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South Dakota Agricultural Off-Farm Occupational Opportunities and Training Needs

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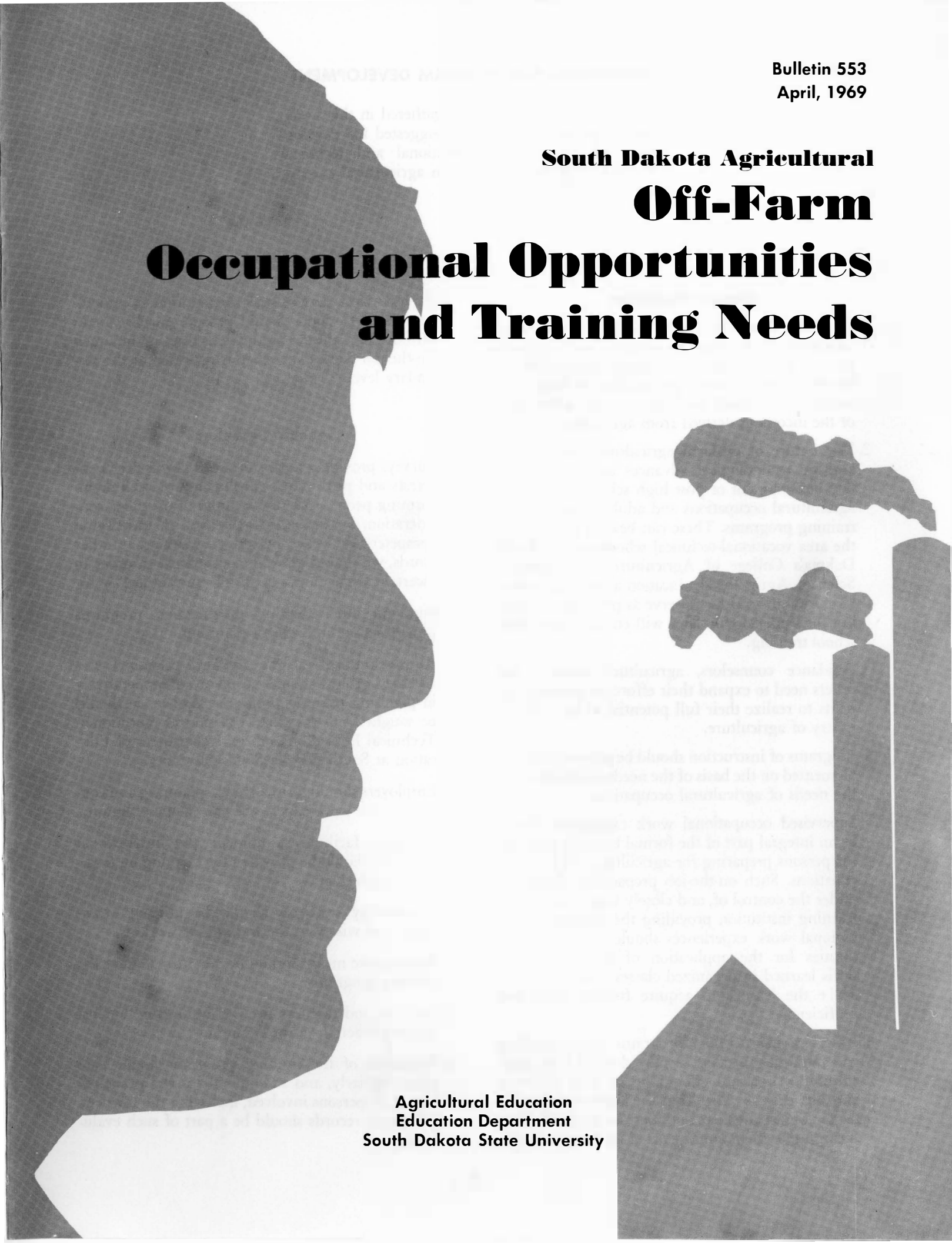
April, 1969

South Dakota Agricultural

Off-Farm Occupational Opportunities and Training Needs



Agricultural Education
Education Department
South Dakota State University

GUIDELINES FOR PROGRAM DEVELOPMENT

Based on the information gathered in this study, the following guidelines are suggested for developing and implementing vocational and technical training programs for off-farm agricultural occupations in South Dakota:

General Guidelines

1. Emphasis should be placed upon development of educational programs to prepare and up-grade persons for off-farm agricultural occupations in South Dakota. Formal preparation is imperative and should be made available in a state where most of the income is derived from agriculture.
2. The nature of off-farm agricultural employment and the technological advances involved necessitate development of post high school training for agricultural occupations and adult refresher or retraining programs. These can best be provided by the area vocational-technical schools and by South Dakota's College of Agriculture and Biological Sciences. Agricultural education at the high school level should continue to serve as preparatory training for students who later will enroll in post high school training.
3. Guidance counselors, agriculture teachers and others need to expand their efforts in assisting students to realize their full potential in the total industry of agriculture.
4. Programs of instruction should be planned and implemented on the basis of the needs of students and the needs of agricultural occupations.
5. Supervised occupational work experience should be an integral part of the formal training program for persons preparing for agricultural off-farm occupations. Such on-the-job preparation should be under the control of, and closely supervised by the learning institution providing the training. Occupational work experiences should provide opportunities for the application of knowledge and skills learned in organized classes, and should enable the learner to acquire further skills and proficiency.
6. In-service instructional programs for up-grading and retraining persons employed in off-farm agricultural occupations should be of such duration and intensity so as to keep the worker abreast of technological advances and increase his proficiency according to the requirements of his employment.
7. At least two years of basic preparation in agriculture in high school should precede enrollment in off-farm agricultural occupations training in which on-the-job work experience is provided at the secondary level.

Specific Guidelines

1. Surveys provide a means of ascertaining needs, interests and prospective enrollments, as well as informing people that such a program is under consideration. Surveys are also helpful in identifying competencies needed by trained workers. In other words, we should go to the occupation in order to ascertain what should be in the curriculum.
2. Studying other existing instructional programs provides a sound basis for planning.
3. Administrators, teachers, guidance personnel, and advisory groups should be involved cooperatively in planning training programs. Assistance should be sought from the State Division of Vocational-Technical Education and the Department of Education at South Dakota State University.
4. Employers should be involved in planning and conducting the work experience part of the program.
5. Adequate facilities, equipment and instructional materials should be provided for carrying on training of high quality.
6. Community resources should be utilized extensively and wisely in the training of workers.
7. Appropriate means should be used to publicize the training programs.
8. Students and teachers need to be insured against hazards inherent in the training.
9. Evaluation of the training program should take place regularly, and should call for the participation of all persons involved, including the learners. Follow-up records should be a part of such evaluation.

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FOREWORD

Appreciation is expressed to Dr. Alfred Musson, associate director of the Experiment Station; Dr. Robert Dimit, professor of rural sociology; Lee Tucker, station statistician; and Douglas Chittick, professor of rural sociology, who served as consultants and made helpful suggestions for designing the study.

Special appreciation is extended to Clarence Schladweiler and Roy Fahey, agricultural businessmen who assisted in pre-testing the data-gathering instrument; and the managers and other business employees who provided data for the study.

Guidance counselors, agriculture teachers, area vocational-technical school directors, public school administrators, parents, students and other will find this publication helpful in gaining and disseminating information pertinent to the present and future occupational opportunities available in the off-farm sector of South Dakota's agricultural industry. Persons responsible for curriculum development in all learning institutions will find the information similarly helpful.

South Dakota Agricultural Off-Farm Occupational Opportunities and Training Needs

By **H. W. Gadda** and **James Pollman***

Agriculture, the largest occupational field in the United States, employs about 40% of the total civilian labor force. In South Dakota approximately 85% of the total income (nearing the $1 billion mark) is derived from agriculture. On the basis of our survey of 126 South Dakota firms we conclude that at least 2,485 new workers with competencies in agriculture will be needed in this state by 1972.

The guidelines we suggest in this report for developing and implementing vocational and technical training programs for off-farm agricultural occupations in South Dakota are based on our findings of growth trends in present occupational areas, plus the new job areas that businesses and industries who responded to our survey predict will come into being.

This sampling of South Dakota firms indicates that new workers with competencies in agriculture will be needed in the 1968 to 1972 period in at least 480 business firms throughout South Dakota. Jobs include replacements for present workers and for newly created positions wrought by growth and development in these firms. The difficulties already experienced in filling jobs requiring specially trained workers in off-farm agriculture points to the need for more training programs.

Over half of the firms responding to this study desired some on-the-job training; 44.4% favored short courses provided by the industry; and 43.2% indicated a need for some form of in-service training. It is evident therefore, that opportunities for workers trained in agricultural competencies far exceed their supply. Furthermore this study substantiates the conclusion that as agricultural technology continues to flourish and as population continues to grow, new off-farm agricultural jobs will continue to grow.

More than three-fourths of the firms studied indicated they would hire new or additional agricultural workers in the next five years. These findings are conservative, since they are concerned only with South Dakota's present businesses, and do not reflect the numbers of workers needed in new and emerging agricultural businesses in the state.

WHAT THE MAJOR EMPLOYMENT NEEDS ARE

Our sampling of South Dakota firms indicates major needs of business are agricultural workers with skills in retailing, service, wholesaling, manufacturing, processing, storage and marketing of products, and purchasing. The products and services in which most of the firms do business are petroleum products, grain and seeds, feed, farm equipment sales and service, fertilizer, general farm supplies, building materials, agricultural chemicals, and product processing (in that order). Other functions, while very important, make up a lesser proportion of the total.

Abilities in rendering specialized service in business, management, and agricultural management or crop, animal and soil sciences represent the kinds of preparation required. Training in such competencies must be provided at the secondary school level, in post high school area vocational-technical schools, agricultural colleges, and in business and industry.

The firms studied do a volume of business annually ranging from $20,000 to over $1,000,000 and employ from one to 2,500 workers. Eight out of 10 firms employ 15 or fewer full-time male workers and 37.5% employ from one to four. Almost half of the firms, or 45.4%, hire from one to five full-time female workers and 60.7% of them hire part-time male and female workers. More than half of the total full-time and part-time male and female workers have an agricultural background and only 1.6% of the firms reported no workers with such a background.

A total of 62.3% of the firms indicated plans to hire from one to 15 new agricultural workers each in the period from 1968 to 1972. Another 10.6% plan to hire 15 or more each. Saleswork will require 26.3% of the new workers; 13.4% will be mechanics; 9.1% managers; 8.6% farm equipment servicemen; 7.7% semi-skilled and unskilled; 7.3% partsmen; and the remainder will be divided among 16 or more additional job titles. All except 2.6% of the job titles for which new agricultural workers are needed will be above the unskilled level.

Wages and salaries for new agricultural workers reflect a desire on the part of employers for specialized training of those to be employed. At least four out of 10 firms indicate top salaries of $600 per-month and up. Almost 90% of the firms desire workers who have education ranging from high school completion to college graduation. At least one-fourth of the employers replying consider a farm background either essential or desirable; however, less than 1% regard such a background as unimportant. Comparatively young workers are needed. Six out of 10 employers prefer new agricultural workers 19 to 34 years of age.

*Professor and instructor in agricultural education, South Dakota State University, respectively.

SOUTH DAKOTA'S CHANGING AGRICULTURE

While about 6% of all American workers are engaged in the production phase of this country's huge agricultural industry, a tremendous increase has taken place in recent years in the number of workers servicing agricultural production and marketing and processing agricultural products. Changes in the agricultural industry during the last decade have resulted in new opportunities for employment in a wide range of agricultural occupations.[1]

Education for a Changing World of Work,[2] the summary report of the Panel of Consultants on Vocational Education, points to the need for vocational and technical education for approximately 80% of American youth during the present decade. This report states that occupational education in agriculture should be broadened to include instruction and increased emphasis on management, processing, marketing, supplies, servicing, and other agricultural careers.

In 1967 South Dakota had 257 retail and wholesale farm equipment establishments employing 1,682 workers; 362 wholesale farm product trade establishments employing 2,282 workers; 165 retail farm and garden supply centers employing 1,058 workers; and 74 meat and dairy product processing firms employing 5,622 workers.[3] The number of agricultural businesses selling chemicals, fertilizers and similar supplies has added phenomenally to occupational opportunities in the field. To these are added governmental agricultural agencies, feed and seed processors, businesses dealing in agricultural credit, management, communications, veterinary supplies and services, and others.

South Dakota's 67 public school programs of vocational agriculture presently offer modest educational opportunities for students to learn off-farm agricultural skills. South Dakota State University provides the major share of educational preparation for the professional off-farm agricultural pursuits. Only one of the newly developed area vocational-technical schools in the state at this time provides preparation for occupational careers in the field of agriculture. The need is great for further development of instructional curricula in agriculture **at the post high school level** in South Dakota's area vocational-technical schools.

Production agriculture, which is farming and ranching, undergirds all off-farm agricultural occupations. The 1964 Census of Agriculture indicates there were 49,703 farms in South Dakota.[4] Without these farm units of production, the supporting off-farm agricultural employment opportunities would be non-existent. However, in most studies of off-farm agricultural occupations in other states, the number of such jobs exceeds the number of farms and and ranches.

OBJECTIVES

Objectives of this study were:

1. To determine by a survey of South Dakota agricultural businesses and services, other than farming and ranching:
   (a) The number and characteristics of businesses employing workers needing competencies in the field of agriculture.
   (b) The number of agricultural workers presently employed who have, or need to have competencies in agriculture.
   (c) The occupational opportunities for agricultural workers with reference to numbers needed, job titles, and remuneration.
   (d) The educational, experience background, and age requirements for new agricultural workers.
   (e) The nature of the services performed by agricultural workers in the most needed job titles with respect to duties and responsibilities and specific agricultural competencies needed.
   (f) The in-service education desired by employers for agricultural workers to advance on the job or to a higher level of employment.
2. To develop guidelines for providing instructional programs meeting the need for vocational and technical training of present and future workers in the off-farm businesses and services in South Dakota.

OFF-FARM AGRICULTURAL OCCUPATIONS DEFINED

Many terms frequently are used to identify the occupations and kinds of businesses with which this study is concerned. For purposes of this study, "agriculturally related business" and "off-farm agricultural business" are synonymous terms. Such a business derives at least some of its gross income by supplying farmers, servicing farmers, by marketing or distributing farm products, and/or by processing farm products. The production and/or distribution of horticultural products also would be included here.

[1] *There's a New Challenge in Agriculture,* a 22-page booklet prepared by a special committee of the Resident Instruction Section, Division of Agriculture, American Association of Land-Grant Colleges and Universities, 1785 Massachusetts Ave., N.W., Washington, D. C., (undated) p. 1.

[2] *Education for a Changing World of Work,* U. S. Office of Education, Government Printing Office, Washington, D. C. 20201, 1963, p. 228.

[3] *South Dakota County Business Patterns,* U. S. Department of Commerce, Bureau of the Census, 1967, pp. 3-6.

[4] *The 1964 U. S. Census of Agriculture for South Dakota,* U. S. Department of Commerce, Bureau of the Census, Vol. 1, Part 19, p. 7.

An off-farm agricultural occupation, then, is any economic pursuit in which a worker assumes responsibilities and renders services in which practical agricultural competencies are required. An agricultural competency, as used here, is defined as a thorough understanding of, and ability to perform, any essential task associated with an agricultural product, commodity or service. An example of a competency needed by a parts and service worker would be an understanding of diesel power and the ability to use a dynamometer in testing and improving the operation of internal combustion engines.

PROCEDURE

The occupational areas, the numbers of persons employed in them, and the agricultural competencies needed were investigated to establish some foundation on which to develop educational programs in agriculture. Another purpose was to explore just what occupational opportunities were available or would be available in the future.

A list of agricutural businesses or firms, other than farms, was obtained from a commercial credit directory. A pre-tested questionnaire was sent to each of 1,878 such businesses, requesting them to indicate whether or not they employed workers requiring agricultural competencies. A total of 366 firms responded, 126 of which employed agricultural workers. The remaining 240 indicated they did not employ agricultural workers. An analysis of businesses responding provides the basis for this study.

Shaded areas in Figure 1 contain off-farm agricultural businesses that responded and indicated a need for off-farm agricultural workers. Note that the bulk of South Dakota's geographic area is shaded. An attempt was made to secure questionnaire responses from firm managers or other persons in higher level positions. Table 1, which discloses positions held by the respondents, indicates that virtually all responses came from persons in management.

CHARACTERISTICS OF THE FIRMS

Retailing and servicing are the major functions of more than half of the off-farm agricultural businesses in South Dakota (confirmed in Table 2). Other frequently reported functions are wholesaling, manufacturing, processing, storage and marketing, and purchasing of agricultural products and supplies. Although construction, contracting, transportation and communications were less frequently reported, they are important and these firms are of considerable size.

The major products and services of the firms needing agricultural workers are shown in Table 3. More than one-third of the firms reporting supply agriculture with petroleum products. Firms dealing in feeds, grains and seeds represent 60.7% of those reporting; farm equipment, 27.9%; fertilizers and chemicals, 38.5%; and general farm supplies, 16.4%. All the functions reported are economically importtant to the state's agriculture.

About three-fourths of the firms derive 90% or more of their income from agriculture (Shown in Table 4). Roughly one-fifth of them reported 50 to 90% of their business volume as agriculturally derived, and 4.2% earned less than half their income from agriculture.

Numbers of full-time workers among 126 firms reporting are shown in Table 5. Almost three-fourths of the firms employ less than 10 full-time workers. However, there is a sizeable proportion, 18.7%, which employ 10 to 24 workers, the remainder employing 25 or more. About four out of 10 firms employ four or fewer workers. Many of the firms employ female workers (Shown in Table

Table 1. Positions Held by Respondents in Firms Needing Workers with Agricultural Competencies (N=126)

Position Held	Percent
Manager (hired)	46.7%
Owner-Manager	24.2
Owner	12.5
Co-owner-Manager	9.1
Office Manager	1.1
Sales Manager	.8
Supervisor	.8
Foreman	.8
Assistant Manager	.8
Partner	.8
Fieldman	.8
Salesman	.8
No response	.8
Total	100.0%

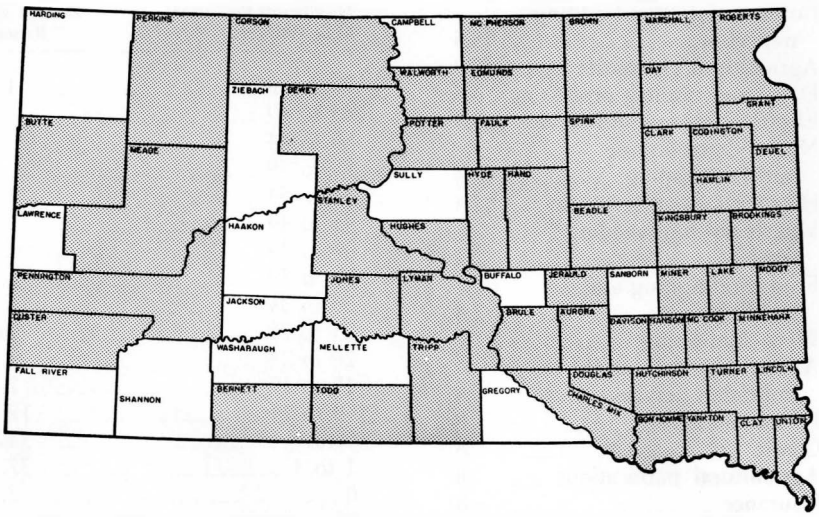

Figure 1. Shaded areas in map show counties in South Dakota from which firms responded to questionnaire, indicating a need for workers with agricultural competencies. No responses came from businesses in unshaded counties.

6). A few also employ part-time help, ranging from one to 14 workers with 60.6% of all firms employing one to five part-time male and female workers (Shown in Table 7).

Most of the firms' present workers have agricultural backgrounds which means they were reared on farms or had some formal training in agriculture, or both. Numbers of workers having agricultural backgrounds in firms reporting are shown in Table 8. A total of 55.8% of all workers reported had a background in agriculture.

FUTURE OPPORTUNITIES

Opportunities for workers trained in agriculture competencies far exceed the supply of such workers. This study reveals that more than 2,485 such off-farm agricultural workers will be needed in

Table 2. Major Functions of Businesses Needing Workers with Agricultural Competencies (N=306)

Function	Percent of Total Functions Reported
Retailing	34.7%
Service	19.3
Wholesaling	9.5
Manufacturing	9.5
Processing	7.1
Product storage and marketing	6.2
Purchasing	5.6
Construction	4.2
Contracting	2.3
Transportation	1.3
Communications	.3
Total	100.0%

Table 3. Major Products and Services of Firms Reporting a Need for Agricultural Workers*

Product or Service	Percent of Firms Reporting
Petroleum products	36.1%
Grain and Seeds	32.0
Feed	28.7
Farm equipment sales, repair and service	27.9
Fertilizer	24.6
General farm supplies	16.4
Lumber and other building materials	15.5
Agricultural chemicals	13.9
Dairy and poultry processing	6.5
Electrical energy and service	3.3
Nursery, greenhouse and landscaping	2.4
Hatchery	2.4
Veterinary and breeding service	2.4
Feed conditioning and handling	2.4
Wool Marketing	1.7
Animal nutrition and sanitation service	.8
Potato Marketing	.8
Credit	.8
Agricultural publications	.8
Insurance	.8

*A majority of the 126 firms reported more than one product or service.

Table 4. Proportion of Agriculturally Oriented Business Volume among 126 Firms Replying to Questionnaire (N=126)

Percent of Business Volume Agriculturally Oriented	Percent of Firms Reporting
95 to 100	61.5%
90 to 94	12.3
85 to 89	2.4
80 to 84	2.4
75 to 79	4.1
70 to 74	4.1
65 to 69	
60 to 64	2.4
55 to 59	
50 to 54	4.1
45 to 49	
40 to 44	.8
35 to 39	
30 to 34	.8
25 to 29	
Less than 25	1.8
No response	3.3
Total	100.0%

Table 5. Numbers of Full-Time Male Workers Employed among 126 Business Firms Reporting

Number of Full-time Male Workers	Percent of Firms Reporting
70 or more	1.6%
65 to 69	.8
60 to 64	
55 to 59	
50 to 54	
45 to 49	
40 to 44	.8
35 to 39	.8
30 to 34	.8
25 to 29	1.6
20 to 24	4.1
15 to 19	2.4
10 to 14	12.2
5 to 9	34.2
1 to 4	37.5
0	2.4
No response	.8
Total	100.0%

Table 6. Numbers of Full-Time Female Workers Employed among 126 Business Firms Reporting

Number of Full-time Female Workers	Percent of Firms Reporting
36 or more	.8%
33 to 35	
30 to 32	.8
27 to 29	
24 to 26	.8
21 to 23	.8
18 to 20	.8
15 to 17	.8
12 to 14	
9 to 11	
6 to 8	.8
3 to 5	6.5
0 to 2*	87.9
Total	100.0%

*48 percent of the firms employ no full-time female workers.

Table 7. Numbers of Part-Time Workers, Male and Female, Employed among 126 Business Firms Reporting

Number of Part-Time Workers	Percent of Firms Reporting
12 to 14	2.4%
9 to 11	3.3
6 to 8	1.6
3 to 5	10.6
0 to 2*	82.1
Total	100.0%

*32 percent of the firms employ no part-time male or female workers.

Table 8. Numbers of Present Workers among 126 Firms Reporting Who Have an Agricultural Background

Number of Workers	Percent of Firms Reporting
45 or more	2.4%
40 to 44	.8
35 to 39	.8
30 to 34	1.6
25 to 29	.8
20 to 24	6.5
15 to 19	6.5
10 to 14	4.9
5 to 9	35.8
0 to 4*	39.9
Total	100.0%

*1.6 percent of the firms reported having no workers with an agricultural background.

South Dakota in the next five years (1968-72). Table 9 shows that 46% of the firms anticipated hiring from one to four workers each, and another 20.5% plan to hire from five to 14 workers each. A total of 6.4% estimated 15 or more new agricultural workers needed.

One indication of the nature of the work for which future agricultural workers will be employed can be derived from an analysis of the types of business functions served by the present workers (Shown in Table 10). Note that five types of businesses employ a total of 80.3% of the workers with an agricultural background. These five types of firms, in descending order of employee numbers, include: processing, grain feed and seed, farm implements, agricultural chemicals and fertilizers, and general farm supplies. Ten other types of businesses employ the remaining 19.7%.

Still another indication of the nature of employment is represented by job title levels of present agricultural workers. These levels are on a continuum ranging from professional and technical to semi-skilled and unskilled. The fewest agricultural workers are found at each end of the range. The largest proportion of the job titles, 22.6%, is in sales work, and the second largest proportion, 16.4%, is in the skilled category (shown in Table 11). Managerial titles account for 14.5%; semi-skilled, 11.8%; clerical, 11.1%; and technical, 9%; with supervisory, professional, and unskilled titles each having less than 9%. It is important to note that in this anaylsis of job titles 96% of all titles are found above the unskilled level. In other words, the vast majority of job titles are those requiring specific training.

As agricultural technology continues to flourish, and as population continues its upward trend, numbers of new off-farm agricultural workers needed during the next five years (1968-72) will increase substantially, along with new agricultural job titles. The firms studied reported that more than 22 new job titles will be added during this period. Employers predict that 26.3% of all new workers will hold jobs under new saleswork titles. The second largest job title, that of mechanics, will represent 13.4% of all new workers. A review of Table 12 reveals that more than one-third of all agricultural workers will be needed in the field of agricultural mechanization. This 35.8% of all new workers needed in agricultural mechanization, however, will not include sales and management personnel, who fall under separate job titles.

Table 9. Numbers of New Agricultural Workers that 126 Responding Business Firms Anticipate They Will Need During the Next Five Years

Number of New Workers	Percent of Firms Reporting
0 to 4*	58.5%
5 to 9	16.3
10 to 14	4.2
15 to 19	1.6
20 to 24	2.4
25 to 29	.8
30 to 34	.8
35 to 39	
40 to 44	.8
Uncertain	14.6
Total	100.0%

*12.5 percent of the firms reported no plans to hire any agricultural workers in the next five years.

Table 10. Types of Firms Responding, Total Employees, and Employees Having Agriculutral Backgrounds

Major Business Function	No. of Firms Reporting	Total Workers Employed (includes both Ag-Non Ag) No.	Percent	Employees with Ag. Background No.	Percent
Processing animal and poultry products	8	2644	65.5%	589	36.3%
Grain, feed and seed	37	384	9.5	255	15.7
Farm Implements	26	215	5.3	196	12.2
Agricultural chemicals and fertilizers	27	148	3.7	135	8.1
General farm supplies	12	161	4.0	130	8.0
Building materials, services and hardware	13	125	3.1	64	3.9
Electric service	4	87	2.2	84	5.2
Petroleum products	18	85	2.1	59	3.6
Crop and livestock handling equipment manufacture, sales and service	3	67	1.7	43	2.6
Agricultural communications	1	60	1.5	40	2.5
Hatchery	3	23	.6	20	1.2
Wool marketing	1	17	.4	3	.2
Horticulture	1	7	.2	3	.2
Welding supplies	1	7	.2	3	.2
Veterinary	1	1		1	.1
Total	156*	4031	100.0%	1625	100.0%

*The total exceeds the number of firms responding since a number of firms are engaged in more than one business function.

Table 11. Job Title Levels of Present Workers in in 126 Firms Reporting

Level	Percent of Job Titles Reported (N=226)
Professional	2.2%
Technical	9.0
Managerial	14.5
Supervisory	8.4
Sales	22.6
Clerical	11.1
Skilled	16.4
Semi-skilled	11.8
Unskilled	4.0
Total	100.0%

New jobs with managerial titles will be taken by 9.1% of the 2,485 new workers anticipated. Businesses reported growing needs for managers, assistant managers and sales managers for businesses concerned with chemicals and fertilizers; grain, feed and seeds; farm implements; and horticultural stock. Other important job titles call for new workers in seeds and feeds, fertilizers and chemicals, processing, marketing, and supervisory pursuits.

The job title levels anticipated for new agricultural workers were analyzed from two basic standpoints: (1) from the proportion of **all new** agricultural job titles anticipated at each level; and (2) from the proportion of **most needed** job titles at each level (See Table 13). This consideration of levels is important in ascertaining the training needed by workers in various job titles.

The results of the two foregoing analyses showed a strikingly parallel relationship between **all new** points: (1) from the proportion of **all new** agricultural job titles. Results indicate a 27.5% increase in new job titles is anticipated in sales and a 32.5% increase in the need for additional workers in present sales jobs. Respondents indicated high priorities for jobs to be filled in the following areas: skilled, with 23.1%; technical, with 14.5%, and semi-skilled, with 8.5%. Unskilled and professional categories received the smallest proportions of the responses.

The anticipated numbers of workers requiring competencies in agriculture indicate some of the opportunities available. Table 14 reports the numbers of such workers in the most needed job titles hired during the year, the numbers to be hired next year and during the next five years. Only 21.8% of the firms reported that they do not anticipate hiring any such workers in the coming year, and only 5.6% do not anticipate any in the next five years. More than 50% of all firms reported that they would hire one or two agricultural workers in their most needed job titles in the next five years, and 27.5% indicated they would need from three to 10.

Table 12. New Job Titles Anticipated by 126 Firms in Next Five Years, and Proportion of New Agricultural Workers Needed in Each Title

New Job Title	Percent of Total New Workers Anticipated (N=232)
Sales persons	26.3%
Mechanics	13.4
Service men, farm equipment	8.6
Semi-skilled and unskilled	7.7
Partsmen	7.3
Managers and assistant managers:	
Chemicals and fertilizer	2.6
Implement	2.2
Elevator	2.2
Warehouse	1.3
Nursery	.4
Feed Mill	.4
Dairy processing workers	3.4
Production men (feed)	1.7
Irrigation technical workers	2.6
Farm equipment technical workers	1.7
Foreman, farm building construction	2.2
Chemical application workers	2.2
Carpenters	1.7
Elevator technical workers	1.3
Clerical, office and shop	1.7
Servicemen, electric	1.3
Deliverymen	1.7
Fieldmen	1.7
Supervisory personnel	1.7
Agronomists and Nutritionists	1.3
Swine specialists	.9
Wool grader and appraiser	.5
Total	100.0%

Table 13. Levels of Job Titles for Which New Agricultural Workers Will Be Needed in Next Five Years

Level	Percent of All New Agricultural Job Titles (N=120)	Percent of Most Needed Agricultural Job Titles (N=117)
Professional	2.5%	.9%
Technical	12.5	14.5
Managerial	8.3	7.7
Supervisory	6.7	6.8
Sales	27.5	32.5
Clerical	3.3	3.4
Skilled	21.7	23.1
Semi-skilled	15.8	8.5
Unskilled	1.7	2.6
Total	100.0%	100.0%

Table 14. Agricultural Workers Employed in Most Needed Job Titles in 1968; Number Anticipated for 1969 and for Five Years Hence, and Annual Turnover in This Job Title

Number of Workers	Firms Reporting Workers Employed New Last Year	Workers To Be Hired Next Year	Workers To Be Hired Five Years Hence	Annual Employee Turnover
0	41.8%	21.8%	5.6%	41.2%
1	38.5	43.5	27.6	27.1
2	7.6	13.0	24.2	17.6
3	8.8	2.4	12.1	5.9
4	1.1	0	3.2	2.4
5	1.1	2.4	7.3	3.1
6	1.1	0	.9	1.3
7	0	0	1.6	0
8	0	.8	0	1.4
9	0	0	0	0
10	0	0	2.4	0
Undecided	0	16.1	15.1	0

Table 15. Monthly Salaries and Wages Reported for Agricultural Workers in Most Needed Job Titles*

	Start $100-$199	Top $100-$199	Start $200-$299	Top $200-$299	Start $300-$399	Top $300-$399	Start $400-$499	Top $400-$499	Start $500-$599	Top $500-$599	Start $600-$699	Top $600-$699	Start $700-plus	Top $700-plus
	Percent of Firms													
Full-Time Employees	1.3%	0	2.5	3.5	27.5	7.0	43.8	24.6	16.2	24.6	7.4	19.3	1.3	21.0
Part-Time Employees	26.1%	17.6	26.1	17.6	30.4	41.3	17.4	5.9	0	17.6	0	0	0	0

*Percentages reported are based on 80 firms reporting starting wages and 57 firms reporting top wages for full-time workers; and 23 and 17 firms, respectively, for part-time workers.

Annual turnover of workers also provides an indication of the numbers of future employment openings. Approximately four out of 10 firms reported no turnover. However, 27.1% of the firms reported an annual turnover of one worker, 17.6% reported an annual turnover of two workers, 5.9% reported an annual turnover of three, and the remainder reported a turnover of four or more. An annual turnover of eight workers was the highest, but reported by only 1.4% of the firms.

Opportunities are frequently measured according to financial remuneration. (Beginning and top monthly salaries for agricultural workers in the most needed job titles are presented in Table 15). The modal beginning figure for full-time workers, reported by 43.8% of the firms, was in the $400-$499 per month range. Top salaries in the $400-$499 per month range were reported by 24.6% of the firms. Another fourth of the firms reported top salary classifications of $500-599. More than one-fifth of the firms have a top salary of $700 or higher. Salaries for part-time agricultural employees range from the $100-199 per month figure up to the $500-599 per month level. The largest proportion, 41.3%, report salaries ranging from $300-399.

Qualifications Needed for Entry and Advancement

Persons interested in off-farm agricultural employment should examine the initial requirements for the particular area of the work contemplated. Also they should consider the opportunities for advancement on the job or to a better job. Minimum level of education, type of background preferred by employers, age, and competencies needed are considerations relevant to initial job entry. The job seeker also should consider the type and extent of on-the-job training the firm offers, as well as refresher training provided by institutions, which would enhance his opportunities for advancement.

Only 7% of the firms reporting will consider hiring agricultural workers with less than 12 years of formal schooling for the most needed jobs. High school completion is required by 41.7% of the employers reporting. Post high school technical training or some college work is required by 40.3% of the firms. Relatively few of the firms require a college degree (Comparative figures are shown in Table 16).

Most employers consider a farm background as either essential or desirable. (New employee background, experience and preparation desired by employers in most needed job titles seen in Table 17). Previous work experience, either as part of a training program or as separate experience, is considered either essential or desirable by 21.3% of the firms. High school vocational agricultural training is deemed either essential or desirable by 14.1%, and post high school vocational school training by 11.8%.

Table 16. Minimum Formal Education Required for Agricultural Workers in the Most Needed Job Titles of Firms Reporting*

Minimum Education Required for Job	Percent of Firms Responding
Eighth Grade	2.8%
Less than 12th grade	4.2
High school diploma	41.7
Technical training (post high school)	23.6
Some college (less than four years)	16.7
College degree	6.9
Master's degree	1.4
Doctor's Degree	
No preference	2.7
Total	100.0%

*Based on responses from 58% of the firms needing agricultural workers.

Table 17. Background Experience and Preparation Employers Desired for Agricultural Workers Entering Employment Under Most Needed Job Titles

Background or Preparation	Percent of Firms' Responses (N=244) Essential	Desirable	Not Important
Farm	9.4%	16.8%	.8%
Previous work experience	4.9	16.4	2.0
High school vo-ag training	1.6	12.5	3.8
Post high school vocational school	2.4	9.4	6.1
College degree in agriculture	1.2	4.5	7.4
Other:			
Experience with farm seeds	.4		
Dairy experience	.4		

The preferred age range for beginning workers in the most needed job titles is 25 to 34, with 41.5% of the firms expressing this preference. However, minimum age levels of 18 or under were expressed by 12.1%; 19 to 24 by 62.1%, and 25 to 34 by 24.1%. There is considerable variation in maximum ages acceptable to employers, although the 45 to 54-year-old age group received the greatest proportion of the responses, accounting for about one-third of all employers (See Table 18 for further analysis of age requirements).

One of the important principles in formulating instruction for vocational and technical education is that the training be based upon what a successful worker in a specific occupation does, knows and believes. For example, the tasks, responsibilities and knowledge needed to become an effective manager of a fertilizer and chemical establishment should be the educational content of a training program for that occupation. Similarly, an individual should be aware of the responsibilities and skills employers expect of a job holder before the trainee can make an intelligent choice about preparing for a particular position.

Employers indicated that their most needed agricultural workers perform duties which are associated with one or more of three main types of responsibilities: (1) working with production, products, materials or services; (2) working with the firm's or customer's equipment, tools, supplies or instruments; and (3) working with business problems (amount of emphasis received by these categories is shown in Table 19). Working with business problems was the category with the greatest number of responses. Promoting the business, keeping records, taking and keeping inventory, planning, and handling money were the five most frequently designated business activities (in that order of importance to employers).

The five most frequently mentioned activities in the category designated "working with equipment" were: repairing, operating, inspecting, testing and trouble-shooting, adjusting, and maintaining equipment (in order of importance). Activities most frequently identified under "working with production, products, materials or service," were: planning production or service, using technical and service manuals and price lists, calculating costs, testing, and inspecting (in order of importance).

A weighted importance index indicates the relative importance firms attached to competencies (See Table 20). The firms were requested to indicate each competency desired, and whether they regarded the competency as "essential," "highly desirable," "useful," or "not important." A value of 3 was assigned to "essential," 2 to "highly desirable," 1 to "useful," and 0 to "not important." The importance index was

Table 18. Age Requirements for Agricultural Workers Entering Employment in Most Needed Job Titles

Age	Percent of Responses Minimum	Maximum	Preferred
18 or under	12.1%	%	%
19-24	62.1	4.3	20.0
25-34	24.1	13.0	41.5
35-44	1.7	19.6	24.7
45-54		32.6	9.3
55-64		19.6	1.5
65 or over		10.9	1.5
No preference			1.5
Total	100.0%	100.0%	100.0%

Table 19. Activities and Duties for Which Agricultural Workers Would Be Responsible in Most Needed Job Titles of Firms Reporting

Activities and Duties	Percent of Firms Indicating This Particular Responsibility
Working with production, products, materials or services:	
Mixing	14.4%
Assembling	9.6
Making and/or building	13.6
Sketching and drawing	8.8
Designing	6.4
Developing techniques	12.8
Planning production or service	28.8
Calculating costs	22.4
Inspecting	18.4
Testing	20.0
Using technical and service manuals, parts lists, etc.	27.2
Other	5.6
Working with firms or customers' equipment, tools (hand or power), supplies or instruments:	
Construction	9.6
Designing	7.2
Repairing	35.2
Operating	33.6
Assembling	12.8
Calibrating	13.6
Remodelling	6.7
Adjusting	28.9
Maintaining	27.2
Inspecting, testing, trouble-shooting	32.0
Installing	15.2
Selecting	8.8
Working with business problems:	
Policy making	14.4
Planning	32.8
Promoting	44.0
Keeping records and accounts	42.4
Filing	16.8
Taking and keeping inventory	33.6
Handling money	32.0
Making technical reports	12.8
Evaluating technical reports	6.4
Writing articles, copy, etc.	6.4
Making speeches	9.6
Decision making	23.2

*Each of the 126 firms indicated a variety of activities and duties.

computed by multiplying these values by the frequencies of the respective responses, summing the products, and dividing by the total responses for each competency listed.

It is readily observable (Table 20) that the category designated "supporting business competencies" received the highest weighted importance indexes. The mean is 1.74. The next highest mean —1.67— is found in "soil science." Third is "agri-business management," with a mean of 1.55, followed by "agricultural mechanics" with 1.20. "Plant science" and "animal science" competencies had means of 1.19 and 1.05, respectively. The two most important competencies are found among the supporting business competencies—"customer relations," with an importance index of 2.48, and "salesmanship," with 2.24.

Attitudes of Employers Toward In-service Training

The aspiration of most agricultural workers is to advance on the job or to a better job. In order to provide challenge and interest to keep the worker content and productive, his occupational pursuit must afford opportunities for advancement through some form of in-service training. The firms were asked what types of in-service training they desired for their agricultural workers (analysis of responses found in Table 21).

Table 21. In-Service Training Desired for Agricultural Workers by Employers*

Type of In-Service Training	Percent of Firms Desiring This Type of Training
Short-courses provided by firm or the industry	44.4%
On-the-job training in the firm of the employer	58.4
Public school (adult education or area vocational-technical school)	24.0
Agricultural college	19.2
Other types (correspondence study, factory schools, service meeting, refresher workshops)	12.8
None needed or no response	9.6

*Most firms expressed a desire for more than one type of in-service training.

Table 20. Agricultural Competencies Needed by Workers in the Most Needed Job Titles of Firms Reporting

Agricultural Competency	Weighted Importance Index (Scale runs 0 through 3)
Agricultural mechanics:	
Building and construction	1.58
Power equipment tractors and motors	1.82
Machinery and equipment	2.00
Electricity	1.38
Welding	1.06
Plumbing	.74
Concrete or masonry	.60
Carpentry	1.02
Ventilation	.73
Heating	.93
Hydraulics	2.10
Metallurgy	.64
Soil and water management	.94
Agri.-Business management:	
Records and analysis	2.03
Credit instruments	1.86
Insurance	1.07
Taxes	1.02
Farm planning	1.60
Farm layout	1.30
Labor management	1.61
Farm law	1.37
Marketing	1.62
Agricultural policy	1.47
Economic principles	2.11
Animal Science:	
Animal breeding	1.17
Livestock production	1.39
Nutrition	1.65
Health and sanitation	1.61
Livestock marketing	1.02
Processing livestock products	.97
Marketing livestock products	1.13
Housing and equipment	1.47
Dairying	1.10
Marketing dairy products	.37
Processing dairy products	.67
Artificial insemination	.57
Marketing poultry products	.67
Processing poultry products	.81
Plant Science:	
Plant breeding	.95
Plant nutrition	1.10
Chemicals	1.73
Processing crop products	1.37
Crop harvesting; drying and storage	1.81
Crop equipment	1.60
Crop marketing	1.19
Horticulture	.82
Floriculture	.68
Forestry	.69
Soil Science:	
Soil structure and management	1.24
Water management	1.69
Chemicals	1.84
Fertilizers	1.85
Soil testing	1.73
Supporting business competencies:	
Salesmanship	2.24
Accounting	1.07
Bookkeeping	1.36
Customer relations	2.48
Buying	1.73
Display	1.83
Financing	1.28
Advertising	1.81
Government regulations	2.12
Give supervisory training	1.52
Give management training	1.66

Some Open-Ended Comments

On-the-job training in the firm was desired by 58.4% of the employers. Short courses provided by the industry represented the second highest frequency, with 44.4% favoring this type of training. Approximately 43% of the firms desired some form of formal in-service training provided by adult education programs, area vocational-technical schools--or agricultural colleges. The firms were given an opportunity also to present open-ended comments regarding the employee in-service training desired. The most frequently stated comment indicated the need for short-duration, intensive short courses, workshops, and clinics. Typical of firms favoring this form of training were fertilizer, implement, feed and seed, farm supply, and petroleum establishments.

Seventy-three percent of the firms surveyed said they would permit their agricultural employees to enroll in formal programs of short-duration in-service training outside the firm. A few qualified their affirmative responses with the reservation that the in-service training must be when the firm could logically release the employee for training. A few also made open-ended comments.

The following are some of the open-ended comments:

An Implement Dealer—"In-service work must be aimed at specialization."

A Petroleum Dealer—" If applicable."

A Hatchery—"At certain seasons."

A Building Supply Dealer—"There is going to be a tremendous demand very soon for people to sell and build modern, specialized, large farm buildings."

A Farmers' Cooperative—"We have company schools—others are not needed."

An Agricultural Chemical Establishment—"A college degree helps, but one still has to learn the business under supervision."

An Implement Dealer—"Short courses are fine for training workers to keep up-to-date; however, more extensive training is needed before job placement."

An Implement, Nursery, Feed and Seed Firm Manager—"There is a desperate need for trained landscapers, nursery managers, etc. in this field."

An Implement Dealer—"Farm tractor and equipment mechanics are needed badly. There are many good job openings now and many future possibilities."

A Wool Marketing Business—"I don't believe South Dakota offers any preparation for workers in the wool trade. Some are needed."

A Fertilizer Dealer—"Short courses would provide the quickest relief to our labor problem."

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