

1965

Opportunities and Training Needs in Non-farm Agricultural Occupations in a South-western Iowa School District

Robert L. Madden

Follow this and additional works at: <https://openprairie.sdstate.edu/etd>

Recommended Citation

Madden, Robert L., "Opportunities and Training Needs in Non-farm Agricultural Occupations in a South-western Iowa School District" (1965). *Electronic Theses and Dissertations*. 3060.
<https://openprairie.sdstate.edu/etd/3060>

This Thesis - Open Access is brought to you for free and open access by Open PRAIRIE: Open Public Research Access Institutional Repository and Information Exchange. It has been accepted for inclusion in Electronic Theses and Dissertations by an authorized administrator of Open PRAIRIE: Open Public Research Access Institutional Repository and Information Exchange. For more information, please contact michael.biondo@sdstate.edu.

OPPORTUNITIES AND TRAINING NEEDS IN NON-FARM AGRICULTURAL
OCCUPATIONS IN A SOUTH-WESTERN IOWA SCHOOL DISTRICT

BY

ROBERT L. MADDEN

A thesis submitted
in partial fulfillment of the requirements for the
degree Master of Science, Major in
Education, South Dakota State
University

1965

SOUTH DAKOTA STATE UNIVERSITY LIBRARY

OPPORTUNITIES AND TRAINING NEEDS IN NON-FARM AGRICULTURAL
OCCUPATIONS IN A SOUTH-WESTERN IOWA SCHOOL DISTRICT

This thesis is approved as a creditable and independent investigation by a candidate for the degree, Master of Science, and is acceptable as meeting the thesis requirements for this degree, but without implying that the conclusions reached by the candidate are necessarily the conclusions of the major department.

Thesis Adviser

July 12, 1965
Date

Head, Education Department

July 12, 1965
Date

266/12

ACKNOWLEDGMENTS

The author extends his appreciation to:

Dr. Hilding W. Gadda, major advisor, able counselor,
dedicated teacher educator, and friend

Mr. George Neuzil, Superintendent of Hamburg Community
Schools and Board of Education members for encouragement and
community support

Cooperating businessmen of the Hamburg, Iowa, community

The author's wife and children, who shared the financial
and emotional strain.

RLM

TABLE OF CONTENTS

	Page
CHAPTER I. THE PROBLEM	1
Introduction	1
Importance and Value of the Study.	2
Purpose.	2
Scope and Limitations of the Study	3
Assumptions	4
Definition of Terms.	5
CHAPTER II. REVIEW OF LITERATURE	9
Importance of Non-Farm Agricultural Occupations.	9
Employment Opportunities	10
Training	12
Recruiting	17
Employer Preferences	17
Summary.	19
CHAPTER III. DESIGN AND PROCEDURE.	20
Selection of Method and Instrument	20
Selection of Sample.	21
Interview Technique.	22
Data Processing.	23
CHAPTER IV. FINDINGS OF THE STUDY.	24
Introduction	24
Description of Firms and Agencies.	24

	Page
Firms' Willingness to Participate in Cooperative Training Program	31
Estimated Employment Opportunities	34
Employee Recruiting.	36
Required or Preferred Personal Characteristics of Employees	38
Frequency of Activities and Duties	43
Importance of Technical Training Areas	51
Importance of Basic Educational Areas.	59
CHAPTER V. CONCLUSIONS AND RECOMMENDATIONS	65
Conclusions.	65
Recommendations.	66
SELECTED BIBLIOGRAPHY	69
APPENDIX A.	71
APPENDIX B.	75

LIST OF TABLES

Table	Page
1. Positions of Interviewees Representing Business Firms	25
2. Main Function of Business Firm	26
3. All Functions in Which Business Firms Interviewed Engage	26
4. Numbers of Firms by Agricultural Business Function Category.	27
5. Numbers of Employees by Agricultural Business Function Category.	28
6. Numbers of Employees Found in all Full-Time Occupations by Levels of Employment and Agricultural Business Function Category.	30
7. Firms' Willingness to Participate in Cooperative Farming Program.	32
8. Problems Firms Anticipated in Employment of Students	33
9. Estimated Employment Opportunities Expected at all Levels of Employment by Agricultural Business Function Category.	34
10. Agency-Sources Utilized by Firms to Recruit Replacement and New Employees.	36
11. Difficulty Experienced by Employers in Filling Full-Time Employment Vacancies with Competent Personnel, by Agricultural Business Function Category.	37
12. Characteristics Required or Desired of Employees for Entry in all Full-Time Occupations Surveyed.	39
13. Frequency Ratings of Activities and Duties of Personnel Employed in Non-Farm Agricultural Occupations.	44

Table

Page

14. Importance Ratings of Specific Areas of Technical Training to Employee Efficiency in Non-Farm Agricultural Occupations 53

15. Importance Ratings of Specific Areas of Basic Secondary Education to Employee Efficiency in Non-Farm Agricultural Occupations. 61

CHAPTER I

THE PROBLEM

Introduction

Various prominent figures on the American agricultural scene, farm magazine editors, and even, to a lesser degree, the general public have become aware of the need for skilled employees in agricultural non-farm occupations. In some areas, the shortage of such personnel has become so acute that an actual demand is being made of vocational agriculture departments in public high schools to help supply trained, employable graduates in these occupations. While most vocational agriculture educators recognize the need and are quite willing to help solve the problem, they frequently are working blindly. Which occupations and jobs in a given community have need for high school vocational training? What is the employment outlook in these occupations for the foreseeable future? What are the general educational standards and competencies and skills required to enter and advance in these occupations? Are there significant restrictions as to age, legal and union regulations, and experience requirements which apply? These are some of the questions for which educators in agricultural education must find answers if they are to make meaningful contributions in off-farm occupational training.

Importance of Study

This study was expected to identify, describe, and classify non-farm agricultural jobs in the Hamburg community in order to accomplish these objectives:

1. Identify occupations in general and individual jobs specifically for which a positive need for high school vocational training exists.
2. Estimate present and future employment opportunities in agricultural non-farm occupations, by numbers.
3. Determine education, skills and competencies necessary to enter these occupations and make satisfactory advancement.
4. Discover minimum and maximum age limits, labor law and union restrictions and experience characteristics which apply to the occupations involved.

Information collected will be made available to school board members, administrators, and teachers of Hamburg Community Schools. The study will be useful in improving and up-dating the vocational education program.

Purpose

The purpose of the study was to test the following hypotheses relevant to non-farm agricultural occupations:

1. There are more non-farm agricultural job opportunities annually than there are graduates of the vocational agriculture department to fill them.
2. Employers are interested in specifying educational achievements or skills to be learned in school by their prospective non-farm agricultural employees.
3. Where specific skills and/or on-the-job training is required of prospective non-farm agricultural employees, employers are interested in cooperating with schools to provide such training.
4. Requirements, limitations, and characteristics of available non-farm agricultural jobs can be expressed in writing based upon responses of employers.

Scope and Limitations of the Study

This study was limited geographically to the Hamburg (Iowa) Community School District, which significantly limited the numbers and kinds of occupations included in the sample.

The study was limited primarily to the opinions of those interviewed, with no cross references.

Economic trends at the time of the study were ignored. There was no control of experience, age, interests, or bias of employers interviewed.

Further limitations of the study were found in the employer's estimations of employee turnover and future needs used to calculate future employment opportunities.

Assumptions

The following assumptions were made in planning and carrying out this study:

1. That the local telephone directory constitutes a reliable and valid listing source of community non-farm agricultural business firms.
2. That non-farm agricultural occupational employment occurs at unskilled, semi-skilled, skilled, clerical, supervisory and managerial levels.
3. That information obtained verbally from employers is reliable.
4. That businesses which at present employ only the owner-operator on a full-time or part-time basis will not provide employment for additional personnel in the foreseeable future and may therefore be ignored.
5. That the field test conducted in nearby communities would minimize errors of technique and develop uniformity of interviews.
6. That results obtained will be used directly only in the school district surveyed and only as a general guide elsewhere.

7. That professional occupations can be deleted from the study without detracting from its value since the preparation for such occupations is only somewhat incidental to high school vocational programs.

Definition of Terms

The following operational definitions were employed in this study:

Agricultural non-farm occupations and businesses. Those which deal exclusively or primarily with services or products required by farmers or products produced by farmers but do not include the actual production of crops or livestock.

Employers. Those persons who as owners, managers, owner-managers, or supervisors are responsible for hiring, training, and supervising personnel in their farm-related businesses.

Employees. All personnel who perform services for a wage or salary, employed by a non-farm agricultural business.

The Community or Hamburg Community. The school district known as Hamburg Community Schools.

Main function of firm. Specific operations performed, services rendered, or contribution made to society by the business firm, requiring more than one-half the time and effort of its employees, as follows:

- a. Manufacturing. The production of goods by hand or machine processing by working material into useful form.
- b. Service. Performance of a specific type of labor, usually skilled, for the benefit of the customer or client.
- c. Construction. Assembling or building (something) from existing or manufactured material.
- d. Retail sales. The selling of goods or property for money directly to consumers.
- e. Wholesale sales. The selling of goods or property in large quantities, generally to a retailer.
- f. Purchasing. Buying of products directly from the farmer, as a local market convenience.
- g. Processing. All operations necessary to transform agricultural products partly or wholly to a form useful to customers.
- h. Warehousing and storage. A service of providing safe temporary or permanent storage facilities for agricultural products, usually grain.

Levels of Employment

- a. Unskilled. A manual occupation involving simple duties which may be learned relatively quickly and requiring little or no independent judgment. Examples are laborer, custodian.

- b. Semi-skilled. Any manual occupation characterized by well developed but routine manipulative ability, and/or alertness and care, and/or a relatively short training period, and/or direct or intermittent supervision.
Examples are truck driver, meat cutter.
- c. Skilled. Manual and craft occupations requiring a thorough knowledge of operations and processes involved in their work, considerable manual dexterity, and independent judgment. Examples are lumber grader, mechanic, welder.
- d. Clerical. Occupations including jobs dealing with preparation, processing, and use of written records and communications. Examples are bookkeeper, secretary.
- e. Technical. Occupations requiring knowledge and skill in the technical and mechanical details of a science or profession between skilled tradesman and professional in level. Examples are artificial inseminator, lay meat inspector.
- f. Sales. Any occupation the main function of which is to represent the firm in selling or transferring ownership of property from the firm to the client or customer.
- g. Supervisor. One who is responsible for coordinating and guiding the work activities of a usually small, often

specialized group of workers. Examples are shop foreman, field foreman or supervisor.

- h. Manager. One who is responsible for planning and coordinating the general activities of workers in a given firm or branch of a firm, often through supervisors as intermediates. Examples are sales manager, plant manager.
- i. Professional. Employment level involving a high degree of mental activity in a complex, though usually specialized field of endeavor. A college degree or equivalent is required for entry in the occupation. Examples are vocational agriculture instructor, veterinarian.

Agricultural business function category. The general category in which a business firm or employee is classified according to the principal product handled or service rendered. Examples are farm machinery sales and service, poultry and livestock industries.

Part-time employee. One employed either fewer than the usual number of weeks per year or fewer than the usual number of hours per day for that occupation. Employee of less than full-time occupation.

CHAPTER II

REVIEW OF LITERATURE

The purpose of this chapter is to present and describe the studies and experiments completed as they relate to this study. Consideration has been given to only those writings directly related to this study. They are rather few in number since this is a relatively new area of investigation in the vocational education field.

Importance of Non-Farm Agricultural Occupations

Dr. A. W. Tenney, addressing an agricultural education seminar at Ohio State University, characterized agriculture as the "...largest and most basic industry."^{1/} He added that agriculture employs 40 per cent of the working population of the United States.^{2/} Since the percentage of American workers engaged in actual farm operation has never exceeded 10 per cent of the working population in recent years, it follows that approximately one-third of our nation's working force is employed in the non-farm agricultural

^{1/} A. W. Tenney, Agricultural Technician Training Possibilities and Responsibilities, Report of a National Seminar on Agricultural Education, July 20 to 24, 1964, Prepared by the National Center for Advanced Study and Research in Agricultural Education (Columbus, Ohio, 1964), p. 37.

^{2/} Ibid.

occupations. This dramatically illustrates the importance of these occupations to the national economy.

Employment Opportunities

Employment opportunities in nearly all non-farm agricultural occupations, except unskilled and semi-skilled laborers, are expected to increase significantly in the next five to ten years. A number of recent studies agree on that conclusion. In New York state, Cushman and his associates^{3/} found that employers predicted an increase of full-time employees needed by 1969 compared with 1964 numbers in ten of twelve non-farm agricultural occupational families. Only two (Poultry Industry and Forestry and Soil Conservation) expected no increase. Total increase of full-time workers in all occupational areas surveyed for the five year period was estimated at 19 per cent. A 13 per cent increase of part-time workers was predicted for the same time period, but the growth was expected to be considerably less general throughout the various occupations.

^{3/} Harold R. Cushman, Virgil E. Christensen, and Garry R. Rice, "A Study of Off-Farm Agricultural Occupations in New York State" (unpublished research project, Agricultural Education Division, Cornell University, 1965), pp. 27-28.

Bower described the situation similarly by stating "the decline of employment on U.S. farms since 1940 has been offset by the increases in agriculturally related industries."^{4/}

The most spectacular growth of agricultural employment is that of the agricultural professions. Dean Weber of Kansas State College estimated that in every year in the indefinite future approximately 15,000 new jobs in agricultural professions will be created. This figure far surpasses the approximately 8,500 graduates of all agricultural colleges each year.^{5/}

Royster^{6/} found that the largest single area of non-farm agricultural employment in Indiana was that of grain elevators and feed sales. Agricultural research provided the second largest number of employment opportunities.

It is commonly recognized that opportunities in farming and ranching are rapidly decreasing. Bower, in 1964, said "the employment

^{4/} John C. Bower, "Vocational Education for Tomorrow's Agriculture" (1964 Proceedings Seminar on Vocational Education In Agriculture, Bozeman, Montana, June 22 to 23, 1964), p. 13. (Mimeographed.)

^{5/} "Careers Ahead" published by National Project in Agricultural Communications, cited by Karl Shoemaker, "Opportunities and Limitations for Employment of Farm People Within and Outside of Farming" (United States Department of Agriculture, Federal Extension Service, Washington, D. C.) pp. 7-8. (Mimeographed.)

^{6/} Ralph R. Royster, "Analysis of Non-Farming Agricultural Occupations in Indiana" (unpublished D. Ed. dissertation, Graduate School, University of Missouri, 1959), summarized by author in the University of Missouri Bulletin, LXI, No. 30 (June 1960), 8.

on farms in the U.S. (Sic) has declined more than 40 per cent since 1940.^{7/} He predicted an additional 29 per cent decrease in farming opportunities throughout the United States during the years 1960 to 1975.^{8/} These facts indicate the need for a change of the public image of agriculture from simply farming and ranching to that of a complete industry.

Training

Speaking for the President's Panel of Consultants on Vocational Education, Bishop and Tolley stated the case for non-farm agricultural training. "Those who migrate from farms will encounter less difficulty in obtaining employment in non-farm occupations if they are provided with the requisite skills and training."^{9/}

Previous to pilot programs now in progress in several states, training for non-farm agricultural occupations has been largely incidental to vocational agricultural programs established for the purpose of training students in farm operation or, indeed, non-existent. Such training is not entirely inappropriate, according

^{7/} Bower, p. 12.

^{8/} Ibid, p. 8.

^{9/} C. E. Bishop and George S. Tolley, Manpower in Farming and Related Occupations, Appendix II: Education for a Changing World of Work, Report of the Panel of Consultants on Vocational Education Requested by the President of the United States, Prepared under contract with the Office of Education, U.S. Department of Health, Education and Welfare (Washington, 1963), p. 28.

to some studies. Royster^{10/}, for example, found that of 1174 graduates of certain Indiana vocational agriculture departments in the years 1948 through 1957, 13.1 per cent were engaged in non-farm agricultural occupations in 1959. This represented nearly one-half as many graduates as the number engaged in actual farming operations. Thus, for some, high school vocational agriculture was sufficient training to meet entrance requirements in the non-farm agricultural occupations. Bishop and Tolley commented, "clearly, the number of students enrolled in vocational agriculture classes far exceeds the number who may expect to find opportunities for employment as operators of efficient commercial family farms. Yet, a rather high percentage of those receiving training in vocational agriculture have been employed in farming and farm related occupations."^{11/}

Griffin^{12/} concluded that high school vocational agriculture departments have a responsibility to prepare or partially prepare students for entry in all agricultural occupations. However, he considered complete training in high school in specific skills

^{10/} Royster, p. 6.

^{11/} Bishop and Tolley, p. 24.

^{12/} Warren L. Griffin, "The Nature of Agricultural Occupations, Other Than Farming, in Saline County, Missouri" (unpublished Ed.D. dissertation, Graduate School, University of Missouri), (abstract), p. 2.

required for a given occupation impractical. Royster's^{13/} findings agree with the latter conclusion. He found that regular vocational agriculture courses in high school were sufficient training for entry into non-farm agricultural jobs for 46.9 per cent of the Indiana group studied. However, 72.1 per cent of the entire occupational group needed additional on-the-job training before employers considered them adequately trained. Royster^{14/} assumed that it would be impractical to extend present high school vocational agricultural programs to include such training. He implied that young farmer and adult farmer classes could be suited to the needs of non-farm as well as farming agricultural workers.

Another study, made in Kansas^{15/}, indicates, though not conclusively, that regular high school vocational agriculture courses are quite satisfactory as preparation for non-farm occupations.

Christensen^{16/}, on the other hand, found no significant differences between high school graduates employed in non-farm

^{13/} Royster, p. 10.

^{14/} Ibid., p. 15.

^{15/} "Kansas Graduates of Vocational Agriculture in Local Farm-Related Businesses" (Manhattan, Kansas, Agricultural Experiment Station of Kansas State University, 1959-), p. 4. (Mimeographed.)

^{16/} Don N. Christensen, "Relation Between High School Vocational Agriculture Training and Status of Graduates in Non-Farm Occupations Related to Farming" (unpublished Master's theses, Graduate School, Iowa State College, 1958), p. 77.

agricultural occupations with and those without vocational agriculture training with respect to occupational satisfaction, occupational prestige, and mean annual occupational income. This finding reduced the estimated general value of vocational agricultural education in Iowa, where the study was conducted. Bishop and Tolley^{17/} argued that in at least some areas of agricultural employment the vocational agriculture programs do not provide suitable preparation. They wrote, "The demand for services by food processors and distributors will continue to grow. But distributive education or other non-farm training may be better preparation for these jobs than training for the relatively unskilled jobs open to those with high school agricultural training."^{18/}

Griffin^{19/} found a significant correlation between amount of training in agriculture and ultimate occupation. The more high school agricultural training students had received, the greater was the probability they were engaged in an agricultural occupation.

Many educators think that technical or professional training in agriculture is necessary for any significant achievement in the field. They try to impress the idea upon their students. Judge^{20/}

^{17/} Bishop and Tolley, pp. 18-19.

^{18/} Ibid.

^{19/} Griffin, p. 2.

^{20/} Homer V. Judge, Occupational and Educational Plans of High School Students of Agriculture, College of Education, Michigan State University, (East Lansing, Michigan: by the university, 1963), p. 6.

did, in fact, find some recognition of the need for such education among students he studied. Of the Michigan high school vocational agriculture students he studied, 62.5 per cent had tentative plans for continued agricultural education beyond high school.

Differences in competencies needed to enter the non-farm agricultural occupations and competencies needed to advance within the respective occupations appear to be in degree rather than kind. Cushman and his associates^{21/} noted that previous informal studies indicate that usually the same competencies are needed to advance within an agricultural occupation as were needed to enter it. They found no disagreement with this conclusion.

There is not general agreement among high school graduates who have taken vocational agriculture courses concerning the areas of knowledge in which they think they should have received more training. Royster^{22/} found only one such knowledge area in which more than one-half the graduates agreed they should have had more training--that of "farm shop work." In the same study more than one-half the employers thought more emphasis in vocational agricultural courses should be placed on "farm records and bookkeeping," farm management, marketing, and economics," and "care and maintenance of farm machinery."^{23/}

^{21/} Cushman, Christensen, and Bice, p. 4.

^{22/} Royster, p. 13.

^{23/} Ibid., p. 11.

Recruiting

Employee recruiting in non-farm agricultural occupations appears to be highly individualized rather than standardized. Griffin^{24/} found that firms he studied in Missouri had no definite methods or procedures for locating and recruiting new employees. Among the advantages for a program in agricultural occupations education in Colorado schools are claims that it "provides for the employer a selection of future employees who are interested and qualified for the field in which the employer is engaged"^{25/} and that it "lessens the unemployment problem."^{26/} It may be expected, then, that as such occupational educational programs develop, they will solve some of the recruiting problems of employers and make the procedure somewhat more uniform in the future.

Employer Preferences

While their employment methods and requirements may differ widely, employers of persons in non-farm agricultural occupations tend to have rather similar preferences, generally, concerning

^{24/} Griffin, p. 2.

^{25/} Marvin G. Linson and Harold Anderson, "Handbook for Developing and Operating Agricultural Occupations Programs" (Colorado State Board for Vocational Education and Vocational Education Department, Colorado State University, August 1964), p. 3. (Mimeographed.)

^{26/} Ibid., p. 4.

employees. A recent study in Alabama^{27/} shows that farm and rural backgrounds are preferred to urban and city backgrounds. Royster^{28/} found the same preference in 88.9 per cent of employers he contacted. This preference has been widely observed by agricultural educators. According to Royster^{29/}, 77.8 per cent of Indiana employers contacted preferred employees who had had vocational agriculture training in high school. Again, agricultural educators have observed this preference for many years. Royster^{30/} also discovered that while the large majority of employers (76.7 per cent) preferred to employ high school graduates in their non-farm agricultural occupations, only 15.3 per cent made high school graduation an actual requirement for employment.

Preferences of these kinds are important and meaningful to the approximately 11,000 teachers of vocational agriculture in approximately 10,000 high schools throughout the nation who are vitally concerned about the future of their more than 450,000 students.

^{27/} "A Study of Employment Opportunities and Pre-Employment Educational Needs of Workers Engaged in Off-Farm Agricultural Occupations" (Agricultural Education Service of the Alabama State Department of Education and the Department of Vocational, Technical and Practical Arts Education of Auburn University, Auburn, Alabama, December, 1964), p. 5. (Mimeographed.)

^{28/} Royster, p. 9.

^{29/} Ibid.

^{30/} Ibid., p. 10.

Summary

The relatively few studies made on non-farm agricultural occupations indicate that as opportunities in farming and ranching are decreasing, off-farm agricultural employment opportunities are increasing. Practically all the more desirable jobs in these occupations require training of a specialized kind not usually obtainable in present high school agricultural education programs. The training needs of students preparing for non-farm agricultural occupations and the principles of adequate agricultural education for them are not generally agreed upon. Experimental findings seem to be somewhat inconclusive. Apparently, some changes in the traditional high school vocational agriculture programs are needed. The exact nature of such desirable changes is not clearly shown. There is reason to believe that local economic and geographical differences may be influencing or limiting factors. Much more investigation at all levels and in all areas, particularly local, is indicated.

CHAPTER III

DESIGN AND PROCEDURE

Selection of Method and Instrument

At least two methods of conducting a study of this general nature are particularly feasible. The first is to question the workers in non-farm agricultural occupations of a given population as to the education, training, experience and personal qualifications needed for their jobs. The second is to obtain the same information from employers of the personnel involved. The second approach was chosen because of two principal advantages. Persons responsible for hiring any class of workers are likely to be more certain of the necessary qualifications than are the workers themselves. Also, employers tend to be more interested in future qualifications and employment outlook than do the employees. This is a natural situation. The employee need be concerned with the desirable qualifications for only one person--himself. The employer will usually be aware of many job qualifications as well as new or pending qualifications.

There are two common means of securing the desired information for such a study as this. The mail questionnaire method was rejected because of a possible low return. A low return from an already small population was considered too great a risk. Personal interviewing was chosen though it has several disadvantages. Among them

are a great expenditure of both researcher's and interviewee's time, lack of uniformity in interviews, and possible interviewer bias. However, because the rate of return and accuracy is usually satisfactory, this method was employed. To control the negative factors of possible bias and lack of uniformity, the data were collected by the use of interviewer marked interview schedules.^{1/} The schedules and interview technique was subjected to rigid trial in a field test of 144 employees in 7 firms located in nearby communities. Some revisions were found to be needed and were made before collection of any data for the study proper.

Selection of Sample

All firms and businesses of a non-farm agricultural nature in the Hamburg school district were included except four which are solely owner-operated, having no employees. These four, a retail milk route, an owner-operated petroleum tank wagon franchise, a part-time auctioneer, and a locker plant in operation less than one month, were excluded. Having no employees, they contribute nothing to the employment opportunities available in the community and thus to the study. The telephone directory published by Northwestern Bell Telephone Company was the source of business listings. From the complete telephone directory listing, two business names were deleted. One was a hatchery which was no longer operating at the

^{1/} See Appendix A and Appendix B.

time of the study. The other was found to be the legitimate trade name used by a large farming operation to purchase farm supplies. No products or services are sold and no payroll is maintained in that trade name. Fifteen firms and agencies in farm machinery sales and service; farm supplies and equipment sales; grain processing, elevators and feed sales; horticulture, ornamental horticulture, and landscaping; wildlife, conservation, and recreation; and farm and agricultural service made up the final sample. No firms or individuals engaged only in producing livestock or grain crops or fruits were considered in the study.

Interview Technique

All firms and agencies included in the sample were contacted in person or by telephone. Each was asked to participate in the study and be represented by the person responsible for the major portion of employee recruiting. All data for this study were collected by the use of interviewer marked interview schedule forms.^{1/} Questions were asked from the forms and responses recorded thereon. One Interview Schedule I was used per firm or agency and one Interview Schedule II was used per job title. The field test served to standardize interview procedure and minimize variations. The author prepared for and conducted the interviews.

^{1/} See Appendix A and Appendix B

Data Processing

Data relative to descriptions of firms and personnel representing firms, statements concerning participation in cooperative training programs, recruiting sources, and personal characteristics of employees preferred were processed and analyzed without subdivision. Part-time occupations data were processed as a unit because differences were few and minor.

Data pertaining to numbers and percentages of firms, numbers and percentages of employees, numbers of employees by level of employment, anticipated employment opportunities, and degrees of recruiting difficulty were grouped by agricultural business function categories for processing, analysis and presentation.

Frequencies of occupational activities and duties and importance estimates of specific areas of technical training and basic education were grouped by agricultural business function categories for indexing, analysis and presentation. The indexing procedure is explained in Chapter IV with data presentation.

Analysis of descriptive educational research of this nature consists largely of comparisons, contrasts, explanatory inferences, and educational policy implications. Detailed statistical investigation is neither possible nor desirable.

CHAPTER IV

FINDINGS OF THE STUDY

Introduction

This chapter presents the findings of the study based on data collected and analyzed according to the procedure explained in Chapter III. The data and related findings are divided into several areas of investigation. The general data include description of firms and personnel and firms' willingness to participate in a cooperative school-work training program for high school students. A second area includes employment opportunities, employment recruiting, and discussion of the personal characteristics required or desired of non-farm agricultural workers in the firms studied. This is followed by data relative to the activities and required technical training and education characteristics of the occupational employment studied.

Description of Firms and Agencies

Fifteen non-farm agricultural businesses and agencies with one or more employees were found in the Hamburg Community School District. Table 1 indicates that 53.33 per cent of them are owned and managed by the same person, a situation not at all unusual in rural communities. Relatively few of the firms studied are now, or are likely to become, large enough in operation to require extensive personnel departments. The one personnel director shown

Table 1. Positions of interviewees representing business firms.

Position	Number	Percentage
Owner-Manager	8	53.33
Manager (hired)	4	26.67
Personnel Director	1	6.67
Sales Manager	1	6.67
Other	1	6.67
Total	15	100.00

in Table 1 represents a Girl Scout Council, of which the only agricultural employee is the camp custodian. The five managers work closely with and under the direction of the owners.

As shown by Table 2, the main function of more than one-half (53.33 per cent) of the business concerns is retail sales. The main functions of the remaining ones are distributed through service, construction, wholesaling, and others. It becomes apparent that distribution of consumer goods to agricultural customers is the most important single group of non-farm agricultural occupations in the community.

Even when all functions of all the firms are included, retail sales remains the leading activity. Table 3 shows that 73.67 per cent of the firms do some retail selling. Some service work, construction, purchasing, processing, and storage are performed by 20 per cent or more of the firms. Manufacturing and

Table 2. Main function of business firms.

Main Function	Number of firms	Percentage of firms
Service	1	6.67
Construction	2	13.33
Retail sales	8	53.33
Wholesale sales	1	6.67
Other	3	20.00
Total	15	100.00

Table 3. All functions in which business firms interviewed engage.

Function	Number of firms engaged in function	Percentage of firms engaged in function
Manufacturing	1	6.67
Service	3	20.00
Construction	3	20.00
Retail sales	11	73.67
Wholesale sales	1	6.67
Purchasing	3	20.00
Processing	3	20.00
Warehousing and storage	4	26.67
Other	3	20.00

wholesaling are the functions least numerous. This is partially explained by the fact that these functions have been largely taken over by larger businesses in more densely populated urban areas.

The numbers of firms and agencies in each of the seven agricultural business function categories found in the community are shown in Table 4. The distribution is exceptionally even.

Table 4. Numbers of firms by agricultural business function category^{a/}

Agricultural Business Function Category	Number of Firms	Percentage of Firms
Farm Machinery Sales and Service	2	13.33
Farm Supplies and Equipment	2	13.33
Grain Processing, Elevator, and Feed Sales	3	20.00
Poultry and Livestock Industries	2	13.33
Horticulture, Ornamental Horticulture and Landscaping	1	6.67
Wildlife, Conservation, and Recreation	2	13.33
Farm and Agricultural Service	3	20.00
Total	15	100.00

^{a/} Several firms have more than one "business function." They have been listed in the category considered by interviewee as most important in gross income.

Only one firm (6.67 per cent) is engaged in the horticultural industries. However, as shown in Table 5, this firm employed more than one-half the total personnel in all non-farm agricultural occupations included in the study. Grain processing, elevators,

Table 5. Numbers and percentages of employees by agricultural business function category.^{a/}

Agricultural Business Function Category	Full-Time Employees		Part-Time Employees	
	Number	Percentage	Number	Percentage
Farm machinery Sales and Service	23	11.73		
Farm Supplies and Equipment	3	1.53		
Grain Processing, Elevator and Feed Sales	37	18.88	6	4.41
Horticulture, Ornamental Horticulture, and Landscaping	112	57.14	117	86.03
Poultry and Livestock Industries	3	1.53		
Wildlife, Conservation, and Recreation	2	1.02	2	1.47
Farm and Agricultural Service	16	8.11	11	8.09
Totals	196		136	

^{a/} Several employees may be classified in more than one category. They are included in the one in which the major part of their working time is spent.

and feed sales firms employ the second largest group and farm machinery sales and service firms the third largest group. The latter two would dominate the employment opportunities in the absence of the horticulture firm. Such a situation would be most probable in any agricultural area of intense cultivation. Supplying production machinery and equipment and providing markets are vitally

important industries in any of the cash grain agricultural areas. Similarly, a somewhat unusual situation exists in the wildlife, conservation, and recreation field. The jobs shown are provided by a state park and a Girl Scout camp located within the school district. These facilities and their resulting employment would not be found in many communities. However, governmental agricultural and conservation agencies common to nearly every prosperous rural community were not found in the population studied.

A total of 196 full-time positions and 136 part-time positions in non-farm agricultural occupations were found in the community studied.

Table 6 indicates that the largest numbers of managerial sales, clerical, skilled, and unskilled workers are all employees of the horticulture firm. However, the largest single group of semi-skilled workers are employed by the grain processing, elevator, and feed sales firms. They are truck drivers and machine operators generally, as are also most semi-skilled workers of the other firms. Skilled workers are of particular interest to vocational educators. Those shown in Table 6 are mechanics (farm machinery sales and service), elevator superintendents (grain processing, elevator, and feed sales), plant propagators (horticulture), and a welder (farm and agricultural service). Employment level extremes are found in the wildlife, conservation, and recreation category. One employee is a state park officer; the other is a camp custodian.

Table 6. Numbers of employees found in all full-time occupations by levels of employment and agricultural business function category.^{a/}

Agricultural Business Function	Levels of Employment					
	Managerial	Sales	Clerical	Skilled	Semi-skilled	Unskilled
Farm Machinery Sales and Service (23)	0	3	2	11	7	0
Farm Supplies and Equipment (3)	0	0	0	0	3	0
Grain Processing, Elevator, and Feed Sales (37)	4		5	4	24	0
Poultry and Livestock Industries (3)	0	0	0	0	3	0
Horticulture, Ornamental Horticulture, and Landscaping (112)	5	7	26	15	11	48
Wildlife, Conservation, and Recreation (2)	1	0	0	0	0	1
Farm and Agricultural Service (16)	2	0	0	1	13	0
Totals (196)	12	10	33	31	61	49

^{a/} Only those categories shown are represented in the community. All part-time jobs are unskilled.

Employers tended to classify employees in higher levels of employment than are usually accepted, hesitating to classify any as "unskilled." This is largely a courtesy gesture because of the stigma attached to unskilled workers. The classification made in Table 6 is in accordance with definitions given in Chapter I.

Firms' Willingness to Participate in Cooperative Training Program

A general willingness of employers to participate in a student training program with the school is shown in Table 7. Only two (13.33 per cent) were unwilling to participate in a school-work experience training program as described in the interview.^{1/} The refusals were made for reasons based on the legal or technical circumstances rather than any disinclination of employers to cooperate with schools. All the remaining employers were willing to participate at least to the extent of permitting students to visit and observe business operations. Nine firms (60.0 per cent) indicated willingness to cooperate with local educators in preparing a proposed school-work experience program. Only three (20.0 per cent) were willing to release personnel to assist with teaching in the school environment. This appeared to be out of apprehension of unfamiliar environs and inconvenience with respect to usual business routines.

Selection of students enrolled in the proposed training program presented the only major problem seen by employers relative

^{1/} See Appendix A, Interview Schedule I.

Table 7. Firms' willingness to participate in cooperative training program.^{a/}

Type of Participation	Number of Firms	Percentage of Firms
Not willing to participate	2	13.33
Permit interested students to visit and observe operations	13	86.67
Employ interested students during vacation periods	11	73.33
Employ interested students on a part-time basis during school year	10	66.67
Employ interested students on a seasonal basis	11	73.33
Participate in a student work experience program a few hours during the school day on a non-pay basis	11	73.33
Participate in a student work experience program a few hours during the school day on a non-pay basis and a pay basis on weekends	11	73.33
Work with school personnel in authoring an educational program which would help prepare persons for work in firm's occupations	9	60.00
Release key employees to assist teachers in providing instruction for high school students	3	20.00

^{a/} Nearly all respondents indicated several areas and levels of willingness to participate.

to employment of students, as indicated in Table 8. More than one-half (53.33 per cent) of the employers observed that students of desirable character and vital interest in business experience are few. Some noted that no other type of students would be tolerated in a training program. The time element and inconvenience requisite to working with trainees presented an important problem in four (26.67 per cent) of the firms interviewed. Problems peculiar to the individual businesses and of rather minor insignificance were cited by two (13.33 per cent) firms. Two others insisted there were no problems appurtenant to employing students.

Table 8. Problems firms anticipated in employment of students.^{a/}

Problem Anticipated by Firms	Number of Firms	Percentage of Firms
Time involved in training employees or participation in cooperative work experience programs	4	26.67
Selection of student trainees	8	53.33
Other	2	13.33
None	2	13.33

^{a/} Some respondents anticipated more than one problem.

Estimated Employment Opportunities

Based upon employers' estimations of employee turnover by category, there are 39.75 full-time employment opportunities in non-farm agricultural occupations annually. Table 9 shows their distribution by agricultural business function category. Again the horticultural firm dominates the employment scene. More than one-half (22.3) the annual employment opportunities are offered by this one firm. However, a net loss of ten positions is expected in this category within five years because of increased mechanization of horticultural works. The unskilled and semi-skilled levels of employment experience the greater amount of turnover. This is to be expected but is not totally significant because many such vacancies

Table 9. Estimated employment opportunities expected at all levels of employment by agricultural business function category^{a/}

Agricultural Business Function Category	Annual Job Vacancies Expected	New Jobs Expected Within 5 Years
Farm Machinery Sales and Service	4.10	3
Farm Supplies and Equipment	.30	0
Grain Processing, Elevator, and Feed Sales	5.00	7
Poultry and Livestock Industries	.60	0
Horticulture, Ornamental Horticulture, and Landscaping	22.30	-10
Wildlife, Conservation, and Recreation	.35	1
Farm and Agricultural Service	<u>7.10</u>	<u>2</u>
Total	39.75	3

^{a/} Based on employers' estimations of expansion and turnover.

occur as employees are advanced within firms. In actual practice, the higher levels of employment may be reached only by advancement within the ranks of individual firms in some instances. Farm and agricultural service offers the second largest number (7.1 annually) of employment opportunities. They are largely heavy equipment operator positions. Third most numerous annual job vacancies occur in farm machinery sales and service, where shop workers are in demand. The fewest opportunities arise in farm supplies and equipment (route truck drivers) and wildlife, conservation, and recreation categories because of small proportions of employees and slight employee turnover. Anticipated expansion resulting in new employment opportunities within five years is greatest and most significant in the grain processing, elevator, and feed sales category. Gross employment increase expected in all categories is noteworthy, but because of the expected abridgment of horticultural employment, the net growth (3) is relatively moderate, as Table 9 illustrates.

No analysis of salaries was made for several reasons. Some employers were reluctant to discuss salaries in detail which resulted in incomplete data. Salaries are subject to considerable supply and demand influence, employers conceded, as well as other local pertinent factors.

Employee Recruiting

All firms recruit new and replacement employees by personal contact, as shown by Table 10. Only one firm makes use of any employment service agencies and only three (20.0 per cent) recruit through news media advertisements. Seldom, if ever, are the firms represented obliged to recruit large numbers of employees quickly, which may explain their disuse of other recruiting sources. The fact remains that at present no use is made of school and college placement bureaus, radio, or other means of recruiting non-farm agricultural employees in this community.

Table 10. Agency-sources utilized by firms to recruit replacement and new employees.^{a/}

Agency-Source	Number of Firms	Percentage of Firms
News media advertisements	3	20.0
Personal contact	15	100.0
Employment services	1	6.7

^{a/} Some firms recruit by more than one means.

Employers experience rather widely varied degrees of difficulty in obtaining competent employees to fill vacancies, as Table 11 illustrates. Difficulty indexes were computed for each agricultural business function category by first assigning values of 0, 1, 2, and 3 to responses of "no difficulty," "some difficulty,"

Table 11. Difficulty experienced by employers in filling full-time employment vacancies with competent personnel, by agricultural business function category.

Agricultural Business Function Category	Extreme Diffi- culty (3)	Great Diffi- culty (2)	Some Diffi- culty (1)	No Diffi- culty (0)	Weighted Frequency	Difficulty Index
Farm Machinery Sales and Service	5	17	1	0	50	2.17
Farm Supplies and Equipment	2	0	1	0	7	2.33
Grain Processing, Elevator, and Feed Sales	0	0	12	25	12	.32
Poultry and Livestock Industries	1	2	0	0	5	1.67
Horticulture, Ornamental Horticulture, and Landscaping	0	0	112	0	112	1.00
Wildlife, Conservation, and Recreation	0	0	2	0	2	1.00
Farm and Agricultural Service	7	9	0	0	39	2.45
Total (All Categories)	15	28	128	25	229	1.17

"great difficulty," and "extreme difficulty," respectively. A weighted frequency for each business function category was then computed by summing the products of the assigned values and their respective numbers of employees. The weighted frequency was then divided by the total number of employees in the category to complete a difficulty index for that category.

To illustrate from the first category in Table 11, there are no zero difficulty employees, one difficulty employee, seventeen two difficulty employees, and five three difficulty employees. Zero difficulty employees are omitted from the computation.

$$1 + 2 (17) + 3 (5) = 50, \text{ the weighted frequency}$$

$$50 \div 23 \text{ total employees} = 2.17, \text{ the difficulty index}$$

Farm and agricultural service employers, with a difficulty index of 2.45, encounter more difficulty obtaining qualified personnel than do any others. The index (2.33) for the farm supplies and equipment category is nearly as high. At the opposite extreme, grain processing, elevator, and feed sales firms (with a .32 index) expressed little difficulty obtaining qualified employees.

Correlation between number of annual job vacancies by category rank and rank in degree of recruiting difficulty is not significant at the .05 level (Spearman's rho = -.19).

Required or Preferred Characteristics of Employees

Table 12 shows the characteristics relative to experience, technical training, educational level, residential background, and

Table 12. Characteristics required or desired of employees for entry in all full-time occupations surveyed.^{a/}

Characteristics	Number of Employees	Percentage of Employees
A. Previous work experience requirements:		
1. Required	10	5.12
2. Desired but not essential	83	42.35
3. Not desired or unimportant	102	52.04
B. Type of work experience required or desired:		
1. Prior full or part-time work experience in specific job	79	40.31
2. Supervised farming experience (High School Vocational Agriculture)	0	0.00
3. Formal apprenticeship	0	0.00
4. On-the-job training	13	6.63
5. Other	12	6.12
6. None	102	52.04
C. Technical short courses required (or available if not required):		
1. None required	195	99.49
2. Provided by firm being interviewed	1	.57
3. Provided by other commercial concern	0	0.00
4. Provided by public high school	0	0.00
5. Provided by college	0	0.00
6. Other	0	0.00
7. Available, but not required	17	8.67
D. Minimum educational level required:		
1. Less than high school	137	69.90
2. High school graduate	48	24.49

^{a/} There are 196 full-time employees included.

Table 12. Continued.

Characteristics	Number of Employees	Percentage of Employees
3. Post high school technical education	0	0.00
4. Bachelor's degree minimum	0	0.00
5. No educational requirement	11	5.61
E. Residential background preference:		
1. No preference	135	68.88
2. Farm background	61	31.12
3. Rural non-farm background	0	0.00
4. Urban background	0	0.00
F. Age limits:		
1. Under 18	96	48.98
2. 18 to 21, inclusive	98	50.00
3. 22 to 35, inclusive	1	.51
4. Over 35	1	.51
Maximum age limit:		
1. No age limit stipulated	171	87.24
2. Less than 50	2	1.02
3. 50 to 65, inclusive	17	8.67
4. Over 65	6	3.07
G. Age limitations where stipulated are a matter of:		
1. Opinion	8	4.10
2. Desirability	104	53.06
3. Definite policy or legal limitation	84	42.86
H. Other limitations of jobs:		
1. Labor union restrictions	0	0.00
2. Labor law restrictions	27	13.78
3. Licensing or certification requirements	0	0.00
4. Physical limitations	14	7.14
5. Others	0	0.00
6. None	154	78.57

age limits required of all full-time employees to enter the non-farm agricultural occupations studied. Previous work experience was found to be of very minor importance. Only 5.12 per cent of employees were required to have experience, although experienced personnel were preferred for another 42.35 per cent of the positions. Some iteration as to types of work experience required or preferred occurred for the reason that more than one type is acceptable for some positions. Experience in the same specific job or on-the-job training was preferred for a total of 92 positions (46.94 per cent). Supervised farming experience in high school vocational agriculture was not mentioned as acceptable experience although farming was the only other desirable experience suggested. Twelve (6.12 per cent) positions were included in this group.

The casual attitude of employers toward work experience may result from the widespread practice of recruiting new employees for unskilled or semi-skilled positions, giving quite extensive on-the-job training and promoting to higher levels of employments as such vacancies occur.

Only one employee (.51 per cent) was required to attend a technical short course provided by the employing firm prior to entering the occupation. Short courses are available for 17 other positions and are recommended by employers as stimulants to advancement. But they are not required.

Unexpectedly, in view of current emphasis on educational standards, employers stipulated but limited educational level minimums. Only approximately one-fourth (24.49 per cent) of employees were required to be high school graduates. In no case was a higher educational level required. All others required levels of less than high school graduate or made no educational requirement.

No residential preference was stated for 135 (or 68.88 per cent) positions. Where preference was expressed, farm background was the preferred one.

Ninety-six positions could be occupied by persons under 18 years of age. Exactly one-half the positions required a minimum age of 18 to 21, inclusively. Only one employee was found in each of the other groups, 18 to 35 and over 35.

Maximum age limits appear to be rather unimportant in the occupations surveyed. None of the firms interviewed have organized retirement programs.

No labor union restrictions apply to the studied occupations. Interstate Commerce Commission regulations relative to labor laws affect 27 (13.78 per cent) employees. Fourteen jobs were thought to be so arduous as to establish physical limitations.

Requirements relative to part-time employment were practically non-existent. Hence, no attempt is made to tabulate the results.

Frequency of Activities and Duties

For purposes of analysis, all full-time employees of the non-farm agricultural occupations studied were grouped by agricultural business function categories. There are seven: farm machinery sales and service; farm supplies and equipment; grain processing, elevator, and feed sales; poultry and livestock industries; horticulture, ornamental horticulture, and landscaping; wildlife, conservation, and recreation; and farm and agricultural service categories. The data appurtenant to each of the categories were indexed and tabulated individually. Data were also recombined to provide indexes for all full-time occupations as a single group. All part-time occupations were tabulated and indexed as a single group.

Frequencies of occupational activities and duties are shown as activity indexes in Table 13, comparable to indexes used in Table 11. The indexes were computed for each activity or duty by first assigning values of 0, 1, 2, and 3 to responses of "never," "rarely," "occasionally," and "frequently," respectively given on Interview Schedule II (Appendix B). A weighted frequency for each activity or duty was then computed by summing the products of the assigned values and the respective number of employees found in each value group. Each weighted frequency was then divided by the total number of employees in the category to complete the index.

Table 13. Frequency ratings of activities and duties of personnel employed in non-farm agricultural occupations.

Activities and Duties	Activity Index By Category									
	Farm Machinery Sales and Service Occupations	Farm Supplies and Equipment Occupations	Grain Processing, Elevator, and Feed Sales Occupations	Poultry and Livestock Industries Occupations	Horticulture, Ornamental Horticulture, and Landscaping Occupations	Wildlife, Conservation, and Recreation Occupations	Farm and Agricultural Service Occupations	All Full-Time Occupations	All Part-Time Occupations	
Working with people outside firm:										
1. Meeting people	3.00	3.00	2.76	3.00	.20	2.00	2.25	1.53	.18	
2. Selling	1.48	3.00	1.32	3.00	.14	1.00	1.69	.75	.07	
3. Advertising, consulting and/or diagnosing	1.07	0.00	.46	3.00	0.00	1.00	.13	.28	.03	
4. Estimating costs	1.00	.67	1.32	3.00	.10	1.00	1.19	.59	0.00	
5. Buying	.35	.33	1.32	3.00	.04	2.00	1.19	.48	0.00	
6. Other	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Working with personnel within firm:										
7. Handling and supervising men	.39	0.00	.59	1.00	.23	1.50	.19	.35	0.00	
8. Inducting new men	.39	0.00	.97	1.00	.13	1.00	.38	.36	0.00	
9. Training others	.39	0.00	.97	1.00	.13	1.00	.31	.36	0.00	
10. Appraising work of others	.39	0.00	.62	1.00	.13	1.00	.38	.30	0.00	
11. Other	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Working with production, materials, or service:										
12. Designing	.13	0.00	.08	0.00	0.00	1.00	.25	.05	0.00	
13. Sketching and drawing	.08	0.00	.08	1.00	0.00	.50	.31	.04	0.00	

Table 13. Continued

Activities and Duties	Activity Index By Category									
	Farm Machinery Sales and Service Occupations	Farm Supplies and Equipment Occupations	Grain Processing, Elevator, and Feed Sales Occupations	Poultry and Livestock Industries Occupations	Horticulture, Ornamental Horticulture, and Landscaping Occupations	Wildlife, Conservation, and Recreation Occupations	Farm and Agricultural Service Occupations	All Full-Time Occupations	All Part-Time Occupations	
14. Building and/or assembling	1.70	0.00	.08	0.00	0.00	1.50	1.44	.35	.12	
15. Inspecting	.39	0.00	.08	0.00	1.23	1.50	.19	.80	.89	
16. Using technical and service manuals, parts lists, etc.	2.65	1.33	1.38	.33	.96	1.50	2.06	1.33	.95	
17. Mixing	0.00	0.00	.81	0.00	.66	.50	.06	.53	.94	
18. Testing and/or developing products	.30	0.00	.14	0.00	0.00	.50	0.00	.07	0.00	
19. Calculating costs	.52	0.00	.16	2.67	0.00	1.00	.31	.17	0.00	
20. Conducting research	0.00	0.00	.03	0.00	0.00	0.00	0.00	.01	0.00	
21. Developing techniques	.39	0.00	.03	0.00	0.00	1.00	.13	.07	0.00	
22. Planning production or service	.22	0.00	.73	.67	0.00	1.00	.13	.19	0.00	
23. Other	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Working with firm's or customer's equipment, tools, supplies, and instruments:										
24. Constructing above	1.43	1.33	0.00	0.00	0.00	.50	.19	.21	0.00	
25. Designing	1.04	0.00	.08	0.00	0.00	.50	.19	.16	0.00	
26. Repairing	1.39	1.33	2.08	1.67	.66	2.00	2.50	1.10	.99	
27. Operating	2.39	2.33	2.62	3.00	2.20	3.00	2.94	2.39	2.10	
28. Assembling or installing	1.96	1.33	1.70	2.33	0.00	1.00	2.00	.79	.10	

Table 13. Continued

Activities and Duties	Activity Index By Category									
	Farm Machinery Sales and Service Occupations	Farm Supplies and Equipment Occupations	Grain Processing, Elevator, and Feed Sales Occupations	Poultry and Live-stock Industries Occupations	Horticulture, Ornamental Horticulture, and Landscaping Occupations	Wildlife, Conservation, and Recreation Occupations	Farm and Agricultural Service Occupations	All Full-Time Occupations	All Part-Time Occupations	
29. Calibrating or adjusting	1.57	1.33	2.22	1.67	0.00	1.00	2.00	.85	.16	
30. Remodeling	.87	0.00	1.62	0.00	0.00	1.00	1.45	.54	.03	
31. Maintaining	1.30	1.33	2.57	3.00	1.62	2.00	2.88	1.88	1.99	
32. Inspecting, testing, trouble shooting, etc.	1.13	0.00	2.08	1.00	.66	1.00	1.31	1.02	.92	
33. Selecting and/or purchasing	.26	0.00	.41	1.67	.66	1.50	.06	.53	0.00	
34. Other	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Working with business problems:										
35. Policy making and implementation	0.00	0.00	.46	0.00	.04	0.00	0.00	.11	0.00	
36. Planning	0.00	0.00	.46	0.00	.04	1.50	.19	.17	0.00	
37. Promoting	.04	0.00	.46	2.00	.04	1.00	.06	.16	0.00	
38. Handling money	.61	3.00	1.27	0.00	.15	1.50	.81	.53	.10	
39. Writing sales slips	.57	3.00	1.27	3.00	.04	1.50	.25	.49	.10	
40. Keeping records and accounts	.43	3.00	.57	.67	.25	2.00	1.19	.52	0.00	
41. Writing articles, copy, etc.	0.00	0.00	.30	0.00	.04	1.00	0.00	.09	0.00	
42. Making speeches	0.00	0.00	.24	.33	.04	1.00	0.00	.09	0.00	
43. Filing	.52	0.00	.76	0.00	.78	1.50	0.00	.66	.07	
44. Inventorying	1.07	2.00	2.41	2.00	2.10	1.50	0.00	1.86	1.72	
45. Making technical reports	0.00	0.00	.54	0.00	.04	1.50	0.00	.14	0.00	
46. Reading technical reports	0.00	0.00	.54	0.00	.04	1.50	0.00	.14	0.00	

Table 13. Continued

	Activity Index By Category	
	Activities and Duties	
	Farm Machinery Sales and Service Occupations	
	Farm Supplies and Equipment Occupations	
	Grain Processing, Elevator, and Feed Sales Occupations	
	Poultry and Live-stock Industries Occupations	
	Horticulture, Ornamental Horticulture, and Landscaping Occupations	
	Wildlife, Conservation, and Recreation Occupations	
	Farm and Agricultural Service Occupations	
	All Full-Time Occupations	
	All Part-Time Occupations	
47. Writing business Letters	.35	0.00
48. Advertising and displaying	.26	0.00
49. Other	0.00	0.00
	.54	3.33
	.43	3.00
	0.00	0.00
	0.00	0.00
	.21	1.50
	.15	1.00
	0.00	0.00
	0.00	0.00
	0.00	0.00
	.30	0.00
	.26	0.00
	0.00	0.00

To illustrate, suppose for a given activity concerning 23 employees, there are seven employees with zero frequency, four with frequency values of one, six two frequency value employees, and six three frequency value employees. Zero frequencies are omitted from computations. The computation would be as follows:

$$4 (1) + 6 (2) + 6 (3) = 34, \text{ the weighted frequency}$$

$$34 \div 23 \text{ total employees} = 1.48, \text{ the activity index}$$

Meeting people, and to a lesser extent, selling, were activities in which nearly all employees frequently engage as shown by Table 13. The exceptions were horticultural employees who, in this case, operate a mail order business, and wildlife, conservation, and recreation employees. The large proportion of personnel employed in the horticulture occupations will be seen to exert major control of "all occupations" indexes throughout the table. Only poultry and livestock industry employees were frequently active in advertising and buying. This group was made up of retail meat cutters.

Employees studied had little to do with personnel problems, a function employers appeared to exercise alone.

Production activities were considerably less frequent than might be expected. Using technical and service manuals was the only such activity with a high index rating throughout much of the employee population. Poultry and livestock industries employees engaged least frequently in this activity. Farm machinery,

wildlife and conservation and farm service people built and assembled somewhat less than occasionally. All others did so less than rarely. Other production activities occupied employees' time and attention but very infrequently.

In general, all employees operated tools and equipment frequently. Such operation often described the usual job routine for a given employee. Maintaining tools and equipment was an activity from which no group of employees was excused. All performed some such maintenance tasks with more than rare frequency. Operating and maintaining were activities in which even part-time employees occasionally engaged. Repairing, assembling or installing, and calibrating and adjusting tools and equipment rather occasionally occupied the attentions of employees in farm machinery, grain processing, poultry and livestock industries, and wildlife and conservation categories. These employees performed their work almost wholly by the use of tools, instruments, and equipment. The construction, design, remodeling, inspection or testing, and selection and purchase of the tools or equipment either was performed by employers or was not a part of the firms' usual activities. For example, only operation and maintenance of equipment was performed by the horticultural employees. Any other necessary work of this order was hired done by outside repairmen.

Working with business problems, with few exceptions, was not an important part of employees' duties. Farm supplies and

equipment personnel did handle money, write sales slips, and keep records frequently and inventory occasionally. Grain processing, elevator, and feed sales employees handled money and wrote sales slips rarely and inventoried occasionally. Poultry and livestock industry personnel (meat cutters) wrote sales slips and did advertising and display work frequently. They occasionally did promotional work and inventorying. Wildlife, conservation, and recreation people occasionally kept records and accounts. On rare or more frequent occasions, they made and promoted business plans, handled money and wrote sales slips, did filing and inventorying, made and read technical reports and wrote business letters. With the exceptions noted, business problems were primarily assumed by employers in all categories.

To summarize the data detailed in Table 13, it appears that the non-farm agricultural employees studied rather frequently engaged in the social activities of meeting people and selling, the production activities of building or assembling, the skills of tool use and care, and business problems of handling money, writing sales slips, keeping records, and inventorying. Less frequently, they plan, promote, and advertize. Personnel handling, buying, technical design or construction, selection of equipment, technical writing and speaking, and communications are activities generally alien to employees. Variations by individual job titles are myriad, as was anticipated.

Importance of Technical Training Areas

The procedure for analysis of the relative importance of specific areas of technical training to employee efficiency rather closely follows that of the immediately preceding frequency of activities and duties. Data were grouped by the seven agricultural business function categories for computation of importance indexes; then recombined to compute item indexes for all full-time occupations. Part-time occupations were tabulated and indexed as a single group. The importance indexes were computed for each area of technical agricultural training by first assigning numerical values of 0, 1, 2, and 3 to responses of "little or no importance," "of some importance," "quite important," and "essential," respectively, recorded in section VII of Interview Schedule II (Appendix B). The weighted frequency for each technical training area was then computed by summing the products of the assigned values and the respective number of employees placed in each group. By dividing each weighted frequency by the total number of employees in the category, the index was completed.

The procedure may be easily illustrated. Suppose that of twenty employees in a given category the importance value of a given technical training area for six is zero, for eight is one, for three is two, and for the remaining three is three. Zeros need not be included in the computation, which would then be as follows:

$8 (1) + 3 (2) + 3 (3) = 23$, the weighted frequency

$23 \div 20$ total employees = 1.15, the importance index

Table 14 shows that employers considered basic mechanical skill as quite important or essential for all full-time occupations studied. For practical purposes, the same rating applies to part-time occupations since it is only .04 of an index point below. On only this one area of technical training did the responses approach unanimity. A knowledge of engines and tractors was important or quite important to personnel of farm machinery sales and service, farm supplies and equipment, and farm and agricultural service as well as wildlife, conservation, and recreation occupations. These are the individuals who sell, service and operate such equipment. The importance was nearly as great to workers in grain processing, elevator, and feed sales occupations. The importance of other areas of technical training relates directly and individually to the separate agricultural business function categories. Welding training was of some importance to workers in farm machinery sales and service. The reason that it is not of more importance resides in the degree of specialization which has developed among service personnel. Selected individuals may perform all welding operations for the group. Knowledge of agricultural processing was quite important to employers of grain processing, elevator, and feed sales occupations, to whom also carpentry was of some importance. To workers in wildlife, conservation, and recreation occupations, farm

Table 14. Importance ratings of specific areas of technical training to employee efficiency in non-farm agricultural occupations.

Technical Training Areas	Importance Index By Category									
	Farm Machinery Sales and Service Occupations	Farm Supplies and Equipment Occupations	Grain Processing, Elevator, and Feed Sales Occupations	Poultry and Live-stock Industries Occupations	Horticulture, Ornamental Horticulture, and Landscaping Occupations	Wildlife, Conservation, and Recreation Occupations	Farm and Agricultural Service Occupations	All Full-Time Occupations	All Part-Time Occupations	
Mechanics, Engineering										
1. Basic mechanical skill	2.83	2.67	2.78	2.00	2.19	3.00	2.63	2.42	1.96	
2. Internal combustion engines	2.39	2.67	1.92	0.00	.43	1.50	2.25	1.13	.14	
3. Farm machinery and tractors	2.39	2.67	1.92	0.00	.43	2.00	2.06	1.12	.16	
4. Rural electrification	.35	1.33	.86	0.00	0.00	.50	.94	.31	0.00	
5. Farm surveying	0.00	0.00	0.00	0.00	0.00	0.00	1.56	.13	0.00	
6. Welding	1.04	0.00	.89	0.00	0.00	0.00	1.50	.41	0.00	
7. Irrigation and drainage	0.00	0.00	.41	0.00	.29	.50	1.15	.59	.04	
8. Farm buildings and equipment	.57	0.00	.11	0.00	0.00	1.00	.63	.08	.08	
9. Agricultural processing	.22	0.00	2.11	0.00	.23	1.00	0.00	.57	.07	
10. Carpentry	0.00	0.00	1.38	0.00	0.00	2.50	.68	.34	.07	
11. Other	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Plant Science										
12. Agronomy and field crops	1.57	1.33	.92	0.00	1.89	1.00	.56	1.52	1.81	
13. Horticulture, floriculture, and landscape design	.57	1.33	.78	0.00	2.08	1.00	.56	1.48	1.81	
14. Vegetable crops	0.00	1.33	.49	0.00	0.00	1.00	0.00	.12	.02	
15. Range management	0.00	1.33	.46	0.00	0.00	1.00	0.00	.11	.02	
16. Forestry	0.00	.67	.46	0.00	.19	1.50	0.00	.22	.05	

Table 14. Continued

Technical Training Areas	Importance Index By Category								
	Farm Machinery Sales and Service Occupations	Farm Supplies and Equipment Occupations	Grain Processing, Elevator, and Feed Sales Occupations	Poultry and Live-stock Industries Occupations	Horticulture, Ornamental Horticulture, and Landscaping Occupations	Wildlife, Conservation, and Recreation Occupations	Farm and Agricultural Service Occupations	All Full-Time Occupations	All Part-Time Occupations
17. Plant disease control	.83	.67	.78	0.00	1.13	1.00	0.00	1.22	.83
18. Insect and pest control	.83	.67	1.65	0.00	1.13	1.00	0.00	1.08	.83
19. Weed control	.83	.67	1.22	0.00	1.13	1.50	0.00	1.00	.86
20. Other	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Animal Science									
21. General livestock husbandry	0.00	.67	.76	0.00	0.00	0.00	0.00	.15	.02
22. General poultry husbandry	0.00	.67	.76	0.00	0.00	0.00	0.00	.15	.02
23. General dairy husbandry	0.00	.67	.76	0.00	0.00	0.00	0.00	.15	.02
24. Animal nutrition	0.00	.67	.76	0.00	0.00	0.00	0.00	.15	.02
25. Animal disease control	0.00	.67	.78	0.00	0.00	0.00	0.00	.16	.02
26. Other	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Agricultural Economics and Business Management									
27. Agricultural marketing	0.00	1.00	0.00	0.00	0.00	0.00	0.00	.02	0.00
28. Agricultural economics	0.00	1.00	0.00	0.00	0.00	0.00	0.00	.02	0.00
29. Business administration	0.00	1.00	.27	0.00	0.00	0.00	.06	.07	0.00
30. Other	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table 14. Continued

Technical Training Areas	Importance Index By Category									
	Farm Machinery Sales and Service Occupations	Farm Supplies and Equipment Occupations	Grain Processing, Elevator, and Feed Sales Occupations	Poultry and Livestock Industries Occupations	Horticulture, Ornamental Horticulture, and Landscaping Occupations	Wildlife, Conservation, and Recreation Occupations	Farm and Agricultural Service Occupations	All Full-Time Occupations	All Part-Time Occupations	
Soils										
31. General soil science	.08	.67	.19	0.00	1.79	.50	1.15	1.14	1.87	
32. Soil and water management and conservation	.08	.67	.19	0.00	1.79	1.50	1.15	1.15	1.82	
33. Other	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rural Recreation and Conservation										
34. General soil science	.08	.67	.49	0.00	1.79	.50	1.15	.43	1.79	
35. Conservation and resource management	.08	.67	.49	0.00	.04	1.50	1.15	.27	.06	
36. Other	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Food Processing										
37. Harvesting	1.74	.67	1.95	0.00	1.13	0.00	0.00	1.23	.88	
38. Transportation	.30	.67	2.32	.67	.20	0.00	0.00	.72	.07	
39. Warehousing and storage	.83	.67	2.51	.67	1.37	0.00	0.00	1.44	.95	
40. Grading	.83	.67	2.38	2.67	1.37	0.00	0.00	1.44	.95	
41. Packaging, processing, and distribution	0.00	.67	2.38	3.00	1.37	0.00	0.00	1.35	.95	

buildings and equipment and agricultural processing was of some importance and carpentry was quite important. Farm surveying, welding, and irrigation and drainage training were of some importance to farm and agricultural service employees. These are part of the services offered by this occupational category. With those discussed excepted, the importance ratings of the mechanics and engineering skills, as estimated by employers, was notably low.

Rather wide variations of importance indexes for the plant science technical training areas were found. A knowledge of agronomy and field crops was of some importance to all employees except those in poultry and livestock industries and farm and agricultural service occupations. None of the services offered by the latter group relate directly to crop or livestock production. Technical knowledge of horticulture and related fields was of some importance to employees of farm supplies and equipment and wildlife, conservation, and recreation occupations. Although quite important to horticultural workers it was not essential to them as a group, because of the close supervision under which they work. Vegetable crop technology was of some importance only to horticultural and wildlife, conservation and recreation personnel. To the latter group only, range management and forestry technology was of some importance, also. Technical training in the control of plant diseases, insects and pests, and weeds was generally of minor importance to the employees studied. These areas were all of some

importance to the horticultural workers and to wildlife, conservation, and recreation workers. To the grains industries personnel, insect and weed control were of some importance. Plant disease control was not. The fact that disease control in grains is ineffective subsequent to harvest and marketing may serve as a partial explanation.

Animal science technology was relatively unimportant to the occupational subjects of this study. For those employed as poultry and livestock industries personnel, contrary to expectations, these technical areas had zero importance indexes. The explanation rests in the employment level of these employees. As semi-skilled workers, they have little opportunity to function in any truly technical capacity. Livestock numbers are sub-normal in the community as a whole by comparison with adjacent and analogous communities throughout the three state region, a situation affecting all agricultural occupations in the community.

To farm supplies and equipment personnel only the agricultural marketing, economics, and business administration areas of technical training were of some importance. This agrees with the infrequent activity of employees in these problems as shown in Table 13.

Soil science and conservation technology areas generally were, with some exceptions, unimportant to non-farm agricultural occupations employees. These areas were of some importance to personnel employed in horticultural wildlife, conservation and recreation; and farm and agricultural service occupations. None were considered

as quite important or essential. Interestingly, the importance indexes for part-time workers were higher in these areas. This possibly is by reason of the demand for part-time employees for seasonal transplanting and similar horticultural and soil work.

Technical training in harvesting was rather important for workers in farm machinery sales and service and grain processing, elevator, and feed sales occupations (indexes of 1.74 and 1.95, respectively). It was less so but of some importance for horticultural employees. To grain and feed handling personnel, a knowledge of transportation technology was quite important. Warehousing and storage and grading were areas quite important to grain processing, elevator, and feed sales occupational workers and of some importance to employees of horticultural firms.

Packaging, processing, and distribution, essential to employee efficiency in the poultry and livestock industries category, was a technical training area quite important to grain and feed workers and of some importance to the personnel of horticulture and landscaping occupations. With respect to other personnel it was of very minor importance.

An occasional contrast or apparent paradox may be observed in employers' responses summarized in Table 14. In plant science technology, basic agronomy and field crops were rated as relatively important areas. The same is true to a lesser degree of horticulture and vegetable crops. By the same employers, the importance of the

technical areas of control of plant diseases, insects and pests, and weeds were rated as proportionately much less important. This situation occurred among employers of farm machinery sales and service, farm supplies and equipment, and horticultural occupations. The reverse is true of employers of grain processing, elevator, and feed sales personnel. A failure to correlate objectives and practice with principles and theory in the employers' thinking is indicated. This observation is supported further by employers' low importance ratings of science and other theoretical areas of basic education discussed in the following section.

In summary, employers generally rated basic mechanical skill, engines and tractors, and basic agronomy and field crops as relatively important areas of technical training as related to employee efficiency. Employers of horticultural workers extended the high ratings to include horticulture and soils technology. Grain processing, elevator, and feed sales occupations employers added harvesting, transportation, storage, grading, and distribution to the list of important areas of technical training. Grading and distribution technology were practically essential to poultry and livestock industry employee efficiency. Other technical areas were relatively unimportant as they affected employee efficiency.

Importance of Basic Educational Areas

The procedure for analysis of the relative importance of specific areas of basic secondary education to employee efficiency

is identical to that explained, illustrated, and used in the immediately preceding section devoted to importance of technical training areas to employee efficiency. Data were grouped by the same agricultural business function categories, indexed, and recombined for indexing of all full-time occupations as a group. Part-time occupations were again tabulated and indexed as a single group. Index computation was performed by exactly the same procedure as that used for previous indexes.

Table 15 shows the indexes as computed by category and line item.

Of all basic educational areas, general mathematics alone was consistently rated by employers as a relatively important one affecting employee efficiency. The lowest index given it was 1.50, from employers in wildlife, conservation, and recreation occupations. All others rated general mathematics quite important (2.00) or higher. It was considered essential to efficiency of farm service personnel. Advanced mathematics was rated as only of some importance to farm supplies and equipment and grain processing, elevator, and feed sales occupations employees.

Natural and physical sciences are of some importance (1.0+) to horticultural occupations workers. They are slightly more important to wildlife, conservation and recreation personnel. Biology is quite important in this category. So, also, is typing.

Table 15. Importance ratings of specific areas of basic secondary education to employee efficiency in non-farm agricultural occupations.

Technical Training Areas	Importance Index By Category									
	Farm Machinery Sales and Service Occupations	Farm Supplies and Equipment Occupations	Grain Processing, Elevator, and Feed Sales Occupations	Poultry and Livestock Industries Occupations	Horticulture, Ornamental Horticulture, and Landscaping Occupations	Wildlife, Conservation, and Recreation Occupations	Farm and Agricultural Service Occupations	All Full-Time Occupations	All Part-Time Occupations	
Natural and Physical Sciences										
1. Bacteriology	0.00	.67	0.00	0.00	1.00	1.50	0.00	.62	.86	
2. Biology	0.00	.67	0.00	0.00	1.00	2.50	0.00	.63	.88	
3. Genetics	0.00	.67	.05	0.00	1.00	1.00	0.00	.62	.86	
4. Physiology	0.00	.67	0.00	0.00	1.00	1.00	0.00	.61	.86	
5. Chemistry	0.00	.67	.05	0.00	1.00	1.50	.06	.63	.86	
6. Physical science	0.00	.67	0.00	0.00	1.00	1.50	.13	.63	.86	
7. Other	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Mathematics										
8. Mathematics, general	2.04	2.33	2.68	2.33	2.34	1.50	3.00	2.44	1.95	
9. Mathematics, advanced	0.00	1.33	1.00	.67	.04	0.00	1.56	.38	.07	
10. Other	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Engineering										
11. Drawing	.52	1.33	0.00	.67	0.00	1.50	1.31	.21	.04	
12. Mechanics, elementary	1.35	2.00	.89	0.00	.10	2.00	1.31	.54	.11	
13. Materials, properties of	.36	.67	0.00	0.00	0.00	1.00	.81	.13	.04	
14. Electronics	0.00	.67	0.00	0.00	0.00	.50	.38	.05	0.00	
15. Hydraulics	1.39	1.00	0.00	0.00	0.00	.50	.50	.22	0.00	

Table 15. Continued

		Importance Index By Category								
Educational Areas		Farm Machinery Sales and Service Occupations	Farm Supplies and Equipment Occupations	Grain Processing, Elevator, and Feed Sales Occupations	Poultry and Live- stock Industries Occupations	Horticulture, Orna- mental Horticulture, and Landscaping Occupations	Wildlife, Conserva- tion, and Recreation Occupations	Farm and Agricultural Service Occupations	All Full-Time Occupations	All Part-Time Occupations
16.	Heat and light	.13	1.33	0.00	0.00	0.00	0.00	0.00	.04	0.00
17.	Other	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Business										
18.	Accounting	.17	.67	.70	0.00	.10	.50	.13	.23	0.00
19.	Advertising	.22	.67	.68	0.00	.04	0.00	.13	.20	0.00
20.	Business law	.17	.67	.32	0.00	.04	0.00	.13	.13	0.00
21.	Typing	.52	.67	.73	0.00	.15	2.50	.13	.33	0.00
22.	Filing	.22	1.00	.70	0.00	.15	1.50	.13	.29	0.00
23.	Bookkeeping	.52	1.67	.76	.67	.15	1.50	.13	.35	0.00
24.	Insurance	.17	.67	.68	0.00	.10	0.00	.13	.22	0.00
25.	Credit and collecting	.39	.67	.68	0.00	.10	0.00	.13	.20	0.00
26.	Taxes	.17	.67	.35	0.00	.04	0.00	.13	.13	0.00
27.	Salesmanship	.48	1.33	1.24	0.00	.04	0.00	.13	.35	.07
28.	Store management	.17	.67	1.24	0.00	.04	0.00	.13	.30	.07
29.	Office practice	.17	.67	.68	0.00	.10	.50	.13	.21	0.00
30.	Other	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

With the exceptions noted above, employers generally failed to correlate most areas of secondary education with employee efficiency. This is the observation upon which, in decades past, vocational and technical education was developed. In areas where little or no vocational-technical education has been established, the situation appears to be unchanged.

The principle upon which effective vocational-technical education is based is that the future needs of the prospective working personnel should be the course work of the present student. In short, needed skills are paralleled by curriculum because the program is so designed.

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

First Hypothesis: There are more non-farm agricultural job opportunities annually than there are graduates of the vocational agriculture department to fill them.

There are an estimated 39.75 annual job opportunities in non-farm agricultural occupations in the community. The number of annual high school graduates with one or more years of vocational agriculture training has never exceeded 12. Some of them become established in productive farming, some leave the community, and some seek employment in their local community. On the basis of this information, it was concluded that the hypothesis was acceptable.

Second Hypothesis: Employers are interested in specifying educational achievements or skills to be learned in school by their prospective non-farm agricultural employees.

Representatives of fifteen non-farm agricultural occupations firms gave specific and detailed entrance requirements of the positions for which they select recruits. The requirements specified personal characteristics including age and background, experience requirements, and minimum education and training standards.

Employing representatives gave frequency ratings of specific activities and duties relative to job titles and rated the importance of

specific technical training areas and basic educational areas as they affect employee efficiency. These facts were considered sufficient evidence upon which to accept the hypothesis.

Third Hypothesis: Where specific skills and/or on-the-job training is required of prospective non-farm agricultural employees, employers are interested in cooperating with schools to provide such training.

Of the fifteen firms interviewed, thirteen were willing to participate in a cooperative school-work experience training program in one or more ways. Nine were willing to work with school personnel in authoring an educational program of occupational training. On the basis of these facts, the hypothesis was accepted.

Fourth Hypothesis: Requirements, limitations, and characteristics of available non-farm agricultural jobs can be expressed in writing based upon responses of employers.

The text and tabulation of the findings of this study were considered prima facie evidence that the described reduction to writing is possible. Therefore, the hypothesis was accepted.

Recommendations

The following recommendations were suggested by the findings and conclusions of the study:

1. Education and guidance personnel should investigate the nature and extent of non-farm agricultural employment within individual communities.

2. Agricultural education personnel should recognize and direct the attention of students, parents, and guidance and administration personnel to the opportunities and training needs of the non-farm agricultural occupations.

3. Appropriate vocational-technical training in non-farm agricultural occupations should be provided in rural community high schools. This training should not be at the expense or sacrifice of vocational agricultural education programs designed to educate youth in productive agriculture and establish them in farming occupations.

4. Agricultural education personnel should consider placement a vital part of the vocational training program in non-farm agricultural occupations. Placement services will benefit employees, employers, and ultimately, the entire community.

5. Additional research in non-farm agricultural occupational opportunities, training needs, and educational methods should be conducted.

6. The administrative personnel of Hamburg Community Schools should invite non-farm agricultural businessmen to organize an advisory committee composed of one representative from each of the seven agricultural business function categories. The purpose of the committee would be to propose curriculum content and recommend appropriate supervised agricultural work experiences to be included in a vocational course in non-farm agricultural occupations. The

course would be known as "Agri-business" or some similarly applicable name.

7. Until a special vocational course in non-farm agricultural occupations can be established, Hamburg educators should counsel students aspiring to these occupations to enroll in the regular vocational agriculture course and should place the students for appropriate supervised agricultural work experience. For the benefit of these students, emphasis should be given whenever feasible to the following subject matter areas:

- (a) Care and use of tools, equipment, and machines.
- (b) Basic tractor and engine mechanics.
- (c) Agronomy, field crops, and basic horticulture.
- (d) Crop storage and processing.
- (e) Distributive business management.
- (f) Applied mathematics and chemistry.

SELECTED BIBLIOGRAPHY

- "A Study of Employment Opportunities and Pre-Employment Educational Needs of Workers Engaged in Off-Farm Agricultural Occupations" (Agricultural Education Service of the Alabama State Department of Education and the Department of Vocational, Technical and Practical Arts Education of Auburn University, Auburn, Alabama, December, 1964), p. 5. (Mimeographed.)
- Bishop, C. E. and George S. Tolley, Manpower in Farming and Related Occupations, Appendix II: Education for a Changing World of Work, Report of the Panel of Consultants on Vocational Education Requested by the President of the United States, Prepared under contract with the Office of Education, U. S. Department of Health, Education and Welfare (Washington, 1963), p. 28.
- Bower, John C. "Vocational Education for Tomorrow's Agriculture" (1964 Proceedings Seminar on Vocational Education in Agriculture, Bozeman, Montana, June 22 to 23, 1964), p. 13. (Mimeographed.)
- "Careers Ahead" published by National Project in Agricultural Communications, cited by Karl Shoemaker, "Opportunities and Limitations for Employment of Farm People Within and Outside of Farming" (United States Department of Agriculture, Federal Extension Service, Washington, D. C.) pp. 7-8. (Mimeographed.)
- Christensen, Don N. "Relation Between High School Vocational Agriculture Training and Status of Graduates in Non-Farm Occupations Related to Farming" (unpublished Master's thesis, Graduate School, Iowa State College, 1958), p. 77.
- Cushman, Harold R., Virgil E. Christensen, and Garry R. Bice, "A Study of Off-Farm Agricultural Occupations in New York State" (unpublished research project, Agricultural Education Division, Cornell University, 1965), pp. 27-28.
- Griffin, Warren L. "The Nature of Agricultural Occupations, Other Than Farming, in Saline County, Missouri," (unpublished Ed. D. dissertation, Graduate School, University of Missouri), (abstract), p. 2.
- Judge, Homer V. Occupational and Educational Plans of High School Students of Agriculture, College of Education, Michigan State University, (East Lansing, Michigan: by the university, 1963), p. 6.

- "Kansas Graduates of Vocational Agriculture in Local Farm-Related Businesses" (Manhattan, Kansas, Agricultural Experiment Station of Kansas State University, 1959-), p. 4. (Mimeographed.)
- Linson, Marvin G., and Harold Anderson, "Handbook for Developing and Operating Agricultural Occupations Programs" (Colorado State Board for Vocational Education and Vocational Education Department, Colorado State University, August 1964), p. 3. (Mimeographed.)
- Royster, Ralph R. "Analysis of Non-Farming Agricultural Occupations in Indiana" (unpublished D. Ed. dissertation, Graduate School, University of Missouri, 1959), summarized by author in the University of Missouri Bulletin, LXI, No. 30. (June 1960), 8.
- Tenney, A. W. Agricultural Technician Training Possibilities and Responsibilities, Report of National Seminar on Agricultural Education, July 20 to 24, 1964, Prepared by The National Center for Advanced Study and Research in Agricultural Education (Columbus, Ohio, 1964), p. 37.

APPENDIX A

VOCATIONAL ORIENTATION OPPORTUNITIES

(Interview Schedule I)

Firm name _____ Address _____

Name(s) of person(s) contacted:

_____ Telephone _____

I. Main product or service of business or firm _____

Position in firm of persons interviewed:

_____ Owner	_____ Purchasing
_____ Owner manager	_____ Processing
_____ Manager (hired)	_____ Warehousing and Storage
_____ Other (specify) _____	

II. Business functions of firm (check all which apply):

_____ Manufacturing	_____ Purchasing
_____ Service	_____ Processing
_____ Construction	_____ Warehousing and Storage
_____ Retail Sales	_____ Other (specify) _____
_____ Wholesale Sales	

III. Firm willingness to cooperate in a school-employer educational program:

Introductory preface:

A. Recently some schools in other states have reported successful programs of vocational training operated jointly by the district high school and local businesses. The school faculty members provide classroom instruction in basic business principles and procedure. On-the-job training is provided by local businessmen. The students upon graduation have the training, experience, and general qualifications to be profitable employees, in a specific business. They usually have been quickly hired in the particular business, frequently by the same firm which gave them student experience. As a businessman, how do you feel about participation in such a program (if it were in this community) in the following ways? (Check all that apply).

- ___ Not willing
- ___ Permit interested students to visit and observe operations
- ___ Employ interested students during vacation periods
- ___ Employ interested students on a part-time basis during school year
- ___ Employ interested students on a seasonal basis
- ___ Participate in a student work experience program a few hours during the school day on a non-pay basis
- ___ Participate in a student work experience program a few hours during the school day on a non-pay basis and a pay basis on weekends
- ___ Work with school personnel in authoring an educational program which would prepare persons for work in these occupations
- ___ Release key employees to assist teachers in providing instruction for high school students
- ___ Additional comments _____
- _____

B. Problems anticipated by employer in employing high school students (or participation in educational work experience programs):

- ___ Liability insurance
- ___ Labor union regulations
- ___ Time involved in training employees or participation in cooperative work experience programs
- ___ Selection of student trainees
- ___ Other (specify) _____
- ___ Additional comments _____
- _____

IV. Present and Prospective Employment Levels and Status

Job Title (A)	Number of persons employed (B)						Esti- mated Turn- over (C)	Monthly (D)		Level of Employ- ment-2 (E)	Recruiting (F) Source of New Employees-3
	Full-Time			Part-Time				Salary-1			
	1 yr ago	Now	5 yrs from now	1 yr ago	Now	5 yrs from now		Start	Top		
						No. Mos. Employed per year					

1. Monthly Salary Code
- 0. Less than \$100
 - 1. \$100-\$150
 - 2. \$151-\$250
 - 3. \$251-\$350
 - 4. \$351-\$450
 - 5. \$451-\$550
 - 6. \$551-\$650
 - 7. \$651-\$750
 - 8. \$751-\$850
 - 9. \$851-above

2. Level of Employment Code
- 0. Unskilled
 - 1. Semi-skilled
 - 2. Skilled
 - 3. Clerical
 - 4. Sales
 - 5. Technical
 - 6. Supervisor
 - 7. Manager
 - 8. Other (specify)

3. Recruiting Source Code
- 1. High schools
 - 2. College employment bureaus
 - 3. Junior colleges
 - 4. Technical schools
 - 5. Radio
 - 6. News media advertisements
 - 7. Personal contacts
 - 8. Employment services
 - 9. Other (specify)

APPENDIX B

IDENTIFICATION OF NEEDED VOCATIONAL COMPETENCIES

AND TRAINING BY JOB TITLE

(Interview Schedule II)

Firm name and address _____

Job Title _____

I. Position of person interviewed:

- | | |
|--|---|
| <input type="checkbox"/> 1. Owner | <input type="checkbox"/> 5. Sales manager |
| <input type="checkbox"/> 2. Owner-manager | <input type="checkbox"/> 6. Office manager |
| <input type="checkbox"/> 3. Manager (hired) | <input type="checkbox"/> 7. Other (specify) |
| <input type="checkbox"/> 4. Personnel director | _____ |

II. General characteristics of job title:

Employment level, classification and category:

- | | | |
|--|--|--|
| <input type="checkbox"/> 1. Unskilled | <input type="checkbox"/> 1. Clerical | <input type="checkbox"/> 1. Rank-and-file |
| <input type="checkbox"/> 2. Semi-skilled | <input type="checkbox"/> 2. Sales | <input type="checkbox"/> 2. Foreman |
| <input type="checkbox"/> 3. Skilled | <input type="checkbox"/> 3. Service | <input type="checkbox"/> 3. Manager |
| <input type="checkbox"/> 4. Technical | <input type="checkbox"/> 4. Technical | <input type="checkbox"/> 4. Supervisor |
| <input type="checkbox"/> 5. Other
(specify) | <input type="checkbox"/> 5. Other
(specify) | <input type="checkbox"/> 5. Other
(specify) |

III. Employee recruiting:

A. Employees' residence:

1. Within local school district (number)
 2. Outside local school district (number)

B. Difficulty in filling vacancies with qualified persons;

1. No difficulty 3. Great difficulty
 2. Some difficulty 4. Extreme difficulty

IV. Characteristics desired in those entering and advancing in this occupation:

A. Pre-employment work experience:

1. Required
 2. Desired, but not essential
 3. Not desired, or unimportant

B. Type of work experience:

- 1. Prior full or part-time work experience in specific job.
- 2. Supervised farming practice (H.S. Vo-Ag.)
- 3. Formal apprenticeship
- 4. On-the-job training
- 5. Other (specify) _____
- 6. None or unimportant

C. Technical short courses required:

- 1. None required
- 2. Provided by firm being interviewed
- 3. Provided by other commercial concern
- 4. Provided by public high school
- 5. Provided by college
- 6. Other (specify) _____

D. Minimum educational level required:

- 1. Less than high school
- 2. High school graduate
- 3. Post high school technical education
- 4. Bachelor's degree minimum
- 5. No educational requirement

E. Residential background preference:

- 1. No preference
- 2. Farm background
- 3. Rural, non-farm background
- 4. Urban background

F. Age limits:

- 1. Minimum age limit
- 2. Maximum age limit

G. Age limitation is a matter of:

- 1. Opinion
- 2. Desirability
- 3. Definite policy or legal limitation

H. Other limitations of this job:

- 1. Labor union restrictions
- 2. Labor law restrictions
- 3. Licensing or certification
- 4. Physical limitations
- 5. Others (specify) _____
- 6. None
- 7. Comments _____

V. Activities and duties of this job title:

	Fre- quently	Occa- sionally	Rarely	Never
--	-----------------	-------------------	--------	-------

Working with people outside firm:

- | | | | | |
|--|--|--|--|--|
| 1. Meeting people | | | | |
| 2. Selling | | | | |
| 3. Advertising, consulting,
and/or diagnosing | | | | |
| 4. Estimating costs | | | | |
| 5. Buying | | | | |
| 6. Other (specify) | | | | |

Working with personnel within firm:

- | | | | | |
|---------------------------------|--|--|--|--|
| 7. Handling and supervising men | | | | |
| 8. Inducting new personnel | | | | |
| 9. Training others | | | | |
| 10. Appraising work of others | | | | |
| 11. Other (specify) | | | | |

Working with production, products,
materials or service:

- | | | | | |
|---|--|--|--|--|
| 12. Designing | | | | |
| 13. Sketching and drawing | | | | |
| 14. Making, building, and/or
assembling | | | | |
| 15. Inspecting | | | | |
| 16. Using technical and service
manuals, parts lists, etc. | | | | |
| 17. Mixing | | | | |
| 18. Testing and/or developing
products | | | | |
| 19. Calculating costs | | | | |
| 20. Conducting research | | | | |
| 21. Developing techniques | | | | |
| 22. Planning production or
service | | | | |
| 23. Other (specify) | | | | |

Fre- Occa-
quently sionally Rarely Never

Working with firm's or
customer's equipment, tools,
supplies, and instruments:

- 24. Constructing above _____
- 25. Designing _____
- 26. Repairing _____
- 27. Operating _____
- 28. Assembling or installing _____
- 29. Calibrating or adjusting _____
- 30. Remodeling _____
- 31. Maintaining _____
- 32. Inspecting, testing,
trouble shooting, etc. _____
- 33. Selecting and/or purchasing _____
- 34. Other (specify) _____

Working with business problems:

- 35. Policy making and
implementation _____
- 36. Planning _____
- 37. Promoting _____
- 38. Handling money _____
- 39. Writing sales slips _____
- 40. Keeping records and accounts _____
- 41. Writing articles, copy, etc. _____
- 42. Making speeches _____
- 43. Filing _____
- 44. Inventorying _____
- 45. Making technical reports _____
- 46. Reading technical reports _____
- 47. Writing business letters _____
- 48. Advertising and displaying _____
- 49. Other (specify) _____

Clarification comments: _____

VI. Areas of technical training needed by employee for job efficiency:

	Essen- tial (a must)	Quite Impor- tant	Of Some Impor- tance	Of Little or No Impor- tance
A. MECHANICS, ENGINEERING:				
1. Basic mechanical skill				
2. Internal combustion engines				
3. Farm machinery and tractors				
4. Rural electrification				
5. Farm surveying				
6. Welding				
7. Irrigation and drainage				
8. Farm buildings and equipment				
9. Agricultural processing				
10. Carpentry				
11. Other (specify)				
B. PLANT SCIENCE:				
12. Agronomy and field crops				
13. Horticulture, floriculture and landscape design				
14. Vegetable crops				
15. Range management				
16. Forestry				
17. Plant disease control				
18. Insect and pest control				
19. Weed Control				
20. Other (specify)				
C. ANIMAL SCIENCE:				
21. General livestock husbandry				
-22. General poultry husbandry				
23. General dairy husbandry				
24. Animal nutrition				
25. Animal disease control				
26. Other (specify)				

Essen- tial (a must)	Quite Impor- tant	Of Some Impor- tance	Of Little or No Impor- tance
----------------------------	-------------------------	-------------------------------	---------------------------------------

D. AGRICULTURAL BUSINESS
MANAGEMENT AND
AGRICULTURAL ECONOMICS:

27. Agricultural marketing _____
 28. Agricultural economics _____
 29. Business administration _____
 30. Other (specify) _____

E. SOILS:

31. General soil science _____
 32. Soil and water management
and conservation _____
 33. Other (specify) _____

F. RURAL RECREATION AND
CONSERVATION:

34. General soil science _____
 35. Conservation and
resource management _____
 36. Other (specify) _____

G. FOOD PROCESSING:

37. Harvesting _____
 38. Transportation _____
 39. Warehousing and storage _____
 40. Grading _____
 41. Packaging, processing,
and distribution _____

VII. Areas of basic training needed by employee for job efficiency:

	Essen- tial (a must)	Quite Impor- tant	Of Some Impor- tance	Of Little or No Impor- tance
A. NATURAL SCIENCES AND PHYSICAL SCIENCES:				
1.	<u>Bacteriology</u>			
2.	<u>Biology</u>			
3.	<u>Genetics</u>			
4.	<u>Physiology</u>			
5.	<u>Chemistry</u>			
6.	<u>Physical science</u>			
7.	<u>Other (specify)</u>			
B. MATHEMATICS:				
8.	<u>Mathematics, general</u>			
9.	<u>Mathematics, advanced</u>			
10.	<u>Other (specify)</u>			
C. ENGINEERING:				
11.	<u>Drawing</u>			
12.	<u>Mechanics, elementary</u>			
13.	<u>Materials, properties</u>			
14.	<u>Electronics</u>			
	<u>Hydraulics</u>			
16.	<u>Heat and light</u>			
17.	<u>Other (specify)</u>			
D. BUSINESS:				
18.	<u>Accounting</u>			
19.	<u>Advertising</u>			
20.	<u>Business law</u>			
21.	<u>Typing</u>			
22.	<u>Filing</u>			
23.	<u>Bookkeeping</u>			
24.	<u>Insurance</u>			
25.	<u>Credit and collecting</u>			
26.	<u>Taxes</u>			
27.	<u>Salesmanship</u>			
28.	<u>Store management</u>			
29.	<u>Office practice and management</u>			
30.	<u>Other (specify)</u>			

Essen- tial (a must)	Quite Impor- tant	Of Some Impor- tance	Of Little or No Impor- tance
----------------------------	-------------------------	-------------------------------	---------------------------------------

E. SOCIAL SCIENCES

31. Principles of economics _____

32. Psychology _____

33. Sociology _____

34. Foreign language _____

35. Government _____

36. Public speaking _____

37. Business English _____

38. Other (specify) _____