education program would suffice for the training of all vocational teachers. All problems are placed together and wrapped in one neat packet. A person trained in any of the vocational disciplines would be able to teach adequately subject matter in all areas of employment. Its a beautiful pipedream, BUT IT WON'T WORK.

There are areas of commonality which embrace all the various services as well as some elements which are applicable to two or more of the fields of vocational education. These may be taught well by persons with various backgrounds and training. But the day agriculture is removed from a specific slot in the curriculum and is submerged into one conglomerate vocational effort the effectiveness of the agricultural instruction is largely dissipated, and the learner is the loser.

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THE TASK OF QUANTIFYING AGRICULTURAL OCCUPATIONS

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by

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One of the fundamental purposes of occupational studies in the area of agricultural manpower has been to identify the labor pool parameters which agricultural education can serve. These studies are attempting to provide empirical documentation to facilitate more judicious educational programming decisions.

Occupational Projections

Methodologically, agricultural educators have treated the subject of quantifying the existing and projected agricultural manpower requirements with a different emphasis than the human resource planners. The human resource planners have oriented their planning models in respect to market force factors, e.g., sectional output, labor productivity, and anticipated changes in structural organization at the firm level. The resulting manpower planning equations have become highly disagregated in an attempt to increase the reliability of their projections. Just how much measured success these involved models will have is conjecture, particularly so, when one considers the multiplicity of variables involved.[1] However, it is evident that educational programming currently under way in agricultural occupations have not been sensitized, in any large measure, to market force variables.

Certainly a legitimate question can be asked concerning the extent that market forces should determine the direction of training programs. Yet, a relatively strong case can be made for the critics of current techniques in programming agricultural education based on our limited efforts aimed at intergrating the "market" into our planning models. It goes without saying that our empirical projection methodology can be improved to provide the more "perfect" programming information. Hopefully, we will take some direction from our colleagues in human resource planning to sensitize our projection techniques with market and productivity documentation.[2]

A more immediate problem, intrinsic to the question of projected agricultural manpower needs, rests with quantifying the existing agricultural labor pool. The remainder of this article is directed at two considerations in this task. First, we need a practical, legitimate, and easily understood definition of what constitutes an agricultural occupation. Second, methodological assistance is needed in data collection to define the universe of agricultural occupations

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[1] To the economist and manpower planner the term "market forces" carries explicit connotations, although, it is ever so elusive analytically. The precise blueprinting of the universe of market force variables is incomplete. Attempts to base manpower estimates on "market forces" will, as a result, have to proceed primarily on theoritical grounds subject to complex difficulties. Nevertheless, this should not curtail efforts on behalf of agricultural educators to intergrate market variables in their planning forecasts. Hopefully, their efforts will constitute a vital contribution in the development of reliable estimating techniques.

[2] A concise summary of the problems involved in programming manpower requirements is provided by Robinson Hollister, A Technical Evaluation of the First Stage of the Mediterranean Regional Project (Paris: Organization for Economic Cooperation and Development, 1966), pp. 17-28; for estimation problems specific to agriculture see OECD, Trained Manpower for Tomorrow's Agriculture (Paris: Organization for Economic Cooperation and Development, 1966), pp 211-243. An excellent compilation of econometric human resource planning models is contained in OECD, Mathematical Models in Educational Planning (Paris: OECD, 1967) 296 pp.

Definition of Job Titles

The "ring" of a job title provides for its intuitive classification by the man in the street. Unfortunately, this over simplified manner of occupational classification, or something close to it, can be found in on-going manpower studies in agricultural occupations. Fortunately the process of job and task analysis provides the researcher an empirical technique to qualify job titles. However, even with the use of limited job analysis, we have yet to develop a definition which is easily understood, 1.e., has common sense qualities, and is operationally specific for use by educational planners.

I suggest that we form two categories of agricultural job titles based exclusively on the concept of time spent performing agricultural tasks. Outlined, the categorization process would follow these three steps: (1) a job title would be analyzed and tasks listed as actually performed by the employee, (2) tasks would be classified into "agricultural" and "non-agricultural" based on whether or not the specific task required competencies in the applied plant or animal sciences, and (3) job titles would be classified as:

1. Agricultural--where fifty per cent or more of the job time is spent performing agricultural tasks.
2. Agriculturally Related--where less than fifty per cent of the job performance time is spent performing agricultural tasks.
3. Non-Agricultural--where no agricultural tasks are performed by the employee.

The key technique in the classification process is an accurate employee-level job analysis. The categorization of tasks could be facilitated by guidelines developed by a representative group composed of agricultural educators, Department of Labor personnel, employers and employees. As task information becomes available it would be submitted to a national task bank for immediate circulation to researchers. There is nothing magic about the fifty per cent performance time acting as the breaking point between agricultural and agriculturally related occupations. However, caution is urged to select a single percentage figure for all occupations. Although a sliding scale of task time might seem more appropriate for given job titles it is of questionable value due to the loss of simplicity of classification and understanding among the lay public,

In addition to providing us a universal classification schema at the task level to quantify job numbers, the classification by tasks will enable us to punctuate existing curricula with currect job performance data which will serve to make training programs directly responsibe to production conditions. And by dealing with task level information the possibility of developing common threads in curricula, either within families of occupations or across all occupations, becomes a definite possibility in the near future.

I want to stress the need, in developing job analysis data, to make the employee the prime source of task information. Job performance data should be collected by a "live" employee interview and if at all possible an employee observation period should be included by the job analysist.

Preferably, the employee would be interviewed and or observed over a period of time to control for task variations due to seasonal differences. By dealing directly with the employee we tend to eliminate the normal impulse of the employer to describe the tasks and competencies of a non-existent ideal employee.

Data Collection

Procedurally, our occupational studies are rapidly becoming Department of Labor oriented. In effect, the researcher sorts through both the Standard of Industrial Classification and Dictionary of Occupational Titles for industries and job titles to study. Most researchers have found their respective State Departments of Labor quite generous when it comes to the provision of addresses of employers. Helpful and as inclusive as these employer lists first appear, they fail to provide a complete census of employers in the following areas:

1. Public employers are not systematically included, e.g., city, county, state, and federal agencies.
2. Self-employed persons are not completely accounted for under present reporting procedures. Addresses only appear for those persons electing to participate in the unemployment compensation program.
3. First are classified by major product (dollar value) into the various S.I.C.'s, therefore unless a complete census or sampling of codes is accomplished there is risk of: (a) excluding a firm with a sizeable but minor agricultural line, e.g., a department store with a garden supply section, or (b) providing an incomplete accounting for a given product or service where a firm deals in more than one agricultural product--the minor products escape accounting by name.
4. Out of state enterprises can and do escape accounting in the state-level studies, e.g., loggers living in Pennsylvania and working in New York would normally not be accounted for in New York studies. However, this appears to be a problem of the smaller type firms. Larger firms generally report (U.C. 202 forms) their employees in the state which they work.

Of the problems outlined, by far the most serious is the quantification problem involved in accounting for public employers and employees. Approximately twenty million public employees would escape accounting utilizing present Department of Labor employer listings. Unofficial estimates by labor department personnel indicate that it will be from three to five years before national-level reporting procedures are made operational for the public sector.

Certainly it is within our self-interest to make some attempt to identify the population parameters encompassed by the horticultural, inspection, research, etc. personnel employed by public agencies. Our immediate hope rests in an occupational estimation study utilizing two prime sources of data. First, annual personnel reports are considered unclassified and are generally available to researchers for most public agencies; second, local and state-level Department of Labor offices, where available staff permits, are assembling public sector employment data, however, the

reporting format is generally "individualized" per each state could make reasonable working estimates available in a relatively short period of time.

The identification of masked employer-employee data contained in multi-product firms lies in the complete census of all firms or a proportional probability sample of firms per SIC code. While one solution to the accounting problem of out-of-state employers is the reporting of occupational information on a regional and or national basis. This leads me to one last consideration.

Costs involved in physical communication are at a level which is facilitating and encouraging a highly mobile labor race. I submit that it is time to seriously consider the reporting of occupational information on a regional or trade center basis. Further programming of manpower training in agricultural occupations can be made more effective through mirroring actual manpower needs which inevitably transcend state boundaries.

Moreover, as our graduates become still more mobile we will find it increasingly difficult to justify state-level differences in occupational training in agriculture, per job title or group of job titles.

It is not outside the realm of possibility that we should consider the establishing of Agricultural Occupational Statistical Areas (AOSA). Functionally, these areas would reflect regional agricultural manpower demands. The area encompassed could be changed periodically to reflect changes in the labor demands or graduate mobility. In many cases the AOSA's would be contiguous with existing Standard Metropolitan Statistical Areas (SMAS) which would facilitate reporting in urban and fringe areas. Hopefully, prior to a national study of agricultural occupations serious consideration needs to be given to the reporting of findings in a manner which reflects the regionalization of manpower needs in the United States.

In closing, before going too much further we must be challenged to come up with a clear, accurate, and easily understood definition of what constitutes a legitimate agricultural and agriculturally related occupation. The practical application of future occupational research and educational programming will be directly related to the effectiveness of the definitions we develop. In preparing manpower demand estimates we should endeavor to sensitize our planning equations with economic indicators and technological information to increase the reliability of our manpower estimate calculations. I also want to re-emphasize the need to coordinate occupational research through a fully integrated regional approach to the subject. This by necessity will call for collaboration between states, human resource planners, Department of Labor specialists, and agricultural educators. It is only through a combined effort that we can maximize the cost-benefit returns with the human and capital resources the public has put at our disposal.