

Development of Public Postharvest Technology and Marketing Economics Research*

Early agricultural societies created considerable interest in agricultural experimentation in the first half of the 1800's. Independently and nearer the middle of the century, a number of American scientists who received graduate training in Europe brought back the idea of agricultural experiment stations. This concept was presented to the agricultural societies and other such groups. But little resulted in formal terms except for some institutionalization of fertilizer analyses.

Two major steps toward creation of agricultural research systems were taken in 1862, when: 1) the President signed a bill on May 15 establishing the U.S. Department of Agriculture (USDA), and 2) Congress passed the Merrill Act on July 2, which provided the basis for the land-grant colleges of agriculture. Neither bill said much about research, which was to be a source of some difficulty, but they did create the basic institutions that could foster research. Little was accomplished in forging research efforts until 1887.

The Hatch Act of 1887 was undoubtedly the most important legislative step taken in the development of agricultural research in the United States. In one stroke, it brought about the establishment of the modern network of State agricultural experiment stations (SAES), and it bound USDA and the States together in the process. The Hatch Act set the stage for the Federal-State agricultural system as we know it today. It led to the establishment of an SAES in each State and provided the basis for continuing Federal support. Its impact on the role of research within USDA itself was less immediate.

In February of 1889, USDA was given Cabinet status, but only modest increases were made in Federal agricultural research under the first two Secretaries of Agriculture (excluding N. J. Colman who served only 3 weeks). Under the two secretaries who served from 1889 to 1897, agricultural research in USDA continued at a relatively modest level and was severely handicapped by limited facilities.

The research situation began to change dramatically, however, when James Wilson was named the third

Secretary of Agriculture in 1897. Wilson took charge of scientific and regulatory work (previously under an Assistant Secretary), and during his 16-year regime, seven new scientific bureaus were established in the place of the Bureau of Animal Industry, which existed before his arrival. Four of the bureaus were established in 1901 alone: Plant Industry, Forestry (which became the Forest Service in 1905), Soils, and Chemistry. Three were established in subsequent years: Statistics (1903), Entomology (1904), and Biological Survey (1905). Staff increased more than sixfold between 1897 and 1912, and expenditures on USDA research increased from \$800,000 in 1900 to \$4 million in 1910 (2). Wilson clearly got USDA solidly on its feet in agricultural research.

Early Marketing Studies

From its establishment, USDA had published information about exports and imports of agricultural commodities, and on occasion, sent representatives abroad to protect or extend markets for U.S. farm products. For example, when exports of cattle were being rejected because of charges of infection with pleuropneumonia in 1879, Charles Lynam, a prominent veterinarian, was sent to Britain to determine the validity of the charges. During Secretary J. M. Rusk's administration (1889 to 1893), an agent was sent to Germany and Denmark to promote the exportation of corn. In 1893, a report on world production and distribution of agricultural commodities was submitted to the Secretary of Agriculture by Jacob R. Dodge, a statistician and editor. This publication represented a compilation of information collected over a number of years and was considered to be "the beginning of serious study of world markets for agricultural products by the Department" (19).

Another milestone publication was prepared for the Secretary by George W. Hill in 1897, *Marketing Farm Produce* described the importance of proper handling by the producer, the need for a uniform product, quality, and the value of proper packing. It gave directions for specific commodities and suggested proper types of containers. This publication is considered a landmark, the first marketing publication.

*The material in this appendix draws heavily from the reports, *Marketing Research and Its Coordination in USDA*, by Vivian Wiser and Douglas Bowers; and *An Assessment of the United States Food and Agricultural Research System*, prepared by OTA.

In 1898, the U.S. Industrial Commission was appointed to collect information on immigration, labor, agriculture, manufacturing, and business. This commission published three volumes of testimony and reports on distribution of farm products, agricultural labor, and agriculture and taxation. Finding outlets for farm products and increasing number of USDA officials appeared before the commission. John Crowell, an economist, prepared volume 3 on distribution of farm products which was described as the "best book on agricultural marketing available at the beginning of the twentieth century." For two decades after its publication, Crowell's report on marketing set the pattern for many studies made by the SAES. The report's recommendations included inspection and grading of agricultural commodities, and livestock, inspection of nursery stock, and establishment of a food section in USDA's Bureau of Chemistry. The implementation of these recommendations meant an expansion of USDA in research and regulatory activities (20).

Formal Marketing Research Organizations, 1900-45

In the early 1900's, a number of SAES, as well as some USDA bureaus, increasingly began preparing studies with an economics orientation. In some instances, they related to the development of an industry, growing and marketing specific crops, livestock or related products, costs of production, etc. These studies raised problems between those educated as biological and physical scientists and those trained in economics. The new field of agricultural economics was defined as "that branch of agricultural science which treats of the manner or regulating the relations of the different elements composing the resources of the farmer" (8).

With the new interest in economics and in finding markets for the crops that were increasing through scientific research, there came a campaign for an agency within USDA to perform marketing services and research (1). This led to the establishment in 1913 of USDA's Office of Markets, The Office of Markets pursued three main lines of activity: research, regulatory and service. Research activity included studies of cooperative marketing associations, transportation and storage of farm products, marketing by parcel post, motor transportation of farm products, marketing and distribution, and marketing methods and costs.

Generally, SAES continued to emphasize production research under the general direction of the Office of Experiment Stations. While research in the SAES had been expanded under the Adams Act of 1906, economic

home economics, and sociological research were underwritten in both the experiment stations and USDA under the Purnell Act of 1925. Efforts to integrate these new areas with production research were initiated but without much success.

Finding outlets for farm products and increasing their utilization were matters of concern in the 1920's. The Bankhead-Jones Act of 1935 addressed these concerns by establishing nine regional laboratories to study particular subjects in cooperation with the States: Plant, Soil, and Nutrition (Ithaca, N.Y.), Pasture Research (State College, Pa.), Vegetable Breeding (Charleston, S.C.), Poultry Research (East Lansing, Mich.), Soybean Research (Urbana, Ill.), Sheep Research (Boise, Idaho), Salinity (Riverside, Calif.), and Plant-Growth-Regulating Substances, and Photoperiod and Plant Development (Beltsville, Md.).

The Agricultural Adjustment Act of 1938 provided for four additional regional research laboratories (Philadelphia, Pa.; Peoria, Ill.; New Orleans, La.; and Albany, Calif.) to develop new uses for surplus agricultural commodities. Although USDA and SAES had previously done some utilization research, this new authorization provided for research into new uses for agricultural commodities that would open new channels for marketing agricultural surpluses.

The Agricultural Adjustment Act of 1938 charged the utilization laboratories "to conduct research into and to develop new scientific, chemical, and technical uses and new and extended markets and outlets for farm commodities and products and by-products thereof. Such research and development shall be directed primarily to those farm commodities in which there are regular or seasonal surpluses, and their products and by-products. Although the outbreak of war in Europe diverted attention of the new regional laboratories to war-related research, this objective—to

carry out research to relieve pressures of surplus farm commodities—held steady in the 1940's and into the 1950's.

A reorganization of USDA in 1938 saw the shifting of commodity divisions and service and regulatory activities from the Office of Markets to the new Agricultural Marketing Service. Within the Agricultural Marketing Service research was redirected to meet war-time needs and to postwar planning; one aspect of this research was marketing economics research. Responsibility for coordinating USDA economics research was given to the Bureau of Agricultural Economics, and responsibility for scientific research was given to the Agricultural Research Administration, in which the scientific bureaus were grouped in 1942. The new approach was to be aimed at solving marketing problems.

Postwar planning activities had involved a considerable amount of research on the part of USDA and the land-grant colleges at a time when greater emphasis was placed on production and marketing and distribution in an emergency. Members of Congress showed their concern about marketing as bills were sponsored in most sessions to improve marketing procedures for the benefit of farmers and consumers. In 1943, the House of Representatives authorized its Agriculture Committee to conduct a study of agricultural marketing, but little was accomplished. In 1945, the work was revived, and a detailed study made. This provided the background for the Research and Marketing Act of 1946 (20).

Interest in agricultural research increased substantially during World War II. While the war effort focused more attention on research, the substantial rise in agricultural productivity proved how valuable agricultural research could be. This new appreciation of research was visible in many ways. In 1944, the National Research Council established a separate Agricultural Board to consider agricultural questions. Simultaneously, preliminary discussions began that would lead to the establishment of the National Science Foundation.

Congress turned its attention to agricultural research after the war. Because production had jumped by 30 percent during the war, it was widely anticipated that there would be massive surpluses when demand declined, surpluses that would require greater Federal expenditures to keep farm prices from plummeting. Thus, of all the different fields, marketing was considered the most urgent.

Federal aid for production research had achieved impressive gains. If a similar effort were devoted to marketing research, it was reasoned, marketing costs and consumer prices could be lowered and farm prices raised. In addition, research might uncover new ways of utilizing agricultural products that would absorb some of the increased production and hold down the anticipated surpluses. The utilization laboratories authorized in 1938 and diverted to war-related research could once again turn to the purposes for which they were established. The fear of surpluses became the chief motivation behind marketing research (4). By the end of the war, sentiment in Congress was nearly unanimous that the Federal Government should initiate a major new research program with marketing at the center,

The Research and Marketing Act of 1946

The Research and Marketing Act of 1946 (RMA) was a major innovation in the conduct of agricultural

research. RMA provided a 5-year research and marketing program with substantial increases in appropriations that would raise the total appropriations from \$9.5 million in 1947 to \$61 million in 1951. RMA funds were intended for new research rather than existing programs. RMA initiated contract work and put greater emphasis than before on regional cooperation. A unique feature of RMA was the combination of private initiatives with government planning. Those closest to the problems at the local level—farmers, industry groups, agricultural colleges, and SAES—had a major input in planning and reviewing research. RMA provided for the first national system of agricultural research advisory committees to meet with Federal officials.

RMA was intended to be a bold push forward for agricultural research. However, instead of reorganizing the entire research program in line with RMA, Congress made it a separate research and marketing program while continuing regular research. From the beginning, there was confusion in funding. In reality, there were three research funds—RMA, regular research, and special research—and the boundaries between them were unclear.

In addition, the complexity of RMA itself added to the difficulty of administration. RMA was the result of two acts that were combined more for convenience than because they represented a unified program. As a result, there were overlapping sections in the act that duplicated appropriations in other sections. The funds were to be divided as follows: 20 percent was to be divided among the States equally; 26 percent was to be allocated by rural population; 26 percent was to be allocated by farm population; and up to 25 percent was to be allocated for cooperative regional research involving two or more SAES; 3 percent was reserved for USDA research administration. At least 20 percent of the money spent under section 9 (all types of research) had to be directed toward marketing research (20).

The administration of RMA was awkward and confusing. Although Congress had intended that marketing research be administered by a new agency within USDA that would combine all marketing functions, USDA kept marketing work divided among several agencies. This division made cooperation difficult. According to Harry C. Trelogan of the Agricultural Research Administration, there was "no clearly defined underlying philosophy as to what should be done other than what is in the Act itself" (9). And, as Trelogan pointed out, "it is evident that the Act means different things to different people" (9). There was more concern with coordinating than planning. At no time was a long-range research plan made. Research plans

tended to come from a variety of sources and were never fitted into a comprehensive marketing research strategy. Those areas backed by strong pressure groups, such as cotton and fruits and vegetables, developed the strongest research programs.

Despite RMA's slow beginning, the new funding put a strain on the research system. The most immediate problem was finding enough scientists qualified to do marketing work. Early critics of RMA charged that marketing researchers were inadequately trained, tended to confine their work to farms rather than later points in the marketing process, and concentrated on descriptive research to the neglect of theoretical problems (10).

Coordination was especially difficult for marketing research because it involved so many different disciplines. For example, in regional research, many of the regional commodity committees were comprised entirely of agricultural economists. It was not easy to convince scientists used to following their own lines of work to cooperate with others outside their own field (7). Furthermore, there was not a satisfactory way to coordinate between regions, a common situation in marketing work.

Complicating RMA's early years were disagreements between State and Federal officials. USDA wanted RMA used for work of national, or at least regional, interest. SAES marketing advisory committees, however, strongly supported local research under RMA. SAES hoped that some RMA regional research funds would be distributed on a formula basis to make appropriations more predictable, but USDA decided against using a formula. When regional funds were divided among the States, it tended to be spread so thinly that no one experiment station had more than a small part of the work. This arrangement satisfied SAES directors, who wanted funds from as many sources as possible. At the same time, however, it made it difficult to coordinate research and often meant that existing facilities were not adequately used. Furthermore, the States were suspicious of the role of Federal employees in State work, and the Federal Government found it difficult to get the information it needed to support SAES appropriations (7).

Finally, some difficulty existed about the place of economics research in the research and marketing program. RMA gave a boost to economics research, but that work was still coordinated separately from post-harvest technology. Some SAES directors complained that the two types of research were not well integrated (4).

Marketing Research Coordination, 1953=81

In 1953, a far-reaching reorganization of USDA came closer to placing marketing research in one agency than any organizational structure had since RMA's enactment. The new Secretary of Agriculture abolished the old bureaus and established a smaller number of agencies to allow more of a team approach to major issues and clearer lines of authority (6).

One of the most sweeping changes involved economics research. In 1953, the Bureau of Agricultural Economics, which had conducted nearly all of USDA's economics research since 1922, was divided between two new organizations: the Agricultural Marketing Service (AMS) and the Agricultural Research Service (ARS). The new ARS was basically a continuation of the Agricultural Research Administration, but the scientific bureau chiefs of the latter disappeared in name and were replaced by deputy administrators (1).

The new AMS pleased supporters of a single marketing administration because it was in line with the intent of RMA, AMS combined the marketing functions of the Production and Marketing Administration with marketing economics research from the Bureau of Agricultural Economics and the marketing areas of Agricultural Research Administration. Within AMS, the Marketing Research Division and the Agricultural Economics Division both reported to the Deputy Administrator for Marketing Research and Statistics, so economic and noneconomic research were grouped more closely than at any time since RMA's establishment (1).

The overall coordination of research was left within ARS, where it had been previously. ARS directly administered both title I and title III of RMA—the SAES funds and the advisory committee structure. Much of this work involved marketing research, which had to be checked against the work conducted by AMS.

Despite the consolidation of most marketing research within AMS, it was clear by the mid-1950's that RMA as a separate program was on the wane. The continuing failure to use the program as a unified research effort led Congress and administrators alike to think increasingly of RMA as simply another part of USDA's research work. After 1950, even the advisory committees established especially to oversee RMA were involved in the entire agricultural research program.

Marketing research prospered under AMS despite RMA's demise. USDA found it easier to obtain appro-

priations when research was part of an action agency, especially when the administrator had good relations with Congress. Appropriations for marketing research increased from \$3.7 million in 1953 to \$6.9 million in 1958.

Despite the reorganization of USDA, coordination of research remained a problem in the 1950's. Regional research was an area of particular difficulty. Regional projects expanded rapidly throughout the 1950's, from 70 active projects in 1950 to 198 in 1958. The regional research program was so popular that it attracted from State sources $2\frac{1}{2}$ times the amount of Federal investment (11). Under law, the Committee of Nine, composed of two SAES directors from each of the four regions and a home economics representative, had great discretion in allocating funds. To stop the scramble for funds that occurred early in the program, the committee in 1953 adopted a strict formula distribution between regions. Within regions, a formula distribution was also often used. Because each State desired to participate in a maximum number of projects, it was common for the funds to be spread too widely. Projects involving more than one region were not well handled (4).

The 1960's brought new initiatives on research. A reorganization of USDA went in the direction of grouping work by discipline. In the process, marketing research was once again divided. Economics research was reestablished in a separate organization. The Economic Research Service (ERS), created in 1961, brought together economics work in AMS, ARS, and the Foreign Agriculture Service. The AMS Divisions of Marketing Economics Research, Agricultural Economics, and most of marketing development research and the economics research functions of the Transportation and Facilities Research Division were separated from other marketing work and placed in ERS. ERS reported to a director of agricultural economics, whereas the rest of AMS marketing research was under the Assistant Secretary for Marketing and Foreign Agriculture. During this reorganization, the SAES directors also succeeded in getting the State Experiment Stations Division transferred from ARS to a Cooperative State Experiment Station Service under the Assistant Secretary of Federal-State Relations. Thus, marketing research was under three separate individuals in USDA. *

This arrangement was awkward for marketing research. Not only was coordination difficult, but the relationship between marketing and some other types of research was so close that it was hard to draw the line between them. This was especially the case with

market quality research where the condition of agricultural produce was related to crop improvement work done by ARS. It was necessary for entomologists to work in both ARS and AMS. In 1964, over the protest of several Senators who felt that marketing research could not be separated from other regulatory and service work, the Divisions of Market Quality and Transportation and Facilities were removed from AMS and placed in ARS (12).

Coordination of research received greater attention as part of a governmentwide effort to better manage scientific information in the 1960's. Dissatisfaction with previous attempts at coordination was evident. Congress favored coordination, and USDA moved in this direction. In 1963 and again in 1965, the Senate Appropriations Committee urged USDA to establish a joint USDA-SAES research review committee to perform a thorough evaluation of all government agricultural research.

USDA created the Agricultural Research Planning Committees to examine long-range research needs in 1965. The committee's 1966 report, "A National Program of Research for Agriculture," the so-called Long-Range Study, was the most important statement of its type since RMA. In addition to recommending an expanded research program, the committee concluded that the diverse USDA-SAES cooperative research system was better than any single, unified arrangement, but cited the "need for better balance and coordination among the various research efforts." The report made a number of administrative suggestions, including the appointment of an Assistant Secretary for Science, broader utilization of contracts and grants beyond the land-grant university system, and use of ad hoc committees of the Agricultural Research Planning Committee to study particular subject areas on a continuing basis. The Long-Range Study spurred further studies in specific areas. For example, a 1969 report by the Joint Task Force of Marketing and Competition not only asked for more money for marketing economics research, but urged a broader systems-oriented approach that would bridge the gap between disciplines.

During the late 1960's, the balance of power within the research establishment also changed. Advisory committees were put under greater USDA control in 1964, and most were finally abolished in 1969. With the formation of the Agricultural Research Policy Advisory Committee (ARPAC) in 1969, USDA's advice was clearly coming from administrators rather than researchers and farmers as had previously been the case. On the State level, power shifted away from SAES and toward university administrators. Nonagricultural parts of the land-grant colleges and universities had been growing rapidly since before World

● Gains were made when economic researchers were placed in proximity to one another. However, this led to an isolation of economics from the other disciplines and is a barrier to interdisciplinary research today.

War II. As SAES were considered less important by legislators, SAES directors had to rely more on university administrators to lobby for funds; however, such administrators often gave a low priority to agriculture.

In the late 1960's and early 1970's, the agricultural research program continued to receive favorable treatment from Congress, but marketing researchers increasingly felt that their role was diminishing. The Long-Range Study did not place a very high priority on marketing work, recommending a decrease from 6 to 5 percent of the total scientist man-years devoted to marketing. Marketing research came under attack in this period for its fragmentation and lack of theoretical underpinning. Much of the debate among agricultural economists in the 1960's centered on the need to broaden the scope of research to meet changing social needs. This concern seemed to leave less of a role for traditional marketing research (14).

Funds for marketing research to SAES increased from \$10.6 million in 1965 to \$14.4 million in 1971, but this increase was due mainly to the requirement that 20 percent of Hatch Act money be used for marketing research. Furthermore, in order to meet the 20 percent requirement, the definition of what constituted marketing was broadened in the 1960's to include recreation, pesticides, marketing of inputs, and other areas (16).

A survey published in 1973 found that while SAES directors supported greater emphasis on marketing research, heads of agricultural economics departments wanted to reduce marketing research. These attitudes were reflected in a shift of funds from the economics of marketing to marketing technology and a decline in the number of students in marketing economics. Marketing research devoted to technology increased from 39 to 57 percent between 1960 and 1970. Remaining marketing economics research centered around macro and systems problems rather than studies of individual firms which had characterized the research up to this point (5). One area of marketing research that came in for a reduction was wholesaling and retailing research. During the 1960's, USDA repeatedly proposed eliminating this research, but each year Congress restored the funds. By 1970, the administration was withholding some of the money appropriated for wholesaling and retailing research (20).

In 1971, the 25th anniversary of RMA, Congress held hearings to reassess the act and its accomplishments. While USDA officials were elated about the progress under RMA, industry representatives almost uniformly criticized the marketing research program as inadequate and uncoordinated and many asked for a return to a single marketing administration.

In 1972, ARS was reorganized along regional lines in a way that displeased those congressional leaders

who favored more centralized control of research. The reorganization came as a surprise. USDA admitted that only about 10 people in ARS knew about it (15).

Following the reorganization and assignment of research to regional offices, ARS established a Marketing Research Coordinating Committee, headed by the National Program Staff, with marketing research representatives from each region. They received recommendations for research, but no increase in funds was requested. The committee was abolished in 1976. An interagency board was also established to coordinate USDA marketing research, but was not utilized. This led the American Farm Bureau Federation to charge that research was fragmented and that production-oriented leadership further reduced the effectiveness of the research program (13).

The report of a special investigation directed by the House Appropriations Committee in 1972 brought out some of the problems that existed in ARS under the new organization. Marketing research in ARS was described as being directed toward increasing marketing efficiency by reducing product losses and costs and by improving methods of quality identification and measurement, including solutions to problems encountered in handling, storage, grading, and distribution of products from farm to retail store. ERS officials reported that its studies covered the complete range of activities from inputs to retailing. Cooperative State Research Service (CSRS) impact had shifted, the report noted, as visits to SAES became less frequent. It became more difficult to terminate unsuccessful projects or to shift priorities, since states would continue projects under other funds.

Metzger's extensive in-house evaluation of the SAES research program in 1973 found marketing research "languishing," with marketing economics especially lacking vigor. He recommended the establishment of marketing research centers at selected stations and closer working relations with government agencies. He advocated that SAES strengthen their ties with their clientele, adopt a systems orientation, and shift emphasis to new problem areas pertaining to marketing organization and structure (20).

A major reorganization in ERS occurred in 1973. The Divisions of Farm Production Economics, Marketing Economics, and Economic and Statistical Analysis were abolished. In their place were established the Commodity Economics and National Economics Analysis Divisions with a less formal structure of groups, and later, program areas in place of branches. Task forces or matrix groups would conduct particular assignments, drawing on personnel from the program areas. A net result was an increase in the staff of the Administrator and the division directors.

Priorities in ERS were shifted from marketing re-

search to other areas. By 1978, the Economics, Statistics, and Cooperatives Service (ESCS) (successor agency to ERS) budget included a proposed decrease of \$600,000 for analysis of marketing of farm products. Some activities were slated to be dropped and others cut, reflecting the radically changed nature of the markets. The Federal-States Relations Committee drew up a resolution deploring USDA's role in allowing the marketing efficiency research program to deteriorate to its lowest point since the 1946 RMA. Marketing studies had declined from 1,046 scientist-years in 1969 to a proposed 648 in 1979 (20).

Marketing research within ARS placed much emphasis on technology, such as improvements in processing and handling and insect detection methods. Marketing research within ERS emphasized market structure and performance, including estimating marketing margins, studies of the sugar industry, the away-from-home food market, the impact of rail reorganization, and a review of marketing orders. Marketing research under the general supervision of CSRS tended to be geared more to scientific rather than economic questions. Thus, in 1975, the SAES worked on such topics as uniform ripening of fruit, apple packing, vacuum-packed beef, and mechanical harvesting.

In 1977, ERS, the Statistical Reporting Service, and the Farmer Cooperative Service were combined into ESCS, cutting the number of agencies reporting to the office of the Secretary, but adding another administrative layer at the top (15). In 1978, ARS, the Extension Service, the CSRS, and the National Agricultural Library were consolidated into the Science and Education Administration.

Some of these changes were in line with the Food and Agriculture Act of 1977. Under this act, USDA was designated as the lead agency for agricultural research. The Joint Council for Food and Agricultural Sciences was established under this act. The Council decided to retain main features of the previous programs, including five ARPAC committees. One of these was the Committee on Coordinating Marketing Research.

Criticism of agricultural research surfaced at the 1977 appropriations hearings. The food industry came together to defend USDA marketing programs scheduled for reduction or termination. USDA defended these reductions by stating that much of the research dropped by USDA would be continued by private industry or the States (13).

Congress restored much of the funding for marketing research that USDA had proposed for deletion. However, the 20 percent earmarking of Hatch formula funds for marketing research was eliminated by Congress. Then, in 1979, selected marketing research func-

tions of the Agricultural Marketing Research Institute, a part of ARS, were transferred to AMS. These included the Animal Products Research, Marketing Operations Research, and the Food Distribution Research Laboratories. The Transportation and Packaging Research Laboratory was transferred to the Office of Transportation, which further added to the problem of coordinating marketing research. In AMS, the units were consolidated in the Market Research and Development Division.

The change of administrations in 1980 shifted the policy direction of USDA. In 1981, the new administration announced a number of organizational changes. Among these was the abolition of the Science and Education Administration. Its constituent parts became separate agencies reporting to the Director of Science and Education (now the Assistant Secretary for Science and Education). ERS was reestablished as a separate agency reporting with the Statistical Reporting Service to the Assistant Secretary for Economics. The Farmer Cooperatives Service was renamed the Agriculture Cooperative Service reporting to the Assistant Secretary for Marketing and Transportation Services.

Reviews of Marketing Research

Because of the debate concerning the virtues of marketing research, three studies were undertaken. In 1977, the Office of Management and Budget asked USDA to undertake a study of marketing research programs to assure that only that research would be performed which would not otherwise be done by the private sector. CSRS was to evaluate research conducted by SAES with Federal funds, ARS was to study postharvest technology research in USDA, and the Industrial Research Institute (IRI) was to conduct a review from the viewpoint of industry.

For its assessment, IRI convened a panel that interviewed representatives of industry and trade associations. Although a limited number of representatives were interviewed and these did not represent a very wide spectrum, their consensus was that any reduction in USDA research would not be supported or assumed by private industry. Many stated that the government should conduct the research for new knowledge in support of national objectives and to satisfy government regulations. The IRI report concluded that the industry believed that Federal research must provide the technical bridge between university science and practical consumer needs (3).

CSRS prepared its evaluation of postharvest technology research in the States. It found that major support was for research on productivity and product quality, but more research was underway on new areas

such as health and safety, energy conservation, environmental protection, and reduction of losses. It concluded that the private sector would not finance the research needed to meet societal needs (17).

The report done by ARS summarized research in the various areas and centers with a view of its importance. It concluded that ARS had played an important role in basic research in technological aspects of marketing research and that such research should remain in the public domain with Federal and State financial support (18).

Principal Findings

- The high point in public PHTME research came in the years immediately after the passage of the 1946 RMA, which placed emphasis on this type of research and required that at least 20 percent of Federal research funds authorized under RMA to SAES be directed for PHTME.
- RMA gave a boost to public marketing economics research, but that work was still coordinated separately from postharvest technology research.
- When RMA regional funds were distributed among the States, they were spread so thin that no one SAES had more than a small part of the work. This arrangement made it difficult to coordinate research and often meant that existing facilities were not adequately used.
- USDA in a major reorganization in 1953 came the closest ever to placing PHTME research in one USDA agency. However, in practice RMA was never regarded as a unified research effort.
- The Food and Agricultural Act of 1977, eliminated the 20 percent requirement under RMA of Federal funds for PHTME research. However, coordination of food and agricultural research supported by Federal funds was written into the law. Since then, PHTME research has nevertheless been deemphasized and dispersed throughout USDA.

Appendix D References

1. Baker, G. L., et al., *Century of Service: The First 100 Years of the U.S. Department of Agriculture*, U.S. Department of Agriculture, Washington, D. C., 1963.
2. Hagami, Yujiro, and Rutten, Vernon W. *Agricultural Development: An International Perspective* (Baltimore: The Johns Hopkins Press, 1971), p. 144.
3. Industrial Research Institute, *Industry Assessment of USDA Post-Harvest Technology Research*, USDA contract No. 53-32 R6-8-O 0005, St. Louis, Me., 1978.
4. Mainzer, Lewis C., "Science in a Political Context: The Agricultural Research and Marketing Act Program," Ph. D. Dissertation, University of Chicago, 1956.
5. Metzger, H. B., *Marketing Research at State Agricultural Experiment Stations, Past, Present, and Future*, Cooperative State Research Service, Washington, D. C., 1973.
6. Moore, Ernest G., *The Agricultural Research Service* (New York: Frederick A. Praeger, 1967).
7. Shepherd, Geoffrey, and Goldman, Alan, "Methods and Procedures in Planning Regional Marketing Research," *Journal of Farm Economics*, vol. 34, December 1952.
8. Taylor, Henry C., and Dewess, Anne, *The Story of Agricultural Economics* (Ames, Iowa: Iowa State College Press, 1952).
9. Trelogan, Harry C., "Federal Projects Submitted Under the Research and Marketing Act of 1946," *Journal of Farm Economics*, vol. 29, Part 2, November 1947.
10. Trelogan, Harry C., "Marketing Research in the United States During the Past Five Years," *Journal of Farm Economics*, vol. 33, November 1951.
11. U.S. Congress, House Committee on Appropriations, *Hearings . . . Agricultural Appropriations, 1961*, Parts 1 and 2, 1961.
12. U.S. Congress, Senate Committee on Appropriations, *Hearings . . . Agricultural Appropriations, 1965*, supp. 1, June 1964.
13. U.S. Congress, House Committee on Appropriations, *Hearings . . . Agricultural Appropriations, 1975*; 1979, Part 8.
14. U.S. Congress, House Committee on Agriculture, *Marketing Research Activities of U.S. Department of Agriculture*, 1971.
15. U.S. Congress, Office of Technology Assessment, *An Assessment of the United States Food and Agricultural Research System*, Washington, D. C., December 1981.
16. U.S. Congress, Senate Committee on Appropriations, *Hearings . . . Agricultural Appropriations, 1967* House Committee on Appropriations, *Hearings . . . Agricultural Appropriations, 1973*, Parts I and III.
17. U.S. Department of Agriculture, *Cooperative Research in Post-Harvest Technology Research*, Science and Education Administration, Washington, D. C., 1979.
18. U.S. Department of Agriculture, *Post-Harvest Technology Research Assessment*, Science and Education Administration (unpublished), Washington, D. C., 1979.
19. Wiser, Vivian, *Protecting American Agriculture*, AER No. 266. U.S. Department of Agriculture, 1974.
20. Wiser, Vivian, and Bowers, Douglas E., *Marketing Research and Its Coordination in USDA*, U.S. Department of Agriculture, Economic Research Service, AER #475, 1981.