

An Occupational Employment Study of Agricultural Service Industries: Standard Industrial Classification 07

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Introduction

The need for accurate and complete data covering all agriculturally related occupations is essential for sound planning of agricultural education programs. The Illinois State Board of Education, Department of Adult, Vocational and Technical Education (ISBE/DAVTE) has affirmed that an important responsibility of the system of public education is to contribute to the preparation of students for entry into employment (ISBE, 1986, 1987, 1988, 1989). Education for employment programs which are supported with federal and state funds will be responsive to the changing nature of the labor market and to the changing characteristics of the work force according to the ISBE/DAVTE policy on vocational education.

The need for additional data on agriculturally related employment became evident when program planners in Illinois reviewed statewide employment data to identify target industries and occupations (Law, Smith, Herbst, 1985; Law and Pepple, 1989; and Pepple, Law, and Smith, 1986). The source of employment data used by these vocational program planners was collected and analyzed by the Illinois Department of Employment Security (IDES), Chicago, Illinois. Although other agencies and individuals occasionally collect and disseminate employment information, IDES is recognized as the official state agency specifically charged with this task. Therefore, if agriculturally related employment is to be identified, reported, and used for funding and program planning purposes, then the information would need to be generated from IDES data files (IDES, 1986, 1987, 1988).

In response to this need, ISBE/DAVTE funded a research and development project at the University of Illinois, College of Agriculture, Vocational Agriculture Service. This research and development project had two objectives: a) to collect additional agricultural employment data; and b) to identify employment in agriculturally related industries in Illinois using data currently collected and reported by the IDES and the Illinois Occupational Information Coordinating Committee (IOICC)(Pepple, Valdes, Helgesen, 1989; Pepple, Valdes, Law, Helgesen, 1989). This paper is concerned with reporting employment data which was collected in the SIC 07 industries - Agricultural Services. To understand what IDES means by Agricultural Service Industries, it is necessary to review briefly their approach in categorizing industries and how this influences the reporting of occupational employment.

Employment data collected by IDES is organized under the Standard Industrial Classification (SIC) system. SIC is the "statistical classification standard underlying all establishment-based Federal economic statistics classified by industry." This system classifies industries in accordance with the composition and structure of the economy. It is important to note that these SIC characteristics are not necessarily the same as those used by educational agencies to classify business and industries for educational program planning purposes. The SIC Manual uses the same general approach to classify industries as biological scientists use to classify plants and animals. They both start with broad, general descriptions and work toward very specific descriptions. The following outline defines the industries covered in this document as determined by the SIC system. This

description defines agricultural service industries more narrowly than would be defined by the general agriculturalist (Executive Office of President, 1980, 1987; U. S. Department of Labor, 1977, 1988).

The first category the SIC system uses is called a "Division." (The data collected for this study is shown by the Bold Type in the following outline.) Divisions separate all Illinois industries into the following 11 areas:

- Agriculture, Forestry, and Fishing**
- Mining**
- Construction**
- Manufacturing**
- Transportation, Communication, Electric, Gas, and Sanitary Services**
- Wholesale Trade**
- Retail Trade**
- Finance, Insurance, and Real Estate**
- Services**
- Public Administration**
- Nonclassifiable Establishments**

Each of the above Divisions are then broken down into Major Industry Groups. For the purpose of this report, the Agriculture Division is separated below:

- 01 - Agriculture Production - Crops**
- 02 - Agriculture Production Livestock and Animal Specialties**
- 07 - Agricultural Services**
- 08 - Forestry**
- 09 - Fishing, Hunting, and Trapping**

The SIC system then divides the Major Groups into Industry Group Numbers. The Major Group 07 - Agricultural Services, on which this document reports data, is separated as follows:

- 071 - Soil Preparation Services**
- 072 - Crop Services**
- 074 - Veterinary Services**
- 075 - Animal Services, Except Veterinary**
- 076 - Farm Labor and Management Services**
- 078 - Landscape and Horticultural Services**

All SIC Industry Groups, as shown above, are used to classify similar individual industries. For example, the Industry Group 074 - Veterinary Services has industries such as:

- Animal Hospitals for Livestock**
- Veterinary Services for Livestock**
- Pet Hospitals**
- Veterinary Services for Pets/Animal Specialties**

The Industry Group 078 - Landscape and Horticultural Services has industries such as:

- Landscape Counseling**
- Landscape Planning**
- Garden Maintenance**
- Lawn Fertilizing Services**
- Arborist Services**

All individual businesses which match the selected industries are then identified and contacted by the surveying agency and then asked to complete an employment questionnaire. A questionnaire is specifically designed for each industry group. The object of the survey is to list all occupational titles found in that industry group. The individual business then indicates how many workers are employed within each occupational titles.

The occupations listed on the questionnaires are also grouped into similar cluster areas. For example, 078 Occupational Clusters are:

- Managers and Owners
- Professional and Technical Occupations
- Machine Operative Occupations
- Mechanics and Repairers Occupations
- Construction and Repairer Occupations
- Production and Maintenance Occupations
- Clerical Occupations
- Sales and Service Occupations

The above occupational clusters contained more specific occupational job titles. For example, the Professional and Technical Occupations Cluster lists titles such as Landscape Architects, Drafters, and Cost Estimators. The Production and Maintenance Occupational Cluster lists Supervisors of Nursery Workers, Nursery Workers, Gardeners and Groundskeepers, and Lawn Service Workers among others in this cluster.

Of all the Major Groups Classified under the Agricultural Division, 07 - Agricultural Services was the only major group where no statistical survey was being conducted by IDES. The 01 and 02 major groups are primarily concerned with production agriculture and are surveyed by IDES in cooperation with the Illinois Department of Agriculture. The same arrangement is used for the 08 and 09 groups. Employment data is available through one or more sources for these four areas.

In 1983, the National Occupational Information Coordinating Committee (NOICC) developed a handbook and appropriate questionnaires, using the Department of Employment Security guidelines and format, which could be used by state agencies to survey the 07 - Agricultural Services Industries. This NOICC Taskforce met in Iowa and these questionnaires have since been used in Iowa, Missouri, and Wisconsin to collect employment data in Agricultural Services. Through various meetings of ISBE/DAVTE staff and other agricultural professionals, it was determined that Illinois should also conduct this survey to add to the agricultural employment data bank of IDES.

Procedure

A series of meetings were held with the IOICC, IDES, ISBE/DAVTE, and project staff to assure the cooperation of these agencies and to define the areas of responsibility for each. The data assembled by the NOICC Taskforce were secured and reviewed for methodology and questionnaire design. The NOICC Taskforce recommended using four separate questionnaires for the 07 data collection. Questionnaire #1 was designed for SIC industries in 071 - Soil Preparation Services, 072 - Crop Services, and 076 - Farm Labor and Management Services. Questionnaire #2 was designed for SIC industries in 074 - Veterinary Services. Questionnaire #3 was designed for SIC industries in 075 - Animal Services, Except Veterinary. Questionnaire #4 was designed for SIC industries in 078 - Landscape and Horticultural Services.

These questionnaires were reviewed by a panel of technical experts, and it was determined that they were appropriate for these same industries in Illinois. Drafts of the

questionnaires were prepared and mailed to selected specialists in each of the six industry groups to review for relevance and current industry employment patterns. The questionnaires were modified according to the suggestions of the technical specialists.

Specific business addresses were identified and printed by IDES. Project staff conducted a statewide search for other businesses using telephone directories. Any additional business addresses which were found were cross-checked with the IDES list to avoid duplication. Project staff conducted a thorough review of extant literature which reports agricultural employment in Illinois, other states, and the nation. As relevant data were identified, the staff reviewed their statistical methodology for data analysis techniques. This information was secured and documented for comparison with other employment data in agriculture.

Questionnaires were assembled and mailed along with a cover letter and self-addressed return envelope to almost 3000 businesses classified by IDES as an Agricultural Service Industry. After approximately four weeks, a follow-up questionnaire was mailed to the nonrespondents. Approximately six weeks after the follow-up mailing, the Survey Research Laboratory (SRL), Urbana, Illinois was used to conduct follow-up telephone calls to the remaining nonrespondents. To satisfy IDES survey requirements, SRL was to secure a return rate of about 70%. The use of SRL staff provided for the use of trained telephone interviewers to collect the final data. IDES has used SRL staff to collect other employment data in past years. The final return rate for the 07 data was 66%. Estimated employment data were calculated and verified using IDES statistical procedures. Data were analyzed at the University of Illinois using descriptive statistics in accordance with IDES standards. The master file data tape was mailed to IDES for review by their statistical personnel to verify its accuracy.

Survey Design

The survey form to collect occupational employment data on agriculture was designed based upon the framework of the OES Survey questionnaire, to include selected occupations and job descriptions related to agriculture. This assured that the occupational employment data on agriculture would be compatible with the data collection systems of the IOICC and IDES.

The OES agricultural survey questionnaire was designed to provide the following information:

- Product or service of the establishment surveyed
- Geographical location by country of the unit surveyed
- Type of business ownership
- Total employment of the firm based on OES classification system. This included covered employees, self employed owner/operator and full or part-time paid workers.
- Total number of covered employees classified according to the OES classification system based on the S. O. C. definitions of occupations and the more detailed D.O.T. job descriptions for agricultural services in a particular industry.

General Procedures for Calculating Employment Estimates

The generalization from sample data to population parameters allowed the researchers to infer the occupational structure of the labor market in agricultural services. The estimate was obtained from a census of the frame rather than a sample. The Agricultural Services survey uses a "ratio estimator." The elementary estimating cell level is the size

class within the area/SIC. Estimates were produced first for these cells and then these estimates were aggregated to produce the SIC and area estimates.

First, the occupational employment for a specific occupation in the k^{th} establishment (p_k) was summed for all sample establishments in the area, SIC, size class cell. All frame units had a probability of selection of one (1), therefore it was to be included in the sample with a weight of 1.00. The result was the summed occupational employment.

Editing of the data concerned the process of manually checking reported schedule data to determine if they satisfied the edit criteria. Mechanical screening errors were rectified, and invalid schedule numbers and occupational data were corrected.

After the manual stage of reviewing survey schedules was completed and all occupational data associated with each schedule were entered, mechanical screening was performed by use of a SAS program which allowed primary record of the control and data sections update correction (validation of schedule numbers), and occupational data update correction (detection of errors in occupational data).

Occupational data error reports, identified through mechanical screening, included the STE/RTE Test and BME/RTE Test. When the Summed Total Employment (STE) was different from the Reported Total Employment (RTE), or when the Reported Total Employment exceeded the Benchmark Employment (BME) by more than the maximum permissible difference, records had to be corrected.

Findings

The representation of business groups making up 07 - Agricultural Service employment opportunities is shown in Figure #1. The greatest number of employees (69%) identified in 07 industries is found in the 078 - Landscape and Horticultural Service Industries sector. This sector accounts for over 16,750 of the total 24,183 employees working for 07 industries (Figure #2).

The second largest employing sector is 074 - Veterinary Services, which has almost 20% (4,610) employees. The remaining employment is almost equally divided between 075 - Animal Services and 071, 072, and 076 - Soil Preparation, Crop, Farm Labor and Management Services with 5% (1,283) and 6% (1,526) respectively completing the remaining employment opportunities in Agricultural Services.

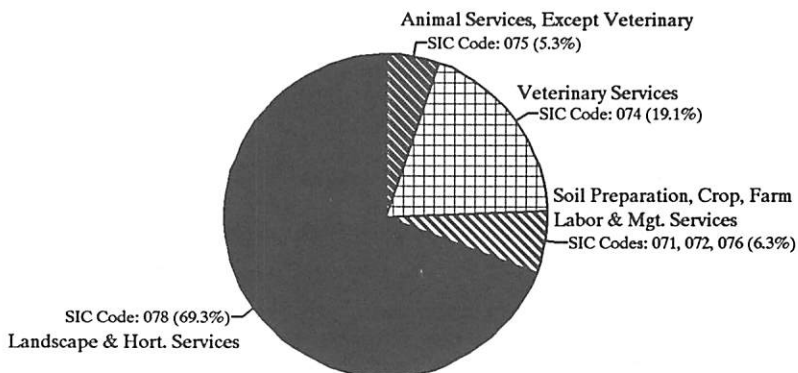
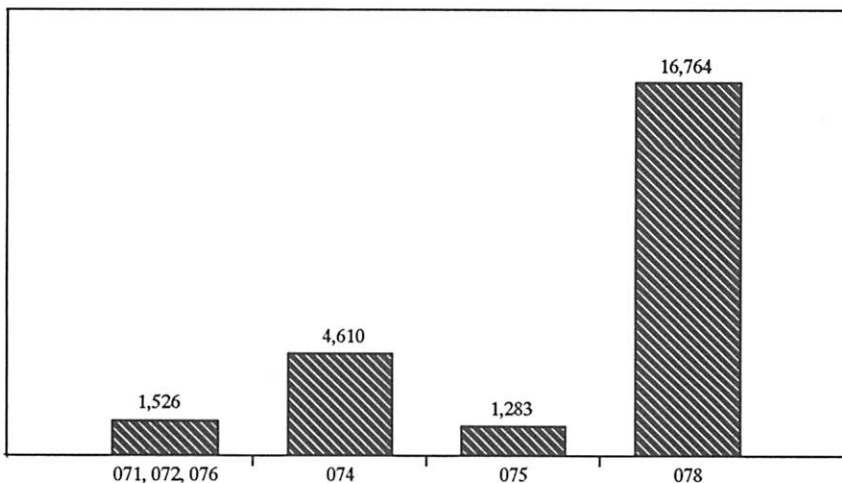


Figure 1. Distribution of Employment in Agricultural Service Sectors



SIC 071, 072, 076: Soil Crop, Farm Labor & Mgt. Services
 SIC 074 Veterinary Services
 SIC 075: Animal Services, Except Veterinary
 SIC 078: Landscape & Horticultural Services

Figure 2. Statewide Estimated Employment in Agricultural Services Sectors

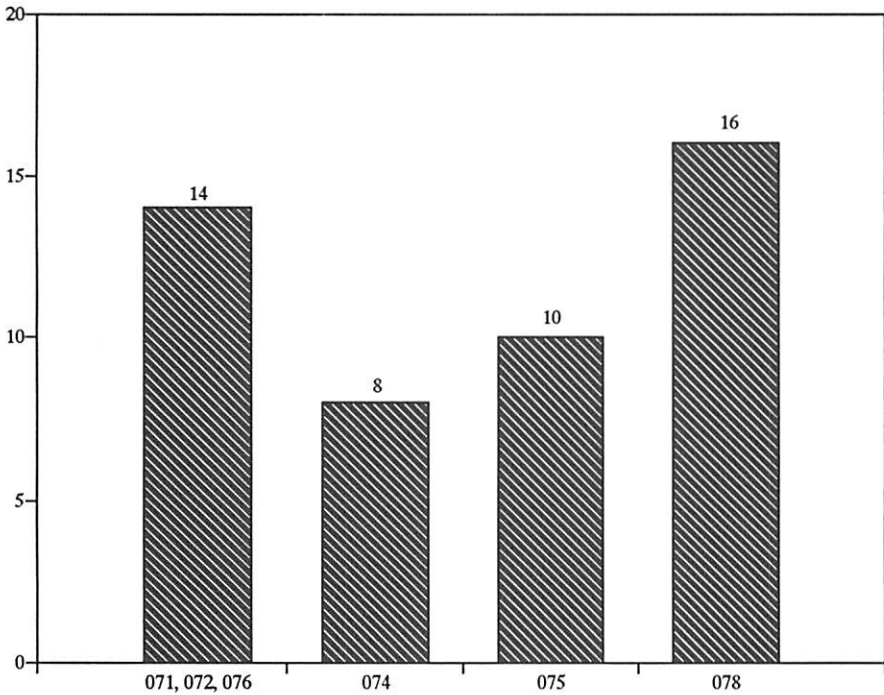
As shown in Figure #3, the agribusinesses which make up the Agricultural Services sector are generally small businesses. The smallest industry group (SIC074) had an average of eight employees and the largest group (SIC078) had 16 employees.

It is important to know the type of occupation a student might expect to find in an Agricultural Service Industry. Figure #4 indicates that 52% of the employees will be found in Production and Maintenance Occupations. However, many of these occupations are concentrated in the Landscape and Horticultural Sector. The second highest occupational cluster in terms of employment is Clerical with almost 12% of the work force. Professional and Technical occupations account for approximately 11% of the employment. Managers and Owners Occupations and Machinery Operative Occupations each contribute 8% toward the total of 24,183 employees. Sales and Service Occupations also make up over 5% of the working force in Agricultural Services. The smallest occupational clusters in Agricultural Services are Construction and Repair and Mechanics and Repairers with each having almost 2% of the total work force in 07 industries.

Conclusions

It is possible to obtain accurate and detailed employment information in the SIC 07: Agricultural Service Industries

To successfully obtain accurate employment data in Agricultural Service Industries requires a cooperative effort by individuals representing several entities, especially the State Occupational Information Coordinating Committee (SOICC), the State Department of Employment Security (DES) and the State Department of Education.



SIC 071, 072, 076: Soil Crop, Farm Labor & Mgt. Services
 SIC 074: Veterinary Services
 SIC 075: Animal Services, Except Veterinary
 SIC 078: Landscape & Horticultural Services

Figure 3. Average Number of Employees Per Industry Number

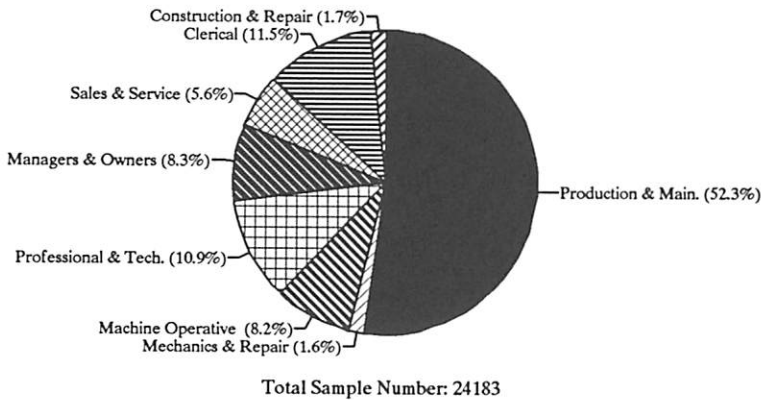


Figure 4. Employment Distribution in Agricultural Services by OES Code

The data can be used for several purposes including identifying trends and making projections if replicated over time.

The data has definite implications for statewide program planning in agricultural education especially if your state requires that program and course offerings be tied to present and future job opportunities as emphasized in the recent federal legislation.

The data does not mean that every employee in the Agricultural Service Industries needs formal training in agriculture.

The procedures are standardized based on a NOICC model and replicable in any state with a SOICC and state DES.

Agricultural Service Industries do employ a significant number of people, especially in horticulture.

Recommendations

The study should be replicated every three years as the SOICC and state DES update their labor market data bases, thus providing insights into trends and future projections.

The study should be conducted in additional states because journey to work information suggests that some individuals travel up to 50 miles one way to work and often this is across state borders.

All concerned entities should be in agreement before data analysis begins as to how the information will be used.

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