

Fig. 1. "Working in the Field, Sussex County, New Jersey. Circa 1900." (Special Collections and Archives, Rutgers University Libraries.)

THE FIRST CENTURY OF AGRICULTURAL EXPERIMENT STATION PUBLICATIONS IN NEW JERSEY

BY ELLEN CALHOUN

Ms. Calhoun is Government Documents Librarian at the Library of Science and Medicine, Rutgers University

Many changes have taken place in the dissemination of agricultural information in the one hundred years since the first establishment of land grant colleges and state experiment stations in the United States. Most dramatic is the change in the types of reports and documents published by the state agricultural experiment stations (AES). Using New Jersey as an example, this article will present an overview of the major types of publications of the state agricultural experiment station in its first century of existence, and examine the several factors that may have contributed to a change in traditional methods of publishing agricultural information. These factors include federal legislative mandates, federal fiscal support, and a basic change in agricultural research initiatives.

The history of agricultural education in New Jersey is unique in many ways. Rutgers University, established as Queens College in 1766, has served as the land grant college for the state since 1864. The basic aim of the 1862 Morrill Land-Grant Act was to promote agriculture by scientific investigation and experiment through the endowment of at least one college in each state. Of the 12 experimental land grant farms in existence in the United States before 1875, New Jersey's was the only one which had been bought and maintained by a private college. In 1880, New Jersey was the third state in the nation to establish a state agricultural experiment station by an act of the state legislature. For 65 years, the College Agricultural Experiment Station, established in 1864, and the State Agricultural Experiment Station, established in 1880, coexisted at Rutgers College and frequently co-published research and annual reports. In 1945 Rutgers University became the State University of New Jersey, and the two stations were merged. New Jersey is the only state in the country in which a combined state university and land grant college can trace its origin to the colonial period.

Although the Hatch Act of 1887 initiated federal support of the land grant university system, the structure of the system itself is state oriented. Decentralized and largely state funded, the agricultural experiment stations were geared toward generating applied, locally-adapted research information of interest to farmers in their area.¹ Until the mid-20th century, the bulk of land grant technology was of a public domain, nonproprietary nature, readily identifiable as having its origins in landgrant research. By 1900, practically all of the state experiment stations were keeping a record of meteorological data, 36 were working on soil investigations (geology, physics, and chemistry); 21 were working on drainage and seepage or irrigation; 33 were performing analysis of commercial and homemade fertilizers; and 47 were doing feedstuff comparison studies.² The results of this research were freely distributed.

During 1899, the 56 agricultural experiment stations in the United States published a total of 445 annual reports and bulletins. The New Jersey Agricultural Experiment Stations (NJAES) maintained a mailing list of about 9,000 names, all of which were placed there by the personal request of persons receiving their bulletins. Station personnel answered over 7,000 letters that year.³ In the first ten years of its existence, the NJAES published 77 bulletins. By 1904 that number had reached 184, and an additional 20 special bulletins had also been released. These bulletins were generally technical in nature and contained the results of research investigations, including statistics, tables, and detailed experimental data.

The first NJAES bulletin issued was entitled "Suggestions in Regard to the Cranberry Rot and Its Cure." Other early bulletins published the results of commercial fertilizer analyses, insect damage and control studies, and field experiments with various crops and fruit trees. Reports on the biology of sewage disposal, crop diseases and remedies, and the shellfish industry were also included in the bulletin series. To more effectively convey the results of investigations to the public, circulars were published. These were generally brief pamphlets summarizing research in a simple style with a minimum of scientific terms. For example, Circular 5 gave an overview of "Commercial Apple Production", Circular 30 covered "Apple Growing in New Jersey", and Circular 75 was a "Spray Calendar for Apples and Quinces".

Vigorous publication schedules on the state levels were matched in the early years by federal efforts. In 1889, the USDA Office of Experiment Stations (OES) began publication of its *Farmers Bulletin*. In 1894, the first *Yearbook of Agriculture* was released. This was a volume of papers to "be specially suited to interest and instruct the farmers of the country." In 1901, the USDA Office of Experiment Stations itself released 52 publications. Its index, the *Experiment Station Record*, contained the abstracts of 348 bulletins and 55 annual reports of the state experiment stations. In addition 3,271 scientific articles were abstracted.⁴

The Hatch Act of 1887 was a contributing factor in this proliferation of publications and their widespread distribution. Section 3 of the Act states: "It shall be the duty of each of said stations annually, on or before the first day of February, to make to the governor of the State or Territory in which it is located a full and detailed report of its operations, including a statement of receipts and expenditures, a copy of which report shall be sent to each of said stations, to the said Commissioner [now Secretary] of Agriculture, and to the Secretary of the Treasury of the United States."

These annual reports were a valuable means of communication for the researchers at the nation's state agricultural experiment stations, as well as for the agricultural public. Although the contents, size, and number of copies of the state AES annual reports varied considerably, most included detailed accounts of their research investigations. The *First Annual Report of the New Jersey State Agricultural Experiment Station* for the year 1880 included this notice (p.11): "the station is prepared...to give information on the various subjects of agricultural science, for the use and advantage of the citizens of New Jersey." Tables of results of fertilizer analyses, summaries of field experiments, a list of the publications from the AES, and an index were typical contents of these early annual reports.

In addition to annual reports, Section 4 of the Hatch Act further required that: "bulletins or reports of progress shall be published at said stations at least once in three months, one copy of which shall be sent to each newspaper in the States or Territories in which they are respectively located, and to such individuals actually engaged in farming as may request the same, and as far as the means of the station will permit. Such bulletins or reports and the annual reports of said stations shall be transmitted in the mails of the United States free of charge for postage..." This franking privilege was no doubt a major factor in the free exchange of publications among the state agricultural experiment stations. In addition to this exchange with other land grant institutions, by 1930 the NJAES was exchanging its publications regularly with 25 foreign countries.⁵ The growth of the farm economy in New Jersey and the United States is evident from the statistics. In 1880, New Jersey farm produce was valued at \$29,650,756. By 1900, the value had risen to \$43,657,529.⁶ In the United States in 1901, each farmer raised enough food to feed himself and 5 others. By 1950, the increase in farm efficiency enabled each farmer to feed himself and 14 others.⁷ By 1950, New Jersey was second only to California in milk per cow production, with a statewide average of 7,200 pounds of milk per cow. Some of this growth is clearly traceable to successful information distribution. For example, The Rutgers tomato, developed at the NJAES in 1934, covered 90% of the New Jersey state tomato acreage by 1950.⁸

The original focus of land grant activities, however, to increase the agricultural productivity of the small farmer, has changed over time. In New Jersey in 1850 farm acreage totaled 2,753,000 acres. By 1969, farm acreage had decreased over 50% to 1,036,000 acres. For the same period, the average acreage per farm had risen from 112 to 122 acres. The value of this farmland, however, nearly doubled from \$555 million in 1850 to \$1131 million in 1969. The value of farm products sold rose from \$2 million in 1925 to \$214 million in 1969. At the same time, farm population declined from 1,076,000 persons in 1890 to only 50,000 persons in 1969.⁹ Large-scale agriculture was displacing the small farmer, and while the agriculture industry in New Jersey was still an important part of the state's economy, the audience for agricultural information had changed.

The amended Hatch Act of 1955 rescinded the franking privileges granted under the original act, stating in Section 6: "Bulletins, reports, periodicals, reprints of articles, and other publications necessary for the dissemination of results of researches and experiments, including lists of publications available for distribution by the experiment stations, shall be transmitted in the mails of the United States..." And, while the Secretary of Agriculture is mandated to "make an annual report to the Congress during the first regular session of each year of the receipts and expenditures and work of the agricultural experiment stations in all the States..." (Section 7), the experiment stations themselves are required only to give to the Secretary of Agriculture a fiscal accounting of the funds allotted to them under the Act.

This 1955 change in the legislative mandate for AES publications did not in itself precipitate a decline in state publication schedules. Rather, it reflects the steady decline in publication efforts which began about the time of the Great Depression in the 1930s. On the federal level, the USDA itself released 52 publications in 1901, 32 in 1929 and only three documents in 1953, including its annual report. The *Experiment Station Record* shows a steady decline in the numbers of agricultural experiment station publications indexed, including 55 documents in 1922, 41 documents in 1932, 11 documents in 1942, and just three documents in 1952.

In New Jersey, the Agricultural Experiment Station has not published a complete list of its research publications since the mid 1960s. Many popular series had already ceased by then, such as Nursery Disease Notes (1943), Plant Disease Notes (1943), Hints to Poultrymen (1953), and New Jersev Agriculture (1966); other series suffered a reduction in size and content. The 1951-52 Annual Report for the station marked the beginning of its new reduced format. Then AES Director William Martin explains the new format in the foreword. In the early days of the agricultural experiment stations, when there were relatively few technical journals being published, the annual reports served as an essential means of recording the results of research. "Gradually over the years the number of technical journals and other media for reporting research results increased, so the annual report became less necessary for this purpose. As a result, with the New Jersey Experiment Station among the leaders, annual reports were converted from technical into popular publications." By reducing the report to bare essentials, primarily fiscal data, and limiting distribution, "money could be released to strengthen other means of communication." Readers of the annual report were informed: "Anyone desiring other information about our work may have it on request."

Current Federal legislation reflects this philosophy of information on demand. The National Agricultural Research, Extension and Teaching Policy Act of 1977, with Amendments of 1981 and 1985, reaffirmed the role of the USDA and the state land grant universities, and initiated a new program of grants for "high-priority agricultural research to be awarded on the basis of competition among scientific research workers and all colleges and universities." This legislation, however, makes no specific reference to the publication of research results, stating only in Section 1469: "The Secretary shall (1) make available through the Extension Service and State cooperative extension services—(A) the information and research reports...and (2) otherwise take such steps as are necessary to ensure that such material is made available to the public." This is far removed from the Hatch Act of 1867, which required each station to publish at least four bulletins each year!

In the late 1970s, the National Agricultural Library initiated a preservation project to microfilm the nation's state agricultural publications. In this project, New Jersey filmed 29 series titles covering the years 1880 to 1979, and totaling 136,155 pages. Sixteen of these titles were experiment station publications: the other 13 titles were cooperative extension service publications. An inventory conducted in 1984 for potential annual updating of this microfilm showed that, in the period from 1980 to 1984, only six NJAES series titles totaling 1,503 pages, and four extension series titles totaling 246 pages were published. Further evidence of the demise of the NJAES publication program can be seen by examining the Monthly Checklist of State Publications. This publication lists all documents received by the Library of Congress from the state agricultural experiment stations. The Library of Congress has traditionally been included in the publication exchange of state land grant institutions. The Checklist shows that in the late 1960s, most states were still providing the Library of Congress with bulletins, circulars, special reports, and other research series, as well as popular reports as issued by the Cooperative Extension Services. Of the 488 New Jersey state document titles listed in the 1966 Checklist, 38 were experiment station or extension service documents. In 1977, only four of the 454 titles listed for New Jersey were agricultural documents. Three of the four were soil surveys and one was an extension leaflet. In 1986, of the 491 New Jersey state document titles listed, none were experiment station publications, and only one was an extension publication-a sales item titled 1984 Pesticides for New Jersey. In 1991, none of the 355 New Jersey titles were agricultural publications! Margaret Lane observed in 1983 that "state agencies are producing fewer publications, they are supplying information on a more individualized basis..."10 This is certainly true today for the New Jersey Agricultural Experiment Station.

The NJAES mission, as outlined in its 1991 report *Planning for the* 1990's, (p.3) is "to apply the land grant concept of integrating teaching, research, and extension to contemporary problems in agriculture, the environment, food and nutrition, and natural resources." An increased emphasis on biotechnology has reinforced the perception that the clientele for agricultural research is no longer the individual farmer but private firms. The very nature of biotechnology buttresses the already existing tendency toward commodification of agricultural technical information. The target audience for technology transfer is private agribusiness input firms, who can profit most from advances in agricultural chemicals, pharmaceuticals, and hybridized crop varieties.¹¹ As the

audience for current agricultural research has changed, so have the publications released by the agricultural experiment stations.

The results of agricultural research at the NIAES have always been published in scientific journals. The New Jersey Experiment Station has traditionally been a federal-state, mission oriented research institution. and a unit within Rutgers University, with mutual constraints and multiple lines of accountability. Research faculty hold joint appointments at both the station and the college. Between 1880 and 1920 more than 900 separate articles were published by station personnel in the journal literature.¹² In 1920, the station began a new publication, titled the Journal Series, which consisted of reprints of papers by staff members published in technical journals. By 1980, this series included 5,333 reprints. A look at the 1990 NIAES Directory of Faculty Researchers indicates that indeed most research results are today being published in scientific journals. A relatively small number of publications are listed as "NJAES Publication". The traditional series of bulletins and circulars have ceased. NIAES publications are currently identified by project number and increasingly are grant funded.

Research projects at state agricultural experiment stations have been supported variously over the years with Federal formula funds, state supporting funds, and separate instrument support funds from Federal, state, and nongovernmental agencies. All NJAES projects and proposals are approved and progress is reviewed by the USDA Cooperative Research Service and Education Administration. In recent years, more projects have been funded by special grants, and by federal agencies other than the USDA. In 1930 a large part of the USDA budget went to support agricultural research activities. Today, less than 2% of the department's budget is allocated for research.¹³ In 1986, formula funds released under the Hatch Act decreased for the first time in the onehundred-year history of the act. Competitive grants, however, rose from 8% of the Cooperative State Research Service managed dollars in 1981 to 15% in 1986.¹⁴

Each of the fifty states approaches the control and distribution of its information sources in different ways, and in no state are all publications distributed from one source. The series in which agricultural experiment station and cooperative extension service materials are published are not as reliable or predictable as those from other sources, making acquisition of these publications difficult for libraries. In 1985, the National Agricultural Library implemented its "State Agricultural Publications Project". The goal of this project is to achieve comprehensive coverage of these publications, through cataloging in OCLC, a cooperative international catalog with over 3,000 participating institutions, and through indexing in AGRICOLA, the database of the U.S. National Agricultural Library. It is interesting to note that for New Jersey, no state publications are currently being cataloged, and only the AES Bulletin, and CES Extension Bulletin, Leaflet, and FS (Fact Sheet) series are currently being indexed in AGRICOLA.



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Fig. 2. "An example of the New Jersey Agricultural Experiment Station's publishing during World War II." (Library of Science and Medicine, Rutgers University)

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