new start. Small farms made available are assumed to be able to consolidate to form \$20,000 economic units. For example, four farms each with gross sales of \$5,000, made available by death or retirement of the operators, are assumed to constitute an opportunity for one new start in farming. Potential entrants and farming opportunities by state and division are shown in Table IV. (See Appendix A for a complete explanation.)

Divisional and State Comparisons of Farming Opportunities for Vocational Agriculture Graduates

According to the estimates in Table IV, the vocational agriculture graduate will have the best chance to obtain an economic unit in the New England division. Here about one graduate out of two can potentially find an economic unit.

Vocational agriculture graduates in the South Atlantic division will have the least chance of obtaining an economic farming unit. Only one graduate out of six can potentially find a farm grossing \$20,000 in this division.

The states having the most favorable ratio of farms to vocational agriculture graduates are Vermont and New Hampshire with the replacement rates being 77 percent and 71 percent, respectively. This indicates that seven to eight out of ten vocational agriculture students might find an economic farming unit in these two states. Maine follows with about 65 percent of the graduates having an opportunity to obtain a \$20,000 farming unit.

TABLE IV

POTENTIAL ENTRANTS AND FARMING OPPORTUNITIES BY STATE AND DIVISION FOR 1965-1974

Divisions and States	Potential Entrants		No. of Farm Operators Needed	Ratio of:		Number of Hired Workers Needed
	All Farm Boys Reaching 20 Years of Age (An. Est. 1965-74)	All Boys Trained in Vocational Agriculture (Av. for 1965-67)		Operators Needed to all Entrants	Operators Needed to Entrants Trained in Vocational Agriculture	
New England	1,449	868	410	.28	.47	384
Maine	416	179	117	.28	.65	76
New Hampshire	151	52	37	.25	.71	24
Vermont	427	115	88	.21	.77	57
Massachusetts	255	247	92	.36	.37	111
Rhode Island	32	125	11	.34	.09	12
Connecticut	173	150	65	.38	.43	104
Middle Atlantic	6,634	4,493	1,297	.20	.29	972
New York	2,882	1,989	604	.21	.30	436
New Jersey	404	390	124	.31	.32	179
Pennsylvania	3,348	2,114	569	.17	.27	357
East North Central	23,522	15,622	4,004	.17	.26	1,246
Illinois	4,807	3,653	1,264	.26	.35	352
Indiana	4,336	2,256	693	.16	.31	162
Ohio	4,714	2,726	766	.16	.28	255
Michigan	4,218	2,678	553	.13	.21	199
Wisconsin	5,447	4,309	729	.13	.17	278
West North Central	24,029	12,202	4,800	.20	.39	1,236
Iowa	5,700	2,197	1,213	.21	.55	262
Kansas	2,567	1,125	703	.27	.63	165
Minnesota	5,297	3,253	749	.14	.23	203
Missouri	4,395	3,231	886	.20	.27	210
Nebraska	2,497	1,173	595	.24	.51	155
North Dakota	1,844	609	306	.17	.50	134
South Dakota	1,729	614	348	.20	.57	106

South Atlantic	22,227	18,479	2,880	.13	.16	2,203
Delaware	168	144	82	.49	.57	33
Maryland	938	718	184	.20	.26	132
Virginia	3,482	2,229	469	.14	.21	250
West Virginia	1,088	986	137	.13	.14	50
North Carolina	7,879	7,002	796	.10	.11	349
South Carolina	3,692	1,365	306	.08	.22	262
Georgia	4,023	3,815	580	.14	.15	385
Florida	957	2,220	327	.34	.15	742
East South Central	17,212	10,471	2,086	.12	.20	1,047
Kentucky	4,854	2,459	600	.12	.24	186
Tennessee	5,289	3,111	571	.11	.18	185
Alabama	4,058	2,910	427	.11	.15	231
Mississippi	3,011	1,991	487	.16	.25	446
West South Central	12,719	10,965	2,519	.20	.23	1,786
Arkansas	3,006	1,800	387	.13	.22	346
Louisiana	2,201	2,467	290	.13	.12	296
Oklahoma	2,146	3,690	509	.24	.14	144
Texas	5,365	3,008	1,332	.25	.44	1,000
Mountain	6,313	4,090	1,058	.17	.26	1,003
Montana	860	529	247	.29	.47	155
Idaho	1,194	811	209	.18	.26	141
Wyoming	357	352	84	.24	.24	74
Colorado	2,012	510	229	.11	.45	182
New Mexico	971	391	107	.11	.27	123
Arizona	421	535	66	.16	.12	234
Utah	426	868	97	.23	.11	57
Nevada	72	94	21	.29	.22	36
Pacific	5,646	6,700	1,472	.26	.22	2,238
Washington	1,523	1,823	327	.22	.18	221
Oregon	1,204	1,094	258	.21	.24	154
California	2,787	3,375	859	.31	.25	1,678
Alaska	15	12	2	.13	.17	2
Hawaii	116	396	28	.24	.07	183
United States	119,751	83,890	20,526	.17	.24	12,113

The states having the least favorable rates are Hawaii and Rhode Island with rates of 7 percent and 9 percent, respectively. Ten states have replacement rates of 15 percent or less. The estimate for the United States indicates that about one graduate in four will have the opportunity to obtain an economic farming unit.

The Pacific division demonstrates the "urbanization" of vocational agriculture more clearly than any other division. In this division, we find more boys trained in vocational agriculture than farm boys reaching age 20. Vocational agriculture is being taught to many urban youth in California. The program in ornamental horticulture has been implemented with much success in the urban area. Also in many of the rural areas, the small towns supply the vocational agriculture programs with a sizable number of youth.

Divisional and State Comparisons of Farming

Opportunities for All Rural Farm Boys

The estimates in Table IV indicate that the rural farm boy's best chances of acquiring a start in farming is in the New England region as was the case for the vocational agriculture graduate. Only about one out of four farm boys can expect to find an adequate farming opportunity.

Rural farm boys in the East South Central division and in the South Atlantic division have the least opportunity to find an economic farming unit. In these two divisions the chances of obtaining an economic farming unit are about one in eight.

The states showing the most favorable ratio of farms to rural farm boy entrants are Delaware, Connecticut and Rhode Island. The least favorable ratios exist in South Carolina, Alaska, and North Carolina.

Hired Laborers

Hired laborers employed on farms more than 150 days per year may be considered an opportunity for farm youth and vocational agriculture graduates to enter farming. The number of hired workers needed exceeds 12,000 annually compared with about 21,000 farm operators needed annually in the 1965-74 decade (Table IV).^{2/} Although the number of hired farm wage workers is declining, the group constitutes an important part of the total farm work force. They are the group upon which the larger farms--those responsible for most of our food production--are particularly dependent. The large-scale farm operator has had to increase wages to obtain competent labor for operation of sophisticated, expensive machinery.

Educational attainment and occupational choice are two characteristics closely associated with income. Farm wage workers are in an occupational group in which income and educational attainment are low. One study comparing the number of school years completed and the type of jobs performed concluded that education significantly influences the type of work performed. Only 2.8 percent of those who completed 0-4 years of school were in a manager or foreman type position, while 44.9 percent of this group listed hand or stoop labor as the highest

^{2/} This estimate is based on the 1964 Census of Agriculture data and mortality data for the total white male population, with the exception of the South in which mortality tables for the total male population were used.

skill performed on the farm. The above relationship represents the extremes of the hired worker's occupational ladder. It does indicate that education is associated with achievement in the hired working force.

The fact that the lowest-skilled farm jobs pay the lowest wages, are highly seasonal, and are performed by workers from the lowest educational segment of the population presents an immense challenge for our educational, economic, and political system. With this in mind, vocational training could be of benefit to those youth who wish to return to the farm but, because of capital or other barriers, find it impossible to return as an owner or operator. Vocational training should be viewed as a supplement to, not a substitute for, a sound basic education. Additional data on skills of hired farm wage workers would be helpful in determining how much vocational education can contribute to the productivity of the worker and to what extent it will increase his income. Also, more research is needed on appropriate "mix" of basic education and vocational education.

The discussion in the following chapter will apply the estimates made in this chapter to some of the farming intentions of the vocational agriculture graduates. Also it will be directed toward changes needed in the present program.

CHAPTER V

AN ANALYSIS OF FARMING OPPORTUNITY ESTIMATES IN RELATION TO VOCATIONAL AGRICULTURE

The first portion of this chapter complements the estimates made in Chapter IV by presenting the results of studies of farming intentions of vocational agriculture students. The latter portion of this chapter will be devoted to some of the implications of the estimates to vocational agriculture.

Farming Intentions of Vocational Agriculture Students

When comparing the farming intentions of graduates of vocational agriculture to the estimates of farming opportunities in Table IV, somewhat consistent relationships are observed. Research conducted in Massachusetts indicated that of the 50 percent of the pupils in agriculture courses making an occupational choice, 35 percent chose farming (Judge, 1963). The estimates in this study indicate that 37 percent would potentially be able to become established on an economic farming unit. Another study in Illinois revealed that slightly more than one-third of the enrollees in vocational agriculture expressed a desire to farm (Krebs, 1959). The estimate in Table IV for Illinois indicated that 35 percent of graduates would potentially be able to acquire an economic farming unit.

A study in Oklahoma that dealt with farm youth rather than just the vocational agriculture graduates indicated that 26 percent of all farm boys planned to enter farming (Lu, 1967). The estimate in this study indicated that 24 percent might be able to acquire an economic farming unit.

It seems that vocational agriculture students and farm youth are in general realistically appraising their opportunities to enter farming. Apparently, by the time students are seniors they know if they can farm or not. Those who see no chance will change their occupational plans and seek another career. These factors partially explain the nearness of the percentage of graduates desiring to farm and the number of farms available.

The need for early guidance and counseling is evident. It is to the student's advantage to form general career choices, including whether to farm or not, in time to gear his schooling to the preparation required to enter the career. It is a responsibility of the counselor to assist the student in making a realistic career choice. Counselors, including the vocational agriculture teacher, should devote time to incoming freshmen and prospective students to assist them in determining whether they should enroll in, or continue in, the vocational agriculture program.

Success in Farming

A study conducted at Iowa State University which included a comparison of graduates of high schools which offered vocational agriculture with graduates of comparable high schools which did not offer vocational agriculture indicated that the farm operators who had completed three or

more years of vocational agriculture in high school had higher crop, livestock, and total gross product yields from their farms (Neilson, 1965). Also the study indicated that the vocational group used more improved production and management techniques than high school graduates who had not received equivalent training in vocational agriculture. A study in Missouri revealed that young farmers who completed the vocational agriculture program had higher farm assets, higher farm net worth, and higher farm income than young farmers who had not taken vocational agriculture after adjustments were made for the initial asset position (Lester, 1961).

O'Kelley and Lester (1965) conducted a study of randomly selected farmers in eight counties in Georgia and concluded that farmers who had studied vocational agriculture in high school had adopted a significantly larger number of recommended practices in all crop and livestock enterprises than the farmers who had not studied vocational agriculture in high school. O'Kelley and Lester also found that farmers who had studied vocational agriculture in high school were more receptive to and participated more frequently in programs of adult farmer education than farmers without prior agricultural instruction. One study also indicated that farmers who had taken vocational agriculture participated more in farm organizations than farmers who had not received vocational agriculture training (Blake, 1963).

These studies are largely impressionistic, and more rigorous analysis is needed to determine the economic payoff from training in vocational agriculture. Specifically, age-earnings data need to be compiled for vo-ag graduates compared to like persons without such training, with appropriate control for parents socio-economic background

and for other factors. Rates of return calculated from such data, with appropriate adjustment for factors such as the proportion of students entering occupations for which they are trained, can be compared with rates of return for other educational programs to determine the optimal mix and level of programs. Data limitations precluded such analysis in this study.

Program Implications

Because of the variance in farming opportunities from state to state, vocational agriculture programs should also vary accordingly. Programs must be related to student needs and opportunities in order to survive and to be successful. Much criticism has been directed toward vocational agriculture because of its emphasis on production agriculture. Production agriculture is useful to those preparing to farm and can be of benefit to many of those in occupations related to agriculture. A study by Roberts (1965) indicated that students were able to effectively utilize many of the skills acquired in agriculture mechanics in non-farm occupations as well as agricultural occupations. The replacement ratio estimates in Table IV indicate that no more than 24 percent of the vocational agriculture graduates in the United States will have an opportunity to obtain an economic farming unit.^{1/} The remaining 76 percent will have to obtain employment in an agriculture-related field or outside the field of agriculture. Those not returning to the farm need more than just production agriculture to compete successfully in the labor market. Vocational agriculture should meet the

^{1/}The percentage will be somewhat less because not all persons trained in vocational agriculture either can be or necessarily want to be a farm operator.

occupational needs of those who cannot return to the farm or should steer such boys to other schooling programs. More attention must be given to the rural youth who by necessity must find non-farm employment and perhaps migrate to urban communities.

CHAPTER VI

Summary, Conclusions, and Recommendations

In this study, a new approach was employed to estimate the number of farming opportunities available each year. Findings indicate that no more than 24 percent of the vocational agriculture graduates will have a potential opportunity to obtain an economic farming unit.^{1/} Only 17 percent of rural farm boys will potentially be able to acquire an economic farming unit.

The number of hired workers needed was estimated to be about 12,000 annually. Although the number of hired workers is declining, the group continues to be a vital part of the total work force. Some farm youth may find this route to a successful farming opportunity.

A review of the literature and estimates in this study substantiate the fact that vocational agriculture programs either must diminish in size or must adequately train students for more than production agriculture. Literature suggests that many of the skills taught in agriculture mechanics may be used effectively in off-farm occupations as well as some non-agricultural related occupations.

Follow-up studies suggest several trends for vocational agriculture graduates: (1) the unemployment rate of vocational agriculture,

^{1/}The percentage may be less than indicated because each new farming opportunity will not necessarily be filled by a person with vocational agriculture training.

graduates is very low, (2) the graduates remaining in agriculture pursuits decline from about 60 percent to 40 percent in a period of about 10 years, (3) about one-third of the graduates are owning or managing a farm, (4) about 12 percent of the graduates are in non-farm occupations related to agriculture, (5) about 40 percent of the graduates continue school full time and about one-third of these will study agriculture, and (6) about 10 percent of the graduates entered the armed forces each year. Some of these results are based on limited data, and generalizations may not be warranted, however.

Conclusions

A number of surveys indicate that vocational agriculture students and farm youth are at least by their senior year realistically appraising their opportunities to enter farming. Early counseling may be required to appraise opportunities earlier so that the schooling program can be geared accordingly.

The estimates in Chapter IV suggest that the ratio of farming opportunities to vocational agriculture graduates is least favorable for graduates in the South Atlantic division. The most favorable ratio is in the New England division.

Only 24 percent of the graduates of vocational agriculture in the United States will have the opportunity to obtain an economic farming unit according to the estimates in Table IV. This indicates that a large majority of the graduates will have to obtain off-farm employment. This may or may not be in an agriculture related occupation. The educational objectives of the vocational agriculture program must be geared to the reality of subsequent employment opportunities for its students.

The Vocational Education Act of 1963 and the subsequent amendments in 1968 have taken an important step in this direction.

Although funding for vocational education has increased a great deal due to the previously cited legislation, vocational agriculture has not enjoyed the generosity of legislators it once did. Most of the criticism directed toward vocational agriculture is that the program has not changed its emphasis enough to the off-farm occupations curriculum. The production agriculture curriculum, although a sound base for teaching related occupations, is not preparing most rural youth for available jobs. Until improvements can be made, the vocational agriculture program will continue to be watched critically. How to overcome the overcapacity problem without losing the favorable counseling and leadership opportunities available to vocational agriculture students is a major challenge indeed.

Recommendations for Further Study

Throughout this study the need for training in agriculture related industries has been stressed. There is a need for studies investigating the particular off-farm occupations that can utilize training students receive in vocational agriculture. Agriculture mechanics and horticulture have been greeted with substantial enthusiasm and success by employers in the agriculture related businesses, as well as employers in the non-farm sector. Refinements need to be made into problem areas in these two fields to determine more specifically what can become salable skills as a result of these two programs. Trends in the agriculture related fields need to be continuously evaluated so programs can be implemented as jobs begin to open.

Additional data would be useful in examining the educational needs of hired farm workers. With the current trend to larger farms with more complex and expensive equipment, it is evident that a parallel trend will emerge in demand for higher skilled farm labor. It would be beneficial to know the amount of educational and occupational skill that would benefit the hired worker.

Finally, with more refined data on costs and returns from agriculture and other fields of vocational training, it will be possible to compare rate of return among fields and to determine a more nearly optimum level and mix of investment in the various vocational programs.

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APPENDIX

COMPUTATION FOR REPLACEMENT RATIOS

EXPLANATION OF COMPUTATION FOR REPLACEMENT RATIOS

The format for the computations of replacement ratios is presented in this appendix.^{1/} Explanations will be made as to how the ratios were actually formulated.

The first page of the computation worksheet begins with the first item being the computation of the number of potential entrants. This number of rural farm boys was based on projections for 1965 made by the U. S. Department of Agriculture and is cited in Chapter IV in the footnotes. The survival ratios refer to the number of rural farm boys that will remain in the rural area and become potential entrants. Each division had a different survival ratio as some divisions had a higher rate of migration and faster decline in rural youth numbers.

By multiplication of the projected entrants times the survival ratios, the number of potential entrants was determined.

The next item considered was the number of replacements needed. The 1964 Census of Agriculture classifies commercial farms into six classes based upon the value of agriculture products sold. The data on the number of farm operators by farm and age group in 1964 were obtained from 1964 United States Census of Agriculture. The rural farm male population was projected to 1964. Death ratios are derived from United States Department of Health, Education, and Welfare, State Life Tables, 1959-61. The age distribution of hired workers was derived from The Hired Working Force of 1968, published by the United States Department of Agriculture. In order to determine the replacements needed, the number of farm operators was multiplied by the appropriate death ratio.

The last two pages of the worksheet contain a summary of the results of replacement needs and potential entrants with cumulative needs shown. Also, on the last page the consolidation rate schedules are shown. This is the portion that takes into account the current trend in economies of size in farming and the possibility of small farms consolidating to become economic units.

^{1/}The following consolidation schedule was developed by Dr. Yao-Chi Lu, Department of Agriculture Economics, Oklahoma State University.

COMPUTATION FOR REPLACEMENT RATIOS

Age in 19__	No. of rural farm youth (1)	Survival ratios (2)	Entrants (3)=(1)x(2)
10-14	_____	_____	_____
15-19	_____	_____	_____
Total Entrants	_____	_____	_____ (A)

Replacements Needed

Class I Age in 19__	No. of farm operators (4)	Death Ratios (5)	Replacements needed (6)=(4)x(5)
Under 25	_____	_____	_____
25-34	_____	_____	_____
35-44	_____	_____	_____
45-54	_____	_____	_____
55-64	_____	_____	_____
65 and over	_____	_____	_____
Total	_____	_____	_____ (B)

Class II Age in 19__	No. of Farm operators (4)	Death Ratios (5)	Replacements needed (6)=(4)x(5)
Under 25	_____	_____	_____
25-34	_____	_____	_____
35-44	_____	_____	_____
45-54	_____	_____	_____
55-64	_____	_____	_____
65 and over	_____	_____	_____
Total	_____	_____	_____ (C)

Class III	No. of farm operators (4)	Death Ratios (5)	Replacements needed (6)=(4)x(5)
Age in 19__			
Under 25	_____	_____	_____
25-34	_____	_____	_____
35-44	_____	_____	_____
45-54	_____	_____	_____
55-64	_____	_____	_____
65 and over	_____	_____	_____
Total	_____	_____	_____ (D)

Class IV	No. of farm operators (4)	Death Ratios (5)	Replacements needed (6)=(4)x(5)
Age in 19__			
Under 25	_____	_____	_____
25-34	_____	_____	_____
35-44	_____	_____	_____
45-54	_____	_____	_____
55-64	_____	_____	_____
65 and over	_____	_____	_____
Total	_____	_____	_____ (E)

Class V	No. of farm operators (4)	Death Ratios (5)	Replacements needed (6)=(4)x(5)
Age in 19__			
Under 25	_____	_____	_____
25-34	_____	_____	_____
35-44	_____	_____	_____
45-54	_____	_____	_____
55-64	_____	_____	_____
65 and over	_____	_____	_____
Total	_____	_____	_____ (F)

Class VI Age in 19__	No. of farm operators (4)	Death Ratios (5)	Replacements needed (6)=(4)x(5)
Under 25	_____	_____	_____
25-34	_____	_____	_____
35-44	_____	_____	_____
45-54	_____	_____	_____
55-64	_____	_____	_____
65 and over	_____	_____	_____
Total	_____	_____	_____ (G)

Part time Age in 19__	No. of farm operators (4)	Death Ratios (5)	Replacements needed (6)=(4)x(5)
Under 25	_____	_____	_____
25-34	_____	_____	_____
35-44	_____	_____	_____
45-54	_____	_____	_____
55-64	_____	_____	_____
65 and over	_____	_____	_____
Total	_____	_____	_____ (H)

Part retirement Age in 19__	No. of farm operators (4)	Death Ratios (5)	Replacements needed (6)=(4)x(5)
Under 25	_____	_____	_____
25-34	_____	_____	_____
35-44	_____	_____	_____
45-54	_____	_____	_____
55-64	_____	_____	_____
65 and over	_____	_____	_____
Total	_____	_____	_____ (I)

Abnormal Age in 19__	No. of farm operators (4)	Death Ratios (5)	Replacements needed (6)=(4)x(5)
Under 25	_____	_____	_____
25-34	_____	_____	_____
35-44	_____	_____	_____
45-54	_____	_____	_____
55-64	_____	_____	_____
65 and over	_____	_____	_____
Total	_____	_____	_____ (J)

Wageworkers Age in 19__	No. of wage- workers (4)	Death Ratios (5)	Replacements needed (6)=(4)x(5)
Under 25	_____	_____	_____
25-34	_____	_____	_____
35-44	_____	_____	_____
45-54	_____	_____	_____
55-64	_____	_____	_____
65 and over	_____	_____	_____
Total	_____	_____	_____ (K)

Opportunities in the 1965-74 period for a/an _____ (state) _____ male rural youth or vocational agriculture graduate to obtain an economic farming unit in the following ten year period.

Economic Class	Replacements needed during next 10 years	Cumulated replacement needs	Cumulated opportunities in next 10 years
I (B)	_____	_____	_____
II (C)	_____	(L) _____	_____
III (D)	_____	_____	_____
IV (E)	_____	_____	_____
V (F)	_____	_____	_____
VI (G)	_____	_____	_____
Part time (H)	_____	_____	_____
Part Retirement (I)	_____	_____	_____
Adnormal (J)	_____	_____	_____
Wageworkers (K)	_____	_____	_____
Total	_____	_____	_____

Consolidation Schedule

Class I & II (L)	= _____
(D) x 0.7500	= _____
(E) x 0.3750	= _____
(F) x 0.1875	= _____
$\overline{(G)} + (H) + (I) + \overline{(J)}$ x 0.075	= _____
No. of economic farming units	= _____
No. of wageworkers needed (K)	= _____

VITA⁸

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Master of Science

Thesis: FARMING OPPORTUNITIES FOR VOCATIONAL AGRICULTURE STUDENTS AND RURAL FARM BOYS WITH IMPLICATIONS FOR VOCATIONAL AGRICULTURE

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