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The Literature Of Agricultural Economics:

Its Bibliographic Organization and Use

Waite Memorial Book Collection
Division of Agricultural Economics

North Carolina Agricultural Experiment Station

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The Literature Of Agricultural Economics:

Its Bibliographic Organization and Use

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The Literature of Agricultural Economics: Its Bibliographic Organization and Use

Chapter I

Introduction and Methodology

This study[1] is an outgrowth of a 1961 conference on the literature of agricultural economists.[2] Discussions at this conference, which was called by committees of the American Farm Economic Association and the Social Science Research Council, indicated that in agricultural economics, as in many applied fields, an unusually high proportion of valuable research material is issued in mimeograph or near-print, "letter-serial" form, with limited distribution. Much of this material does not appear in bibliographical services and is difficult or impossible to locate. Because of the great variety of forms in which publications appear and the large amount of extension and informational publishing, a comprehensive study of the rate of indexing and abstracting of various types of publications, particularly by form and publisher, was indicated. Even this would not be sufficient unless the usefulness and value of various categories of publications were evaluated in relation to the rate of indexing. Because of sampling practicalities, the scope of the study is limited to that part of agricultural economics literature produced by economists in the United States.

Bourne points out that there are only a few specialty fields, such as chemistry, that are well covered by indexing and abstracting services. In 1960 all of the major indexing services combined—services that comprise the membership of the National Federation of Science Abstracting and Indexing Services (NFSAIS)—covered about 16,000 journals out of the world's estimated 30,000 scientific and technical journals.[3]

S. C. Bradford, in an important study which was reported in 1950, found that "less than half the useful scientific papers published are abstracted in the abstracting periodicals." He deplored the fact that more

1. This report is a shortened revision of: Isaac Thomas Littleton, "The Bibliographic Organization and Use of the Literature of Agricultural Economics." Unpublished Ph.D. dissertation, Graduate School of Library Science, University of Illinois, 1968.

2. Conference on Retrieval Problems Associated with Agricultural Economics Literature, March 30, 1961, *Report* (Sponsored by the Sub-Committee on More Adequate Cataloging System for Agricultural Economics Publications of the Social Science Research Council Committee on Agricultural Economics and the American Farm Economics Association on New Orientations in Research, 1961). (mimeographed)

3. Charles P. Bourne, *Methods of Information Handling* (New York: John Wiley and Sons, 1963), p. 4.

than half of the useful discoveries "lie useless and unnoticed on the library shelves" because they are inadequately indexed.[4] Bradford's study pointed to reasons for the gaps in abstracting and indexing. One is that abstracting agencies concentrate mainly upon the periodicals devoted to their special subjects. Many articles are missed because they are published in journals which are not within the scope of the indexing and abstracting service. For this reason, the subject interest of the journal or other publisher (which does not necessarily reflect the subject of the individual article) is a determinant of bibliographic control of the article. Another cause for the large gap is that "abstracting agencies generally ignore books, pamphlets, patent specifications and such-like."[5]

The recent proliferation of information retrieval systems and bibiographical services has not solved the problems of bibliographical control. Swanson, in an article entitled "On improving Communication Among Scientists," questions whether the "proposed cures" in the form of mechanical information storage and retrieval take into account "the nature of the illness."[6] There is an urgent need for greater understanding of present methods of retrieval and how researchers and users obtain information as an aid in the design of new systems.

The study has two primary objectives: (a) to determine the extent to which various types of publications by agricultural economists are indexed and abstracted in existing bibliographic services, and (b) to relate the use of various types of publications to their rates of indexing and abstracting. The hypothesis that there are significant differences in rates of indexing among forms and sources of publications was tested for the field of agricultural economics and four factors that influence indexing have been identified. Although not a primary objective, an important by-product of this study was an understanding of the pattern of publication in agricultural economics.

Methodology

The intensive study of a large population of publications is combined with the analysis of a questionnaire on the use of the literature of agricultural economics. A brief outline of each phase of the study is provided here:

Phase I. Analysis of the Characteristics of the Literature of Agricultural Economics.

A study was made of the sources, forms, and subject fields of a population of 7,624 publications produced by agricultural economists in the United States for the three year period, 1961-63. The population of publications was obtained by the following means: (a) A letter requesting complete lists of publications of staff members for the period

4. S. C. Bradford, *Documentation* (Washington, D. C.: Public Affairs Press, 1950), p. 108.

5. *Ibid.*, pp. 109-110.

6. Don R. Swanson, "On Improving Communication Among Scientists," *The Library Quarterly*, 36 (April 1966), 79.

1961-63, was sent to all departments of agricultural economics in the United States, including those in land-grant universities, and to general economics departments with some agricultural specialization. Lists were received from all but two universities, both of which have small staffs and few publications. (b) Publications of U. S. government departments were obtained from the "Monthly Checklist of Reports" issued by the Economic Research Service and the Statistical Reporting Service and from the USDA periodical, *Agricultural Economics Research.* (c) Letters were sent to the statistical reporting services in state departments of agriculture requesting copies of their publications during the three study years. The population, if not absolutely complete, is highly representative of the publications of U. S. agricultural economists during the three-year period. Possible gaps in the population are described completely in the original study. This phase of the study included the following steps: (1) collecting the large population of publications (2) classifying them by (a) form of publication (b) source (c) and subject interest of publisher;* (3) statistically analyzing the population by form, source, and subject interest of publisher.

Phase II. Study of the Bibliographical Control of the Literature

An intensive study was made of the extent to which the publications in a stratified random sample, drawn from the population of publications, is included in eight indexing and abstracting services. This phase of the study included: (1) designing and choosing a random sample of publications stratified by form-source categories, which would be representative of the population of publications (a total of 1,527 publications make up the small sample, which turns out to be 20 per cent of the population) (2) choosing appropriate indexing and abstracting services in which to check the sample publications (3) determining if each of the publications in the sample is included in each of the eight bibliographical services selected (4) statistical analysis of the sample to determine the extent to which each form and publisher category is indexed and abstracted in each of the bibliographical services, and (5) statistical projection of the rate of indexing from the small sample to the population of publications and computation of statistical significance for the rate of indexing for each form and source category of publications in the population.

Phase III. Study of Use of the Literature by Researchers and Professional Workers

This phase included: (1) Design of a questionnaire which would provide information on the types of publications most useful to agricultural economists for current awareness and retrospective searching and on the ways in which users find information (2) Choosing a representative national sample of agricultural economists to whom to administer the questionnaire (3) Statistical analysis of the questionnaire, relating use to bibliographical control.

* For the publisher, form and subject categories used see Table I.

Choosing the Sample for Determining the Rate of Indexing

A disproprotionate, stratified sample of publications was chosen from the population of 7,624 publications for intensive checking in selected indexing and abstracting services. The sample was stratified according to form-publisher categories. It was decided to eliminate the subject categories from the stratification because the number of cases in some of the form-publisher-subject categories was too small to be meaningful.

The size of the sample is determined by choosing enough cases from each form-publisher cell to produce a desired standard error at a given level of indexing. The number of cases in each cell was arrived at by solving for n in the formulas for determining the standard error of proportions (of items indexed), as "typified by $s_x^2 = s^2/n$ or s_w^2/n, where s_x is the standard error desired (aimed at), and where s^2 and s_w^2 are respectively . . ., the total variance and the variance within strata."[7] The formula actually used for determination of n is as follows:

$$n = \frac{n_0}{1 + (n_0 - 1)/N}$$

$$\text{where } n_0 = \frac{pq}{V}$$

p = percentage of cases judged to be indexed
$q = 1 - p$
$V = s^2$ (variance)

The derivation of the formula is outlined in Cochran's *Sampling Techniques.*[8]

Based on this formula and a desired standard error of five percentage points, a chart was prepared showing the number of cases that must be drawn from each population cell to give a standard error of five percentage points at three levels of indexing: 90 or 10 percent, 75 or 25 percent and 50 percent. (These percentages represent the p in the formula above). Due to the lack of any previous knowledge as to the percentage of items in the various form-publisher cells that might be indexed, it was necessary for the author to use his best judgment regarding the percentages of indexed publications in each cell. On these bases, the number of cases was drawn which would give the hoped for standard error of five percentage points or less in each form-publisher cell. A simple random sample from each form-publisher category was chosen by the use of a table of random numbers.

A total of 1,527 cases makes up the sample, which turns out to be 20 percent of the population. Table 1 shows the number of cases in each form-publisher cell in the sample. Standard errors were computed for the indexing rate for each form and publisher category after the estimated indexing rate for the population was determined.

7. W. Edwards Deming, *Sample Design in Business Research* (New York: Wiley, 1960), p. 255.

8. William G. Cochran, *Sampling Techniques* (New York: Wiley, 1963), p. 75. (See formulas 4.1, 4.2, 4.3.)

Table 1. Number of Cases In Small Sample of Agricultural Economics Publications By Form and Publisher[a]

Form[c]	Publisher[b] I	II	III	IV	V	VI	VII	VIII	Total
1	29	34		55	2		13	2	135
2	43	19	6	23			38		129
3	20	19	10	64	5		28	15	161
4	9	27	9	92					137
5	43	11	80	67		89	18	1	309
6						51	7		58
7	79	13	37	40	2		31	11	213
8	36	51	37	33			3		160
9		29		7	45			4	85
10				52					52
11	14	33	7	22	8	2	2		88
TOTAL	273	236	186	455	62	142	140	33	1,527

[a] This sample was drawn from a population of 7,624 publications for the years 1961, 1962, 1963 by the use of a table of random numbers. The publications in the sample were checked intensively in selected bibliographical services.

[b]Publisher
- I. National or regional organization
- II. Federal government
- III. Local or state society
- IV. College or university agency
- V. State agency
- VI. Trade publisher
- VII. Foreign publication
- VIII. Industrial or commercial firm

[c]Forms
1. Research monographs in series
2. Research or professional journal article
3. Unnumbered, separate research monograph
4. Informational circular or monograph
5. Informational or trade periodical
6. Trade book
7. Conference or institute proceedings
8. Papers or speeches issued separately
9. Statistical reports
10. Theses
11. Miscellaneous

Perhaps a brief word regarding the reliability and validity of the sampling method should be made here. W. E. Deming provides the rationalization for the method in "Sampling New Material," Chapter 4 of *Sampling Design in Business Research.*[9] He says, "The advance estimates that the statistician uses represent the statistician's efforts to design an economical or efficient sample. Whether he is successful or not in designing an efficient sample, the *sample* is *valid.*"[10] He points out that inaccurate advance estimates of data may lead to too much or too little precision (ie., high or low standard errors), but "not to bias."[11] The final estimated variance and standard error depend entirely upon the data and are unaffected by the accuracy or inaccuracy of the investigator's judgments. "The final estimate of the standard error of a result, made from the sample itself provides the stamp of quality, good or bad."[11] The reliability and the validity of this sample can be judged on the basis of the statistical inferences in Chapter III.

Indexing and Abstracting Services

Each publication in the sample was checked against selected indexing and abstracting services to determine the extent to which the literature

9. Deming, *op. cit.*, pp. 255-275.
10. *Ibid.*, p. 270.
11. *Idem.*

of agricultural economics is listed in standard indexes and abstracting services. The bibliographical services were selected because each is known to index publications in agricultural economics. Only services that index government and non-government publications were selected. Indexes that list only government publications would include a very small percentage of the total number of publications since only 11.33 percent of the population are published by government agencies. In the services which have author indexes, such as the *Bibliography of Agriculture*, each publication was checked by author. In the services with the subject approach only, e.g., *Agricultural Index* (later *Biological and Agricultural Index*), the entire file of 1,527 publications was checked systematically under each appropriate subject heading. The publications in the sample were checked in each indexing and abstracting service for the period from 1961 through 1965.

The bibliographical services used in the study are listed in Chapter III (p. 21). However, it should be pointed out here that services in the fields of general economics and general agriculture were checked as well as the only service specifically in the field of agricultural economics, *World Agricultural and Rural Sociology Abstracts*. Two specialized services, *Dairy Science Abstracts* and *Index to Business Periodicals* were checked also. Admittedly, all indexing and abstracting services that might contain scattered listings of publications were not checked. However, it is believed a very insignificant number of publications by U. S. agricultural economists are listed in other services.

Statistical Analysis

After the intensive checking of the sample in the selected bibliographical services, the data were analyzed statistically as follows:

1. The sample number of publications indexed in each form-publisher category (cell) was projected to the population by multiplying the total number of publications indexed in each form-publisher cell in the sample by a factor equal to the total number in the sample divided into the total number of the population. The formula for this computation is as follows:

$$\frac{N}{n}(i) = I$$

N = Total number of cases in population
n = Total number of cases in sample
i = Number indexed in sample
I = Estimated number indexed in population

This computaion gives the estimated number of publications indexed in each category in the population of publications.

2. The variance for the estimated percentage of publications indexed once or more in each form-publisher category in the population was computed, using the general formula for the variance of a proportion:

$$s^2 = \frac{pq}{n - 1}\left(1 - \frac{n}{N}\right)$$

where $p = \frac{i}{n}$ and $q = 1 - p$

The use of variance for proportions and percentages is discussed in *Sampling Techniques* by William G. Cochran.[12]

The computation of the variances of each form-publisher cell was an important step in the understanding of the reliability and validity of the data. Since variance is the average squared deviation from the mean, it is the best statistical description of the variability of the sample or the extent to which the indexing percentage in the sample varies from the indexing percentages of the population. The variance tells us the extent to which the samples which might have been drawn would deviate from the population percentage, which, in this case, is the indexing rate of the population.

3. The variance for each form and source percentage was computed as a sum of the variance in the form-publisher cells of which it was composed. The formula for this computation is as follows:

$$V = S^2 = \frac{1}{N^2} \sum N_h \quad (N_h - n_h) \quad \frac{s_h^2}{n_h}$$

where the suffix h denotes the form-publisher cell

$$\text{and} \quad s_h^2 = \frac{pq}{n-1} \left(1 - \frac{n}{N}\right)$$

These proportions were computed from the total population frequencies in Table 2 in Chapter II. This formula is that for the variance of a mean of a stratified sample as outlined in Cochran.[13] The standard error for each form-publisher category in the total population was computed by taking the square root of the variance.

4. The standard errors of the difference between percentages of publications indexed were calculated and tests of significance applied to determine if there are significant differences in the rate of indexing among various forms and publishers. The standard error of difference between two percentages is calculated by taking the square root of the sum of the variance of two percentages. The standard error of difference is divided into the actual difference between two percentages to obtain the critical ratio.
5. The estimated percentages of indexing were computed also for each bibliographical service separately.

The Questionnaire

A questionnaire was designed to determine how agricultural economists use the literature in their field (see Appendix VII). The final questionnaire

12. Cochran, *op. cit.*, pp. 49-52.
13. *Ibid.*, formula 5.11, p. 93.

after a pre-test and consultation with agricultural economists at N. C. State University and in the U. S. Department of Agriculture, was mailed to 592 agricultural economists in universities and the U. S. Department of Agriculture. University economists were chosen by drawing every third name listed under agricultural economics departments in *Agricultural Handbook* no. 305, "Professional Workers in State Agricultural Experiment Stations and Other Cooperating State Institutions" for 1965-66, published in December, 1965, by the U. S. Department of Agriculture and the Cooperative State Research Service.[14] Government personnel were chosen in the same proportion from lists of agricultural economists in the Economic Research Service and the Farmer Cooperative Service. Of the 592 questionnaires mailed out, 379 were returned and analyzed. The analysis of the questionnaire is reported in Chapter IV. The results from the questionnaire are interpreted in the light of the rates of indexing of various types of publications and the effectiveness of the services tested.

Summary

This chapter has presented the purpose and methodology of the study. The general hypothesis that there are significant differences in rates of indexing among various forms of publications and sources will be tested for the field of agricultural economics. The study has three main objcetives: (1) to describe the characteristics of the literature of agricultural economics by analyzing a large population of publications, published during 1961, 1962, and 1963 by agricultural economists in the U. S.; (2) to analyze the extent to which the publications by agricultural economists are indexed and abstracted in existing bibliographical services and to compare indexing rates by form and source of publications; and (3) to analyze the usefulness of various types of publications to agricultural economists by means of a questionnaire relating usefulness to the rates of indexing of various forms and sources of publications.

14. U. S. Department of Agriculture, Cooperative State Research Service, Research Service. *Professional Workers in State Agricultural Experiment Stations and Other Cooperating State Institutions*, 1965-66 (Agriculture Handbook no. 305; Washington, D. C.: USDA, 1965).

Chapter II

The Characteristics of the Literature of Agricultural Economics

The main purpose of the present chapter is to describe the population of 7,624 publications from which the sample of publications for testing indexing rates was chosen. This analysis will provide an understanding of the nature and the characteristics of the literature of agricultural economics.

The Field of Agricultural Economics

Agricultural economics is "that particular branch of economics primarily concerned with problems relating to agriculture."[1] Black defines agricultural economics as "a specialized form of pure science of economics" and emphasizes the role which is plays in coordinating general economics and the natural sciences.[2] More specifically, agricultural economics includes farm management, land economics, prices and statistics, agricultural policy, production economics, marketing, agricultural law, and farm credit.

Agriçulture has been an important factor in economic thought from the time of the early economists, but agricultural economics did not begin to develop as a specialization until the early part of the twentieth century. Courses in agricultural economics were offered first in 1903 at Harvard University, the University of Wisconin, and Cornell University. Professor H. C. Taylor at the University of Wisconsin published his book *Agricultural Economics* in 1905, and Professor Thomas Nixon Carver at Harvard University published his *Principles of Rural Economics* in 1911.

A vast literature of agricultural economics has developed during these sixty-odd years, the scope and quantity of which "equals, or perhaps even exceeds" that of all other fields of economics combined.[3] The major fields of research in the United States continue to be in the traditional areas of farm management and marketing, but new interests have developed in inter-regional competition, productive adjustments, and foreign agricultural development.[4] The shifts in research interests have occurred because of the changing nature of agriculture in the United States and the world.

Trends of the past few years have led to more emphasis on interdisciplinary research, not only with other disciplines, but a crossing of areas of research within the field of agricultural economics.[5] Bressler encourages

1. R. G. Bressler, "Agricultural Economics in the Decade Ahead," *Journal of Farm Economics*, 47 (August 1965), p. 521.

2. John Donald Black, *Introduction to Economics for Agriculture* (New York: Macmillan Company, 1953), p. 12.

3. Carl M. White and Associates, *Sources of Information in the Social Sciences* (Totowa, N. J., Bedminster Press, 1964), p. 139.

4. Bressler, *op. cit.*

5. White and Associates, *op. cit.*, pp. 139-140.

more interdisciplinary research, broader studies of inter-regional competition and regional specialization which utilize "the interrelated contributions of studies of farm production and supply of marketing and transportation, and of farm and finished product demands."[6] Bressler calls for a greater number of "programs of research that are truly additive and cumulative."[7] If agricultural economists are to build "research upon research,"[8] researchers must have available, through bibliographical services or other means of communication, more complete coverage of the studies and information in the field.

It is important that improvements in bibliographical control of the literature be based upon an understanding of the pattern of publication in the field. This involves a knowledge of the forms in which publications appear, the periodicals in which publications are most frequently published, the major publishing sources, and the subject areas of publications. An analysis of the total population of publications will provide an understanding of the characteristics of the literature in the field. Since this study is limited to the publications of agricultural economists in the United States, it must be interpreted with this limitation in mind. Although we would like to assume that the U. S. literature of agricultural economics is similar to that of other countries, this may not necessarily be true.

Analysis of the Form and Sources of Publications

Table 2 gives a detailed analysis of the total number of publications in the population by form and type of publisher. The data on form and publisher were analyzed separately for 1961, for 1962, and for 1963 to determine if there were differences in the pattern of publishing in the field from year to year. The 7,624 publications in the total population are broken down by year of publication as follows: 2,351 published in 1961, 2,547 in 1962, and 2,458 in 1963, with 267 having no date indicated. The percentages of publications in each form and publisher category from year to year are so similar that it can be concluded that the data in the total population are highly reliable. A small general increase from 1961 to 1963 can be seen, but no trend can be predicted because of the short period. The number of publications is relatively stable for the three years.

Sources of Publications

Over one-half (53.76 percent) of the publications originated in the agricultural experiment stations, extension agencies, and academic departments of colleges and universities. It must be remembered that although administered by the schools of agriculture in land-grant colleges and universities, the agricultural extension agencies and agricultural experiment stations are cooperative programs of the U. S. Department of Agriculture,

6. Bressler, *op. cit.*, pp. 525-527.
7. *Ibid.*, p. 526.
8. *Ibid.*, p. 528.

Table 2. Total Population, Publications of U. S. Agricultural Economists By Form-Publisher Categories, 1961-63

Form[b]	Publisher[a] I	II	III	IV	V	VI	VII	VIII	Totals	Percent
1	53	353		1,257	2		13	2	1,680	22.04
2	400	46	6	68			57		577	7.57
3	20	34	10	375	5		28	15	487	6.39
4	9	47	9	1,496					1,561	20.48
5	62	11	396	643		683	19	1	1,815	23.81
6						142	7		149	1.95
7	353	13	73	62	2		31	11	545	7.14
8	70	256	69	57			3		455	5.95
9		72		7	73			4	156	2.05
10				111					111	1.46
11	14	33	7	22	8	2	2		88	1.16
TOTAL	981	865	570	4,098	90	827	160	33	7,624	
PERCENT	12.87	11.33	7.48	53.76	1.18	10.85	2.10	.43		

[a]Publisher

I. National or regional organization
II. Federal government
III. Local or state society
IV. College or university agency
V. State agency
VI. Trade publisher
VII. Foreign publication
VIII. Industrial or commercial firm

[b]Forms

1. Research monographs in series
2. Research or professional journal article
3. Unnumbered, separate research monograph
4. Informational circular or monograph
5. Informational or trade periodicals
6. Tradebook
7. Conference or institute proceedings
8. Papers or speeches issued separately
9. Statistical reports
10. Theses
11. Miscellaneous

and in some states, the state departments of agriculture. Extension personnel are supported from federal, state, and university funds. The publications of state agricultural extension agencies and experiment stations, are classified as university publications together with the publications of the academic departments because of the impossibility, in many cases, of deciding if publications originated with academic departments, the experiment stations, or the extension agencies. In many cases, the publications may be joint endeavors of the agricultural economics departments and the agricultural experiment stations or the academic departments and the extension agencies. The relations among all of these agencies are extremely close in land-grant institutions. Therefore, they are all grouped together under "universities" as the source. As nearly as could be determined, about an equal number of university publications are published by agricultural economics departments and by agricultural experiment stations and extension agencies.

As can be seen from Table 2, universities are the largest publishers of both research monographs or bulletins as well as informational bulletins in the form of extension leaflets, circulars, or pamphlets. The experiment stations and academic departments also publish a large group of unnumbered, separate research reports or bulletins (375, or 4.92 percent of the total number). These represent the largest group of separate research monographs and, as can be seen in Chapter III, a major gap in bibliographical control.

One of the important means of communication in the field is through workshops, conferences, and symposia. Universities contribute significantly to this activity by providing speakers, leaders, and meeting places and by publishing the proceedings or separate talks and papers presented at these workshops. Of 545 conference procedings, university agencies published 62; of 455 talks and papers, universities issued 57. These are too numerous to list here, but some examples will illustrate the range of subjects. Agricultural economists participated in the following conferences or workshops which were held at universities and for which proceedings were published: the Conference on College Teaching of Foods and Nutrition, University of Wisconsin; Conference on Southern California Wildlife Problems, sponsored by the Agricultural Experiment Station of California, Berkeley; the annual Purdue Marketing Clinic; and Annual Agricultural Industries Forum and the Farmstead Planning and Mechanization Workshop, both of which are sponsored by the University of Illinois; the Annual Institute on Cooperative Education, sponsored jointly by the Cooperative Leagues of the United States and Canada, respectively, and the Extension Department of the University of Wisconsin; the North Carolina Agricultural Extension Service Conference. Publications of the proceedings of these conferences represent one of the most obscure categories of publications. The proceedings or separate talks given at these conferences are usually sent to those who attend, but they are not generally available and seldom come to the attention of bibliographical services.

The 111 theses and dissertations in the population may not be complete for the three-year period since many departments reported no theses; however, those included are representative of this form of publication. They were included primarily to check upon the extent to which they are

indexed and abstracted in the standard bibliographical services used by agricultural economists; more detailed descriptions of them are contained in Chapter III.

After unversities, regional and national societies and associations issue the largest number of publications. There are hundreds of these organizations, but perhaps the most important one for agricultural economists is the American Farm Economic Association. Others that issue large numbers of publications of direct interest to agricultural economists are the Farm Foundation, the regional agricultural economics associations, the Agricultural Policy Institute at North Carolina State University, the American Institute of Cooperation, and the Center of Agricultural and Economic Adjustment at Iowa State University. There are also many professional societies in related agricultural fields which issue publications of agricultural economists.

National and regional organizations are the major publishers of research journals; of 577 research journal articles published, 400 were in journals published by national or regional organizations. The list of research journals in Appendix I will indicate the large number of national or regional professional society journals in which agricultural economists publish, but the *Journal of Farm Economics* is the leading research journal for agricultural economists; 40 percent of the articles appear there.

Regional and national associations are also the largest source of published conference proceedings; of the 545 conference proceedings in the population, 353 or 65 percent are sponsored and published by these organizations. Although they do not publish as many research monographs as universities or the U. S. government, they publish important research monographs both as separates (20) and in series (53). The workshop proceedings and research monographs of many of these organizations are obscure and would not normally come to the attention of a bibliographical service. The regional and national organizations that publish in the field of agricultural economics are too numerous to list completely, but a representative listing will show the range of intests of agricultural economists: the American Association for the Advancement of Science, the Upper Midwest Research and Development Council, the American Society of Agricultural Engineers, the Committee on Soil and Water Conservation of the Agricultural Board of the National Academy of Sciences, the Association of Southern Agricultural Workers, the National Marketing Service Workshop, National Association of Mutual Companies, Milk Industry Foundation, the Great Plains Economics Committee, the American Meat Institute, the Soil Conservation Society of America, Southwest Social Science Association, the National Apple Institute, and many others.

The ferreting out of the important publications of these and similar organizations in the field of agricultural economics will require the organization and concentration of a specialized service for the field. Almost 13 percent of the publications in the field are issued by these national and regional societies and associations, and less than half of these are specifically agricultural economics organizations.

The U. S. federal government is the third largest type of publisher in the population; a total of 865 U. S. government publications are included, accounting for 11.33 percent of the total. The majority of the U. S. publi-

cations are issued by the Economic Research Service, the Statistical Reporting Service, the Farmer Cooperative Service, Foreign Agricultural Service, and other agencies of the U. S. Department of Agriculture. The USDA Statistical Reporting Service and the statistical reporting services of the states are the two main sources of statistics on crops and farm products of which agricultural economists make extensive use (see Chapter IV). About an equal number of these reports from the USDA Statistical Reporting Service and the states are included in the population. All articles published in the USDA periodical, *Agricultural Economics Research* during the three-year period are included in the population, representing the 46 U. S. government research journal articles.

Publications of trade publishers, because of the large number of trade periodical articles published, make up 11 percent of the population. A very small proportion of the literature (less than 2 percent) in the field is contained in trade books. Included in the 142 trade books are not only complete treatises, but chapters of books as well. The majority of the books published in the field are collections of articles on particular subjects, and many are published by university presses, most notably the State University of Iowa Press.

Of the 1,857 articles in trade or informational periodicals, the largest publishers are private trade publishers (683). By far the majority of these are general agricultural periodicals, such as *Successful Farming*, *Prairie Farmer*, etc. (see Appendix II for a list of these), published for a local or state clientele of farmers, county agents, and agriculturalists. Much valuable research and statistical information about the farm situation in several states is contained in these periodicals and should not be ignored by bibliographical services. However, the inclusion of articles from these periodicals must be done on a highly selective basis.

With the exception of statistical reports, state government agencies publish a relatively small amount of agricultural economics literature; state governments accounted for only 1.18 percent of the publications in the population, with about one percent constituting statistical reports from the state statistical reporting services.

A total of 160 publications, or 2.10 percent, are published by foreign publishers or international organizations. The greatest number of these (57) are in foreign or international research journals (see Appendix I). Important categories of foreign and international publications which should be included in the bibliographical services are research monographs, both in series and in separate forms, as well as conference proceedings, separate talks and books. Included among the publications are papers from a number of published proceedings of international congresses, such as the International Dairy Congress, and, of the highest importance for agricultural economists, the International Conference of Agricultural Economists. Among separate monographs are reports of agricultural missions to various foreign countries. Even though there is an increasing interest in the application of economics to foreign agriculture, a relatively small percentage of literature was reported to have been published by foreign or international publishers. Nevertheless, it is important that bibliographical services index what is written about foreign agriculture regardless of the country in which it is published. Much of the material issued by foreign

universities and publishers is in mimeographed report form, is issued in a limited number of copies, and is not now indexed; these reports can be obtained only from the authors or the universities issuing them. Since this type of material is not readily available, it is likely that a specialized, centralized service will be required to acquire and list it.

Broadly, publications in the total population may be classified into three categories by purpose as follows:

Research and Professional	
Research reports in series	22.04%
Research or professional journal	7.57
Separate research report	6.39
Conference proceedings	7.14
Separate talks and papers	5.95
Books (trade or university press)	1.95
TOTAL	51.04%
Informational or Popular	
Trade or informational periodicals	23.81%
Informational circular or pamphlet	20.48
TOTAL	44.29%
Miscellaneous	
Hearings reports	.45%
Yearbooks and annual reports	.51
Statistical reports	2.05
Theses and dissertations	1.46
Other	.20
TOTAL	4.67%

To summarize, about half (51.04 percent) of the publishing in the field is in the category of professional or research publications. Almost half (44.29 percent) can be classified as informational or popular, written expressly and primarily for the layman or the farmer.

Subject Fields of Publications

The publisher of each publication in the total population was classified broadly by four subject categories: (1) agricultural economics, (2) general economics, (3) agriculture other than agricultural economics, and (4) other subject fields. Tables 3 and 4 show the breakdown of forms and publishers by broad subject field.

Over 90 percent of the publications in the field of agricultural economics are published by publishers that have as their primary interest agricultural economics or agriculture. A total of 3,652 publications (47.91 percent) are in the field of agricultural economics. Only 129, or 1.6 percent, of the publications are published by publishers in the field of economics, whereas 469, or 6.15 percent, of the publications are published by publications in other fields, such as political science, forestry, law, sociology, history, and education. This leads to the conclusion that agricultural economics has

Table 3. Broad Subject Interests of Publishers of Agricultural Economics Literature, By Form, 1961-63

Form[b]	Subject[a] A	B	C	D	Total	Percent
1	925	22	710	23	1,680	22.04
2	341	51	110	75	577	7.57
3	277	5	128	77	487	6.39
4	792	3	756	10	1,561	20.48
5	314	3	1,381	117	1,815	23.81
6	104	21	5	19	149	1.95
7	194	19	256	76	545	7.14
8	243	5	165	42	455	5.95
9	50		103	3	156	2.05
10	110		1		111	1.46
11	24		37	27	88	1.16
TOTAL	3,374	129	3,652	469	7,624	
PERCENT	44.25	1.69	47.91	6.15		

[a]Subject
A. Agricultural economics
B. Economics (not agricultural)
C. Agricultural fields
D. Other subject fields

[b]Form
1. Research monographs in series
2. Research or professional journal article
3. Unnumbered, separate research monograph
4. Informational circular or monograph
5. Informational or trade periodical
6. Trade book
7. Conference or institute proceedings
8. Papers or speeches issued separately
9. Statistical reports
10. Theses
11. Miscellaneous

Table 4. Broad Subject Interests of Publishers of Agricultural Economics Literature, By Source, 1961-63

Publisher[b]	Subject[a] A	B	C	D	Total	Percent
I	469	45	329	138	981	12.87
II	735	2	96	32	865	11.33
III	3	2	503	62	570	7.48
IV	2,035	23	1,951	89	4,098	53.76
V			76	14	90	1.18
VI	101	21	632	73	827	10.85
VII	30	35	59	36	160	2.10
VIII	1	1	6	25	33	.43
TOTAL	3,374	129	3,652	469	7,624	
PERCENT	44.25	1.69	47.91	6.15		

[a]Subject
A. Agricultural economics
B. Economics (not agricultural)
C. Agricultural fields
D. Other subject fields

[b]Publisher
I. National or regional organization
II. Federal government
III. Local or state society
IV. College or university agency
V. State agency
VI. Trade publisher
VII. Foreign publication
VIII. Industrial or commercial firm

Table 5. Number of Periodical Articles Broken Down By Subject Interest of Publisher

Subject Category	Research Journal Articles N	Research Journal Articles %	Information Periodical Articles N	Information Periodical Articles %
Agricultural economics	341	59.11	314	17.30
Economics	51	8.84	3	.16
Agricultural fields	110	19.06	1,381	76.10
Other	75	12.99	117	6.44
TOTAL	577	100.00	1,815	100.00

developed a specialized literature separate from general economics. Its literature is related more to agriculture in its readership and sources than to general economics. This fact has an important implication for the planning of bibliographical services in the field. Any bibliographical service in the broader field of agriculture will provide greater coverage of the literature than a service in the field of general economics. This will be seen as the extent of indexing and abstracting in various bibliographical services is analyzed in Chapter III.

As can be observed from Appendices I and II, the periodical literature of agricultural economics is published in a wide variety of subject fields. Table 5 gives a comparison of the subject coverage between research and informational periodicals. As can be observed, the research or professional articles are concentrated to a greater extent in the journals devoted specifically to agricultural economics, whereas the trade and informational periodicals are concentrated in general agricultural periodicals or in other agricultural fields.

It is interesting to note that when the articles in agriculture and agricultural economics periodicals are combined, 78.2 percent of the research journal articles and 93.4 percent of the informational periodical articles are in the broad field of agriculture.

Summary

Many of the characteristics of the literature of agricultural economics are different from those of the basic social sciences and sciences[9] but may be typical of many applied fields, particularly in agriculture. Title dispersion in agricultural economics is greater than in the sciences, i.e., the publications appear in a greater number of books, journals, and reports, and in a greater variety of forms.

Research in the field is published primarily in monographs or bulletins, in large measure by state agricultural experiment stations and the U. S. Department of Agriculture, rather than in journals. Because of this fact,

9. *Cf.* Rolland E. Stevens, *Characteristics of Subject Literatures* (ACRL Monograph no. 6; Chicago: American Library Association, 1953).

it is important that the bibliographical services include research bulletins, conference proceedings, and separate reports and papers of all land-grant university experiment stations, departments of economics, and appropriate U. S. Department of Agriculture agencies and divisions, as well as those of many state, regional, and national societies, associations, institutes, and conferences. The large number of obscure publishers and research publications outside of journals make bibliographical control in the field particularly difficult.

The literature has a large component of popular or trade information which does not report original research, but the application of research. Almost half of the literature of agricultural economics (44 percent) is in informational or trade periodicals and circulars. The very nature of these publications places upon libraries and bibliographical services a special problem of selectivity. Undoubtedly many are not of sufficient importance or long-term value to be included in an information system.

Over 50 percent of the publishing in the field is by university departments, the reason being the great amount of research and extension activity of agricultural experiment stations, extension agencies, and special institutes.

Publication in the field is primarily in the broad subject area of agriculture, rather than in economics. Over 92 percent of the publications are by agricultural publishers, divided about evenly between the areas of agricultural economics and agricultural sciences. Only 1.69 percent of the publications are by publishers in the area of general economics. Publications in subject fields outside of agriculture and economics constituted 6.15 percent of the total but are broad in scope. Agricultural economists publish extensively in the journals, books, and conference proceedings of the fields of poultry science, dairy science, food science, agricultural enginering agricultural education, soil scienc,e horticulture, and agronomy, as well as in those of sociology, veterinary science, water resources, forestry, health sciences, education, public administration, statistical methodology, marketing, finance and banking, business administration, political science, law, home economics, and behavioral sciences. Bibliographical services in the broader field of agriculture will provide far greater coverage of the literature than a service in the field of general economics. However, the wide scope of subject fields in which the literature is published means that, in order to be as comprehensive as possible, a bibliographical service for agricultural economics must include many publications outside of the major agricultural disciplines and general economics.

Chapter III

Indexing and Abstracting in the Field of Agricultural Economics

Introduction

Dr. S. von Frauendorfer has outlined the history of abstracting in agricultural economics.[1] The first bibliographical journal specializing in agricultural economics was the house organ of the former Bureau of Agricultural Economics in the U. S. Department of Agriculture. It began in 1923 as a mimeographed Library Supplement to B. A. E. News and was expanded in 1927 into a regular journal called *Agricultural Economics Literature.* This publication continued until the *Bibliography of Agriculture* began in 1942, which is still published by National Agricultural Library (formerly called the U. S. Department of Agriculture Library). A general index in the field of agriculture, it is a list of title references received by the National Agricultural Library.

International documentation in the field began with the *International Bibliography of Agricultural Economics,* which was published from 1932 to 1938 as a regular supplement of the journal *Berichte Uber Landwirtschaft.* In 1938/39, the International Institute of Agriculture issued it quarterly in a trilingual edition under the title *Bibliographie internationale d'Agriculture.* The first editor of the publication was Dr. von Frauendorfer, who was the chief librarian of the International Institute of Agriculture. This journal was published until 1946 when the institute was dissolved and absorbed by the Food and Agricultural Organization (FAO) of the United Nations. Because of organizational and administrative difficulties, the FAO was not able to continue the international bibliography, and for a period of twelve years, the bibliographical coverage of agricultural economics literature was left to *Bibliography of Agriculture.*

With the organization of the International Asociation of Agricultural Librarians and Documentalists (IAALD) at Ghent (Belgium) in 1955, interest in an international abstracting service was renewed. With the cooperation of the International Conference (now Association) of Agricultural Economists (IAAE) and with financial assistance from American foundtaions, the IAALD published a preliminary issue of *World Agricultural Economics Abstracts* in July, 1958.

Dr. von Fraudendorfer outlines the details of the establishment and operation of the *World Agricultural Economics and Rural Sociology Abstracts.* It is sufficient to state here that in 1958 the editorial office was set up in Vienna in the "Agrarwirtschaftliches Institute" of the Austrian Ministry of Agriculture and Forestry. However, due to financial difficulties imposed by the expiration of foundation grants, the responsibility for the publica-

1. S. Von Frauendorfer, "The Story of Abstracting in Agricultural Economics," *Quarterly Bulletin* of International Association of Agricultural Librarians and Documentalists, II (July 1966), 97-104.

tion was accepted by the Review Conference of the Commonwealth Agricultural Bureaux (CAB) at Oxford, England, and in 1964 the editorial offices of WAERSA were transferred from Vienna to Oxford with no gap in the regular publication. Dr. von Frauendorfer sees bright hopes for the future of WAERSA and regards the first six volumes (1959-1964) "as an experiment in tackling an international documentation project with a minimum of expenditure."[2]

Description of Bibliographical Services

The main purpose of the present chapter is to analyze the extent to which publications of agricultural economists in the United States are indexed and abstracted in existing bibliographical services. The selection of indexes for this study was based to some extent on the number of U. S. publications which a service might list. Thus, some of the services published in other countries were eliminated because they index principally publications of their countries.

The Index of Economic Journals, an important indexing service in the field of general economics, is *not* included in the present study. The 1960-63 volume was received after the checking of references and statistical analysis of the data were completed. It was, therefore, not feasible to include it in the analysis of data. Published by the American Economic Association, it indexes a selected group of journals in the broad area of economics. The first seven volumes cover the period from 1886 through 1965. Articles are arranged by subject according to a classification scheme which was developed by a committee of economists in consultation with other experts. In addition, a personal author index is provided. Only those professional journals which the Committee believes "will be of widest use to teachers and scholars of economics" are included. "Government publications and specialized journals are excluded."[3]

Volume 6 of this index covers the period 1960-63, and thus lists some of the journal articles in the sample of the present study. However, since this service indexes only journals of general economic interest and omits all government publications, only a small percentage of the publications of agricultural economists are included. A check has been made to determine how many journals in which agricultural economists publish articles in 1961-63 are in fact indexed by this service. Here it will suffice to say that only 3.7 percent of the 7,624 publications in the population have any possibility of being indexed in the *Index of Economic Journals* and that only 15 out of 119 research journals in which agricultural economists published during the period are covered by this service. A further check reveals that all research journal articles in the sample which appear in the *Index of Economic Journals* are also indexed by one of the eight bibli-

2. *Ibid.*, p. 104.

3. "Introduction," *Index of Economic Journals*, VI (1960-63) (Homewood, Ill.: Richard D. Irwin, 1965), p. vii.

ographical services in the original study; consequently, the omission of the *Index of Economic Journals* from the study data does not alter the overall statistical findings.

The services used in this study are listed below. As pointed out in Chapter I, the list includes one international abstrcating service specifically in the field of agricultural economics, two U. S. indexing services in the field of agriculture, two general economics services, one indexing service in social and economic affairs, and two services in specialized but related fields.

1. *Bibliography of Agriculture.* Washington, D. C., U. S. Department of Agriculture, National Agricultural Library, v. 1- . July 1942- .
2. *Biological and Agricultural Index* (formerly *Agricultural Index*), N. Y., H. W. Wilson Co., 1916- . . . v. 1- . .
3. *World Agricultural Economics and Rural Sociology Abstracts.* Oxford, England, v. 1- . . 1959- . . .
4. *International Bibliography of Economics. Bibliographie internationale de science economique,* 1952- . Paris, UNESCO, vol. 1- . . Annual.
5. *Journal of Economic Abstracts.* Cambridge, Massachusetts, American Economic Association, v. 1- . . 1963- . . .
6. *Public Affairs Information Service Bulletin.* N. Y., Public Affairs Information Service, v. 1- . . 1915- . Annual cumulations.
7. *Business Periodicals Index.* N. Y., H. W. Wilson and Co., v. 1- . . 1958- . .
8. *Dairy Science Abstracts.* Commonwealth Bureau of Dairy Science and Technology, Sheffield, Reading, England; published by the Commonwealth Agricultural Bureaux, Farnham Royal, Bucks, England. v. 1- . . 1939- . . .

Extent of Indexing and Abstracting in Agricultural Economics

Each of the publications in the sample of 1,527 was checked by author or subject, as appropriate, in the eight indexing and abstracting services to determine if it is listed. The statistical methodology used in analyzing the data is described in Chapter I. The number of publications indexed and the number not indexed in each form-publisher category were projected to the population by the formula on page 6, and percentages and standard errors were computed for each form and publisher category in the population.

The percentages of publications in the population which are indexed in one or more of the eight bibliographical services are reported by form and publisher in Tables 6 and 7. From the data in these tables, it can be seen that 44.54 percent (± 1.60) or slightly less than one-half of the publications by U. S. agricultural economists for the period of the study are estimated to be indexed or abstracted in one or more of the eight services. With a standard error of 1.60 percentage points, it is unlikely (in less than one percent of the samples that could have been taken) that the percentage of 44.54 is more than 4.8 percentage points (three standard errors) from the population value.

In interpreting this figure, it must be remembered that many of the publications in the population may not be suitable or appropriate for inclusion in an information system and would be weeded out by an indexer

Table 6. Estimated Number and Percentage of Publications Indexed Once or More, By Form

Form category	N[a]	Publications indexed once or more: Est. no. indexed	Publications indexed once or more: % indexed S.E.
TOTAL POPULATION	7,624	3,396	44.54 ± 1.60
Research and Professional journals	577	465	80.53 ± 3.70
Research monographs in series	1,680	1,212	72.10 ± 4.74
Trade books or parts of books	149	104	69.81 ± 3.17
Statistical reports	156	79	50.66 ± 3.31
Trade or informational periodicals	1,815	652	38.11 ± 2.65
Published proceedings of conferences	545	181	33.17 ± 3.17
Informational reports or circulars	1,561	503	32.22 ± 4.48
Miscellaneous ((hearings, yearbooks, annual reports, etc.)	88	28	31.72 ± 0.00
Theses	111	34	30.77 ± 4.71
Unnumbered talks and papers	455	75	16.76 ± 3.16
Unnumbered research reports	487	63	12.66 ± 2.97

[a]N = Total Number of Publications in Population

or abstractor on the basis of quality or research value. Therefore, the percentage of the total number of items indexed does not reflect the items that should be indexed. An analysis of the indexing rates by form and source provides a guide to the effectiveness of the services in listing the publications of value to research.

The hypothesis of this section of the study is that significant differences exist in the rate of indexing among varous forms and sources of publications for the two reasons stated by Bradford: (1) that bibliographical services concentrate mainly upon periodicals devoted to the particular subject and (2) that they generally ignore large groups of publications that are not in periodicals or in serial form, such as books, separate research monographs, talks, papers, etc. In order to test the hypothesis, standard errors of difference between each form category and between each publisher category were computed. The standard errors of difference were divided into the actual difference to determine critical ratios. If the ratio is two or more, the difference is declared to be significant at the 5 percent level of confidence, but if the ratio is above three, the difference is declared to be significant at the 1 percent level of confidence. There are such extreme differences between the categories with higher and lower rates of indexing that the hypothesis of the study is confirmed beyond any reasonable doubt.

Research Publications. It is clear that research journal articles and research monographs in series are indexed to a significantly greater extent than any other form of publication. Over 80 percent of the research journal articles and over 72 percent of the research monographs in series were indexed. The two categories with lowest rates of indexing are the unnumbered, separate research monographs and *separate* papers or talks. Separate research and professional publications, whether they are monographs, papers, or talks, have significantly less chance of being indexed and abstracted than serials or periodicals articles. The critical ratios de-

Table 7. Estimated Number and Percentage of Publications Indexed Once or More, By Source

Source category	N[a]	Publications indexed once or more: Est. no. indexed	Publications indexed once or more: % indexed S.E.
TOTAL POPULATION	7,624	3,396	44.54 ± 1.60
U. S. federal government	865	565	65.29 ± 2.81
National or regional organization	981	532	54.13 ± 2.70
Universities and colleges	4,098	1,880	45.88 ± 2.72
Trade publishers and university presses	827	287	34.89 ± 3.75
Foreign publishers and international organizations	160	45	27.83 ± 1.76
State government agencies	90	19	21.58 ± 3.25
Commercial and research firms	33	6	18.19 ± 0.00
Local or state organizations	570	62	10.94 ± 1.85

[a]N = Total Number of Publications in Population

noting differences in indexing rates between research serials and research separates range between 10 and 14, indicating differences well above the one percent level of confidence.

Conference Papers and Talks. Likewise, talks and papers which appear in published proceedings of conferences have a significantly greater chance of being indexed than if published seperately. About 33 percent of the papers in published proceedings were located in the indexes, whereas only 17 percent of the separate papers were indexed. The low indexing rate of conference and workshop papers is unfortunate because they constitute an important body of professional literature (see Chapter II for representative lists of organizations that sponsor conferences).

Informational Literature. About 38 percent of the 1,815 articles in trade and informational periodicals appear in either *Bibliography of Agriculture* or *Agricultural Index*. The difference in the rate of indexing between this category and the more than 1,500 informational and extension circulars and leaflets is not statistically significant. About one-third, or almost 33 percent, of the informational reports are under bibliographical control. It is in these two informational categories that greatest selectivity is needed. Undoubtedly, a large proportion of those not included are not appropriate for indexing.

Trade Books. Books published by commercial publishers and university presses and chapters and parts of these books have about a 70 percent chance of being indexed. Out of 149 items in this category, it is estimated that 86 (58 percent) are to be found in *Bibliography of Agriculture;* 48 (32 percent) in *World Abstracts of Agricultural Economics and Rural Sociology;* 31 (21 percent) in *International Bibliography of Economics;* 25 (17 percent) in *Agricultural Index;* and 20 (13 percent) in *PAIS Bulletin.*

Statistical Reports. The population includes a representative group of 156 statistical reports, an equal number published by the Statistical Reporting Service of the USDA and by state statistical reporting services.

About one-half of the total number of statistical reports are indexed. However, a further breakdown by source indicates that almost 80 percent of the USDA reports are indexed, as compared to 24 percent of the reports issued by states.

Theses. The theses in the population are for both master's and Ph.D. degrees, but only Ph.D. didssertations listed in *Dissertation Abstracts* are indexed. Not all these are suitable for inclusion in an information service, but efforts should be made to increase the number of Ph.D. theses listed and to include the more important master's theses.

There are also significant differences in the rate of indexing among the sources of publications (see Table 7). A more detailed analysis of the indexing rates of sources, broken down by form, should provide greater understanding of how to improve the bibliographical control in the field.

U. S. Federal Government

Over 65 percent of U. S. government publications are indexed, representing the highest rate of indexing by source. The differences in the rate of indexing between federal publications and those of each of the other types of publishers are statistically significant.

The two informational categories have the highest indexing rates among government publications. About 93 percent of the U. S. informational reports are estimated to have been indexed. All of the Economic Research Service informational reports, the Farmer's Bulletins of the USDA, agricultural handbooks, and marketing bulletins were found in either *Agricultural Index, Bibliography of Agriculture, WAERSA,* or *PAIS Bulletin.* Those publications not indexed were the reports of the Federal Extension Service.

Articles from the following federal informational periodicals are included in the sample: *News for Farmer Cooperatives,* a publication of the U. S. Farmer Cooperatve Service; the *Extension Service Review;* the *Federal Reserve Bulletin;* and *Farm Index* of the Economic Research Service. All articles in U. S. informational periodicals were found, except those in *Farm Index.*

USDA research reports in series and articles in U. S. government research journals are indexed at very high rates. Included in the research report series are those of the various divisions of the Economic Research Service as well as the AMS series of the Agricultural Marketing Service. A total of 311 research reports, or 88 percent, are estimated to be indexed in one of five bibliographical services.

Articles in U. S. federal research journals were estimated to be indexed at the rate of 84 percent. The majority of the articles are from the USDA's *Agricultural Economics Research* and *The Agricultural Finance Outlook.*

Eighty percent of the statistical reports of the Economic Research Service and the Statistical Reporting Service are estimated to be indexed by one of four services. However, it is distressing that *Agricultural Index,* the service that indexed the highest number of these reports (62 percent), has discontinued indexing USDA publications. The other services that

index USDA statistical reports are *PAIS Bulletin* (34 percent), *Bibliography of Agriculture* (31 percent), and *WAERSA* (10 percent).

The miscellaneous publications in the sample include annual reports, hearings, and the "miscellaneous publications" series of the Economic Research Service. The ERS "miscellaneous publications," which are bibliographies and lists of references on various topics, are indexed completely by *Bibliography of Agriculture, Agricultural Index, World Abstracts,* or *PAIS Bulletin* combined and, in most cases, by two, three, or all four. The seven articles in U. S. government yearbooks are all in the *USDA Yearbook of Agriculture,* and all are indexed in *Bibliography of Agriculture.* Of 15 items contained in published hearings, only two were found and these in the *Bibliography of Agriculture.*

Separate research reports by agricultural economists are published by several departments of the U. S. federal government; some are parts of larger reports or comprise joint authorship of committee reports. Only about one-third of these reports are listed in the bibliographical services. The only separate reports of agricultural economists which were found are the publications in the "Unnumbered" and "Other Reports" series of the Economic Research Service of the USDA. Agencies publishing reports which are not indexed in any of the services are: the Department of Labor; the President's Committee to Appraise Employment and Unemployment Statistics; the U. S. Extension Service; Voice of America (Special Publication); U. S. AID, Department of State; the President's Science Advisory Committee Life Sciences Panel.

It can be concluded that government publications which are included in serial or journal form have a greater chance of being indexed than if published as separates. Publications by U. S. government agencies outside of the Department of Agriculture are not generally included in the indexing service, possibly because they do not come to the attention of the services. Other bibliographies of government publications, such as the *Monthly Catalog of U. S. Government Publications* and the *U. S. Government Research Reports,* must be consulted to locate a large number of government publications. There are actually greater gaps in the indexing and abstracting of USDA reports of the Statistical Repotring Service and the Economic Research Service than shown by this study because of the change in the indexing policy of *Agricultural Index.*

National and Regional Organizations

A total of 54.13 percent of the 981 publications of national and regional organizations are indexed. These organizations have been described in some detail in Chapter II. A few examples of specific publications that have high and low indexing rates might be helpful here. The preponderance of articles from the American Farm Economic Association's *Journal of Farm Economics* precluded a high indexing rate for research journals because all of them were found in *Bibliography of Agriculture.* However, agricultural economists must search other specialized indexes to find articles in non-agricultural and non-economic journals.

Over one-half of the serial research reports of the national and regional organizations are indexed, but the coverage of the reports of specific series is spotty. For example, only about one-half of the bulletins in the Southern Cooperative Series are indexed, and the reports of the Agricultural Policy Institute and Farm Foundation have only minimal coverage. On the other hand, all of the reports of the Center for Agricultural and Economic Adjustment of Iowa State University were found in the *Bibliography of Agriculture* and a few in WAERSA also. Examples of series not indexed are the Great Plains Agricultural Council Publications, the General Series of the National Bureau of Economic Research, North Central Publications, and Mutual Insurance Circulation Papers of the National Association of Mutual Insurance Companies.

Less than half of the articles in informational periodicals were indexed. Many of those not found are in non-agricultural and non-economic journals or in obscure or strictly news publications. Examples of some of the periodical titles not indexed in these services are *Banking, Dairyman's League News, Agricultural Ammonia News, The Cooperative Accountant, The American Legion Magazine, Camping Magazine,* and *Social Order.* There is evidence of selectivity of the articles in this group. Some of the articles in a periodical are indexed and others in the same periodicals are not listed. Selection apparently is based on the quality or subject to the individual article.

Among published proceedings, there are serious gaps. Only about one-third are under bibliographical control, and there seems to be no pattern or policy guiding selectivity. The presence of a publication in one of the indexes seems to be determined largely by chance.

The indexing of these publications could be increased if greater efforts were made to determine the national and regional societies that issue important publications, and to increase coverage, particularly of their published proceedings of conferences and symposia, separate research reports, and talks and papers. Many of these are issued in a limited number of copies and do not readily come to the attention of bibligrophical services.

University and College Publications

The 4,100 publications of colleges and universities constitute over half of the publications of agricultural economists, but only about 45 percent of these are under bibliographical control.

The great majority of the publications of universities are experiment station, extension, and agricultural economics departmental publications. It is surprising that 30 percent of the research bulletins in series are not indexed. The majority of the publications not indexed are published by general economics and non-agricultural departments. Great efforts should be made to include published proceedings of conferences, separate research reports, papers and talks which are issued by university departments and which do not now come to the attention of any bibliographical service.

Trade Publishers and University Presses

The publications of trade publishers and university presses include books and trade magazines. The 683 articles in trade periodicals constitute

one of the largest categories of publications.

Only about 27 percent of the articles in informational periodicals by trade publishers are indexed as compared to 92 percent of those published by government agencies and 63 percent of those published by universities. There seems to be high selectivity of those articles included. Many of these articles concentrate on "how-to-do-it" techniques and therefore are not included. Many popular and practical articles, such as "How Large Should Your Sales Area Be" from *Milk Dealer*, "Direct Selling is Better Farming" and "How to Make $10,000 a Year on Your Dairy Farm" from *Better Farming Methods*, are indexed in *Bibliography of Agriculture*. On the other hand, "Marketing Orders and Agreements—Their Economic Implications" from *Better Farming Methods* is not indexed. A comparison of those articles indexed with those not indexed reveals no pattern or meaningful policy as to why one article from the same periodical was chosen to be indexed and another was not. Again, it appears that chance, or perhaps the judgment of indexers, plays a large part in the indexing of articles from trade periodicals.

Books by agricultural economists are published by both trade publishers and by university presses. Included in the sample are 15 full-length books and 36 chapters from books, making a total of 51 items. Of the books and chapters 72.55 percent were found to be indexed, including all 15 books in the sample.

Foreign Publishers and International Organizations

A total of 160 items were published outside the United States or by international organizations. The only form of foreign and international publications with indexing rate above 50 percent is the research journal article. The foreign and international publications of U. S. agricultural economists reflect their increasing involvement in the agriculture of the developing countries. It is unfortunate that a greater number of these publications are not listed in the bibliographical services.

The number of foreign research journal articles in the total population is 57, representing more than 30 different journals. U. S. agricultural economists published articles in journals of the following foreign countries: Australia, Canada, England, France, Germany, India, Ireland, Italy, Pakistan, Poland, Thailand, and Venezuela. In addition, articles appeared in journals of international organizations, including the *Monthly Bulletin of Agricultural Economics and Statistics of the Food and Agricultural Organization; Fatis Review*, the Journal of the Organization for Economic Cooperation and Development; *Documentation in Food and Agriculture*, the Bulletin of OECD; and the *International Economic Review*.

It is estimated that slightly over one-half (55 percent) of the foreign and international journal articles are indexed in one of the eight bibliographical services. It is not surprising that the greatest number of foreign journal articles are included in WAERSA. This service abstracted about 40 percent of the foreign journal articles; *Bibliography of Agriculture* indexed 29 percent; *International Bibliography of Economics*, 13 percent; and *PAIS Bulletin*, 6 percent.

Except for rseearch journal articles, no significant number of foreign publications of U. S. agriculutral economists are indexed. Generally, special reports on marketing and economic problems for foreign governments or international organizations do not come to the attention of indexing services. Of some 40 foreign research reports, none of the separate reports and only three of those in series were indexed.

State Government Agencies

Statistical reports of cooperative crop and livestock reporting services in each state are the only types of publications in agricultural economics which are published in any quantity by state government agencies. A total of 73 representative state statistical reports are in the population. However, only an estimated one-fourth of these are indexed, all in *Bibliography of Agriculture*, except for a single report which appeared in *Agricultural Index*. A comparison of statistical reports indexed and those not indexed reveals no apparent pattern in the selection of reports for indexing. One factor which may play an important role in determining if a report will be listed in *Bibliography of Agriculture* is its time limit of six months imposed by the service; it is possible that most state statistical reports are excluded from *Bibliography of Agriculture* because they reach the National Agricultural Library six months or more after they are published. Since 1965, however, the time limitation has been changed to one year.

Local or State Publications (Non-official)

Only 11 percent of the 570 local and state publications are listed in the eight bibliographical services, constituting the lowest indexing rate of any of the source categories.

If articles appear in agricultural research journals, they are more likely to be indexed than those in journals of state scientific societies.

Papers and talks presented at local and state societies which become a part of published proceedings, have a 43 percent chance of being indexed by the *Bibliography of Agriculture* (no other indexing service listed them), but if issued as separates, they are not likely to be listed by any indexing service.

The reasons some of these papers get indexed and others remain unlisted are not obvious. Undoubtedly, chance plays some role in determining if a publication will come to the attention of a bibliographical service at the proper time to meet deadline policies of the individual service. It does not appear that the quality or the research value of the article play significant roles in this regard. While none of the separately published papers and talks given at state and local meetings were indexed, most of them are not appropriate for indexing at the national level because they are popular presentations of research findings that have only local or state interest. This category of publications would naturally have very low priority in a national indexing service.

Informational periodicals written primarily for the farmer at the state and local level are numerous and, in terms of quantity, constitute a major

source of publication of agriculutral economists. Examples of periodicals in this category are: *Alabama Agribusiness, Maryland Dairy Production News, Arkansas Poultry News, Georgia Farmer, Ohio Farmer, County Farm News Service* (New York), *The Indiana Farmer, Minnesota Farm Business Notes,* etc. It is estimated that only 6.25 percent of the articles from informational local and state periodicals are indexed, the lowest indexing rate of any source of informational periodicals. In comparison, 90.91 percent of those pubilshed by the U. S. federal government are indexed, 62.69 percent of those published by universities, 44.19 percent of those published by national and regional organizations, and 26.97 percent of those published by trade publishers for a national audience. The indexing rate of informational periodical articles seems to be related not so much to the fact that it is popular in nature as to the authority of the publisher and the national interest of the publication.

Commercial and Research Firms

A total of 33 publications issued by commercial and research firms are in the sample; only six of these were located in the indexes.

Of the 27 publications of commercial and research firms not indexed, 15 are separate research reports, eight commercially-sponsored conference proceedings, and four annual statistical reports. The separate research reports include five studies published by Arthur D. Little, Inc., four economic and engineering surveys by engineering firms; and a treatise on nonlinear programming, published by General Electric Co. Proceedings of conferences in which papers by agricultural economists appear are sponsored by IBM and the First National Bank of Chicago. The four statistical reports are annual compilations on citrus grove costs and yields published by the Florida Citrus Mutual.

All of the research publications of commercial firms have important research value and warrant inclusion in bibliographical services. These are examples of publications of interest to agricultural economists which, under the present bibliographic organization, either never come to the attention of present indexing services, or, for some policy or judgemental reason, are not indexed.

Effectiveness of Individual Bibliographical Services

The *Bibliography of Agriculture* is the most successful in listing the publications of agricultural economics. Of the 3,395 items which were estimated to be indexed in all services, *Bibliography of Agriculture* listed an estimated 3,004 items, or 39.4 percent of the total population of publications. The second most successful service is the other general service in the field of agriculture, *Agricultural Index,* which listed an estimated 1,359 or 17.48 percent of the population. An estimated 664, or 8.71 percent, of the items were located in *World Agricultural Economics and Rural Sociology Abstracts.* However, it must be pointed out that the period of the study, 1961-63, was a time of experimentation for *WAERSA.* During these early

years of its history, it was undergoing serious financial difficulties because of the expiration of foundation grants. In 1964 the Review Conference of the Commonwealth Agricultural Bureaux (CAB) assumed responsibility for the publication, and the editorial offices of *WAERSA* were transferred from Vienna to Oxford, England. Great improvements have taken place in the organizational and financial structure of *WAERSA*. Recent correspondence from its present editor indicates that the coverage of U. S. publications has been increased substantialy. It is estimated that roughly 20 percent of U. S. publications are indexed now, a considerable improvement since the time of the present study. *PAIS Bulletin* listed 3.58 percent or 273 of the total number of items. The four services which listed the smallest number of publications are the general economics services and the two specialized services in related fields. It is clear that the literature of agricultural economics has a greater chance of being indexed in general agricultural services than in general economics services or even in the present specialized service in agricultural economics.

Conclusions

The major conclusions, based on the data in Chapter III, are as follows:

1. *Differences in rates of indexing.* There are statistically significant differences in the rates of indexing among forms of publications and among publishing sources. The forms with the highest rates of indexing are research periodical articles, research monographs in series, and trade books; the forms with the lowest rates of indexing are separate research monographs and separate papers and talks. The publishing sources with the highest rates of indexing are U. S. government agencies and national or regional organizations; the publishing sources with the lowest rates of indexing are local and state organizations.

These findings cannot be generalized for other fields, but Bradford's hypothesis that indexing and abstracting services concentrate mainly upon periodicals and that they generally index non-periodical and non-serial publications to a lesser extent is supported for the field of agricultural economics.

2. *Total listings.* Less than one-half (45 percent) of the total number of publications of agricultural economists are estimated to be listed in one of the eight bibliographical services. Two-thirds of the publications are in forms that have indexing rates of less than 40 percent.

3. *Indexing rate of Bibliography of Agriculture.* The most successful of the bibliographical services, *The Bibliography of Agriculture*, has a total indexing effectiveness rate of about 40 percent but about a 65-67 percent coverage of both research journals and research monographs in series and about 58 percent coverage of trade books. It was found that this gives only minimal coverage of separate talks and papers and separate research papers and about a 30 percent coverage of trade and informational periodicals, statistical reports, published proceedings of conferences, theses, and informational circulars. About 55 percent of U. S. government publications and about 41 percent of the publications of universities and experiment stations were indexed.

Special attempts should be made to determine the national and regional as well as local and state organizations, societies, and associations that issue published proceedings of conferences, talks and papers, separate research reports and research reports in series and to list a greater number of these.

4. *Factors influencing indexing.* By analyzing significance of difference ratios among forms and sources of publications, four factors that influence indexing have been identified:

(1) *The form of publication.* The most important determining factor seems to be the form of the publication. If a publication appears as a part of a *series* or periodical, it has a significantly greater chance of being indexed than if it appears as a *separate* publication. This factor is clearly established as the most important determinant because of the differences, significant above 1 percent level of confidence, in the rates of indexing among serial publications and separates.

(2) *The national authority of the publisher.* A second important one is the national interest and the authority of the publisher. Thus we find that the most significant differences in indexing rates occur between U .S. government publications, which have the highest rate of indexing of any source, and state and local publications, which have the lowest rates of indexing, and between publications of national and regional organizations and state and local organizations.

(3) *The purpose of the publication in terms of research versus information.* Overall, research publications have a significantly higher rate of indexing than trade and informational publications, but those informational perodicals published by the U. S. government have as high indexing rate as U. S. government research journals, whereas local and state informational periodicals are among the lowest indexing rates, an example of the effect of two important factors working in combination.

(4) *"Chance" factors.* A fourth group of important determinants are such factors as the judgment of the indexer, policies and time limits imposed by individual bibliographical services, and the obscurity of the publication or publisher. These factors may be grouped under the heading of "chance." In some categories of publications, such as conference proceedings, separate papers, and research reports published by national and regional organizations, as well as statistical and research reports published by state agencies and private organizations, these factors of chance seem to play a major determining role as to whether a particular publication will in fact be indexed.

The findings relating to indexing rates of forms and sources are more reliable than those of individual indexing and abstracting services because of the changing policies of individual services. Indexing rates for a given period of time for a specific service may change completely in future years if the policies and organization of the service change. This is true in this study for *Agricultural Index* (now *Biological and Agricultural Index*) and for *World Agricultural Economics and Rural Sociology Abstracts,* both of which have changed drastically since the period of the study. The data for

individual services cannot be generalized for succeeding years unless the policies and organizations remain stable.

Chapter IV presents data on the use of the various types of publications and, thus, provides guidelines on the degree of selectivity necessary for various categories of publications.

Chapter IV

The Use of the Literature of Agricultural Economics: Analysis of a Questionnaire

An evaluation of bibliographical control cannot be made effectively without an understanding of the use of literature of the field. Moreover, recommendations for improvements should not be made without obtaining opinions of those who use the literature. A questionnaire was employed to determine how agricultural economists find information and the types of publications and bibliographical services they find most useful. It was adapted, with many modifications, from the one used by Tauber and Lilley in their study of educational media information.[1] The responses to the questionnaire have proved to be extremely valuable in understanding the relative usefulness of various types of publications and the methods employed by agricultural economists in finding information. The findings confirm many of the conclusions reached from the study of bibliographical services.

The Sample

A sample of agricultural economists from land grant universities and the U. S. Department of Agriculture was selected by the procedure described in Chapter I. The questionnaire was sent to a random sample of 592 agricultural economists. A total of 379, or 64 percent of the sample, returned the questionnaire.

In order to check on the representativeness of the small sample, the academic ranks and government service grades of the 379 economists in the small sample were compared with the 592 in the larger random sample. The comparative breakdown of the two samples is given in Table 8.

The only large difference between the two samples is a decrease of 6.73 percent in the "other" category in the small sample. Since this category is made up of extension specialists primarily, it can be assumed that those who did not return the questionnaire make less use of the literature than the USDA and university researchers and teachers with academic rank and government service grades. Therefore, this discrepancy tends to strengthen the small sample for the purposes of this study since it can be assumed that there is a higher proportion of economists who use literature to a great extent in the small sample than in the large sample.

Geographical Distribution

The sample includes a broad cross-section of agricultural economists from 49 universities and 47 states and from the USDA. The only states not

1. Maurice F. Tauber and Oliver L. Lilley, *Feasibility Study Regarding the Establishment of an Educational Media Research Information Service* (New York, School of Library Service, Columbia University, 1960).

Table 8. Comparison of Large and Small Samples of Agricultural Economists, By Academic Title and Government Service Rating, 1966

Rank	Number: Large Sample (592)	Number: Small Sample (379)	Percent: Large Sample	Percent: Small Sample	Difference
Instructor	35	15	5.91	3.98	−1.93
Assistant Prof.	102	65	17.23	17.15	−0.08
Associate Prof.	111	79	18.75	20.84	+1.09
Professor	142	89	23.99	23.49	−0.50
Other (university)	96	36	16.22	9.49	−6.73
GS-7	3	1	0.51	0.26	−0.25
GS-9	10	8	1.68	2.11	+0.43
GS-11	16	16	2.71	4.22	+1.51
GS-12	23	22	3.88	5.80	+1.92
GS-13	27	26	4.56	6.86	+2.30
GS-14	13	10	2.20	2.64	+0.44
GS-15 and above	14	12	2.36	3.16	+0.80
TOTAL	592	379	100.00	100.00	

represented are Alaska, Florida, and New Jersey. The institutions and agencies represented in the sample are listed below:

Arizona (U. of)	2	Nevada (U. of)	4
Arkansas (U. of)	5	New Hampshire (U. of)	2
Auburn U.	7	New Mexico State U.	6
California (U. at Berkeley)	2	N. C. A. and T.	1
California (U. at Davis)	5	N. C. State U.	13
Clemson U. (S. C.)	6	North Dakota State U.	1
Colorado State U.	6	Ohio State U.	10
Connecticut (U. of)	3	Oklahoma State U.	4
Cornell U. (N. Y.)	9	Oregon State U.	7
Delaware (U. of)	4	Pennsylvania State U.	6
Georgia (U. of)	12	Purdue U. (Indiana)	10
Hawaii (U. of)	5	Rhode Island (U. of)	3
Idaho (U. of)	4	South Dakota State U.	6
Iowa State U.	5	Tennessee (U. of)	13
Illinois (U. of)	8	Texas A. & M.	15
Kansas State U.	8	Utah State U.	3
Kentucky (U. of)	5	Vermont (U. of)	3
Louisiana State U.	5	Virginia Polytech. Inst.	4
Maine (U. of)	5	Washington State U.	9
Maryland (U. of)	7	West Virginia U.	3
Massachusetts (U. of)	2	Wisconsin (U. of)	12
Michigan State U.	11	Wyoming (U. of)	4
Minnesota (U. of)	10	USDA, Economic Research Service	70
Mississippi State U.	4	USDA (Other Agencies)	19
Missouri (U. of)	2		
Montana State U.	5		
Nebraska (U. of)	4	TOTAL	379

Fields of Research Work

Each respondent was asked to list first, second, and third areas of the research interests in order of importance. The respondents listed 359 first choices, 268 second choices, and 170 third choices by the use of 79 different phrases. The responses may be grouped into 14 categories. Table 9 gives a summary of the fields of research interest, arranged in rank order by the total number of times listed. The classification of economic research interests into broad categories is difficult because of inevitable overlapping and the difference in interpretation of phrases. Admittedly, the classification in Table 9 is not precise, but it does give an indication of the research activities of the researchers in the sample.

Over one-third of the economists indicated that their main research activity was in the area of marketing, and about half of these named specific products in which they specialized. Dairy products (20), livestock (11), eggs and poultry (9), and fruits and vegetables (9) ranked highest among specialized marketing interests. Production economics, which includes studies of development such as "agricultural development," "economic development," "technological development," "resource economics,"

Table 9. Fields of Research of a National Sample of Agricultural Economists Included In the Study of the Use of Agricultural Economics Literature, 1966

Field of Research	1st Choice	2nd Choice	3rd Choice	Total Choices
Marketing	123	53	27	203
Production economics	86	69	35	190
Management	57	26	19	102
Policy	13	27	26	66
Demand, income, prices	15	24	15	54
Methodology (statistics, econometrics)	8	13	11	32
Land economics & appraisal	15	8	5	28
General theory & history	5	11	12	28
International economics	12	11	2	25
Consumer & food economics	8	8	8	24
Cooperatives	5	8	2	15
Water resources	8	2	2	12
Socio-economics	2	4	4	10
Human resources	2	4	2	8
TOTALS	359	268	170	797

and "regional economics," constituted the second largest area of research. The area of production economics (86) and management (57) also made up over one-third of primary research interests of the economists in the sample. About 70 percent of the sample indicated that their research interests fell in marketing, production economics, and management in that order of importance. Significantly smaller numbers indicated other areas as their first interest. (See Table 9)

Results of the Use Study

Table 10 provides information on the degree of usefulness of information sources to agricultural economists, arranged from most useful to least useful as rated by the respondents.

Extensive use is made of information sources by agricultural economists. But how do they find information? What methods and publications do they use? An analysis of the questionnaire provides partial answers to these questions. The range of approaches is considerable. The sources and approaches used depend to a great extent on the purpose of the search. Some of the general comments from the questionnaire are indicative of this multiple approach:

> In the field of natural resource economics we are interested in a wide variety of economic and related-discipline articles and publications from many sources. Many journals and sources are consulted, but not standard bibliograhpical services in agricultural economics.

> For this reason [inadequacy of coverage, currency and subject headings of present bibliographical services], my usual survey of literature starts with a handful of recent journals. I then trace back through the bibliography listed by the author of the latest article on the subject . . . . I have found this procedure is quicker, and usually uncovers articles more recent than are listed by bibliographies.

> Tap every source you can lay your hands on!

> There are many unnumbered mimeos that I find out about and obtain through friends and there is never any reference to them. Exchanges fostered by regional committees and man-to-man arrangements between friends in other states work best.

Agricultural economists find informal discussion with colleagues and direct use of professional publications of their field of greater value in keeping up with current developments than existing indexing and abstracting services.

It is well-established that a large amount of useful scie ntific information is exchanged verbally and informally. One writer estimates that "possibly as much as 85 percent of useful scientific information is exchanged informally and verbally before the usual bibliographic tools are consulted to ascertain whether published information is available."[2] It is not surprising then that conversations with colleagues at work and at meetings received the

2. Don R. Swanson, "On Improving Communications among Scientists," *The Library Quarterly*, 36 (April 1966), p. 80.

Table 10. Degree of Usefulness of Information Sources to Agricultural Economists For Current Awareness, Arranged In Order of Overall Ratings

Information Source	Percent Respondents: Excellent	Fair or Better	Poor	Never Use	Overall Rating	N
Conversations at work	35.9	98.9	0.8	0.3	2.00	376
Discussions at meetings	27.9	96.3	2.9	0.8	2.30	377
Periodical of AFEA (complete texts)	22.8	90.4	4.8	4.8	2.60	377
Serial pubs. of USDA (complete texts)	16.4	93.7	3.4	2.9	2.60	378
Bulletins of ag. exp. stations	21.3	89.3	6.7	4.0	2.64	375
Correspondence with colleagues	13.0	89.6	7.5	2.9	2.76	376
Information from workshops	17.8	88.3	4.8	6.9	2.77	377
Papers heard at meetings	10.1	93.3	5.2	1.1	2.84	376
Lists of pubs. in JFE	16.1	86.3	4.3	9.4	2.84	373
Serial pubs. of USDA (summaries)	12.3	91.1	4.3	4.5	2.87	373
Pubs. of ag. econ. depts. (summaries)	13.1	85.8	6.4	7.8	2.88	373
Pubs. of ag. econ. depts. (complete texts)	9.9	88.0	4.8	7.2	2.97	377
Treatises and handbooks	9.2	84.3	8.4	7.3	3.11	369
Periodicals of ag. exp. stations (summaries)	8.0	81.5	8.6	9.9	3.26	373
Memos from dept. head	8.8	77.7	15.2	7.2	3.34	375
Periodicals of ag. exp. sta. (complete texts)	5.3	80.6	12.0	7.4	3.36	376
Serial pubs. of gov't dept. (complete report)	6.6	81.5	9.3	9.3	3.43	376
Journals of economics (summaries)	9.2	72.7	9.7	17.6	3.49	370
Journals of economics (complete text)	8.5	73.5	9.1	17.4	3.57	374
Bib. of Agriculture	7.5	70.4	5.6	23.9	3.61	372
Serial pubs. of gov't dept. (summaries)	3.5	76.1	11.6	12.3	3.63	372
Extension pubs.	2.4	68.9	17.3	13.8	3.80	376
Lists of pub. in AER	8.6	59.8	9.1	31.1	3.83	373
Index of Econ. Journals	12.4	53.4	5.7	40.8	3.99	370
Journal of Econ. Abst.	8.2	52.3	6.5	41.1	4.09	367
Journals of other fields (complete report)	4.1	57.1	16.5	27.0	4.12	370
Prof. journals of agri. (complete report)	4.1	54.4	21.7	23.4	4.13	369
Pop. periodicals of agri.	3.8	57.1	21.7	21.2	4.16	373
USDA-Coop. State Exp. Sta. Research in Progress	4.3	50.6	11.6	37.7	4.22	371
Prof. journals of agri. (summaries)	1.9	50.3	18.5	31.3	4.27	368
Bioligical & Agri. Index	3.3	39.6	10.4	50.0	4.55	366
Yearbooks (complete reports)	0.5	34.0	16.5	49.5	4.80	370
WAERSA	2.7	33.9	8.1	58.0	4.82	371
Yearbooks (summaries)	0.0	42.2	18.0	49.7	4.87	372
International Bib. of Econ.	1.3	21.7	5.6	72.7	5.26	373
Biological Abst.	1.1	16.8	7.0	76.2	5.32	369
Public Affairs Info. Bull.	1.3	14.3	5.9	79.8	5.41	371

highest overall usefulness ratings by agricultural economists. Only one respondent said he never used conversation with colleagues at work as a means of keeping currently aware of research developments. Thirty-six percent rated this approach as "excellent," 45 percent as "very good," 21 percent "good." Only three respondents rated it as "poor." Discussions with colleagues at meetings received the second best rating. Since these methods received the most favorable uesefulness rating, it is appropriate to comment here that several respondents indicated that one reason that they used informal methods to such a great extent was the inadequate or delayed coverage of agricultural economics literature in existing and abstracting services.

The information sources that received the greatest amount of use are conversations with colleagues, discussions at meetings, reading of the *Journal of Farm Economics*, USDA serial publications, bulletins of agricultural experiment stations, correspondence with colleagues, information from workshops, papers heard at meetings, and publications of agricultural economic departments, in that order. All of these are informal methods or direct use of professional publications.

Many categories of publications rated as highly useful by users have low rates of indexing and these are the categories of publications that should be more completely indexed.

The bibliographical service that receives the greatest amount of use by U. S. agricultural economists is *Bibliography of Agriculture.* Its overall usefulness rating is between "Good" and "Fair" and is the best given to any of the indexing and abstracting services. All indexing and abstracting services have a high non-use rate among agricultural economists. For example, 58 percent of the respondents stated that they never use *World Agricultural Economics and Rural Sociology Abstracts*, and 73 percent of the respondents stated that they never use the *International Bibliography of Economics. Bibliography of Agriculture's* non-use rate of 23 percent is the lowest of any of the indexing and abstracting services.

The questionnaire included questions relating to the promptness of reporting and the subject headings used in existing indexes and abstracting services. Users expressed greater dissatisfaction with the promptness with which publications are listed than with the comprehensiveness of reporting or the subject headings and classification used. Greater depth of indexing, up-dated subject headings, and headings using general economics terminology were strongly urged by respondents to the questionnaire.

Major Conclusions

The major conclusions regarding the use of the literature are the following:

1. Agricultural economists make extensive use of the specialized literature of their field, but considerably less use of the litrature of other fields. As the subject field of the literature becomes less specifically related to economics, agricultural economists' use of the literature decreases in depth and frequency.

2. Agricultural economists find direct contact with their colleagues and

their own professional publications of far greater use in keeping up with current development than the use of bibliographical services.

3. The *Bibliography of Agriculture* is the indexing and abstracting service that receives the greatest amount of use by agricultural economists.

4. There is gerater dissatisfaction with promptness of reporting research than with the thoroughness of reporting in bibliographical services. It appears that one of the major reasons that informal communications and direct consultation of professional literature are used to a greater extent than indexing and abstracting services is the length of time that it takes for research to be included in the bibliographical services after publication.

5. Statistical reports of the Economic Research Service, Statistical Reporting Service, and the state crop and livestock reporting services are used extensively but are not generally located through indexing and abstracting services.

6. There seem to be no strong feelings that subject headings are either extremely good or bad. There was a slight preference for the subject classification in the *Index of Economic Journals,* which contains a classified subject arrangement using traditional concepts of functions in general economics. Some opinion was expressed that subject headings used in existing services need to be up-dated and based on traditional economic concepts. The opinion was expressed also that greater depth of indexing was needed.

7. Agricultural economists use many approaches in finding information, depending upon the nature of the particular search. However, due to inadequate coverage of certain types of publications and to a lack of currency in reporting, the indexes and abstracting services are used to a lesser extent than informal communication and direct use of materials.

8. It is clear that many categories of publications should not be completely indexed, but rather, the levels of indexing should be based upon their usefulness to the researcher or the reader.

Chapter V

Conclusions and Recommendations

On the basis of the findings of this study, it is hoped that steps can be taken to meet more adequately the information needs of researchers, teachers, extension workers, and agriculturalists.

It has been clearly established that a well-defined, specialized literature of agricultural economics does exist. This body of professional literature includes: (1) articles that appear in agricultural economics research journals, (2) trade books on agricultural policy and economic problems of agriculture, (3) research reports, talks and other publications of agencies of the U. S. Department of Agriculture, (4) research reports by agricultural economists issued by the state agricultural experiment stations and departments of economics in land-grant universities, (5) proceedings and papers of agricultural workshops, conferences, and institutes, (6) research reports of national and regional agricultural and agricultural economics organizations, such as the Farm Foundation, the Agricultural Policy Institute, the Center for Agricultural and Economic Adjustment and the Western Farm Economics Association. These professional and research publications are not only produced by agricultural economists, but are used most frequently by them. They should receive first priority for listing in a specialized agricutural economics information service.

The study of indexing rates, supported by the data on use, brings into serious question the adequacy of existing bibliographic services in providing access to the information of agricultural economcs as thoroughly and as promptly as needed by users. It is important that communications between librarians and information specialists, on the one hand, and subject specialists, on the other, be improved. Those who are responsiile for providing information need to know the types of materials and information that are important to the user. The use study points up the fact that there should be greater recognition of the informal methods of communication of researchers in the design of information services and that personalized information service is just as important and possibly more so in information transfer than formal methods and techniques.

Although there are significant differences in the rates of indexing and abstracting among various forms and sources of publications, large gaps exist in the indexing of all types of literature. A study of the data in Chapter III reveals that between 70 percent and 80 percent of the research literature in series and in periodicals is listed in the services, but only about 13 percent of the separate research reports is listed. The indexing rates of other forms and sources fall between these two extremes. About two-thirds of the papers in published proceedings of workshops, conferences, and institutes and about 85 percent of the separate papers given at conferences are *not* listed in existing bibliographical services.

General Economics Bibliographical Services. The indexing and abstracting journals in general economics index few specialized publicatons in applied fields of economics; since the general economics services are limited almost entirely to journal literature, the many important non-periodical

publications in economics are not included in any service. One respondent to the questionnaire recognizes the gap in the indexing of non-periodical literature in economics when he comments that "there is a need for a service for general economics similar to the *Bibliography of Agriculture* for agriculture."

The majority of the agricultural economists, in answering the questionnaire, stated that they did not use the general economics services. Greater knowledge of these services is needed because the analysis of the questionnaire showed that the literature of general economics is used to a greater extent by agricultural economists than that of any field other than the specialized literature of agricultural economics.

World Agricultural Economics and Rural Sociology Abstracts. It is recommended that arrangements be made for this service to give more comprehensive coverage to the important publications in the field. Attempts should be made to acquaint agricultural economists in the United States with WAERSA because of its wider coverage of foreign publications. It is the only service that lists any large proportion of the professional literature of the field in abstract form; this feature should also appeal to researchers who generally prefer shorter abstracts to any other form of reporting.

Bibliography of Agriculture. Of the present services, *Bibliography of Agriculture* has the greatest potential for providing the most comprehensive coverage of agricultural economics literature because of the large amount of publishing in related agricultural fields and by general agricultural agencies, such as agricultural experiment stations.

More comprehensive coverage will undoubtedly be forthcoming when all recommendations of the *Agricultural Biological Literature Exploration Project* (Task Force ABLE) are implemented.[1] This project is a system study of the National Agricultural Library and its users. The report states that the problems of acquisition, dissemination, and bibliographic access to the agricultural literature is acute; the purpose of the study is to find ways to provide greater access by the application of computers to the solutions of these problems. One of the goals of the proposed system is to increase the number of bibliographic citations in the *Bibliography of Agriculture* by automating "the purely clerical functions and apply[ing] the savings in man hours to increased citation productions."[2]

In a recent interview with Mr. John B. Forbes, Chief of the Division of Indexing and Documentation of the National Agricultural Library, it was learned that a computerized file of bibliographic items may be possible after the new building for the National Agricultural Library becomes available in 1969. When magnetic tapes become available, it will be possible to retrieve bibliographic data on agricultural publications and their contents. It is possible that these tapes may be made available to other libraries, thus making agricultural bibiographic information more widely and more comprehensively available.

Another project which will improve the usefulness of the *Bibliography of Agriculture* is the Agricultural Vocabulary Project. Subject headings

1. U. S. Department of Agriculture, National Agricultural Library, *Agricultural Biological Literature Exploitation: A Systems Study of the National Agricultural Library (Report of Task Force ABLE)* (Washington, D. C.: USDA, 1965).

2. *Ibid.*, p. 5.

are being up-dated for use in the National Agricultural Library's catalog as well as the *Bibliography of Agriculture*. Experts in each subject discipline have reviewed headings and recent correspondence indicates that the Vocabulary List will soon be available. If proper procedures could be arranged, economists who are authors could be of great assistance to the *Bibliography of Agriculture* by indicating subject categories for their publications.

One reason for inadequate coverage of agricultural economics literature by the *Bibliography of Agriculture* is that publications of some agencies never reach the National Agricultural Library; others may reach the Library too late for inclusion in the *Bibliography of Agriculture*. Economists could provide real assistance by making sure that publications are sent to the National Agricultural Library promptly after publication. As a policy, the *Bibliography of Agriculture* omits any item bearing publication date more than one year earlier than the date of receipt.

In scientific and technical fields, information centers have developed because of the need to help the scientist and engineer utilize effectively the specialized literature that appears in many varied forms. In January of 1963, a report of the President's Science Advisory Committee, entitled *Science, Government, and Information* was published.[3] This now famous report by Dr. Alvin M. Weinburg, Chairman of the Committee, urged the establishment of more and better information centers.

Allen Kent has listed the functions of specialized information centers as follows: acquisitions, analysis (abstracting, indexing, classifying, extracting), terminology control, recording of results of analysis on searchable medium, storage of source documents, question analysis and development of search strategy, conducting of searches and delivery of results of search.[4] But Swanson, in a provocative article, "On Improving Communication among Scientists,"[5] envisions for the future a new kind of information center that could serve the informal verbal means of communication which are used to a greater extent now than the existing bibliographic services.

As a focus for improving information services, Swanson proposes considering the communication practices which researchers themselves have invented and initiated: informal verbal communication; the writing of reviews and summaries; mailing to selected colleagues reports, papers, reprints, and pre-prints; the use of citations in current journal articles. He says:

> My purpose is to suggest that at least certain of these and other informal and haphazard information activities be aided and amplified and that the potential advantage of organization and planning be brought to bear on the matter. The objective is improved communication, and the

3. *Science, Government, and Information: A Report of the President's Science Advisory Committee* (Washington, D. C.: Government Printing Office, 1963), pp. 33-34.

4. Allen Kent, *Specialized Information Centers* (Washington, D. C., Spartan Books, 1965), pp. 23-24.

5. Don R. Swanson, "On Improving Communication among Scientists," *The Library Quarterly*, 36 (April 1966), pp. 79-87.

questions of whether we then need new "centers" or bigger and better machines becomes subordinate (though still important) issues.[6]

There are now informal, small-audience, information-exchange groups of researchers and scientists with the same interests who exchange reprints and papers.[7] A few informal newsletters which circulate among small groups of scientists have developed. One function of specialized information centers of the future might be the identification of these small groups within a field, and perhaps the publication of periodic directories listing special interests of researchers. These centers, after identifying specialized groups, could then publish and circulate limited-audience newsletters, and sponsor select conferences of a few dozen people with the same specialized interests.

In reviewing the special problems of selection, acquisition, and dissemination of information in agricultural economcs, it seems clear that a specialized information center, working in cooperation with the Natonal Agricultural Library, would be highly desirable to achieve adequate control of the literature. It is recommended that this service be established within one of the existing agencies of the U. S. Department of Agriculture, possibly in the Economic Research Service, and that it be closely coordinated with the acquisitions policies of the National Agricultural Library. The primary objectives of this service would be the following:

1. The maintenance of a directory of information sources in the field. This would include organizations, industries, commercial establishments, research centers, libraries, institutes, academic departments, experiment stations and other agencies that participate in research and issue publications in agricultural economics.
2. Acquisition of a comprehensive collection of specialized professional and research publications in agricultural economics, especially those which do not now reach the National Agricultural Library.
3. Development of a systematic, centralized, and prompt announcement of studies in the field so that researchers, students, faculty members, extension workers, agriculturalists and farmers can find out about material promptly enough to meet their needs. First priority in announcing should be given to USDA and agricultural experiment station publications.
4. Gradual introduction of new approaches or equipment, including computerization.
5. The publication of review articles on selected areas of research interest, bringing together the important research bulletins of the U. S. Department of Agriculture and state agricultural experiment stations which make contributions to methodology and theory.
6. The development of suitable classification and descriptors for the field of agricultural economics. This may mean the preparation of a thesaurus which can be up-dated and revised as terminology changes. This effort should be coordinated with existing subject heading lists or

6. *Ibid.*, p. 80.

7. *cf.* Manfred Kochen, *Some Problems in Information Science* (New York: Scarecrow Press, 1965), pp. 271-88.

classification schemes, particularly those being developed by the National Agricultural Library.

7. The maintenance of an information service about research completed and in progress and the distribution of this information to researchers who have common interests.

8. The issuance of microfiche or microfilm edition of research reports, conference or workshop proceedings, papers, and talks which are issued in a limited number of copies.

The center should not duplicate the abstracting services of the *World Agricultural Economics and Rural Sociology Abstracts*, but instead concentrate on prompt announcement and making original research more accessible to the profession.

Summary of Recommendations to the Bibliographical Services and to the Agricultural Economics Profession

1. The coverage and currency of the *Bibliography of Agriculture* and general economics indexing and abstracting services should be expanded. Agricultural economists should assist in improving coverage of their publications by making sure that they are sent to the National Agricultural Library as promptly as possible.

2. The *World Agricultural Economics and Rural Sociology Abstracts* deserves greater support and use by American agricultural economists. Arrangements should be made to broaden its coverage into a world wide selective abstracting service for the research reports of permanent value, perhaps in cooperation with the *Biblography of Agriculture* and any specialized center which may be established.

3. The establishment of a specialized information center for agricultural economics literature in the U. S. Department of Agriculture, in coordination with the National Agricultural Library's acquisitions program would be highly desirable. The recommended functions of the center have been outlined.

4. The aiding of present informal methods of communication as one of the future roles of a specialized information center should be considered. These new services would include the organization of information exchange groups, the publication of a directory of researchers with the same specialized interests, the selective dissemination of specialized information to selected researchers with continuous feedback; the publication of reviews and summaries of research studies on broad topics, and studies of citations in current publications in the field.

5. A wider dissemination of information among agricultural economists about existing bibliographical services and other sources of information in the field is a must for the profession.

6. Subject headings or classification for agricultural economics needs careful study. It is strongly recommended that the bibliographical services consider the following: (a) a greater depth of indexing, (b) the up-dating of terminology of subject headings and the compilation and constant up-dating of a thesaurus for the field, (c) the greater use of general

economic terminology combined with the practical crop and product-oriented headings, and (d) the development of procedures whereby economists could assign suitable subject headings to their publications, possibly from a standard thesaurus.

Summary of General Findings and Recommendations for Further Research

This study is the most comprehensive to date of a discipline in the area of agriculture. There are several general findings of the study which have important implications for librarianship and information science and which may lead to further study:

1. It is clear that many of the characteristics of the literature of agricutlural economics are different from those of the basic social sciences and sciences.
   a. Title dispersion in agricultural economics is greater than in the sciences and basic social sciences.
   b. Research in the field is published primarily in monographs or bulletins, rather than in journals.
   c. Publication in the field is primarily in the broad subject area of agriculture, rather than in economics. This pattern of publishing may be typical of other fields in the agricultural sciences. It is possible that future studies will show that the literature of other agricultural sciences have similar characteristics to agricultural economics.
2. The central hypothesis that significant differences exist in the rates of indexing among forms and sources of publications was strongly confirmed.
3. By analyzing significance of difference ratios among forms and sources of publications, four factors that influence indexing have been identified.
   a. The form of publication.
   b. The national authority of the publisher.
   c. The purpose of the publication in terms of research versus information.
   d. "Chance" factors, such as the judgment of the indexer, policies and time limits imposed by individual indexes, and the obscurity of the publication or publisher.
4. This study generally supports the thesis that the degree to which a field is under bibliographic control is related to the characteristics of its literature (i.e., the degree of title dispersion, the forms in which publications appear, and the sources of publications).

The differences in indexing rates among forms and sources are based on a combination of services and are, therefore, it can be assumed, relatively stable.

The findings relating to indexing rates of forms and sources for several indexing services combined are more reliable than those of individual services.

Indexing rates of individual bibliographic services are subject to the greatest change and are likely to improve tremendously. As pointed out in

Chapter III, the indexing rate of a specific service for a given period of time may change completely in future years if policies and organization change, if financial support is increased or decreased, or if new methods and technology are introduced. This is true for *Agricultural Index* (now *Biological and Agricultural Index*) and for *World Agricultural Economics and Rural Sociology Abstracts*, both of which have had drastic changes in policies, organization and financial support even since the period of this study. Undoubtedly, the coverage for agricultural economics in *Bibliography of Agriculture* has increased since 1963 because of the use of new technology and increased financial support. It cannot be emphasized too strongly that the data for individual services cannot be generalized for succeeding years unless the policies and organizations remain stable.

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Appendices

Appendix I

Research and Professional Journals In Which Agricultural Economists Published, 1961-63

	Name of Journal	No. of Articles	Cum. No. of References
1.	Journal of Farm Economics	241	241
2.	Agricultural Economics Research	38	279
3.	Quarterly Bulletin	26	305
4.	Agricultural Policy Review	19	324
5.	Journal of American Society of Farm Managers and Rural Appraisers	15	339
6.	American Economic Review	12	351
7.	Poultry Science	11	362
8.	Journal of Land Economics	10	372
9.	Canadian Journal of Agricultural Economics	8	
10.	Journal of Soil and Water Conservation	8	388
11.	Food Technology	6	394
12.	Journal of Dairy Science	5	
13.	Southern Economic Journal	5	
14.	Journal of Forestry	5	
15.	Challenge	5	
16.	Journal of Political Economics	5	419
17.	Rural Sociology	4	
18.	Journal of American Statistical Association	4	
19.	Econometrica	4	
20.	Southwestern Social Science Quarterly	4	
21.	Hilgardia	4	
22.	Cahiers de l'Institut de Sci. Economique Apliqueé	4	443
23.	Journal of Economic History	3	
24.	Journal of Range Management	3	
25.	Kyklos	3	
26.	Agricultural Financial Outlook	3	
27.	Nebraska Law Review	3	
28.	Agrarwirtschaft	3	
29.	Journal of Rio Grande Valley Horticultural Society	3	464
30.	Journal of Agricultural and Veterinary Science	2	
31.	Modern Age	2	
32.	Operations Research	2	
33.	Public Administration Review	2	
34.	American Sociological Review	2	
35.	Journal of Animal Science	2	
36.	Banking Journal of American Bankers Assn.	2	
37.	Agronomy Journal	2	
38.	Journal of Regional Science	2	
39.	Journal of Marketing	2	
40.	Agricultural Education Magazine	2	
41.	Transactions of SAE	2	
42.	Foreign Agriculture	2	
43.	Agricultural Finance Review	2	
44.	Human Organization	2	

(Continued)

Appendix I—Continued

Name of Journal	No. of Articles	Cum. No. of References
45. Natural Resources Journal	2	
46. Journal of Pakistan Academy for Village Development	2	
47. Indian Journal of Agricultural Economics	2	
48. Journal of Agricultural Economics	2	
49. Documentation in Food and Agriculture	2	
50. Monthly Bulletin of Agricultural Economics and Statistics	2	
51. Australian Journal of Agricultural Economics	2	
52. International Fruit World	2	510
53-119. Others—one each	67	577

Appendix II

Trade and Informational Periodicals In Which Agricultural Economists Published Articles, 1961-63

Name of Periodical	No. of Articles	Cum. No. of References
1. County Farm News Service	107	107
2. Virginia Farm Economics	59	166
3. Food Topics	57	223
4. Better Farming Methods	47	270
5. Minnesota Farm Business Notes	46	316
6. Timely Economic Information for Ohio Farmers	42	358
7. Michigan Farm Economics	40	408
8. Indiana Farmer	38	
9. Louisiana Rural Economist	38	484
10. Citrus and Vegetable Magazine	36	520
11. Poultry Tribune	33	
12. Ohio Farmer	33	586
13. Highlights of Agricultural Research	28	
14. Iowa Farm Science	28	642
15. Oklahoma C. F. E.	26	
16. Tennessee Farm and Home Science	26	
17. Successful Farming	26	720
18. Arkansas Farm Research	24	744
19. Arkansas Agricultural Economist	23	767
20. Dixie Dairyman	22	
21. Illinois Agricultural Economist	22	811
22. Citrus Industry	20	831
23. North Dakota Farm Research Bulletin	19	
24. Farm and Home Science	19	
25. Hoard's Dairyman	19	888
26. Broiler Business	18	
27. Prairie Farmer	18	
28. Maryland Agricultural Economist	18	942
29. Poultry Digest	17	949
30. Feedstuffs	16	
31. Poultry Processing and Marketing Magazine	16	981
32. Texas Agricultural Progress	15	996
33. Illinois Research	14	1,019

Name of Periodical	No. of Articles	Cum. No. of References
34. Ohio Farm and Home Research	13	
35. Farm Policy Forum	13	1,045
36. National Livestock Producer Magazine	12	
37. American Agriculture	12	
38. Agricultural Banker	12	1,081
39. Feed and Farm Supplier	11	
40. California Agriculture	11	
41. Michigan Farmer	11	1,114
42. Utah Farmer	10	
43. Progressive Agriculture	10	
44. Science for the Farmer	10	
45. Pennsylvania Farm Economics	10	
46. Sunshine State Agricultural Research Report	10	
47. Broiler Industry	10	1,174
48. Alabama Agribusiness	9	
49. Everybody's Poultry Magazine	9	
50. Farm Mechanization	9	
51. Turkey Producer	9	1,210
52. Buckeye Farm News	8	
53. Turkey World	8	1,226
54. Cornell Countryman	7	
55. American Milk Review	7	
56. Cordially Yours	7	1,247
57. National Wool Grower	6	
58. Mutual Insurance Bulletin	6	
59. Farm Bureau News	6	
60. Dakota Farmer	6	
61. Farm Store Merchandising	6	
62. Ice Cream Field	6	
63. Ford Farm Management	6	
64. Farm Chemicals	6	1,286
65. Montana Farmer Stockman	5	
66. Gobbles	5	
67. Georgia Farmer Magazine	5	
68. Kentucky Farmer	5	
69. Indiana Business Review	5	
70. News for Farmer Coops	5	
71. Minnesota Farm and Home Science	5	
72. Nevada Ranch and Home Review	5	
73. Louisiana Agriculture	5	
74. Tar Heel Farm Economist	5	
75. Veterinary Law Timely Topics	5	
76. Poultry Marketing Newsletter	5	
77. Farm Journal	5	
78. Sunbelt Dairyman Magazine	5	
79. Poultryman	5	
80. Extension Service Review	5	
81. Plant Food Review	5	1,371
82.-99. 18 Titles	4	1,452
100.-131. 32 Titles	3	1,548
132.-182. 51 Titles	2	1,650
183.-347. 165 Titles	1	1,815

Appendix III

Estimated Percent Publications Indexed In Population, By Form

Form of Publication	Percent Indexed in								
	Bib. of Ag.	Ag. Index	WAERSA	J. Econ. Abst.	IBE	PAIS	Dairy Science Abst.	BPI	One or More Services
Research & professional journals	65.11	33.89	23.76	2.12	20.55	5.48	0.00	1.61	80.53
Research monograph in series	66.65	32.73	20.43	0.00	2.02	9.01	1.36	0.00	72.10
Trade books or parts of books	57.90	16.81	32.43	0.00	20.55	13.08	0.00	0.00	69.81
Statistical reports	27.89	32.21	0.00	0.00	0.00	15.78	0.00	0.00	50.66
Trade or informational periodicals	32.81	16.26	2.06	0.00	0.00	0.32	0.00	0.05	38.11
Published proceedings, conferences, symposia, etc.	31.59	0.00	2.55	0.00	0.00	0.00	0.55	0.00	33.17
Informational reports or circulars	28.17	13.15	1.17	0.00	0.17	0.44	0.11	0.00	32.22
Miscellaneous (hearings, yearbooks, annual reports, bibliographies)	29.59	17.04	13.63	0.00	2.27	7.95	0.00	0.00	31.72
Theses and dissertations	28.78	0.00	24.94	0.00	0.00	0.00	0.00	0.00	30.77
Separate talks, & papers (not part of pub. proc.)	16.17	0.00	0.60	0.00	0.00	0.00	0.00	0.00	16.76
Separate research reports	7.69	4.71	3.34	0.00	2.14	5.34	1.20	0.00	12.66
ALL FORMS	39.40	17.83	8.71	0.16	2.60	3.58	0.44	0.13	44.54

N = 7,624

Appendix IV

Estimated Percent Publications Indexed In Population, By Source

Source of Publication	Percent Indexed in								
	Bib. of Ag.	Ag. Index	WAERSA	J. Econ. Abst.	IBE	PAIS	Dairy Science Abst.	BPI	One or More Services
U. S. federal government	55.57	31.87	38.98	0.00	4.44	18.05	0.20	0.11	65.29
National or regional organization or society	48.42	16.52	9.06	0.94	10.81	1.15	0.00	0.94	54.13
Universities and colleges	41.34	20.84	5.77	0.07	0.35	1.70	0.70	0.00	45.88
Trade publishers and university presses	29.91	6.74	6.65	0.00	3.70	2.35	0.00	0.00	34.89
Foreign publishers and internat'l organizations	16.00	0.00	18.70	0.00	4.65	2.01	1.87	0.00	27.83
State government agencies	18.00	1.80	0.00	0.00	0.00	1.01	0.00	0.00	21.58
Commercial and research firms	15.15	0.00	3.03	0.00	3.03	3.03	0.00	0.00	18.19
Local or state organizations	8.66	1.73	0.34	0.00	0.00	1.04	0.00	0.00	10.94
ALL SOURCES	39.40	17.83	8.71	0.16	2.60	3.58	0.44	0.13	44.54

N = 7,624

Appendix V

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May 1966

QUESTIONNAIRE ON SOURCES OF INFORMATION

ON AGRICULTURAL ECONOMICS

This questionnaire is being sent to approximately 500 agricultural economists who are engaged in significant research activities. The inquiry is directed to users of agricultural economics literature as part of a broad study designed to:

1. Determine the extent to which agricultural economics information is now indexed and abstracted and the variables which determine the probability that it will be brought under adequate bibliographical control.

2. Determine how agricultural economists find out about research in their field, what information they need, and how they obtain it.

3. Propose a plan or system for bringing the literature of agricultural economics under better bibliographical control.

The study is being financed in part by a grant from the American Farm Economics Association and a contract with the Economic Research Service, U. S. Department of Agriculture.

Objectives of the Questionnaire

In order to have a guide to follow in recommending the kind of a bibliographical apparatus that will meet the needs of agricultural economists we need some information concerning the ways in which you find out about research in the field and how you now use the literature. Questions are also designed to learn more about what you need in the way of economic information to carry on your research.

Your cooperation in completing and returning this questionnaire will be greatly appreciated.

I. T. Littleton
Librarian
N. C. State University
Raleigh, N. C.

THE UNIVERSITY OF NORTH CAROLINA, William Friday, President, comprises: North Carolina State University at Raleigh, the University of North Carolina at Chapel Hill, the University of North Carolina at Greensboro, and the University of North Carolina at Charlotte

1. Name _____

2. Institution _____

3. Main fields of research work in Agricultural Economics. List in order of importance

   1. _____

   2. _____

   3. _____

4. Academic rank, title or GS number _____

Part I. Use of Literature of Various Fields

To what extend do you need to draw upon the literature in the fields listed below? Check the appropriate column for each field

	Constantly	Very frequently	Frequently	Some but infrequently	None
(1) Agricultural Economics					
(2) General Economics					
(3) Marketing					
(4) Econometrics					
(5) Animal Sciences					
(6) Plant Sciences					
(7) Engineering					
(8) Political Science					
(9) Law					
(10) Sociology					
(11) History					
(12) Others: (specify)					

Part II. Usefulness of types of information sources in Agricultural Economics

Please indicate the degree of usefulness to you of those procedures you employ in keeping currently aware of developments in your field by making a check mark in the column appropriately describing its usefulness to you. If you never use the method or read the publication please check column 6.

A. Reading the complete, original texts of dissertations, theses, or research reports, which may appear in:

	Excellent	Very Good	Good	Fair	Poor	Never Use
(13) Separate monographs and research reports of Agricultural Exp. Stations						
(14) Periodicals of Agricultural Experiment Stations						
(15) Serial publications (journals, report series, etc.) of U.S. Dept. of Agriculture						
(16) Circulars or series of state Extension Agencies						
(17) Serial publications (journals, report series, etc.) of other governmental agencies						
(18) Periodicals of the American Farm Economic Assn.						
(19) Serial publications of university agricultural economic departments						
(20) Journals of general economics						
(21) Professional journals of agriculture						
(22) Popular journals of agriculture, such as SUCCESSFUL FARMING, PRAIRIE FARMER, etc.						
(23) Journals of other fields						
(24) Yearbooks of professional societies						

B. Reading the summaries or reviews of research, which may appear in:

	Excellent	Very Good	Good	Fair	Poor	Never Use
(25) Treatises (including textbooks), and handbooks						
(26) Periodicals of Agricultural Exp. Stations						
(27) Serial publications (journals, report series, etc.) of U.S. Dept. of Agriculture						
(28) Circulars or series of state Extension Agencies						
(29) Serial publications (journals, report series, etc.) of other governmental agencies						
(30) Periodicals of the American Farm Economic Assn. (JOURNAL OF FARM ECONOMICS)						
(31) Publications of university agricultural economic departments						
(32) Journals of general economics						
(33) Journals of professional societies In the field of agriculture						
(34) Popular journals of agriculture, such as SUCCESSFUL FARMING, PRAIRIE FARMER, etc.						
(35) Journals of other fields						
(36) Yearbooks of professional societies						
(37) USDA Cooperative State Exp. Station Service card file of research in progress in the experiment stations						

C. Scanning or reading abstracts contained in the following indexing and abstracting services or lists of publications:

	Excellent	Very Good	Good	Fair	Poor	Never Use
(38) INDEX OF ECONOMIC JOURNALS. (American Economic Assn.) Up to 1951.						
(39) BIBLIOGRAPHY OF AGRICULTURE.						
(40) BIOLOGICAL ABSTRACTS.						
(41) BIOLOGICAL AND AGRICULTURAL INDEX.						
(42) INTERNATIONAL BIBLIOGRAPHY OF ECONOMICS. Paris, UNESCO.						
(43) BULLETIN OF PUBLIC AFFAIRS INFORMATION SERVICE. (PAIS).						
(44) WORLD AGRICULTURAL ECONOMICS & RURAL SOCIOLOGY ABSTRACTS.						
(45) JOURNAL OF ECONOMIC ABSTRACTS.						
(46) Lists of publications in the JOURNAL OF FARM ECONOMICS.						
(47) Lists of publications in the AMERICAN ECONOMIC REVIEW.						

D. Informal means of communication in the form of:

	Excellent	Very Good	Good	Fair	Poor	Never Use
(48) Conversations with colleagues at work						
(49) Correspondence with colleagues						
(50) Papers heard at meetings or conferences						
(51) Discussions with colleagues at meetings or conferences						
(52) Information gained from attending workshops						
(53) Memoranda or reports sent to you by supervisors at your institution						

Part III. Literature Searches

When you need to discover whether or not some particular aspect of agricultural economics has been subjected to investigation, which of the following indexes, abstracting journals, or bibliographies, if any, do you now employ to identify reports about this kind of research?

Please indicate the degree of usefulness to you of those items you employ in literature searches by making a check mark in the column appropriately describing its usefulness to you. If you never use the method or read the publication please check column 6.

A. Consultation of non-government bibliographies and indexes:

	Excellent	Very Good	Good	Fair	Poor	Never Use
(54) INDEX OF ECONOMIC JOURNALS. (American Economic Assn.) Up to 1959.						
(55) BIOLOGICAL & AGRICULTURAL INDEX. (formerly AGRICULTURAL INDEX.)						
(56) INTERNATIONAL BIBLIOGRAPHY OF ECONOMICS. Paris, UNESCO.						
(57) BULLETIN OF PUBLIC AFFAIRS INFORMATION SERVICE. (PAIS)						
(58) WORLD AGRICULTURAL ECONOMICS & RURAL SOCIOLOGY ABSTRACTS.						
(59) JOURNAL OF ECONOMIC ABSTRACTS.						

B. Consultation of bibliographies of government publications:

	Excellent	Very Good	Good	Fair	Poor	Never Use
(60) BIBLIOGRAPHY OF AGRICULTURE.						
(61) MONTHLY CHECKLIST OF STATE PUBLICATIONS.						
(62) U.S. GOVERNMENT PUBLICATIONS: MONTHLY CATALOG.						
(63) U.S. GOVERNMENT RESEARCH REPORTS.						
(64) CHECKLIST OF REPORTS. (USDA Agricultural Economics)						
(65) Other bibliographies or indexes of government publications you have used for this purpose. Specify:						

C. Consultation of lists of dissertations:

	Excellent	Very Good	Good	Fair	Poor	Never Use
(66) DISSERTATION ABSTRACTS.						
(67) Other lists of dissertations you have used for this purpose. Specify:						

D. Consultation of subject bibliographies:

(68) Specify:						

(69) _____ When I need this kind of information I ask someone else to search for it. The people I am most likely to ask are:

_____ my assistants
_____ my librarian
_____ others. Please specify.

Part IV. Evaluation of the Present Situation

The purposes of the questions below are to determine your estimate of the effectiveness and completeness with which the information about research in agricultural economics is communicated to the field and to determine the difficulty or ease which you have in locating information.

	Excellent	Very Good	Good	Fair	Poor	Never Use
(70) How would you describe the thoroughness with which the available indexes, abstracting journals, bibliographies, etc., provide references to all important studies:						
(71) How would you describe the promptness with which completed research studies are made known:						

(72) How much use do you make of the statistical and economic reports issued by:

	Constantly	Very Frequently	Frequently	Some but Infrequently	None
Statistical Reporting Service Crop Reporting Board Washington, D. C.					
State Crop and Livestock Reporting Offices					
Economic Research Service Washington, D. C.					

(73) Are the reports issued by these Agencies adequately indexed and reported in bibliographies:

Statistical Reporting Service Crop Reporting Board Washington, D. C.	Yes _____	No _____	Don't Know _____
State Crop and Livestock Reporting Offices	Yes _____	No _____	Don't Know _____
Economic Research Service Washington, D. C.	Yes _____	No _____	Don't Know _____

How would you describe the effectiveness of subject headings or classification systems for agricultural economics in the following abstracting and indexing services? In answering this question please keep in mind how well studies dealing with specific topics can be identified.

	Excellent	Very Good	Good	Fair	Poor	Never Use
(74) INDEX OF ECONOMIC JOURNALS. (American Economic Assn.) Up to 1951.						
(75) BIBLIOGRAPHY OF AGRICULTURE.						
(76) BIOLOGICAL & AGRICULTURAL INDEX. (formerly AGRICULTURAL INDEX.)						
(77) INTERNATIONAL BIBLIOGRAPHY OF ECONOMICS. Paris, UNESCO.						
(78) BULLETIN OF PUBLIC AFFAIRS IN INFORMATION SERVICE. (PAIS)						
(79) WORLD AGRICULTURAL ECONOMICS & RURAL SOCIOLOGY ABSTRACTS.						
(80) JOURNAL OF ECONOMIC ABSTRACTS.						

Part V. Suggestions or Recommendations for Improvements

(81) Do you have any suggestions for the improvement of the bibliographical control of the literature of agricultural economics? Please be as specific as possible.

(82) Are there certain categories of publications which, from your experience, you have found inadequately indexed or abstracted? If so, please specify below:

(83) Do you have any suggestions as to how subject headings now being used in indexes and abstracting services might be improved?

In which of the following forms would you prefer to have research material presented? If no one of these forms always meets your needs, please rank your answers by using numerals instead of check marks. Place a "1" in the front of the form that is most often needed by you; a "2" in front of the next most useful form, and so on.

(84) _____ Complete texts of individual research reports

(85) _____ Informational summaries or reviews of the findings of several related studies

(86) _____ Critical (evaluative) summaries or reviews of related studies

(87) _____ Long abstracts of individual studies, reporting in detail the experimental conditions, statistical methods and controls, and complete findings

(88) _____ Shorter abstracts of individual studies, reporting the nature of the study, and the significant findings

(89) _____ Annotated bibliography

(90) _____ Un-annotated bibliography

(91) _____ Other (Please explain on the back of this sheet, or on a separate sheet)

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Division of Agricultural Economics

Agricultural Experiment Station

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at Raleigh

R. L. Lovvorn, Director of Research

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