

# Background, Education and Non-Technical Competency Needs for Agricultural Workers in Central Washington

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Agriculture has undergone considerable change during the past several decades due to advances in technology. Surplus commodities and high interest rates have imposed adverse economic conditions on producers and agri-business. Employment in agriculture has been affected by new technology; mechanization has decreased the need for labor in production agriculture and commodity surpluses have reduced employment opportunities (Holmes, 1986). The dramatic shifts taking place in agriculture are dictating changes that need to be made in agricultural education. As the industry of agriculture changes, so do occupational requirements. If the educational system is to effectively prepare people to fill changing job requirements, instructional programs must change to reflect the dynamic needs of industry (Merritt, 1984; Moore & Borne, 1986). Currently, there is a lack of accurate data regarding current and emerging competencies needed for employment in agriculture (Holmes & Hempel, 1985). As Moore (1986) notes, many of the competency studies conducted ten to fifteen years ago are out of date. Without accurate knowledge of competencies desired by employers, it is difficult for schools to know how to modify current agricultural curricula, accurately advise students concerning career choices, or plan continuing education programs.

## Purpose

Supervisors of agricultural workers in the Columbia Basin, a diversified farming region in Central Washington, were surveyed to identify their perceptions regarding agricultural employees' desired background, education and competencies. More specifically this study examined supervisors' perceptions of: (a) preferred educational background for agricultural employees; (b) preferred agricultural background for agricultural employees; (c) non-technical competencies needed for agricultural employees in the areas of: academic knowledge and job performance skills and attitudes; and, (d) types of continuing education being utilized and continuing education needed by agricultural employees.

## Methodology

The entire population of employers in agriculturally related businesses and government agencies in the Columbia Basin were surveyed. The list of employers was compiled using several sources including the yellow pages of the phone book, key agribusiness leaders, county, state and federal government agencies, and county Cooperative Extension agents. With this considerable effort the researchers were comfortable that all major agricultural employers (including farms which hire outside labor) were contacted. An initial list of about 400 firms was compiled. After contacting firms and eliminating duplication (eg. same firm in two locations), those not hiring agricultural workers, and those out of business, 251 firms provided data for the study.

Data collection consisted of two parts. Part I was a telephone survey designed to collect information related to the scope of the enterprise,

job titles, number of employees, skill levels, sources of employees, and continuing education utilized and wanted by employees. Part II was a mailed survey designed to collect data on competencies for each job title identified in Part I. Job titles identified in Part I were used in developing Part II so that competencies could be matched with specific job titles. The Part I telephone respondent, usually an owner or manager, was asked to suggest a supervisor in the firm who would have direct knowledge of the specific job competencies as a respondent to Part II.

The Part II survey included: questions related to desired educational and agricultural background and, lists of non-technical competencies that were divided into non-technical academic knowledge and non-technical job performance skills and attitudes. Competency lists were adapted from the "National AC Occupations Competency Study,, (McClay 1978) and were rated by supervisors on a four point scale ranging from 1 = not important, to 4 = essential.

#### Tests of Rigor

The trustworthiness of a study is generally based on four criteria: validity, reliability, objectivity and generalizability (Cuba & Lincoln, 1981). Careful development of the survey instrument provides the basis for validity, The survey instruments were developed based on previous studies and instruments (McClay, 1978; Loreen, 1967; Priebe, 1981; Thompson, 1981). Four researchers worked together to refine the instruments and interview procedures. Pilot tests were conducted prior to use. The procedures followed Dillman's (1978) Total Design Method. These procedures make the case for construct, content and face validity.

Four reviewers with agricultural backgrounds and training in interviewing participated in the pilot test, then collected data. Their background, questioning procedures, and consultations with the researchers provided evidence that data collected were reliable. The team approach, review of procedures by the social research center at WSU, and review by members of the Foundation which commissioned the study offer evidence of objectivity. Finally, the effort made to contact all agricultural employers in the Columbia Basin suggests that the study results generalize to the Columbia Basin. The results are generalizable to other areas to the extent that those areas are similar to the Columbia Basin. Consumers of this research will need to make that determination.

#### Findings

After completing Part I, firms were grouped into five program areas in agriculture similar to those defined by the US Department of Education as follows: (a) Supplies and services, including firms involved in consulting, chemical sales and application, equipment sales, seed sales, feed sales and financing, (b) Production, including farms producing grain, vegetables, livestock, fruit, alfalfa and seeds, (c) Processing, including farms producing grain, beans, meat, onions, seeds, and apples, (d) Horticulture, including pest control, turf sales, yard and garden equipment, and (e) Resources and Recreation. In this study, mechanization, a separate program area identified by the US Dept. of Education, was included in supplies and services. The firms involved with mechanization were implement dealers who operated similarly to those firms in the supply and services area. Forestry is not an industry in the Columbia Basin and was not included. Several firms fit into more than one program area; for example, producers who process their own commodities. These firms were

counted under each program area into which they fit. Table 1 summarizes the agricultural firms surveyed by program area and number of employees.

Table 1  
Renondents Grouped by Program Areas and Number of Employees

Program Area	No of firms	%*	No of Employees
Supplies and Services	136	53.3	1221
Production	90	35.3	441
Processing	55	21.6	599
Horticulture	25	9.8	67
Resources & Recreation	14	5.5	99
Total	320	125.5	2427

**Note.** \*Percentages total more than 100 because several firms fit into more than one program area.

Preferred Educational Background: Supervisors were asked to indicate their preferred educational level and area of specialization (major) for employees in seven employment categories as identified by Loreen (1967) and Thompson (1971): (a) Professionals such as agronomists or soil conservationists, (b) Farm Managers, (c) Business Managers, (d) Sales Personnel, (e) Office Personnel, (f) Employee Supervisors, and (g) Labor. Figure 1 shows the supervisors' preferred educational background by employment category.

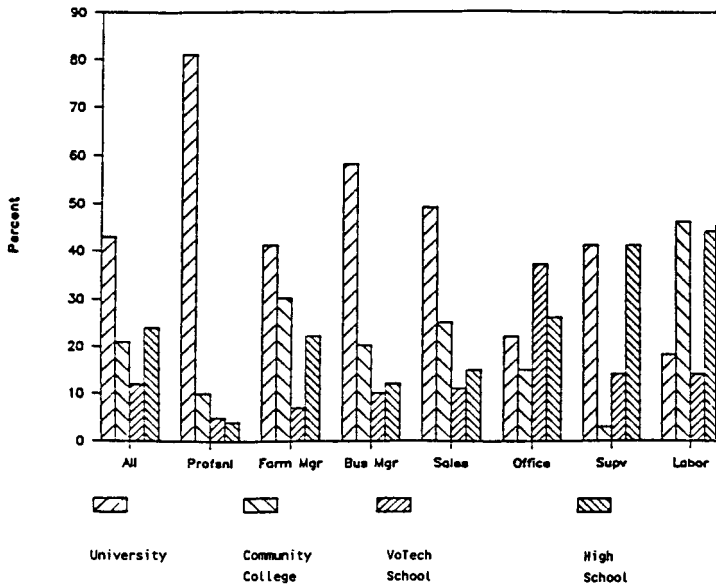


Figure 1. Preferred educational background by employment category

Supervisors preferred university degrees for over 40% of all their employees. A Bachelor's degree was preferred for professionals, farm managers, agribusiness managers, and sales personnel. It was also highly rated for many supervisors. Desired majors for professionals in descending order of preference were: Agronomy, Ag Engineering, Fish/Wild-life Biology, Resource Management, Soils, and Business. Supervisors preferred business managers with a bachelor's degree in business or agricultural economics. The preferred educational training for sales personnel was a bachelor's degree in agronomy, agricultural economics or business. Vocational-technical school training in accounting was rated highest for office personnel. Community college (any major) and high school (especially vocational agriculture classes) were the preferred training for general labor in agriculture.

At the time of this study, 26% of all positions were filled with new university graduates, 19% were filled with experienced workers hired from other firms, and 17% were filled by employees promoted from within the company. The remainder were new hires without college degrees.

Preferred Agricultural Background: Supervisors were asked to indicate their preference for employees with agricultural experience and background in the seven employment categories. Figure 2 illustrates their choices. Note that supervisors could select one or more types of experience for each employment level as follows: (a) RAISED ON FARM = raised on a farm or ranch, (b) FARM EXPERIENCE = work experience on a farm or ranch, (c) BUSINESS EXPERIENCE = work experience in an agricultural business, (d) NO AG BACKGROUND = no agricultural background needed. Overall supervisors felt that only 12% of their employees needed no agricultural background while work experience on a farm, ranch or agricultural business was most highly desired.

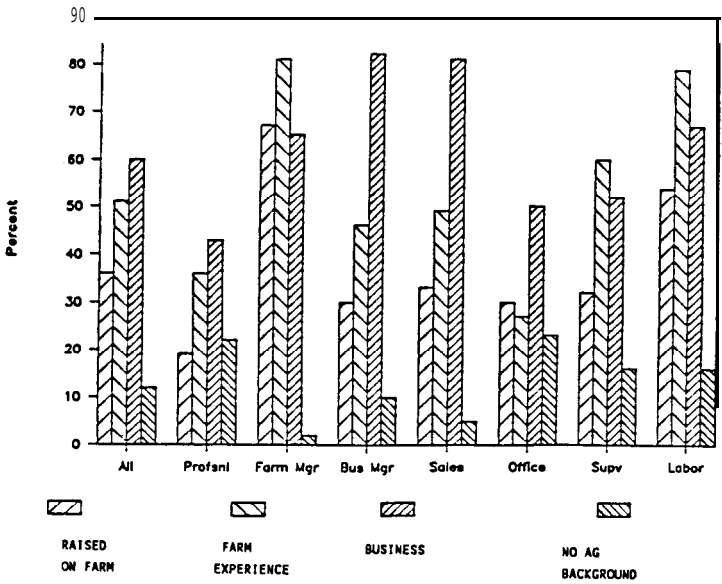


Figure 2 Preferred agricultural background by employment category

Non-Technical Competencies: Two different methods were used to identify the importance of non-technical competencies. First, the importance of non-technical academic knowledge was determined by asking supervisors to rate specific non-agricultural academic areas as "essential, important, of little importance, or not important". Academic areas rated essential or important are summarized in Table 2 by employment category. General math, oral and written communication and organizational skills were most highly rated overall. These areas were especially important for professionals, managers and sales and office personnel. Note that oral communications was rated as essential or important for 98% of all categories.

The second method estimated the importance of non-technical job performance skills and attitudes. Supervisors rated lists of competencies for each employment category on the 1 to 4 point scale. These lists were taken from McClays's (1978) study which did not include non-technical competencies for the category "professionals". The lists for the other six employment categories included from 14 to 44 competencies. The highest rated competencies and the mean rating for each of the competencies are summarized in Table 3. Personal integrity is among the top three non-technical skills and attitudes in four of the six employment categories.

Sources of Continuing Education: Supervisors were asked to indicate the likelihood that their employees would use different sources of continuing education to stay current in their work. Table 4 shows the top five sources supervisors thought their employees were likely or very likely to use. Magazines and trade publications rated highest in all categories while other sources varied in order. For example, company training programs were more important to firms providing services to agriculture while firms involved in the processing of agricultural products relied more heavily on trade or professional organizations (Farm Bureau, Wheat Growers, Cattleman, etc.). This preference for different sources may be due in part to the average size of the supply or service firms which are generally larger than firms in other categories and thus, more able to afford their own training programs. Although not ranked among the top five, the local community college and the State Land Grant Institution were rated likely or very likely sources of employee continuing education by 52% and 40% of supervisors respectively.

When asked what additional continuing education sources were needed, respondents stated a preference for seminars on a wide variety of topics. Data revealed that many topics requested were already available and being used by other firms. Forty-eight different subjects for continuing education were suggested, the most popular being business and marketing, safety training and agricultural mechanics. Some of the more innovative ideas for continuing education included starting company libraries, telecommunication classes, holistic resource management and human relations in agriculture.

Table 2

Percent\* of Non-technical Academic Areas Rated Important or Essential by Employment Category

Academic Area	All N = 449	Professional N = 59	Farm Manager N = 52	Business Manager N = 115	Sales Personnel N = 37	Office Personel N = 30	Supervisors N = 25	Labor N = 133
Oral Communic.	98	98	98	98	100	97	84	91
Cnneral Math	95	100	94	97	100	100	96	97
Written Communic.	88	98	81	94	97	100	80	74
Organiz. Skills	84	82	100	93	98	96	84	62
Bus Management	79	80	98	95	91	87	88	
Labor Management	68	62	96	87	59	50	84	
Bookkeeping	58	52	88	75	50	93		
Accounting	51	52	82	69		90		
Botany	52	82	66	55	60		52	
Algebra		79	55	53		53		
Liberal Arts		53	50	54	60			
Environ. Science		82	50	53				
Biology		79	62					
Chemistry		69	64					
Geometry		61						
Physics		68						

Note, \*Percentages below 50 are not shown.

Table 3

Highest Rated Non-Technical Job Performance Skills and Attitudes by Employment Category

Employ. Cat.	No. rated <sup>1</sup>	No. rated <sup>2</sup> 3.49	Highest Rated Skills and Attitudes	Rating <sup>3</sup>
Farm Mgr.	32	10	1. Determines labor requirements and work schedules	3.74
			2. Plans effective use of equipment	3.71
			3. Hires and trains employees	3.65
Bus. Mgr.	44	5	1. Considerate & concerned conduct in social & bus. situations	3.70
			2. Under. employer/employee relations & promotes harmonious atm.	3.65
			3. Recognizes basic human needs	3.58
Sales Pers.	29	18	1. Demonstrates personal integrity	3.86
			2. Keeps customers' financial records confidential	3.83
			3. Sincere, demonstrates concern in meeting cust. needs	3.79
Office Pers.	14	10	1. Keeps customers* financial records confidential	3.88
			2. Demonstrates personal integrity	3.84
			3. Takes and follows instructions	3.80
Supervisors	18	11	1. Plans and organizes work schedules	3.88
			2. Demonstrates personal integrity	3.84
			3. Maintains desirable job attitude	3.80
Laborers	30	11	1. Demonstrates personal integrity	3.17
			2. Works on own and accepts responsibility	3.75
			3. Follows directions	3.66

**Note.** 1 = Total number of competencies rated/employment category; 2 = Number of competencies with mean rating of 3.5 or higher on 4.0 scale; and 3 = Mean rating for competency.

Table 4  
Leading Scores of Continuing Education

	Prod N = 90	Service N = 136	Process N = 55	Hort N = 25	Resource N = 14	Total N = 251
Trade Publications	90	91	94	92	79	88
Prof. Organization	78	75	84	72	50	76
Extension Publications	79	74	78	80	71	73
Extension Agents	77	69	70	80	64	68
Company Training	57	82	68	72	36	68
Average no. of sources used	5.4	6.2	5.6	6.3	4.4	5.7

**Note.** All values except average expressed as percentages,

#### Conclusions and Recommendations

Supplies and services is the largest employer in the Columbia Basin employing about half of all agricultural employees. These data confirm a growth trend in this sector (Loreen, 1967; Priebe, 1981; Thompson, 1971). Educators and counselors need to inform students of job opportunities in this sector and train them in the competencies needed.

About 88% of the respondents felt agricultural experience was necessary. With fewer farms and ranches and fewer children per family, future employees might become scarce. SOE projects in high school and internships at the college level should be tailored to help provide practical agricultural experiences for students.

Ratings of non-technical competencies revealed supervisors place a high value on personal integrity, human relations and communication skills for all categories of employment. Coursework and extra curricular activities need to emphasize development of these skills. FFA, FHA, speech, and other student clubs need to continue to have high priority.

Since trade publications and professional organizations were the most widely used sources of continuing education, agricultural educators would be well served to work closely with these groups.

Qualitative data and general impressions revealed respondents were more optimistic about the future of their businesses than the current economic situation might suggest. Respondents showed great interest in the study and a willingness to work with educators to ensure the educational system met their needs for qualified employees. Educators need to take advantage of this resource and invite agricultural employers to serve on vocational advisory committees and in other appropriate roles.

Institutions need to continue and expand educational opportunities for agricultural workers. This means offering courses, at times and locations when workers can attend.

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