

Regional Trends in Extension Resources¹

By Mary Ahearn, Jet Yee, and John Bottum²

Abstract: *The benefits of the Cooperative Extension Service are difficult to quantify. Nevertheless, Extension does continually examine its program focus and make marginal adjustments in its portfolio. The purpose of this descriptive paper is to examine the trends over time in Extension personnel (FTEs). The trends will be described in two ways. First, the paper will describe the trends in Extension FTEs for the U.S. and for the major regions for the 1977-97 time period. Secondly, the paper will contrast the trends in FTEs for the four major program areas of Extension, again at the U.S. and regional levels, for the 1977-92 time period. The temporal and regional variations in resource allocations for Extension will be discussed in the context of other relevant variables and the institutional setting.*

Introduction

The Cooperative Extension Service is in the education business. In particular, the Extension Service is charged with delivering information that has a public good nature. The classic characteristics of public goods applied to educational information means that use of the information by any one person need not diminish the quantity used by anyone else and it is impossible to confine the benefits of the information to selected persons. Educational information with a public good nature, such as information that enhances environmental quality and food safety, is likely to be undersupplied by the private sector. The public good nature of information makes it difficult to place a value on it. Hence, those charged with allocating resources to the Extension Service, and those with the responsibility to allocate the resources of the Extension Service among competing program areas, face a difficult challenge. The purpose of this paper is not to offer advice about how the allocation of resources should be done. Rather, the purpose is to describe how for a recent period the resources were allocated across major

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program areas and major regions of the country. These data have not been readily available, in contrast to comparable data for research activities. Data on Extension full time equivalents (FTEs) are valuable for many of the reasons indicators of inputs into the research process are valuable, such as program evaluation, analysis of budget allocations, and rates of return estimation on investments in Extension. Before describing these trends, we will briefly review the mission and funding of the Extension Service and the state of performance indicators.

Mission of the Extension Service. The Cooperative Extension Service was established by federal legislation with the Smith-Lever Act of 1914. In large part, its establishment was a response to the need to disseminate the information generated by the land-grant colleges to the people. Its cooperative nature comes from funding being provided by local, state, and federal sources. That Act was amended several times to broaden the purposes of Extension and to alter the funding mechanisms. The original mission of the Extension Service is:

“...to aid in diffusing among the people of the United States useful and practical information on subjects relating to agriculture and home economics, and to encourage application of the same...”

At the time the land-grant colleges were first established, 1862 and 1890, most of the population lived on farms. Hence, the focus of Extension, as reflected in the original mission statement, was on agriculture and mechanical arts. Extension was organized on a state-by-state and county-by-county basis with Extension offices in nearly every one of the nation’s 3,150 counties. When the Cooperative Extension Service was established with the passage of the Smith-Lever Act of 1914, about one-third of the

population was employed in farming. Only about 1% of the hired work force is in farming today. Consequently, the mission has broadened considerably over time and is reflected in a recent statement of its mission by the National Association of State Universities and Land-Grant Colleges

(www.nasulgc.org/publications/ces_strategic.htm):

“to enable people to improve their lives and communities through learning partnerships that put knowledge to work.”

More recent efforts of the Extension Service to reinvent itself are exemplified by the 1987 so-called “Futures Report” (Report of the Futures Taskforce to the ECOP) and in a 1997 initiative to reaffirm its direction to become a more relevant, dynamic, and flexible organization (www.nasulgc.org/publications/ces_strategic.htm).

In the late 1980s, Extension with its “new direction” shifted from a focus on *audience* to a focus on *issues*. With issue-based programming, the goal became one of resolving the issue. This required bringing all possible resources to bear on the issue. Hence, it required a much higher level of cooperation among Extension staff and staff of other agencies, as well as a much higher level of organization to successfully resolve issues. At this time, Extension established seven base programs and launched several national initiatives, in which nearly all states participated. In 1994, 19% of Extension FTEs were devoted to eight national initiatives. These included: water quality, youth at risk, food safety and quality, sustainable agriculture, and communities in transition.

Funding the Cooperative Extension Service. Extension is a cooperative effort among federal, state, and local governmental units. Hence, funding is derived from each source to address priority issues identified by all three levels of government, or their representatives. There have been considerable shifts in funding in recent times, and we would expect funding shifts to be reflected in program priorities over time. Currently, the major funding source for Extension is the states. In 2000, 49% of the total \$1.7 billion that supported the Extension Service was from the states (USDA, CSREES, 2001). The Federal share was 24% and the local share was 27%.³ But, the federal share has historically been larger. In 1977, the federal component of Extension funding was 42%, with the state share of 38% and the local of 20% (USDA, CSREES, various years). The federal contribution is composed of formula funds, allocated primarily on the farm and rural populations of states, and earmarked funds. In recent times, the share of formula funds has decreased and the share of funds earmarked by Congress has increased. Changes in federal support for Extension have not been identical to changes for federal support of research. In the early 1970s, federal support for Extension exceeded federal support for research at land-grant institutions (in absolute terms).⁴ By the end of that decade, the reverse was true. The federal share of funding state R&D activities in 2000 was 33%, compared to the 24% share for Extension.

Performance Indicators. Over the past decade, the USDA and the Land-Grant System has been challenged to pay closer attention to priority setting and

³ The local share includes 6.6% classified as “non-tax” sources. Non-tax sources are non-governmental funds, such as private donations.

accountability. On the federal side, this is exemplified by the Government Performance and Results Act (GPRA) of 1993. GPRA requires that federally funded agencies, such as the Extension Service, develop and implement an accountability system based on performance measurement. USDA has five issue-oriented goals and, in their annual reports on Extension activities, states are asked to report their Extension activities under these goals.⁵ Subsequent legislation, the latest Farm Bill (i.e., FAIR Act of 1996) and the Agricultural Research, Extension, and Education Reform Act of 1998, have reinforced the move to performance-based management. Performance indicators include indicators of *inputs, outputs, outcomes, and processes*. An obvious example of inputs, would be the focus of this paper, full-time-equivalent extension personnel. A typical extension output could be considered an extension program to a group of farmers. And, an example of an outcome would be a change in behavior that resulted in an improvement in the quality of life or the quality of the environment. Obviously, the measurement of these is more complex as one moves from an input indicator to an outcome indicator. An example of a process indicator would be a measure of the extent to which the views of stakeholders were solicited in the planning and evaluation processes.

The recent history of measuring performance of public information programs extends back at least to 1976 with the National Research Council's report on statistical priorities (NRC, 1976). In that report, the panel argued that statistical budgets should be subject

⁴ This includes funding of the following non-federal institutions: Experiment Stations, 1890 institutions, schools of forestry, veterinary colleges and other cooperating institutions.

⁵ These are: An agricultural production system that is highly competitive in the global economy; A safe, secure food and fiber system; A healthy, well-nourished population; Greater harmony between agriculture and the environment; and Enhanced economic opportunity & Quality of life.

to the tools of benefit-cost analysis. This generated a controversy about the feasibility of measuring the benefits of publicly-produced information. In another NRC study in 1985, the panel concluded that a formal benefit-cost analysis could not be conducted for a public information system on natural gas. In fact, they argued that the principle of benefit-cost analysis applied to public information systems in general had been “counterproductive” (NRC, 1985). A significant amount of conceptualization has already been invested in this measurement challenge as it applies to investments in Extension, and this paper makes no attempt to summarize it (e.g., Ladewig, 1999; Accountability Task Force, 2001b). An example of this type of effort is available from the University of Florida at <http://pdec.ifas.ufl.edu>; and examples of Extension indicators for four Southern states (Florida, Virginia, Mississippi, and Texas) are provided in Accountability Task Force, 2001a.

Technical economic analysis may also contribute to an understanding of performance indicators for information dissemination and educational investments. The relevant economic literature includes:

- The well-developed literature on the rates of return to investments in formal education in terms of salary levels, e.g., Willis, 1986.
- The literature on technology adoption and diffusion, e.g., Griliches, 1957; Rogers, 1995.
- The literature on the role of formal education in agricultural profitability, e.g., Huffman, 1976.

- The literature on the role of Extension in agricultural productivity, e.g., Huffman and Evenson, 1993.

The latter literature focuses directly on Extension and was the motivation for developing the data series described in this paper. The traditional activity of Extension is to reduce the time lag between development of new agricultural technologies or information and the application of that information for enhancing productivity. Consequently, economists have devoted some effort to measuring the impact of Extension on agricultural production and to estimating the rate of return to Extension activities (e.g., Huffman and Evenson, 1993; Yee, et al, 2002b). The empirical evidence on the rate of return to Extension is rather mixed. Estimates range from 20 percent to over 100 percent (Fuglie, et al., 1996). More recent studies (Huffman and Evenson, 1993) find a low rate of return to public Extension. Huffman and Evenson (1993) also find that farmers' schooling is a substitute for Extension, possibly suggesting that Extension has become less important as farmers' educational attainment have risen over time. For example, farmers who have more education may be better able to assess the merits of and successfully adapt a new technology to their particular situations. A major problem in estimating the rate of return to Extension is data-related. The data reporting system for Extension expenditures is less complete than for research expenditures for which there is an established system (i.e., CRIS).

The Major Program Areas of Extension

While labels have changed over time, Extension program areas can readily be classified into four major program areas during our study period. These are: Agriculture &

Natural Resources; Community Resource Development; 4-H & Youth Development, Home Economics and Human Nutrition.

Agriculture & Natural Resources. Given the history, it is easy to understand why agriculture is the largest program area of Extension and other functions of the USDA-Land-Grant system. An argument can be made that this most traditional of all Extension programs is losing its public support. Many private sector firms are now in the business of extending production-related information to producers, and this will likely only expand in the future as farms increase in size. USDA regularly surveys producers to determine the source of their advice for making their pest and nutrient management decisions. The most common source of information for pest management is, in fact, private chemical dealers, but this varies by commodity. Chemical dealers were the major source of advice to wheat producers for 58% of wheat acres in the mid-1990s (Padgitt, et al). Extension personnel were the major source of advice for wheat producers for only about 16% of the wheat acres. The other sources, such as private crop consultants and media sources, accounted for the remaining wheat acres. The share of acres where Extension provided the major source of pest management advice varied across commodities, for example, 10% for cotton and 22% for grapes. However, because of the large share of acres in the major row crops of corn, soybeans, and wheat, most of Extension's pest management advice is focused on those commodities nationwide. In another survey of large farms by the Gallup Organization, Extension was reported to have a significant influence on the buying decisions of farmers only 28% of the time (Association of Leading Ag Media Companies). They were somewhat more influential in the decisions of lower income households and those over 50 years old.

What the studies that report increases in private company sources of information for individual producers do not show is the amount of education and information provided to the private sector (media, consultants, and chemical companies) by the Extension Service. In fact, many in the industry rely on Extension to serve as an objective supplier of information, and a check on the agribusiness and agricultural media which supplies information on agricultural production and marketing options, but which may have a vested interest. In addition, as intellectual property rights protect more research results, the role of Extension in educating all interested parties, not just those willing to pay, is becoming more important.

We have also grouped natural resource programs into this category because of the overlap between the two areas. For example, adoption of conserving farm production practices could be classified in either category. While it would have been instructive to monitor resources overtime in separate categories for agriculture and natural resources, any distinction would have been arbitrary and, perhaps, misleading. Extension information and activities in the natural resource area are likely to be more public good in nature. This is especially true for agricultural practices that are viewed as sustainable and for which there is little profit motive for the private sector.

Community Resource Development. Extension activities in the area of community development are important both in communities with economies dependent on agricultural production activities and those with non-agricultural economies. This likely

reflects the local leadership and financial support of the Extension Service, in contrast to the research arm of the land-grant system. Social scientists, such as economists and sociologists, dominate Extension activities in community development.

4-H & Youth Development Programs. Traditional 4-H programs for youth are focused on agricultural production activities. However, the overarching goal of all youth programs, both agricultural and non-agricultural, is youth development.

Home Economics and Human Nutrition. Home economics and human nutrition Extension programs are targeted on all issues that affect all populations, and rely significantly on the expertise of consumer economists and nutritionists. This program area also includes programs associated with food safety.

Data and Methods

Historically, most of the focus in the information management of the Extension system was on measures of inputs, especially expenditures and staff years. Measurement of inputs will continue to be important in more modern systems of evaluation in order to measure the efficiency of those inputs relative to the outcomes. The expectation is that this information will facilitate the evaluation by program managers of how closely the system's resource allocation for Extension matches stated priorities of the system. One indicator of the focus of Extension activities is the allocation of personnel to various program areas. Unlike the allocation for research expenditures in the Land-Grant System captured in the Current Research Information System (CRIS), no easily

accessible information system exists for Extension full-time-equivalents (FTEs). There are likely many good reasons for this, not the least of which is the greater burden in allocating time of Extension experts who are more likely to work on multiple issues on a daily basis, compared to researchers who are more likely to dedicate longer time periods to single issues. Consequently, the historical trend information is piecemeal, and must be assembled from a variety of published and administrative documents. The data we have assembled here for total FTEs in a state are for 1977-97. However, the state data for each of the four program areas only covers the 1977-92 period.

Results for Total Extension FTEs

The total Extension FTEs in the U.S.⁶ for 1997 was 14,890. This compares to a total of 16,990 in 1977, representing a 12% decline over the period. The year-to-year changes over the period were always modest at the national level. The greatest changes on a year-to-year basis were between 1982 and 1987. These temporal trends in Extension FTEs varied across the regions (see figure 1)⁷ and the states. Nearly three-quarters of the Extension FTEs are in the two regions that had the greatest declines in FTEs over the period. The greatest declines in Extension FTEs were experienced in the North Central region (-16%) and in the South (-15%). In contrast, the West and the Northeast experienced more modest declines of -2% and -6%, respectively. From 1982 to 1992, the West actually experienced some increases in Extension FTEs, although like the other three major regions, Extension FTEs declined between 1992 and 1997.

⁶ Data are not included for Alaska and Hawaii.

⁷ Regions were defined in the following manner: The Northeast included ME, VT, NH, RI, CT, NJ, DE, MD, PA, WV, NY, and MA. The North Central included ND, SD, NE, KS, MO, IA, MN, IL, WI, MI, IN, KY, and OH. The

Seventeen states had more Extension FTEs at the end of the study period, 1997, than at the beginning, 1977. The greatest increase in FTEs, both in absolute terms and as a percentage change, was in Montana. Illinois had the greatest decline in the number of Extension FTEs between 1977 and 1997, with a decrease of 318.5 FTEs, from 778.5 to 460.0. Vermont had the greatest decrease as a percent of the 1977 FTEs, with a 56.8% decline in FTEs by 1997.

Results for Extension FTEs by Program Area

The declines in the total FTEs reported above between 1977 and 1992 were not evenly distributed across the four major program areas. Agriculture & natural resources and home economics & nutrition had modest increases in FTEs (30.3 and 253.4, respectively), but community resource development and 4-H & youth activities had significant decreases in FTEs (488 and 1,320.4, respectively). This is in contrast to inputs into research in the Land-Grant system. Although there are a somewhat different set of program area categories for research, the 1995 Land-Grant study reported that there was little change in the distribution of expenditures across program areas from 1972-92 for the 1862 institutions (NRC, 1995).

The largest program area in terms of FTEs at the beginning and the end of the period was agriculture & natural resources (See figure 2). In 1992, 6,959 FTEs were dedicated to the agriculture & natural resource program area, this was nearly half (45%) of the total Extension FTEs. At first glance it is surprising that the agriculture & natural resource area continues to utilize such a large share of the FTEs in Extension, given the

South included FL, GA, SC, NC, VA, TN, AL, MS, LA, AR, OK, and TX. The West included WA, OR, CA, ID, NV, UT, AZ, MT, WY, CO, and NM.

possible private good nature of information about agriculture production decisions. However, some justify public investment in private decisions based on efficiency grounds, namely that society benefits from a more efficient system resulting in cheaper food. In addition, some justify public investment to assist small farmers make decisions based on equity grounds because it is argued that society benefits from a system of agriculture with many small farms. It may be true that if it were possible to accurately separate out agricultural extension activities more finely to identify potential public good outcomes, e.g., those that reduce environmental externalities, much of the increase would be associated with those activities. However, that type of analysis is beyond the scope of this paper.

In 1977, more FTEs were dedicated to 4-H & Youth activities than Human Nutrition & Home Economics. By 1992 the reverse was true. That decline in 4-H & Youth FTEs has been relatively steady. By 1992, this program area accounted for 23% of total FTEs at the national level. Although the mission of the Extension 4-H programs has generally been perceived to be broadened to include nonfarm youth, the FTEs has not matched this broadened mission. Perhaps this is because there are viable alternative sources of youth development activities outside of the farm community. In contrast, the Human Nutrition & Home Economics program areas of Extension have experienced increases in FTEs, both in absolute numbers and the share of total FTEs. In 1977, there were 22% of the FTEs dedicated to this program area, compared to 26% in 1992.

The Extension FTEs trends also indicate that the smallest of the program areas, Community Resource Development, has gotten smaller over the time period, 1977-92. In 1977 there were 1,416 FTEs (or 8% of the total FTEs) devoted to this program area, and in 1992 there were 924 FTEs (or 6% of the total FTEs). Perhaps this is the result of a declining portion of the population living in rural areas. In 1977, 28% of the U.S. population resided in nonmetropolitan areas, compared to 20% in 1992. The greatest decline in FTEs came between 1982 and 1987, and FTEs was very stable between 1987 and 1992. It is interesting to note, that this program area is an area dominated by social scientists. During a 1996 survey of agricultural economists, community development activities were seen as a relatively higher priority for Extension than for research (Ahearn, et al., 1997). Perhaps, the respondents considered there to be more potential in community development extension activities compared to community development research activities.

The regional differences by program area are not dramatically different for the latest time period for which program area data are available, 1992:

- Agricultural & natural resources varied from 42% to 48% of the total FTEs
- Home economics & nutrition varied from 24% to 29% of the total FTEs
- 4-H & youth varied from 22% to 23% of the total FTEs
- Community resource development varied from 4% to 8% of the total FTEs

The trends in Extension FTEs by program area in the North Central region (figure 3) are similar to those described for the general U.S. trends. This is true, in spite of the fact that a larger share of the population of this region is connected to agriculture in some

way. This region accounts for about 40% of the farms and farm marketings of the U.S. In 1992, there were 434 farms per FTEs in the agricultural & natural resource program. This is 1.5 to 2.5 times the number of farms per FTEs of the other major regions. A number of factors could account for this allocation, including economies of size associated with the provision of services in the region, but a careful analysis of factors is beyond the scope of this paper. About 8% of the FTEs are dedicated to Community Resource Development, which is the highest of all four regions. FTEs dedicated to 4-H & Youth activities declined in this region, both in absolute numbers and as a share of the total FTEs in the region.

The Northeast, a significantly more urbanized region than the North Central region, had a faster decline in FTEs devoted to community resource development and a faster increase in the FTEs dedicated to agricultural & natural resources, than the North Central region between the 1977 and 1992 time period (figure 4). There was the lowest number of farms per Extension FTEs in the Northeast of all the regions. The Northeast had somewhat more FTEs (29%) devoted to nutrition and home economics than the other regions in the final year of our data, 1992.

About 46% of the Extension FTEs in the South (figure 5) are dedicated to agriculture & natural resources. The South had the smallest share of FTEs devoted to community resource development of all the regions for all the time periods. Extension FTEs went from 439 in 1977 to 278 in 1992. Following the U.S. trend, the share of FTEs devoted

to 4-H & youth activities declined slightly and the share devoted to home economics and nutrition increased slightly.

The West had the largest share of Extension FTEs dedicated to agriculture & natural resources than any of the regions during the full time period (figure 6). Perhaps this is a result of the relatively more important resource policy issues in this region, e.g., water rights and grazing rights issues. In 1992, there were 48% of the FTEs in this major program area. Correspondingly, the shares of FTEs in the other program areas were slightly less than the national shares.

Concluding Remarks

The demand for information as a commodity is derived from its value in reducing uncertainty in decision-making processes. Lack of accessible information about technical issues may be an obstacle to addressing a variety of contemporary issues in the USDA-Land-Grant system, from obesity and acceptance of GM food to adoption of sustainable production practices and local land use issues. From that point of view, there continues to be a strong need, though perhaps addressing a more diverse set of issues, for the services of Extension. NASULGC states, “the Cooperative Extension System is constantly changing to meet the shifting needs and priorities of the people it serves.” As Extension FTEs have declined in recent decades, the shifts in needs and priorities are mainly reflected by declines in community resource development and 4-H Extension FTEs.

The most useful type of indicator of performance of an educational enterprise, such as the Cooperative Extension Service, is an indicator that measures the desired outcomes of the educational process. Development of outcome indicators will likely continue to challenge administrators of the USDA-Land-Grant system charged with evaluating the benefits of public investments in Extension activities. Input measures are an obvious and important complement to the outcome indicators under construction. Results of technical economic research on the returns to investments in Extension, such as those presented in Yee, et al., (2002a) regarding agricultural productivity trends, are likely too aggregated to be useful in short-term and detailed program administration. But, they can provide information for long-term system-wide goals. However, without accurate measures of the Extension inputs, such as program area FTEs, the performance-based assessments of Extension cannot be quantified.

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Figure 1. Total FTE, by region

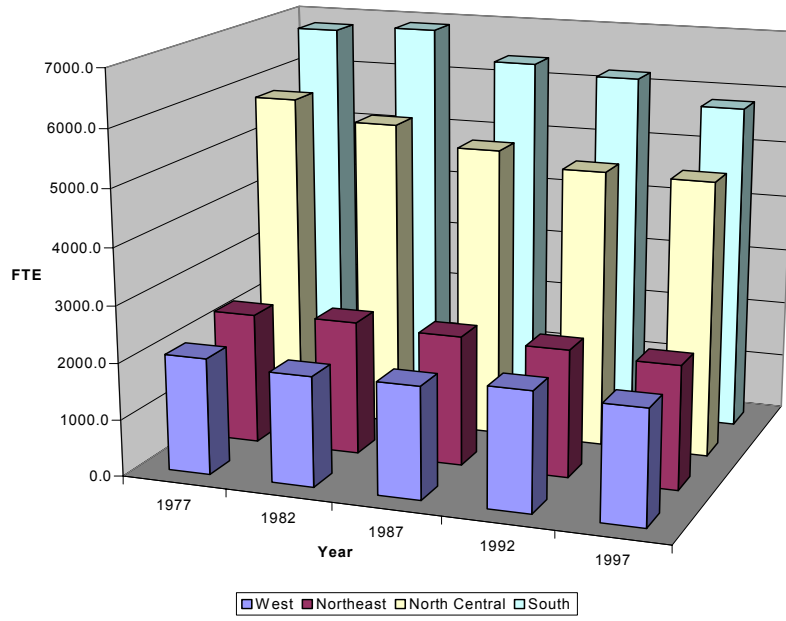


Figure 2. FTE by program area

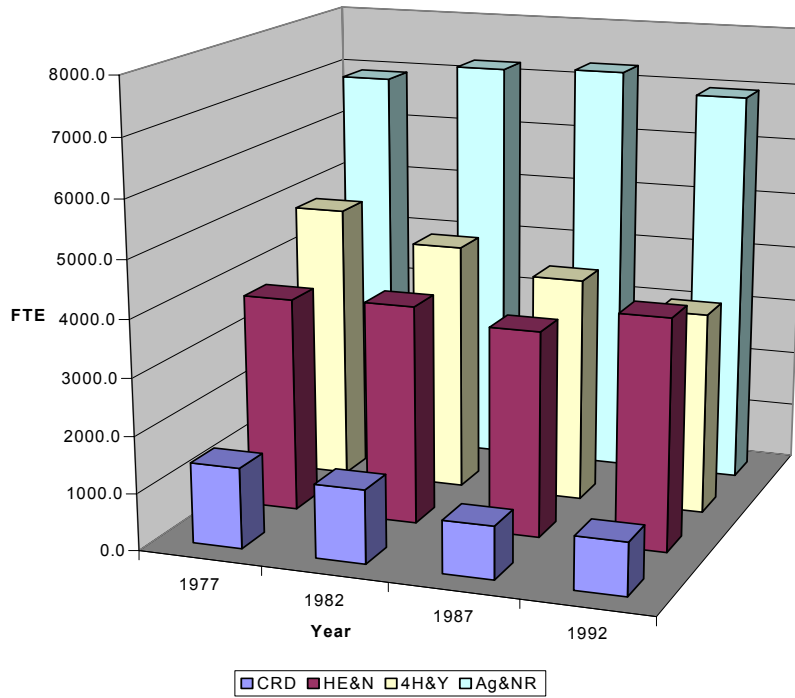


Figure 3. Percent of FTE by Program Area, North Central

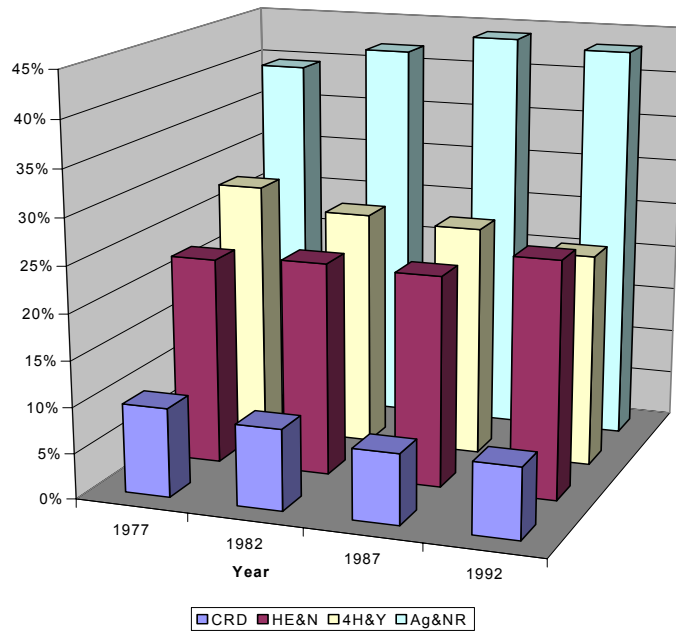


Figure 4. Percent of FTE by Program Area, Northeast

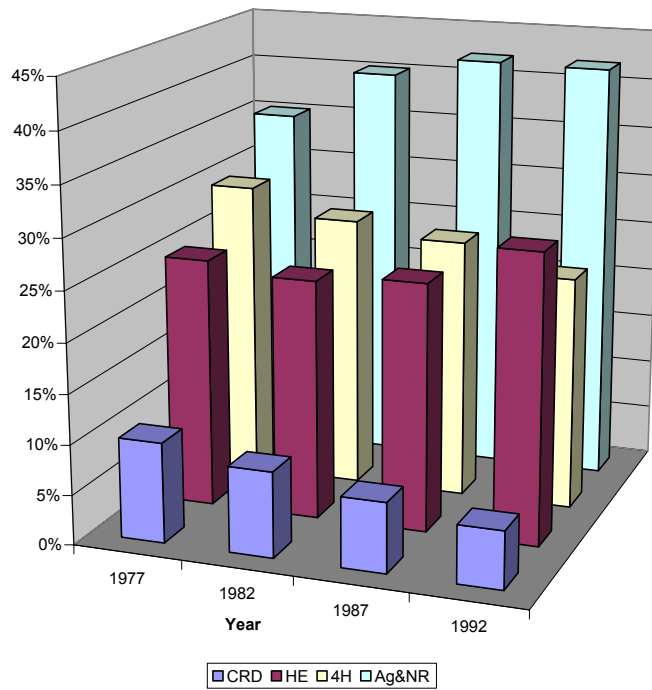


Figure 5. Percent of FTE by Program Area, South

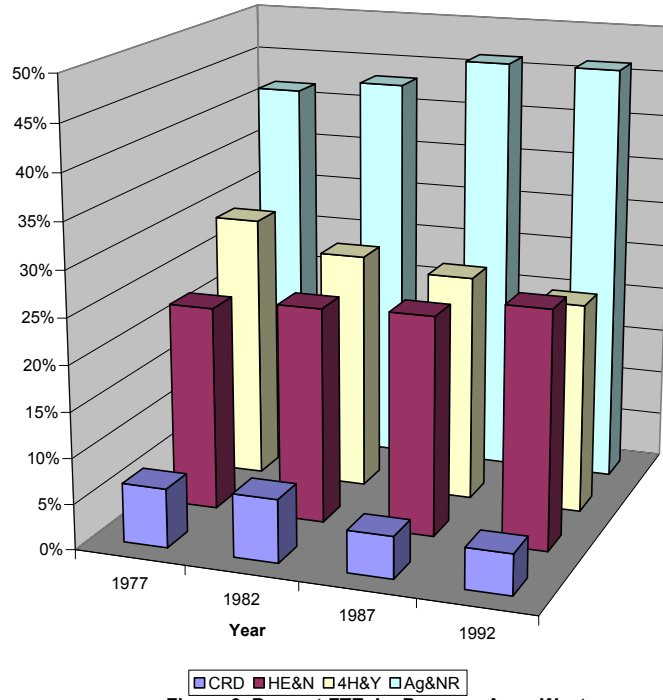
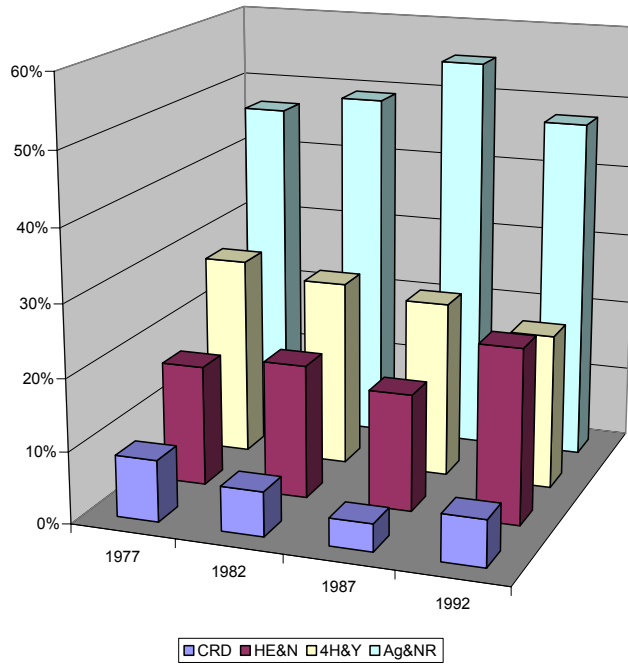
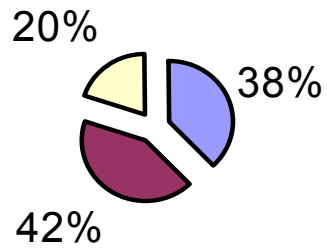


Figure 6. Percent FTE, by Program Area, West



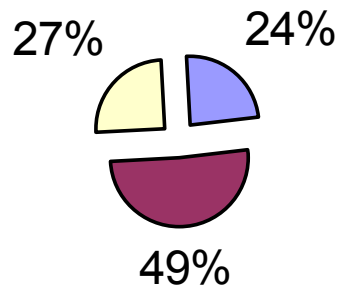
Sources of funding for Extension, 1977

■ federal ■ state ■ local



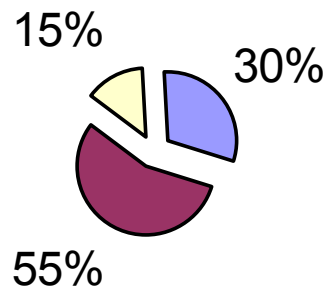
Sources of funding for Extension, 2000

■ federal ■ state ■ local



Sources of R&D funding, 1977

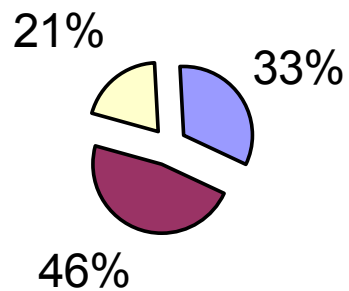
■ federal ■ state ■ other



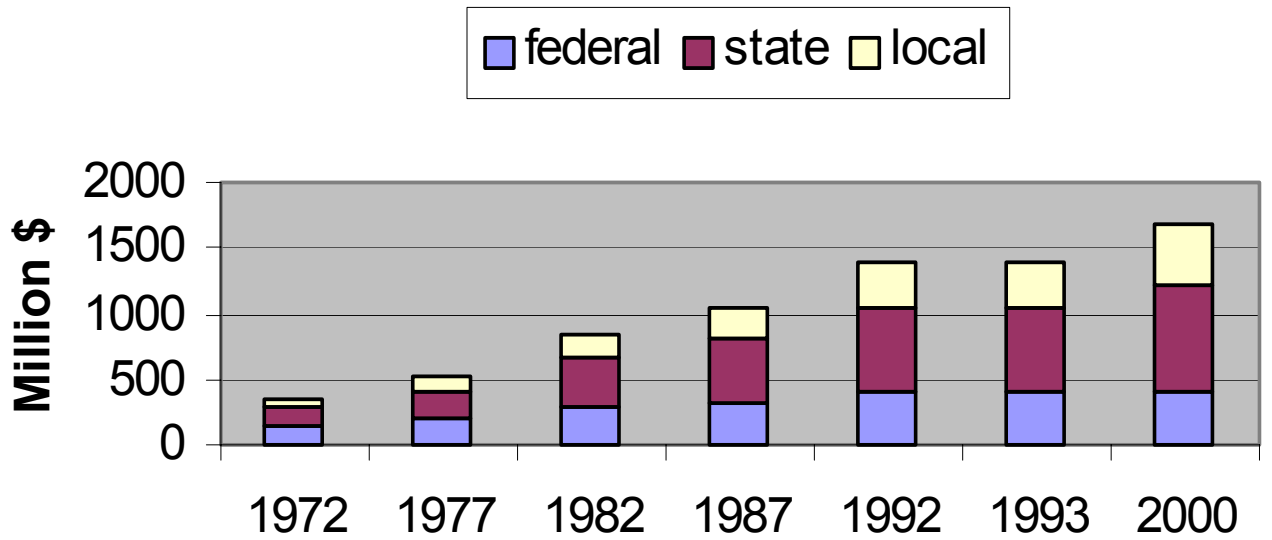
Non-federal research institutions only. Excludes funding to USDA research agencies.

Sources of R&D funding, 2000

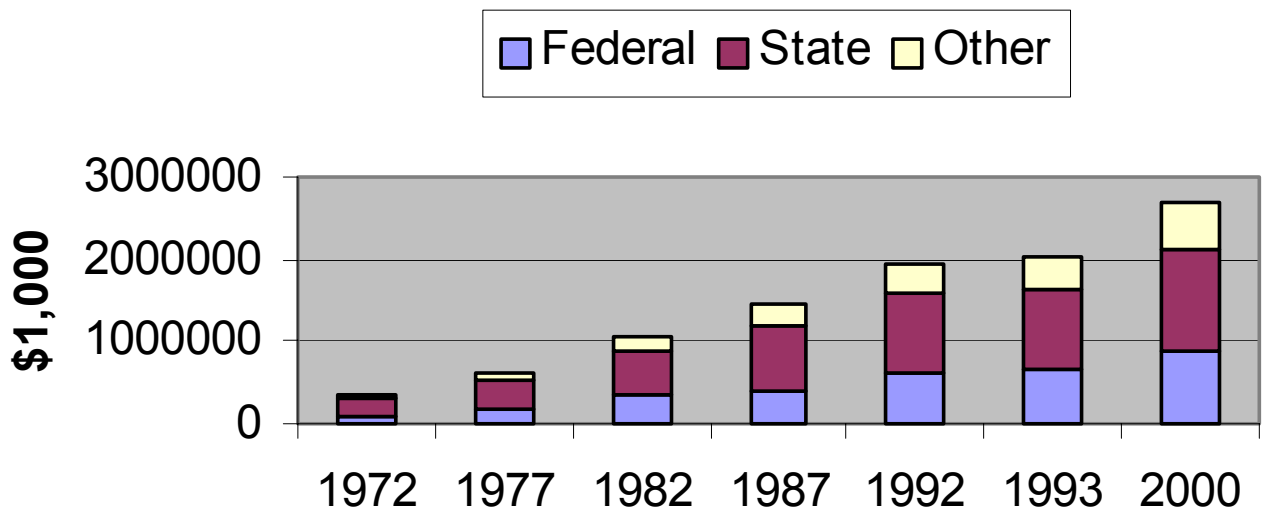
■ fed ■ state ■ other



Sources of Extension Funds

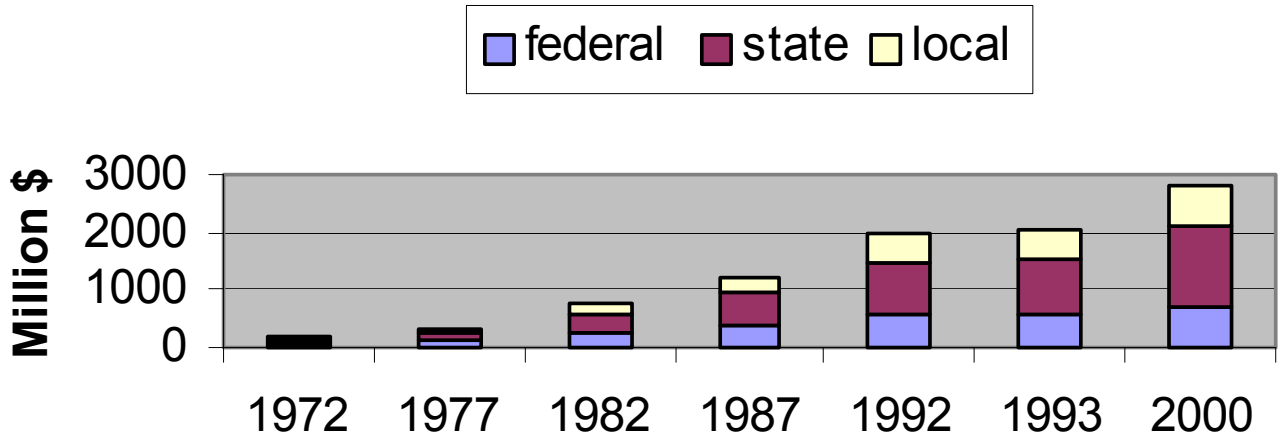


Sources of funds for R&D



Non-federal research institutions only. Excludes funding to USDA research agencies

Sources of funds for Extension, constant 1984 \$



Sources of R&D funding, constant \$1984

