ANNUAL REPORT
1973-1974
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PREFACE

Because of one man’s dream of a better life for South Carolinians, Clemson University was established to respond to people’s needs. Throughout its 82 years of service to the State and Nation, Clemson has remained a “people oriented” institution. Its teaching, research and public service activities touch people’s lives every day.

As a state land-grant institution, Clemson’s earliest commitments were to the “study of agriculture and natural science.” And later to the expansion of industrial growth. These early commitments continue, but they expand as people’s needs change. Today, Clemson is responding to a wide range of problems affecting South Carolinians and people everywhere, such as developing new high protein meat substitutes; seeking a safer and higher quality environment; improving health care delivery; creating innovative education programs; broadening recreational opportunities; and seeking to improve man’s other basic needs, clothing and housing.

Through these and other commitments, the University’s nine colleges and Graduate School are exploring all fields of knowledge to improve life for mankind.

Clemson began its commitment to people when its doors opened in 1893. That day was the realization of a dream come true for Thomas Green Clemson, a man of wisdom and courage who saw the great need in South Carolina for a scientifically oriented institution of higher learning to provide the state’s young people with the training which was needed to build a better society.

So strongly was he committed to the need for such an institution that he bequeathed his land and other real and personal property to the state for use in establishing the “high seminary of learning” he envisioned.

Mr. Clemson was a scientist and agriculturalist who came to South Carolina from Pennsylvania in the 1830’s and married a daughter of John C. Calhoun, a foremost statesman in South Carolina history and Vice President of the United States from 1825-32.

In 1889, the year following Mr. Clemson’s death, the South Carolina General Assembly accepted the terms of Mr. Clemson’s will and, following the decision of the U. S. Supreme Court to uphold the will, the State of South Carolina and the full Board of Trustees proceeded to convert the dream of Thomas Green Clemson into the reality of Clemson Agricultural College.
The College also was established under the Morrill Land-Grant Act passed by the National Congress in 1862. Clemson therefore is a member of the national system of State Universities and Land-Grant Colleges.

In 1964, in recognition of expanded offerings of the institution not only in the areas of agricultural and mechanical arts but also in the sciences and arts, the name of the institution was changed to Clemson University.

The University now has nine colleges and the Graduate School. The colleges are Agricultural Sciences, Architecture, Education, Engineering, Forest and Recreation Resources, Industrial Management and Textile Science, Liberal Arts, Nursing, and Physical, Mathematical and Biological Sciences.

This report presents a comprehensive look at Clemson University, its programs and activities during the 1973-74 academic year.
ACADEMICS

Graduate Studies and University Research
Arnold E. Schwartz, Dean

Undergraduate Studies
Claud B. Green, Dean

University Extension
Samuel M. Willis, Dean

College of Agricultural Sciences
Luther P. Anderson, Dean

College of Architecture
Harlan E. McClure, Dean

College of Education
Harold F. Landrith, Dean

College of Engineering
Lyle C. Wilcox, Dean

College of Forest and Recreation Resources
W. H. Davis McGregor, Dean

College of Industrial Management and Textile Science
Wallace D. Trevillian, Dean

College of Liberal Arts
H. Morris Cox, Dean

College of Nursing
Geraldine Labecki, Dean

College of Physical, Mathematical and Biological Sciences
Henry E. Vogel, Dean
Degree Programs

Instruction in agriculture basic to South Carolina's needs is completely in harmony with the purpose of Clemson University as outlined in the will of Thomas G. Clemson and in the Morrill Act of 1862, which established the land-grant colleges.

The population of this nation and the world continues to increase significantly, requiring greater quantities of food and fiber. To meet this demand, a larger number of college agricultural graduates are needed.

The total agricultural industry is dynamic and complex. The College of Agricultural Sciences is continuously revising and modernizing its educational programs to ensure that graduates will be properly prepared for future demands. For instance, students in many curricula now can specialize by choosing a minor in Science, Business, Production, International Agriculture, or Environmental Science. In addition, a student may select a minor in a second department, or a department other than the one in which he is majoring. This minor may be in the College of Agricultural Sciences or in one of the other colleges of the University.

The College of Agricultural Sciences recognizes and accepts the responsibility of disseminating factual information about career opportunities in agriculture. To assist in discharging this responsibility, a Public Relations Committee for Resident Instruction in Agriculture was organized in 1973-74. The members of this committee, together with other faculty members and some students, visited approximately 50 high schools during the year. They met with guidance counselors, science teachers, agriculture teachers, students, and others as appropriate. Included in the visits was the showing of a new, 10-minute slide-tape presentation on career opportunities. Experience indicates that this service is needed and appreciated. It will, therefore, be continued in 1974-75.

In order to meet more completely the needs of students and the agricultural industry, a new Bachelor of Science degree was established in Community and Rural Development. This curriculum, administered by the Department of Agricultural Economics and Rural Sociology, is designed to provide an educational opportunity for students who desire special knowledge of the problems of community development, economic growth and resource management.
It will provide local, district, state, regional, and national agencies and industries concerned with community and rural development problems with graduates who have training in the basic concepts needed to become effective professionals. The Rural Development Act of 1972 asserts a strong national intent to expand the roles of the land-grant colleges of agriculture in the community and rural development programs.

**Agricultural Technology Programs**

Since 1966-67, the College of Agricultural Sciences has cooperated with the State Board for Comprehensive and Technical Education and the State Department of Education in conducting programs in Agricultural Technology at selected education centers and colleges in the State. The role of this College in this special instructional program primarily involves curriculum planning and development, and program evaluation. In addition, the College of Agricultural Sciences assists in program operation by making available the research programs and facilities at Clemson and the branch experiment stations for class field trips, laboratory sessions, and demonstration purposes, and by providing instructional staff at a cost as necessary and feasible for successful program operation.

Currently eight two-year programs and one one-year program in Agricultural Technology are offered at eight technical education centers and colleges in the State.

Enrollment in the Agricultural Technology programs has been increasing—from 88 in 1969-70 to 289 in 1973-74. Job opportunities and salary levels for graduates of the technology curricula have been very good.

**Continuing Education**

Modern agriculture is a rapidly changing industry. The fast pace of both adoption of new technology and application of new research results in modern agriculture and rural living necessitates a program of continuing education for professional educators and other agricultural workers to ensure that ongoing programs in which they are involved will be timely—and will utilize the latest research and other information available. Personnel associated with agriculture and rural living in this State who especially benefit from continuing education programs include the county staff of the Cooperative Extension Service, Vocational Agriculture teachers, Soil Conservation Service personnel, State Land Resources Conser-
vation Commission personnel, members of agricultural organizations and agencies, farmers and other special groups.

There are two basic concepts of continuing education. The first is the use of continuing education programs as a means of constantly updating professional educators and other agricultural workers in the specialty areas in which they were professionally trained and are employed. To meet this type of continuing education need, periodic workshops and short courses are held in areas such as beef, dairy science, horticulture, farm management and marketing. The second concept of continuing education places emphasis on providing specialized educational programs on subjects of immediate or impending importance such as occupational safety, food safety standards, safe pesticide application, environmental protection, and specific plant or animal disease control. Participants in such programs are then in a position to conduct further educational programs in these topical areas. Both these concepts have been emphasized in planning continuing education programs in the College of Agricultural Sciences.

In-service training programs in agriculture were expanded significantly in 1968-69 as a result of a special State appropriation for this purpose. Continuing education activities in the College currently encompass special in-service training programs for Cooperative Extension Service personnel and Vocational Agriculture teachers in areas considered to be of greatest current importance. During fiscal year 1973-74 programs were conducted in areas such as communications, general agriculture, home furnishings, horticulture, agricultural outlook and resource development.

In addition, this College conducted many other types of continuing education activities during 1973-74 such as seminars, conferences and workshops for a wide variety of professional personnel. These programs covered such subject matter areas as a butter-fat testers short course, a pesticide chemicals school, a nurseryman's short course, hortitherapy short courses and similar types of specialized continuing education activities.
The College of Architecture has been involved in a number of major activities at both undergraduate and graduate levels. These activities are in direct response to the need to train professionals able to cope with the changing world. Some national problems which have been long evident have come to focus during this academic year. Many of these problems have implications for the professionals served by the College of Architecture: building constructors, city and regional planners, visual designers and architects.

The fuel crisis prompted the College to consider the implications of increasing costs of fuel in building and to study fuel conservation in building in its many projects. The critical housing shortage is another example of an ever present problem which has now reached a crisis stage.

Realizing that College of Architecture graduates will quickly be placed in a position that requires solving these kinds of problems in the professional world, the College has long believed that the use of "real world" projects for instruction is optimal in each of its areas. Because they are tangible and realistic instructional vehicles, the projects are capable of motivating students. In addition, a great deal of benefit is received by the State and region through very considerable public service that results through these studies.

Although constrained by physical limitations for the past several years, the College of Architecture is anticipating the completion of a major addition to Lee Hall which will more than double its physical space. Once the new facility is completed, and the bringing together of the studios, classes, lecture activities and laboratories that are now located in five other buildings, the new spaces will be filled. This is due to an unprecedented demand for admission to the College and its programs. Admissions have been limited and kept consistent with the needs of the professions and the budget and physical resources available for education. Despite these limiting physical problems, the faculty of the College has pressed on with education and public service in a more expansive way than at any time in its history.

**Assisting the State**

For the past five years the College’s Health Care Studio has been involved in research and collaboration with and for the South Carolina Department of Mental Health. These studies have re-
sulted in the Village System of Patient Care and Treatment. In the first phase, it was necessary for the faculty and graduate students of the College to work through a long sequence of conferences with staff psychologists and psychiatrists from the South Carolina Department of Mental Health to determine some preliminary concepts for health care facilities for the mentally ill. Afterwards, conceptual models were developed and modified through a sequence of studies, and presently the idea of the Village System is being implemented in three developing centers and additional updated projects continue. This has been a most effective and constructive example of intra-agency collaboration. Frequently research studies do not have the follow through of repetitive phases, and one of the exemplary things about these studies in collaboration with the State Department of Mental Health has been their on-going character.

Although the College of Architecture has been involved in planning studies of entire towns and portions of cities, and has provided planning assistance for regions in the State during the past 19 years, it now has a greater capacity for providing excellent education and public service than in the past. More than 30 communities have been studied in the past. During 1973-74 there were three planning projects in Oconee County and three additional projects in Pickens County. A conceptual study for Highway 11 was completed in the fall of 1973, as well as a detailed study of the central business district of Walterboro.

In addition to normal city and regional planning, the College also has become involved through collaboration of several of its departments on highly specialized planning projects such as a study of the historic districts of South Carolina communities. The historic district of Anderson and the historic preservation in Bennettsville and Charleston are examples during this period.

During the spring of 1974, prototype studies were made for the site planning and specific building planning of a new Regional Corrections Center for the State Department of Corrections. This is of vital interest as the old Central Corrections Institution is to be replaced with regional centers throughout the state.

The College also makes every effort to collaborate with other colleges at Clemson in educational activities which can be a public service. Thus, faculty members and students from the College of Architecture have collaborated with the University Housing Institute in basic homes design, and is planning to expand this ac-
tivity by the creation of a graduate studio in housing studies during the 1974-75 academic year. This studio will do research and prototype studies of architectural design for low cost housing. The College collaborated with the College of Forest and Recreation Resources on the Recreation-Outdoor Education Resource Laboratory located on Lake Hartwell. The Laboratory provides programs for senior citizens, the handicapped and retarded children.

Service to Community

In addition to its educational and research activities, the College continues to maintain several facilities for the use of its own students and for the general cultural advantage of the University and general area. The Lee Hall Gallery has a lively and multifaceted series of exhibits, which cover the general fields of architecture, furniture design, industrial design, painting, sculpture, ceramics, weaving, printmaking, planning, photography, landscape design, building technology and various exhibits of historic interest.

The College of Architecture lecture series has been an annual event for the past 18 years, and recently has taken on a new life. The lectures include noted persons from each of the fields under the College purview. They are open to the public and have become an important cultural resource to the geographic area. Twenty lectures were presented in 1973-74.

During this same academic year, the College co-sponsored a short course for professionals on "Designing Buildings for Fuel Conservation." The College developed and presented a short course for the Easter Seal Society on the "Elimination of Architectural Barriers for the Handicapped," which was attended by state officials, architects and engineers in the region.

The College has become increasingly active in publications. "The Semester Review" is sent to architects, contractors and planners in the State, and to the Schools of Architecture throughout the United States and Canada, and to some Universities throughout the world. Papers and informal materials, significant design, and research are published in the Review, and it has become an important means of communication.
The College of Education concentrated its efforts on teaching, research and development, and in-service education. Enrollments increased in both on-campus and off-campus programs. Graduate students receiving advanced degrees continued to outnumber undergraduate students (373 masters to 299 bachelors).

Program Objectives

The College of Education reassessed its efforts in assisting the State to reach the educational goals adopted by the State Board of Education in 1970. Activities of the College emphasized:

- Programs to provide adequate and qualified personnel to staff the State's educational system.
- Programs and services to assist the State in providing adequate occupational training for public school students.
- In-service education for up-grading public school and post-secondary education personnel.
- Preparation of personnel to work with children who have physical, mental and emotional handicapping conditions.
- Development of materials and specialists to work with the vocational, technical and community college systems.

In-service Education

The College conducted seminars, workshops, and provided graduate level courses in 29 counties.

The Department of Industrial Education increased efforts to serve industrial education teachers and industrial training personnel. Workshops, short courses, seminars, conferences and off-campus courses involving more than 600 teachers and industrial training personnel were held. One emphasis was a “Media Applications Workshop in Industrial Training” for personnel in industry who needed competence in developing, organizing and presenting audio visual programs.

Workshops, conferences and courses were conducted for vocational teachers in Area Vocational Centers throughout the State. Some of the occupational subjects offered were masonry, drafting, machine shop, textiles and plumbing. Courses and conferences were held for teachers in 28 areas of occupational instruction.

Two special institute courses were conducted in Columbia to serve industrial education teachers located in mid-state. These
institutes trained teachers to lead secondary school students in exploring construction and manufacturing.

Two new courses provided opportunities for teachers of vocational agriculture to learn by doing. Internship teaching assisted beginning teachers in planning for and implementing successful programs in their local schools. Another course, "Internship in Agribusiness," was offered to experienced teachers who were placed for a minimum of 90 hours working in successful agribusiness firms. This experience was most helpful to teachers in interpreting job opportunities and working conditions and requirements to high school students.

In-service education received major emphasis in agricultural education. Five graduate courses were taught at off-campus centers to serve teachers near their jobs. Also, 71 teachers attended seven oxyacetylene workshops to increase their welding proficiency. As an indication to their interest and response, 50 teachers of vocational agriculture registered for graduate courses.

More than 1,900 students enrolled in off-campus courses, primarily in the Department of Elementary and Secondary Education. Cooperating colleges—Columbia, Erskine, Newberry, Presbyterian and Wofford—utilized their faculty and facilities to teach 24 additional courses which carried Clemson graduate credit.

Research and Development

Research and development of curriculum materials—slides, audio tapes, learning activities packets—for graphic arts teachers were completed and produced for sale to teachers throughout the nation. A unique three-way contract with the University, the State Department of Education and the Printing Industries of the Carolinas (PICA) as partners was signed in October, 1973. This venture was established to reproduce and distribute the graphic arts instructional materials and to direct the income from these materials to the Department of Industrial Education for further development of instructional materials. Seventy school districts throughout the nation purchased the graphic arts instructional materials when the initial announcement was made.

The Vocational Education Media Center continued to increase its production of instructional materials for the State's greatly-expanded vocational program. The Center supplements instructional materials needs of more than 1,900 programs.
Material packets for more than 200 different jobs were completed to assist in the support of the vocational programs in local schools and teacher education programs of Clemson and other South Carolina universities. This involved the development of more than 4,700 pages of content.

Two publications have been accepted as vocational school materials and as college texts. One was developed in Textile Processing and involved consultation with 39 industries, four vocational center teachers, 10 Clemson faculty members and four State Department of Education staff members. The second text—in Forestry—was developed in the same manner with 14 Clemson faculty members, eight staff members of the South Carolina State Forestry Commission, the U.S. Forest Service, three teachers of vocational agriculture and representatives of the State Department of Education.

Special Activities

The College of Education cooperated with other state colleges and agencies in developing an educational television course, "The Teacher As Manager," which will be telecast in 1974-1975.

The Educational Clinic completed its first year of operation in providing services to area children and instructional opportunities for graduate students. The Clinic functions in the areas of reading, educational psychology, guidance and counseling, and special education.

The Departments of Military Science and Aerospace Studies sponsored the Second Annual Tiger Drill Meet which provided competition among drill units of Junior ROTC units located at high schools throughout the State. More than 500 high school students participated in the meet.

The Department of Military Science established a Cross-Enrollment agreement with Tri-County Technical College to expand the opportunities for students to receive a commission through Army ROTC.

The Department of Aerospace Studies completed negotiations with Central Wesleyan College so that students from that institution may attend Aerospace Studies courses at Clemson.

The Fourth Annual Reading Conference, featuring nationally-recognized reading authorities, was held in October with about 700 people attending one or more sessions. The conference drew participants from six states.
A regional seminar on “Building Our American Communities” was hosted by the Department of Agricultural Education. Sixty participants representing agricultural education leadership in the Southeast attended and planned for more effective community development through the FFA.

A new service was initiated for University students who are weak in reading skills and subject area comprehension. Through this developmental program tailored to meet individual needs, students are able to become more proficient in reading and studying.

THE COLLEGE OF ENGINEERING

Careers in engineering are becoming increasingly attractive and engineering graduates can look to the brightest employment picture in a decade. The demand far exceeds the supply, a situation predicted to exist through 1985. The resulting higher salaries, plus media coverage about the shortage, have served to increase enrollments nation-wide.

The College of Engineering has responded to this demand with a renewed commitment to high quality programs in education, research and public service. At Clemson, accepted applications for 1974-75 admission to freshman engineering programs was up 20 per cent from the previous year. An overall enrollment increase of eight to 10 per cent is anticipated in the College for the 1974-75 academic year. A public information program in South Carolina has helped attract these students to engineering at Clemson.

The challenge to meet demand is made greater because it comes at a time when higher education costs are at an all-time high. Consequently, the College places high priority on the goal of increasing administrative and program efficiency through improved organization within the College. For example, the faculty of the Department of Engineering Mechanics was merged with the Departments of Mechanical and Civil Engineering. This eliminated one administrative unit while maintaining the integrity of the graduate program in Engineering Mechanics.

When compared to the average of engineering programs at major Southeastern institutions, Clemson’s instructional costs per engineering student is more than six per cent less.

More than 1,200 students are enrolled in the College of Engineering. There are 155 master’s candidates and 55 doctoral candidates. There are 35 women representing about three per cent of the enrollment. National emphasis on recruitment of women and
members of minority groups into engineering is producing results. Clemson is making significant strides in this area and will continue its efforts.

Department Advisory Boards, which met for the first time in November 1973, have been established to further strengthen the overall engineering program. These boards have been helpful in suggesting curriculum improvements and in developing closer academic-industrial relationships.

Through the College's new career development program, students in primary and secondary schools will receive increased counseling assistance. One part of this program is guidance counselor workshops to be held during 1974-75 to better prepare them to help students with interests in engineering. Radio and television public service announcements, prepared for release during the fall of 1974, describe the College's activities in instruction, research and public service.

THE ACADEMIC PROGRAM

Dual-Degree Program Development

The dual-degree program has been expanded to include Wofford, Lander, Newberry and Presbyterian Colleges. Under these agreements, students can be awarded a Bachelor of Arts degree from one of the four participating colleges and a Bachelor of Science degree from Clemson's College of Engineering in five years of study. The program provides a strong basic foundation for engineering students and also reduces Clemson's teaching load at the freshman and sophomore levels in areas which are burdened by large enrollments.

Instruction

To meet the demands of changing technologies and to increase instruction efficiency, self-paced instruction programs are being developed wherever practical. To strengthen this area, the College has engaged a Visiting Professor with expertise in individualized instruction for the 1974-75 academic year. Because the material is modular in nature, changes can be made frequently with a minimum of time and money. The program is especially efficient in classes of 50 or more. This type instruction provides students an opportunity to progress at their own speeds, and gives the instructor a more effective way to evaluate student performance since he requires the student to master one topic before going on
to another. The course enrichment which develops through repetition and personal contact with the professor produces a knowledge base of lasting nature when compared to the "lock step" classroom mode of instruction.

The College's interactive computers and a variety of media including television tapes and audio cassettes coupled with slide presentations are being used in the self-paced programs.

Computer-based instruction is used in almost all of the instructional areas of the College. All curriculums require instruction in computer programming while many give students opportunities to explore systems design and development using various computer programming tools. The College's computer capabilities, unsurpassed in the Southeast, include a large scale real-time/hybrid computer system, a real-time interactive conversational computer system and a time-shared system-8 interactive conversational computing system. Students at Clemson are taught to use computers as problem solving and design tools in much the same way that engineering students of 20 years ago used the slide rule and drawing board.

A high school interactive computing program in seven upstate counties continues to enrich mathematics and science for students by providing direct communication links between the high schools and the College's time-shared computers. Four workshops or "computer camps" were held during the summer of 1973 where recreation and computer education complemented each other.

A Cooperative Education Program permits students to alternate work and study. A total of 42 students are now participating in the program.

Students are encouraged to seek practical, real-world engineering experience beginning as early as the sophomore years and culminating in many cases in the senior year with a semester internship with industry. These design programs emphasize involvement with industry engineers, opportunities for creative and inventive thinking, appreciation of non-technical considerations in engineering practice and design analysis.

Recent industrial participants include Armco Steel, Intech Corporation, J. C. White Co., Texize Chemicals and American Enka.

Student design projects in Mechanical Engineering resulted in prize-winning papers at a regional American Society of Mechanical Engineering conference. Student projects have included the design of a door opening/locking device for handicapped persons,
self-cleaning bathroom, pantyhose packaging device and a boxtop folding mechanism. All devices were designed, built and tested by students while evaluations were made by faculty and industry engineers. Defending one's own design is truly a stimulating way to learn engineering practice.

Degree Programs

Bachelor of Science degrees are offered in eight undergraduate engineering programs in addition to Engineering Analysis and Engineering Technology degree programs. The Master of Science degree is offered in 12 fields and the professional degree of Master of Engineering is available in eight of these areas.

The four-year baccalaureate Engineering Technology degree has been strengthened with the appointment of a program coordinator and a Visiting Professor with experience in engineering technology who will join the faculty during the fall semester 1974-75.

RESEARCH

The College of Engineering is addressing many of society's most complex problems in the areas of energy, basic human needs, environment and industry.

The College spent approximately $1 million from State, Federal and industrial grants on research projects this year. In addition, the College's capabilities have been augmented by substantial gifts and equipment loan programs from industry and federal agencies. Equipment valued at more than $900,000 was received from NASA in 1973-74. Research grants and gifts have totaled more than $7 million since 1960. From a total research budget of about $20,000 in 1964, Engineering's research program has grown to more than $3.5 million in 1974.

Energy

The College has several programs directed toward energy independence. Present research indicates that economical use of solar energy is nearly at hand. Faculty members are developing demonstration units that will provide builders, financiers and home owners in South Carolina with information on economical construction of solar energy-based mobile homes, low-cost modular homes and middle-income homes. Units will be demonstrated during 1974-75 and the basic mobile home unit is scheduled for delivery during the fall of 1974.
Technical and economic assessment of various agricultural crops and crop residue as alternate energy resources are being considered. Gasification and liquefaction of various carbohydrates to hydrocarbon fuels is being examined. Technical and economic assessment of various retrofit systems is under way which would allow existing pulverized coal-fixed steam power stations, originally designed as base-load stations, to assume a cycling mode of operation. The combustion fuel oil in fluidized beds is being studied in an attempt to optimize conditions for burning.

Other research is directed at removal of textile wastewater impurities. Significant savings in chemicals, heated water and cooling water contribute net savings in total cost and energy sufficient to pay for all treatment facilities in less than a year.

Additional energy research efforts include pumped storage studies, process design for energy conservation, increased automobile engine efficiency with lower emission using catalytic exhaust control, mass transportation and traffic control studies for more effective movement of people and materials.

Basic Needs

Food, clothing, medical aid and shelter needs are exerting more and more pressure on the consumer's pocketbook. Engineering researchers are moving to minimize some of these pressures.

Tomato, apple and okra harvesting is automated to increase yield, reduce time from field to market to insure freshness and reduce product price—the item consumers worry about most. Shrimp agriculture and the development of artificial seedbeds for oyster production will provide a continuing supply of seafood.

Improved cloth weaving, dyeing and finishing result from instrumentation and computer systems developed at Clemson. Improved product quality with higher product yield means lower cost to the consumer while maintaining profits for industry.

The College's basic homes research programs have been expanded to the demonstration phase with actual construction in several eastern South Carolina counties to begin in late 1974. Home costs will be much less than conventional home costs.

Health-related Engineering research ranges from a program aimed at eliminating classical false teeth by providing implantable ceramic teeth to computer automated anesthesia systems. All research is oriented toward clinical practice and improved health care delivery.
Environment

Maintaining the State’s environment at a level commensurate with varied uses—such as industrial development, recreation, agriculture and scenic beauty—is becoming more difficult with current economic and energy problems. College of Engineering projects seek to solve many of these problems.

For example, breakthroughs in the reuse of processing chemicals in the textile industry reduces both manufacturing costs and environmental pollution. Other efforts include research on the quality of the State’s natural waters, siting of new industry and the development of better waste treatment systems that take energy problems into account.

Environmental research also embraces thermal pollution, pumped storage siting, brick manufacture from solid wastes, flue gas filtering, nuclear industry waste management, wastewater treatment plant operator education and education of South Carolina citizens in land use for effective community development.

Industrial Development

The College of Engineering—through direct and indirect support by research grants and contracts, the industrial associates program, faculty consulting and student projects—has developed a strong cooperative relationship with industry. The current level of industrial research support of College researchers is about 30 per cent of the total grants-in-force, and continues to grow.

Typical Clemson-industry research programs include computer based instrumentation system studies that help improve product quality and reduce costs. Development of an extruder die-gap opening controller produces a more uniform plastic film. New developments in textile dyeing processes will reduce costs and save energy. More efficient steam power plant operation has resulted on cyclic operation modes.

CONTINUING ENGINEERING EDUCATION

Both enrollment and the number of programs presented by Continuing Engineering Education continued to grow at a rapid rate. More than 3,700 engineers and other professionals were enrolled in 85 continuing education programs.

As a public service, these programs were initiated in 1967. During this period, more than 11,200 professionals have returned to campus to learn of the latest technological advances in their fields.
The rapid growth and use of this educational resource for the State is best illustrated in that more than 60 per cent of this total enrollment has occurred in the past two years.

Each of these short courses, seminars, and symposia featured topics relevant to the state's current problems. Many of these were offered as a cooperative effort between the College of Engineering and other state and federal agencies.

COLLEGE OF FOREST AND RECREATION RESOURCES

The education, research, and extension programs of the College of Forest and Recreation Resources are directed at man's well-being through wise use of his leisure, and at the management use and stewardship of all forest resources. The objective is to assure the management of our forest resources and our recreation resources for their maximum service to present and future generations. These programs are carried on through the Department of Forestry, with curricula in Forest Management and in Wood Utilization, and through the Department of Recreation and Park Administration.

The College of Forest and Recreation Resources completed its fourth year as an academic unit of the University. The College continues to progress in its service to the State in each of its areas of responsibility.

Education

Enrollments in both Departments of this College continued to increase steadily, with a dramatic increase of 32.4 per cent from fall of 1972 to fall of 1973. This included a substantial increase in coed enrollment in Recreation and Park Administration. From fall 1970, when the College was established, until fall 1973 enrollment has increased 52 per cent overall for the two Departments.

This indicates that more and more students recognize that careers in forestry and in recreation make positive contributions toward increasing the productivity of our resources and improving the environment and the quality of life for people.

Orderly growth of the College received an additional boost when in November, 1973 ground was broken for the new Forest and Recreation Resources building, authorized by the State Legislature to be funded from sale of revenue bonds. The building, to be completed in 1975, will relieve many of the critical problems associated with insufficient space for offices and teaching laboratories.
Rooms for class lectures will continue as a problem, however, because the new facility has no lecture rooms. Work also was begun on a Recreation-Outdoor Education Research Laboratory. This camp facility will meet many teaching and research needs as it provides programs for special groups.

The new program in Wood Utilization in the Department of Forestry, which was implemented in July, 1973, now has 15 students enrolled. This is within the initial enrollment projected in the program to the Commission on Higher Education. It is anticipated that this program will grow by six to 10 students over each of the next two or three years, and then stabilize.

In the Department of Recreation and Park Administration, the Recreational Sports courses, offered for the first time, have proved tremendously popular. These service courses are available to any student in the University for elective credit. The number and variety of courses offered will be increased with the completion of Fike Recreation Center. Increasing student demand for the Recreational Sports course offerings is expected to make this a major growth area.

The emphasis area elective programs initiated in each Department are functioning smoothly, and have been well received by the students. Selecting an emphasis area allows the undergraduate student to explore in greater depth certain areas of special interest within a given curriculum.

Placement of graduates has continued to be reasonably successful, with a very high proportion of graduates working in South Carolina or the Southeast. It appears that the two Departments will continue to supply adequate numbers of professionals in the Forest and Recreation Resources fields to meet the State's need without danger of oversupply. This applies both at the undergraduate and graduate levels. The only need not presently being met is for Ph.D.-level graduates. Both Departments are studying this need.

Public Service Activities

Research:

Program analysis, evaluation, and planning were processes shaping the Forestry research program in 1973-74. The increasing emphasis on wood utilization, the initiation of a new program in research on multiple-use forestry, and the developing scientific effort at The Belle W. Baruch Institute at Georgetown made it an ideal time to plan the programs in these areas. Valuable assistance
was rendered by the Foresters Council of South Carolina in its capacity of advisory committee to the Department of Forestry, by a special team of scientists from the Cooperative State Research Service of the U.S. Department of Agriculture, and by the South Carolina Forestry Study Committee in reviewing Clemson programs and seeking support for them.

Important to the overall research program also was the establishment at Clemson University of the Integrated Recreation-Wildlife Habitat Management Research Project by the Southeastern Forest Experiment Station of the U.S. Forest Service. The three Forest Service scientists presently assigned to the project are housed with the Department of Forestry. This arrangement provides excellent opportunities for close cooperation and coordination that should work to the mutual benefit of both programs.

In the Department of Recreation and Park Administration, a state-funded research effort was initiated with major emphasis on the study of the Hartwell Basin as a major Destination Recreation Region. The scope of the project will be expanded to include the Keowee-Toxaway Lake Area.

Another study has dealt with energy consumption by recreation vehicle users in an effort to assess the potential impact of the energy crisis on the leisure industry.

Other projects included development of a conceptual plan for Keowee-Toxaway State Park, and a compilation of a list of plants used by the Cherokee Indians, looking toward the nation's Bicentennial Celebration.

In both departments, graduate students contributed substantially to research progress.

The real impact of research is in the ever-increasing flow of research results from our scientific endeavors. The knowledge gained from research helps the forest or recreation manager or planner to meet the rapidly growing demands upon the forest and the leisure industry.

Extension

Extension is the link between research and practice. In 1973-74 extension programs in Forest and Recreation Resources operated through the Cooperative Extension Service in the College of Agricultural Sciences, and results are reported in that section. Increased funding by the State Legislature has provided expansion of Extension work in Forestry and in Recreation and Park Administration.
COLLEGE OF INDUSTRIAL MANAGEMENT
AND TEXTILE SCIENCE

A new department, a statewide gathering of economics teachers and more than $1 million in textile research are among the year's highlights for the College of Industrial Management and Textile Science.

The curricula of the College recognize the need for an understanding of the basic principles of science and appreciation for the nature of human beings, and the comprehension of the economic, political and social environment.

Department of Textiles

The 13 professors of this Department are conducting sponsored research funded for $960,073 from outside sources. In addition, the state has provided $95,000 for textile research. Three flammability studies account for almost half of the active funded research. Other subjects include byssinosis, safety courses, water purification and consumer protection.

Professors and graduate students work together to perfect in the laboratory technical improvements that would be of interest to the textile industry. The result is a thesis for the student, a publication for the professor, and an increased store of knowledge for the textile industry.

In some projects more researchers are involved, with the professor designated as principal investigator responsible for reporting the project and coordinating the work of other sub-contractors.

With funds appropriated by the State, the Department purchased a number of major pieces of equipment as well as small items needed for more efficient operation. Among the major items are a scanning electron microscope to photograph for study and publication the very fine details of fiber structure, an open end spinning frame to experiment with different kinds of fibers and blends, a nuclear magnetic resonance spectrometer to determine chemical structure of polymers, and a fluorimeter to analyze textile fibers and dyes.

Other major items are a frequency analyzer to determine cycles of defects in yarn, an instron tensile tester to determine stress-strain curves, a light scattering measurement apparatus to characterize the amount of polymerization in a textile-type polymer, a sample weaving loom to demonstrate many varieties of weaves.
and an osmometer to determine the molecular weights of textile polymeric chemicals.

The Department had 128 students enrolled for 1973-74, 16 more than in 1972-73.

Department of Economics

The 1973-74 academic year brought a surge of interest in economics on the part of students at Clemson University. Fall registrations in economics courses rose to 1,396 students in 1973, a 20 per cent increase over the previous year's enrollment.

The concept of team teaching was expanded and introduced into several courses, using specialists from within the Department to cover specific components of courses. In addition, 20 speakers from industry and government visited the department.

The senior seminar in economics was taught for the first time. This course serves as a capstone for the undergraduate program and enables the student to put together the many concepts developed during the four year program. Students were assisted in traveling to Washington, D.C., during their spring break for visits and orientations provided by several governmental offices and organizations.

A significant new course, "Consumer Economics," was developed and offered to the general student body in 1973-74. Designed to provide understanding of budgeting, insurance, real estate purchases, taxation, investments and other financial decisions, the course has been received enthusiastically.

An increased enrollment in the master's program in Economics brought additional resources for research. Each graduate student in Economics writes a thesis. Thesis research has been directed toward applied problem-solving, much of it involving South Carolina problems. Research by faculty and students was conducted in such areas as housing, labor developments in the public sector, control of wetlands and the impact of safety and health regulations on the textile industry in the state.

The Department seeks to promote economic literacy by writing a weekly column for the editorial page of "The Greenville News" and by studying specific local or state problems and writing articles on these for the news media. A collection of columns written by the faculty has been published as a book, Economics Today, and a second volume is being planned.
Every college teacher of economics in the state was invited to Clemson in April 1974 for a one-day meeting dealing with problems common to the profession. Thirty-six attended. The program may become an annual event.

Department of Accounting and Finance

The Department of Accounting and Finance was established July 1, 1974, to administer the existing degree programs for the Bachelor of Science in Accounting and the Bachelor of Science in Financial Management. These curricula had been administered by the Department of Industrial Management since their authorization in 1970.

In the first semester of 1974-75, 175 students were enrolled as Accounting majors and 225 as Financial Management majors.

The faculty sponsored or conducted professional development course subjects such as real estate problems, local government accounting and auditing, public accounting, and individual income tax returns.

Department of Industrial Management

A concentration in occupational health and safety within the Administrative Management program is being developed with funds from the Department of Health, Education and Welfare. This program is expected to begin in January 1975.

In addition to providing technical assistance to industry and professional associations in their certification programs, the faculty participates in the college’s professional development program.

The Department’s six degree programs have an enrollment of approximately 1,000 students.

Office of Professional Development

During the year the Office of Professional Development presented 47 short courses and seminars to a total of 1,691 persons. Forty faculty members and 127 outside speakers presented short course programs.

Short courses were presented in such major topic areas as occupational safety and health, textile printing, nonwoven fabrics, accounting, personnel management and industrial training.
COLLEGE OF LIBERAL ARTS

No university can aspire to be a great university without an excellent program in liberal arts. That is the guiding philosophy of the College of Liberal Arts and the justification for its strong support by the University.

The College of Liberal Arts has a twofold role: to provide required and elective courses for students from all divisions of the University, and to meet the needs of undergraduate and graduate students whose area of specialization is within the College of Liberal Arts. The College comprises six departments: English, Languages, Music, History, Political Science and Sociology, and Psychology. With the exception of the Department of Music, each unit offers an undergraduate major, with the Departments of English and History also offering the master’s degree. Qualified graduates from this College have no difficulty entering outstanding graduate, medical, law, and other professional schools.

The World As Classroom

The College of Liberal Arts functions under the assumption that the real world is the ultimate classroom, that all human events are proper topics for scholarly debate and interpretation, and that people are the most valuable "textbooks" available in the pursuit of knowledge and understanding.

In the first of its new annual lecture series, the College met head-on one of the biggest political powder keg issues ever to face the American Republic: "The Future of the American Presidency." Twelve of the nation’s most notable authorities on the Presidency gave the lectures, which were video-taped and rebroadcast throughout the Southeast in a cooperative venture with the South Carolina Educational Television Network. Planning for the lecture series bordered on the prescient, having begun almost a year prior to the historic Watergate break-in. Another timely program was the College’s fall semester symposium, “Two Decades of Change: The South Since the 1954 Supreme Court Desegregation Decision.” It was the nation’s first major humanities conference to analyze the profound cultural, social, and political changes during the past 20 years in the South and South Carolina resulting from the landmark Supreme Court Decision and subsequent civil rights legislation and court decisions. The symposium was a cooperative effort by the College and the South Carolina Committee for the Humanities.
People—people who have either played active roles in shaping history or have otherwise gained a profound understanding of major events—were again used extensively during 1973-74 in the classroom and lecture hall as learning resources. These “living textbooks” included state and federal elected officials; the former commanding general of the 3rd U.S. Army; former chief of personnel of the Central Intelligence Agency; a renowned New York Times correspondent and author; the former commander of the U.S. Naval Air Force; and several of America’s leading historians, psychologists, and humanities scholars. Rubbing shoulders with people of such rich experience and expertise is a vital complement to students’ regular classes and textbook study.

**Leaders In Professional Scholarship**

One measure of the quality of a college faculty is the scholarly achievement of its members and the esteem given them by their colleagues at their own and at other campuses. In 1973-74, faculty members continued in coveted positions as editors/publishers of *The Journal of Political Science* (professional journal of the South Carolina Political Science Association), and the *Southeastern Latin Americanist* (quarterly newsletter of the Southeastern Conference on Latin American Studies). The English Department also obtained the editorship of *The South Carolina Review*, the only magazine in the State devoted to scholarly articles on literary subjects, as well as creative literature. The *Review* under Clemson leadership has increased its subscription fivefold in one year and is now listed in all important bibliographies in the country.

The individual departments continued to gain regional and national attention through their faculty members’ numerous published books, articles, reviews, papers presented at national meetings, and participation on national conference panels. The College was honored with the naming by Governor John C. West of three of its professors as the official delegates of South Carolina to the 78th annual meeting of the American Academy of Political and Social Science. Similar recognition came for classroom teaching, the very backbone of the body of the College’s work. A member of the English faculty was selected as the first recipient of the annual “Alumni Master Teacher Award,” given along with a $1,000 stipend by the Clemson Alumni Association to an outstanding teacher nominated by students. The College also named its first William James Lemon Professor of Literature, a professorship established to bring to the campus nationally known teacher-scholars.
Public Service

Like all Clemson academic units, the College of Liberal Arts is dedicated to public service activities beyond the restricted goal of simply educating students. Disavowing the old "town versus gown" attitude, the College of Liberal Arts continues to expand its cultural affairs programs to share a great variety of entertainment/learning experiences with the public. Virtually all the programs—Clemson Players drama troupe productions, guest speakers, music and choral programs, lecture programs like the 12-part "The Future of the American Presidency" series—are open to the public at no charge. The University Concert Series, administered by the Department of Music, brought to the Piedmont area, at minimal cost to audiences, programs by some of the world's most famous musicians and other performing artists.

During the summer Clemson hosted for the second consecutive year the Robert A. Taft Seminar in Government and Practical Politics, a program that brought together a select group of secondary school social studies teachers from throughout South Carolina for intensive face-to-face seminars with 20 local, state and national political leaders and analysts. Clemson is the only institution in South Carolina ever selected to conduct the prestigious Taft Seminar.

The College conducted its third annual "Dionysia Festival," a regional program of foreign language emphasis that brought several hundred college and high school students and teachers to campus for language contests and seminars. Some 240 students and 100 teachers from 60 high schools also participated in the College's annual statewide declamation contest for foreign language students. The strong response from schools throughout the Carolinas and Georgia to these programs is a good indication of the growing influence of this area of the humanities within the College of Liberal Arts.

The College provided a more direct sort of public service through its yearly Symposium on Children's Literature for public school teachers, librarians and principals from throughout South Carolina, and through activities such as language translation services and the co-sponsoring of short courses in technical writing for upper South Carolina business and industry personnel.

The College of Liberal Arts also takes educational and entertainment programs directly to South Carolinians through a variety of regular radio programs broadcast over the South Carolina Edu-
cational Radio Network, through programs like concert tours, and the Language Department's faculty and student visits to schools in the Upstate to present foreign language plays.

The Future

Public service, high scholarly achievement, and educating responsible citizens remain the guiding principles of the College of Liberal Arts. All indications point to continued growth in the area of the humanities and the social sciences. The humanities will probably remain campus oriented and contribute most significantly in the area of teaching, personal research, and expanding the cultural affairs goals of the University. Research, teaching, and public service activities of the social science units will be aimed more and more toward finding solutions to problems of poverty, class, race, pollution, rapid urbanization and population growth, public administration, and mental health.

Clemson's College of Liberal Arts is no ivory tower. It is a scholarly and student community with doors always open for the study of man's basic needs and drives—intellectual, emotional, cultural, and social.

COLLEGE OF NURSING

The College of Nursing continues to reflect steady growth toward its previously projected enrollment of 500 undergraduate students by 1980. At the end of the academic year, the College had 320 students enrolled in Nursing programs—230 in the Baccalaureate program and 90 in the Associate Degree program. Projected enrollment for 1974-75 includes a 110 per cent increase in the number of seniors and a 40 per cent increase in the number of juniors registered for the Baccalaureate program.

During the year, the College of Nursing awarded the Bachelor of Science degree to 25 students, the Associate in Arts degree to 21. All graduates are employed.

Undergraduate programs offer to practitioners an opportunity for career advancement. Licensed practical nurses and medical corpsmen may take challenge examinations in the Associate Degree program's first course in nursing. Registered nurses may take the examinations during sophomore and junior courses. Development of a self-instructional laboratory has provided a new teaching-learning process for both faculty and students. The laboratory is staffed by graduate assistants and a full time faculty member.
In June the South Carolina Commission on Higher Education approved the master’s degree program in Family Health Nursing which will be in operation during the 1974-75 fall semester.

Nursing Building Funded

Nursing education will get a tremendous boost with the construction of a $3.5 million College of Nursing building. The facility will be funded through a $2,025,656 grant from the Department of Health, Education and Welfare; $170,136 from Appalachian Regional Commission funds; and the remainder from State funds. The five-story building, to be located east of Strode Tower, should be ready for occupancy by 1977-78.

Contractual arrangements for use of the clinical facilities were established with the Self Memorial Hospital and the Beckman Mental Health Center in Greenwood, and the Easley Baptist Hospital. Also, the Health Department in Anderson and Oconee counties were added to the College of Nursing’s public health facilities.

Two key appointments were made during the year, Dr. Arline M. Duvall as Director of the Baccalaureate program, and Dr. Gwendolyn Lee as Director of Nursing Research. Dr. Duvall, who joined the faculty in 1971 as associate professor, received the master’s degree in public health nursing from the University of Michigan and the doctoral degree from Columbia University. Dr. Lee joined the faculty in 1972, and has expertise in maternal-infant care. She received the master of nursing degree from the University of Colorado and the doctorate from the University of Tennessee.

Nursing faculty continue to be involved in public service activities. A noteworthy example is the continuation of the Nursing In-Service Education Project which includes institutes, workshops, and consultation to hospitals and nursing homes in the six-county Appalachian region. In addition, a program to upgrade the clinical expertise of the emergency room nurse in small hospitals was funded by the Department of Health, Education and Welfare. The first three-week, non-academic course will be offered in December.

Though the College’s student learning experiences have never been identified as a public service, citizens do receive the expertise of the faculty who are specialists and the personal attention of students. The Public Health Nursing program reflects this exchange. While working closely with the County health departments, faculty and students are picking up families who need services and care and are not in a public health nurse’s case load.
During 1974-75, the College will have an average of 25 students and six faculty members involved daily with this type of activity.

COLLEGE OF PHYSICAL, MATHEMATICAL AND BIOLOGICAL SCIENCES

The College of Physical, Mathematical and Biological Sciences continued its program of excellence in teaching and research during 1973-74, carrying more than one-third of the total teaching load of the University. Late in the year, plans for a new biological sciences building, Jordan Hall, were completed and construction will begin in October 1974. This facility will provide a total of 90,000 square feet devoted entirely to advanced laboratories and research in the areas of biochemistry, botany, microbiology, and zoology. These expanded facilities are necessitated by the rapid growth in the biological sciences over the past four years. The total enrollment for the fall semester of 1974 in this area was 73 per cent larger than the similar period in 1971. The widespread concern regarding the quality of health care in the nation has undoubtedly contributed to this growth.

Biochemistry

The Department of Biochemistry continued to strive toward providing the very best of biochemical instruction for interested students from many different disciplines on the Clemson campus. A total of 634 students were enrolled in biochemistry courses during the 1973-74 school year, a 65 percent increase over the previous year and a 188 per cent increase above the Department’s inaugural year, 1971-72. Fourteen graduate students, including one Ph.D., were enrolled in biochemistry degree programs.

The faculty exchange with the Medical University of South Carolina continued to be enthusiastically received on both campuses. The research efforts of the faculty were very successful; papers were presented at one international, eight national, and five regional meetings, and seven manuscripts were published. Several research grants were received.

Botany

In teaching, enrollment in the introductory botany course remained at a high level, and enrollments in advanced courses have increased. Two additional faculty positions were authorized, and the recruitment for a biosystematist and terrestrial systems ecologist is under way.
Three faculty members received research grants totaling $26,200. Projects supported included studies of the effects of thermal stress on primary productivity in a lake; evaluation of an aquatic fungus for use as an agent for the biological control of mosquitoes; and an investigation of photosynthesis in an alga.

The public responsibility of a plant identification service and the maintenance and enlarging of the University herbarium are continuing. Numerous plant specimens submitted by County Agents and the public have been identified and reports returned to the originators of the requests. Several faculty members have presented talks at other colleges as well as to garden clubs and nature groups in the state.

**Chemistry and Geology**

The second High School-College Chemistry Interface Conference sponsored by the Department of Chemistry and Geology was most successful. Plans are to make the Conference an annual event because it allows the cooperation of industry, professional organizations, and the two academic communities.

Chemists and geologists of the faculty are giving increasing assistance as consultants to various industries in the State.

**Mathematical Sciences**

The Department of Mathematical Sciences is committed to excellence throughout its teaching, research and service roles. The faculty brought recognition to the University in holding national appointments to the Mathematical Association of America, the Society for Industrial and Applied Mathematics, and the American Statistical Association. Additionally, one member served as a Visiting Consultant for the Mathematical Association of America’s Committee on Undergraduate Programs in Mathematics.

During the spring semester more than 80,000 computer jobs were processed by students in the program. A new computing facility in the central classroom area resulted in an increase of 40,000 computing jobs.

In research, the significance of professional contributions is best illustrated by the program invitations that two members received to the 1974 International Congress in Mathematics which is held every four years. Another faculty member served as the Director of Statistics and Probability Research Program for the Office of Naval Research in Washington, D.C.
In public service, the Department continued a wide based program of evening and late afternoon courses designed to meet the growing needs of mathematics teachers in the Piedmont Region. Additional public service has been provided by the contract development of large information management systems for State agencies. These programs were developed by members of the Mathematics faculty through the University’s contracting Division of Information Systems Development.

Microbiology

The number of students majoring in microbiology has continued to increase. Currently there are more than 200 students pursuing a B.S. degree program with a microbiology major—twenty times more students than five years ago when the major was established. Many of these students plan medical profession careers. The graduate program has continued to expand, and the Department graduated the University’s first black woman with the Ph.D. degree from the plant physiology program with an emphasis in microbiology.

Research is being conducted in a number of fundamental and applied areas, many of which are specifically relevant to the State. The ecological effects of thermal and chemical pollution of rivers and lakes by nuclear power plants and reactors is being investigated. Studies are underway to determine the effects of toxic chemicals discharged by industries located on rivers, lakes, and estuaries on the microbes routinely monitored as indicators of sewage pollution. Studies also are being conducted to determine which drugs should be used to control the venereal disease, gonorrhea. Other research efforts have focused on the molecular structure of viruses; the biology of food poisoning; and the characteristics of methane producing bacteria. Findings from the later project may assist in the development of large scale plants for the biological production of methane to be used as a fuel.

Physics and Astronomy

The Department of Physics and Astronomy acquired and installed a scanning electron microscope during the year. Funded and operated in cooperation with the College of Textile Science and Industrial Management, the instrument will be an essential factor in advanced interdisciplinary research programs in surface physics, biological science, and the structure and properties of textile fibers.
The Department also has begun a research program directed toward the reduction of damage to agricultural crops and other property by hailstones. The general approach to the problem has been through the achievement of a better understanding of the basic physics of thunderstorm activity and hail formation. The influence of storm cloud seeding procedures is being studied and assessed by observing the scattering of radar signals by rain and hailstones within the storm clouds.

A new course has been offered for non-technically oriented undergraduates on energy sources and the social and environmental impact of energy generation. The course stresses basic physical concepts and environmental factors related to energy sources such as nuclear fusion and fission, solar energy, and ocean currents and thermal gradients.

The Department's planetarium and astronomy program continues to be a source of education as well as entertainment for school children and the public. During the year more than 2,000 school children visited the facility.

Zoology

In February the Department of Zoology hosted a national conference on the "Biological Aspects of the Bird/Aircraft Collisions Problem." It was sponsored by the U.S. Air Force Office of Scientific Research. The impact of the conference is reflected in that such collisions now cost the Air Force about $24 million annually.

The Department was active in several other research areas. A study of the effects of thermal effluent from nuclear power plants on aquatic animals in nearby reservoirs received continued support. Some faculty members were involved in a number of environmental impact statements for large construction projects in the Piedmont area of the State. Other faculty members, in cooperation with members of the Department of Textiles, initiated research on byssinosis, a respiratory disease that threatens workers in textile plants with a high fiber particle content in the air.

GRADUATE STUDIES AND UNIVERSITY RESEARCH

During the first semester 21.4 per cent of the student body was enrolled in the Graduate School, a percentage which is nearly identical to last year's statistic. Of this total 651 attended classes off-campus through in-service institutes for elementary and secondary school teachers and the Clemson-Furman MBA Program.
Evening courses were expanded to include several areas in engineering in addition to those courses normally offered for teachers by the College of Education.

A spring semester enrollment of 2,291 graduate students represented the largest graduate student group in Clemson's history. Similar to last year, this growth was primarily in off-campus enrollments which increased 54 per cent over the fall semester. With the slight decrease in total enrollment during the spring semester, graduate students accounted for 23.5 per cent of the total student body.

The number of students enrolled in Ph.D. programs continued at about the same level of the past three years. The 614 graduate degrees awarded in 1973-74 included 573 master's in 37 majors and 41 doctoral degrees in 16 majors. Also during the year, Clemson was authorized by the S. C. Commission on Higher Education to initiate two new programs: a Master of Science in Nursing and an Educational Specialist Certificate in Administration and Supervision for initiation in fall 1974.

The Graduate School established a new policy on the withdrawal of students from graduate courses which is consistent with the undergraduate policy. The overseas segment of the graduate program in the College of Architecture was approved. The Graduate School revised the language requirements for the Ph.D. degree, implementing a departmental option policy which would be reviewed and approved by individual colleges. Also, residency requirements for graduate degrees were reviewed and amended with particular attention to University employees enrolled in graduate programs. A non-thesis option for the Master of Science in Physics was requested and approved.

A final report on evaluation of certain graduate programs was submitted to the S. C. Commission on Higher Education, recommending the discontinuation of Ph.D. programs in Chemical Physics, Materials Engineering, and Water Resources Engineering as well as the consolidation of Master of Science programs in Animal Science, Dairy Science, and Poultry Science. The Graduate School plans to continue the review of all graduate programs over the next two or three years.
UNIVERSITY RESEARCH

This office continued to serve the faculty in the dissemination of current information on opportunities for sponsored programs and activities, and by assisting in the preparation of proposals seeking this support.

In other activities, the Office of Graduate Studies and University Research continued to serve the faculty and the University as liaison for the Office of Federal Programs (AASCU); the Oak Ridge Associated Universities; and other similar organizations. The Office originated and implemented a University General Assurance of compliance with the policies of federal agencies for the protection of the rights and welfare of human subjects. Also, the Office continued to supply the executive component for the University Human Subjects’ Laboratory Animal Welfare, and Faculty Research Committees.

COMPUTER CENTER

In keeping with growth plans outlined in 1972, the System/370 was upgraded to a Model 158 with virtual storage capability. Neither cost nor total computing capacity was increased to any large extent by this upgrading, but management of computer resources for meeting the diverse needs of the University was greatly enhanced by the addition of virtual storage.

Installation of batch facilities in Martin Hall, providing central campus service to the user community, has been well received. The remote station has been heavily used, especially for quick turnaround of student jobs.

Expanded interactive facilities have been made available to University users and have contributed significantly to the accomplishments of other state agencies. Upgrading of facilities to provide additional remote terminal service to users is progressing according to plan.

DIVISION OF INFORMATION SYSTEMS DEVELOPMENT

The Division received contracts during the year with several agencies. With Appalachia II Health Department, work was continued toward development of a multiple county health delivery system. Completion of a comprehensive appointment system and a prototype cooperative interagency information system highlighted the development.
Two projects met needs of the Division of Administration, Office of the Governor. In the area of comprehensive manpower development, systems analysis and programming were provided in the development of an online data collection and retrieval system. In addition to these activities, services were provided in training of Division of Administration personnel through both on site individual instruction as well as special seminars. In a second project, enhancement and extension of a grants management system for the entire Division of Administration were undertaken. Interfaces to an existing system at General Services were established so online systems support and maintenance could be supported through the University Computer Center.

A site selection system for potential industry was designed and implemented for the S. C. State Development Board. This system allows industrial requirements to be matched with available sites throughout the state so a "real time" answer to needs and questions can be provided.

Besides these accomplishments, the Division of Information Systems Development has been involved in a number of activities which can also be utilized by the entire University. These include:

- Development of special time sharing software.
- Evaluation of Data Base Management Systems.
- Education and financial support of many computer science undergraduate and graduate students.
- Evaluation and selection of computer hardware.
- General consultation on information systems design.

**ROBERT MULDROW COOPER LIBRARY**

The Robert Muldrow Cooper Library continued its strong support of the academic area with the addition of 35,000 volumes, increasing its total collection to 542,697 volumes. In addition, there are 31,250 microcards, 7,697 reels of microfilm, and 162,753 units of microfiche. The Library regularly receives 10,069 serial titles—periodicals on a regular basis; transactions, proceedings, and reports shortly after they are published.

To supplement its collection, the Library borrowed 1,843 items from other libraries. It loaned 1,086 items. As the collections increase it is anticipated fewer loans will be made from other libraries, particularly in the areas of the social sciences and humanities. Of the 1,128 items borrowed for the Science, Technology and Agriculture Division, 326 of them were available from the Medical
University of South Carolina. As mentioned in a previous report, the relatively small number of items borrowed reflects the growing strength of the Library collections since Clemson offers doctorates in 27 disciplines and the items borrowed were for graduate students as well as faculty members. The most distant place requesting material was the University of South Wales, Australia.

Thirty-three researchers visited Clemson to use the papers in the Special Collections—15 from South Carolina, one from Canada, one from West Germany, and the remainder from 13 states including California, Texas, Pennsylvania, Ohio, Illinois and New Jersey. More than 2,000 Xerox copies of manuscript materials were prepared for researchers using the papers.

In cooperation with the National Agricultural Library, a very useful service—“Document Delivery Service”—was initiated on a trial basis during the year. In performing this service, Clemson supplies to U.S. Department of Agriculture personnel with South Carolina the publications needed in their research that are available here, and refers to a regional center, the University of Georgia, requests for which Clemson does not have the material. Of the 408 requests received, Clemson was able to supply 289, or about 70 per cent, with a turnaround time of less than a week.

Three useful publications were prepared during the year:

“South Carolina Agricultural Experiment Station Publications: An Index 1888-1973,” which was prepared by Jane Harris (Library Technical Assistant) and Charles W. Triche, III (Reference Librarian). This publication has been issued by the South Carolina Agricultural Experiment Station, Clemson University. A need has existed for an accurate, comprehensive, yet concise index to these publications. It will be kept current by an annual supplement.

“A Library Guide to the Science, Technology and Agriculture Division, Clemson University” by Charles W. Triche, III. The guide contains information about the classification system, acquisitions, interlibrary loans and other services, and includes a bibliography of important dictionaries, directories, encyclopedias and handbooks in each of the major subject classifications.

“Index and Abstract Journals in the Clemson University Library” was compiled by Myra Armistead (Documents Librarian). This publication is arranged by subject matter and is a valuable reference guide for users of the collections.

An immediate goal of the library is to expand the stack area and provide additional shelving for the growing collections.
STUDENTS

Academic year 1973-74 was a year of several milestones in the institution's history. It marked the first time total enrollment (on-campus and off-campus) reached the 10,000 level. The University for the first time graduated more than 1,000 students at a single Commencement and awarded more than 2,000 degrees during a single academic year.

It was a year of several other notable "firsts," all of which represent trends in student life at Clemson: the first black student elected president of the student body; the first black woman to receive a doctoral degree from the University; the first coed at Clemson (and one of only a handful in the Southeast) ever to receive a master's degree in wildlife biology; the first coed to be named an ROTC Distinguished Cadet and be inducted into the National Society of Scabbard and Blade; the first coed to serve as editor of The Tiger student newspaper; and the first group of architecture graduate students to attend the University's new overseas Center for Building Research and Urban Studies at Genoa, Italy. Looked at in isolation, these "firsts" mean little. Considered as reflecting the on-campus life of some 10,000 men and women, these events are a clear demonstration that Clemson University's primary goal is to expand all the opportunities it can offer, to all the people it serves.

1973-74 saw the stabilization of several statistical trends (percentage of women students, number and utilization of student dormitory beds, academic quality of incoming freshmen and overall scholastic achievement, etc.) as Clemson moved a step closer to its plan to hold on-campus enrollment to 10,000 students and provide the buildings and other facilities to meet their needs.

Clemson President Robert C. Edwards sums up the philosophy behind the enrollment ceiling: "Last fall when our on-campus enrollment passed the 9,000 mark, many people wondered out loud if our desire to limit enrollment to 10,000 would be forgotten. Emphatically, it will not be forgotten. We still believe that we can maximize quality only by limiting enrollment to the number we feel we can handle in support services—physical and otherwise. There are no advantages to growing larger than 10,000, and there are many disadvantages. No one institution can be all things to all people. One of the worst things that can happen to a university which becomes big in numbers is that it becomes imper-
sonal. That will not happen during my tenure at Clemson. To de-humanize this campus would be a tragedy.”

Quantitatively and qualitatively—through student body statistics and student activities—1973-74 demonstrated clearly that a university of Clemson’s size and character can provide any person with a superior college education without sacrificing that environment of cultural, intellectual, and demographic diversity so essential to produce enlightened citizens in a complex modern society.

Excellence in student achievement can be measured in many ways. One is by the quality and success of programs the students plan and run themselves.

The University Speakers Bureau lined up for the campus and the community one of the most impressive lists of guest lecturers ever brought to South Carolina during an eight-month period. The speakers included Christine Jorgensen, one of the most famous newsmakers of the past quarter century; television news commentator David Brinkley; seeress Jeane Dixon; former Hollywood star Buster Crabbe; conservative columnist James J. Kilpatrick; and Karl Hess, former right wing conservative turned radical “anarchist.” Also under contract but unable to appear were Congressman Gerald Ford, who cancelled because of his nomination to the Vice Presidency, and convicted Watergate burglar James McCord, whose speaking tours were prohibited by the federal judge trying the Watergate case.

The Clemson Players drama troupe also made an immense contribution to the enrichment of cultural life in the Clemson area with its productions of Man-in-the-Moon Marigolds, The Importance of Being Earnest, Angel Street, and The Threepenny Opera. Less in the public eye but of equal importance were the community service projects conducted by several student organizations, and student-oriented programs like the Student Alumni Council’s summer job referral service, which served more than 100 Clemson students.

A signal honor for the University was the selection of a group of Clemson undergraduates to represent one of the “big five” nations—France—for the annual Harvard National Model United Nations held in Boston, Mass., and attended by 750 outstanding college students from throughout North America. Clemson’s local chapter of fraternity Pi Kappa Alpha won for the second consecutive year the national organization’s prestigious Smythe Award as
the nation's most outstanding chapter, only the second time in history a chapter has received the awards back-to-back.

Academic excellence also continued to characterize the Clemson student body. Some 91 per cent of the entering freshmen in 1973 were graduated in the upper half of their high school class with 32 percent graduating in the top 10 per cent. Some 330 students, about 39 per cent of the senior class, were cited for high scholastic achievement at May 1974 Commencement exercises.

Total enrollment was up more than 4.7 per cent in the 1974 fall semester when a record 10,586 students registered for classes. The main campus enrollment of 9,763 in 1974 represented a 3.2 per cent increase over the previous year, while graduate enrollment (2,415) was up almost 9.7 per cent.

Fall semester enrollment comparisons for recent years are shown below:

<table>
<thead>
<tr>
<th>Year</th>
<th>Undergraduate</th>
<th>Graduate and Others</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1968-69</td>
<td>6,165</td>
<td>674</td>
<td>6,839</td>
</tr>
<tr>
<td>1969-70</td>
<td>6,203</td>
<td>818</td>
<td>7,021</td>
</tr>
<tr>
<td>1970-71</td>
<td>6,679</td>
<td>1,359</td>
<td>8,038</td>
</tr>
<tr>
<td>1971-72</td>
<td>7,300</td>
<td>1,590</td>
<td>8,890</td>
</tr>
<tr>
<td>1972-73</td>
<td>7,686</td>
<td>2,071</td>
<td>9,757</td>
</tr>
<tr>
<td>1973-74</td>
<td>7,910</td>
<td>2,202</td>
<td>10,112</td>
</tr>
<tr>
<td>1974-75</td>
<td>8,171</td>
<td>2,415</td>
<td>10,586</td>
</tr>
</tbody>
</table>

The 1974-75 figures include 691 students attending off-campus institutes and 132 in the Clemson-Furman University Master of Business Administration degree program.

Clemson students come from all 46 South Carolina counties, 48 states, Puerto Rico and the District of Columbia, and 38 foreign countries (140 students). The Admissions Office processed 3,924 applications and more than 12,000 College Board scores for 1974-75. Out of 2,980 students accepted for admission, 65 per cent actually enrolled.

Enrollment of women reached an all-time high during the 1974 fall semester with 3,876, of which 2,771 were undergraduates on the campus. Enrollment of undergraduate coeds increased about 7 per cent over last year. Women students now constitute 35 per cent of on-campus enrollment and about 37 per cent of total enrollment, reflecting a rapid growth trend which is now stabilizing.
This year there was a slight decrease in new student men (freshmen and transfers) and an increase in new student women (freshmen and transfers) compared to 1973.

The Clemson student body continues to be a working student body which also receives significant loan, scholarship and other financial assistance. In 1973-74 approximately 2,400 students earned $2,100,000, a figure which does not include substantial earnings of students engaged in off-campus employment or of participants in the College Work Study Program. The University awarded several hundred long term loans and 173 scholarships and grants (exclusive of athletic grants-in-aid and donor-selected scholarships) with a value of more than $120,000. In all, a total of almost one-third of Clemson’s students received University-administered financial assistance. Some 60 per cent of the student body received from scholarships, grants, athletic grants-in-aid, veterans, social security and rehabilitation benefits, and student employment on-campus, more than $5.4-million during 1973-74.

Additional tabular information about the Clemson University student body is given below:

**FALL SEMESTER 1974 ENROLLMENT BY COLLEGES, AND DEGREES AWARDED DEC. 1973—AUG. 1974**

<table>
<thead>
<tr>
<th>Main Campus Enrollment</th>
<th>Degrees Awarded</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Fall Semester</td>
</tr>
<tr>
<td>Agricultural Sciences</td>
<td>730</td>
</tr>
<tr>
<td>Architecture</td>
<td>585</td>
</tr>
<tr>
<td>Education</td>
<td>1,873</td>
</tr>
<tr>
<td>Engineering</td>
<td>1,319</td>
</tr>
<tr>
<td>Forest &amp; Rec. Resources</td>
<td>765</td>
</tr>
<tr>
<td>Ind. Mgt., &amp; Tex. Science</td>
<td>1,414</td>
</tr>
<tr>
<td>Liberal Arts</td>
<td>1,150</td>
</tr>
<tr>
<td>Nursing</td>
<td>447</td>
</tr>
<tr>
<td>Phys. Math &amp; Bio. Sc.</td>
<td>1,431</td>
</tr>
<tr>
<td>Non-degree</td>
<td>49</td>
</tr>
<tr>
<td><strong>TOTALS</strong></td>
<td><strong>9,763</strong></td>
</tr>
</tbody>
</table>

Degrees awarded since 1896 total 30,091 of which 163 have been associate degrees; 26,234 bachelor's degrees; 3,348 master's degrees; and 346 doctorates.
### Number and Per Cent of Students from South Carolina and from Out-of-State (On-Campus)

<table>
<thead>
<tr>
<th>Year</th>
<th>S. C.</th>
<th>Per Cent</th>
<th>Out-of-State</th>
<th>Per Cent</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1950</td>
<td>2,416</td>
<td>78</td>
<td>677</td>
<td>22</td>
<td>3,093</td>
</tr>
<tr>
<td>1960</td>
<td>3,231</td>
<td>80</td>
<td>817</td>
<td>20</td>
<td>4,048</td>
</tr>
<tr>
<td>1965</td>
<td>3,494</td>
<td>70</td>
<td>1,530</td>
<td>30</td>
<td>5,024</td>
</tr>
<tr>
<td>1966</td>
<td>3,867</td>
<td>70</td>
<td>1,673</td>
<td>30</td>
<td>5,540</td>
</tr>
<tr>
<td>1967</td>
<td>4,201</td>
<td>69</td>
<td>1,856</td>
<td>31</td>
<td>6,057</td>
</tr>
<tr>
<td>1968</td>
<td>4,604</td>
<td>71</td>
<td>1,921</td>
<td>29</td>
<td>6,525</td>
</tr>
<tr>
<td>1969</td>
<td>4,799</td>
<td>72</td>
<td>1,867</td>
<td>28</td>
<td>6,666</td>
</tr>
<tr>
<td>1970</td>
<td>5,219</td>
<td>73</td>
<td>1,969</td>
<td>27</td>
<td>7,188</td>
</tr>
<tr>
<td>1971</td>
<td>5,968</td>
<td>75</td>
<td>1,997</td>
<td>25</td>
<td>7,965</td>
</tr>
<tr>
<td>1972</td>
<td>7,170</td>
<td>83</td>
<td>1,414</td>
<td>17</td>
<td>8,584</td>
</tr>
<tr>
<td>1973</td>
<td>7,469</td>
<td>79</td>
<td>1,992</td>
<td>21</td>
<td>9,461</td>
</tr>
<tr>
<td>1974</td>
<td>7,704</td>
<td>79</td>
<td>2,059</td>
<td>21</td>
<td>9,763</td>
</tr>
</tbody>
</table>

### Number and Per Cent of Black Students

<table>
<thead>
<tr>
<th>Year</th>
<th>Number</th>
<th>Per Cent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1972</td>
<td>179</td>
<td>2</td>
</tr>
<tr>
<td>1973</td>
<td>211</td>
<td>2</td>
</tr>
<tr>
<td>1974</td>
<td>216</td>
<td>2</td>
</tr>
</tbody>
</table>

### Number of Students in Summer School

<table>
<thead>
<tr>
<th>Year</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1950</td>
<td>948</td>
</tr>
<tr>
<td>1960</td>
<td>1,015</td>
</tr>
<tr>
<td>1965</td>
<td>3,216</td>
</tr>
<tr>
<td>1966</td>
<td>3,539</td>
</tr>
<tr>
<td>1967</td>
<td>3,980</td>
</tr>
<tr>
<td>1968</td>
<td>4,820</td>
</tr>
<tr>
<td>1969</td>
<td>4,472</td>
</tr>
<tr>
<td>1970</td>
<td>4,428</td>
</tr>
<tr>
<td>1971</td>
<td>4,692</td>
</tr>
<tr>
<td>1972</td>
<td>5,232</td>
</tr>
<tr>
<td>1973</td>
<td>6,267</td>
</tr>
<tr>
<td>1974</td>
<td>5,997</td>
</tr>
</tbody>
</table>
### STUDENT-FACULTY RATIO

(Full-Time Equivalent)

<table>
<thead>
<tr>
<th>Year</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>1969</td>
<td>12.6 : 1</td>
</tr>
<tr>
<td>1970</td>
<td>13.1 : 1</td>
</tr>
<tr>
<td>1971</td>
<td>14.6 : 1</td>
</tr>
<tr>
<td>1972</td>
<td>14.6 : 1</td>
</tr>
<tr>
<td>1973</td>
<td>16.8 : 1</td>
</tr>
<tr>
<td>1974</td>
<td>17.9 : 1</td>
</tr>
</tbody>
</table>

### AVERAGE COLLEGE BOARD SCORE OF FRESHMEN

<table>
<thead>
<tr>
<th>Year</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1960</td>
<td>998</td>
</tr>
<tr>
<td>1965</td>
<td>1003</td>
</tr>
<tr>
<td>1966</td>
<td>995</td>
</tr>
<tr>
<td>1967</td>
<td>1005</td>
</tr>
<tr>
<td>1968</td>
<td>1005</td>
</tr>
<tr>
<td>1969</td>
<td>1015</td>
</tr>
<tr>
<td>1970</td>
<td>1005</td>
</tr>
<tr>
<td>1971</td>
<td>997</td>
</tr>
<tr>
<td>1972</td>
<td>995</td>
</tr>
<tr>
<td>1973</td>
<td>982</td>
</tr>
<tr>
<td>1974</td>
<td>984</td>
</tr>
</tbody>
</table>

### NUMBER OF DORM BEDS AND PER CENT BEING UTILIZED

<table>
<thead>
<tr>
<th>Year</th>
<th>Beds</th>
<th>Per Cent Utilization</th>
</tr>
</thead>
<tbody>
<tr>
<td>1960</td>
<td>2,900</td>
<td>100</td>
</tr>
<tr>
<td>1965</td>
<td>3,624</td>
<td>97</td>
</tr>
<tr>
<td>1966</td>
<td>3,920</td>
<td>99</td>
</tr>
<tr>
<td>1967</td>
<td>4,348</td>
<td>97</td>
</tr>
<tr>
<td>1968</td>
<td>4,780</td>
<td>95</td>
</tr>
<tr>
<td>1969</td>
<td>4,764</td>
<td>94</td>
</tr>
<tr>
<td>1970</td>
<td>5,190</td>
<td>93</td>
</tr>
<tr>
<td>1971</td>
<td>5,174</td>
<td>97</td>
</tr>
<tr>
<td>1972</td>
<td>5,174</td>
<td>100</td>
</tr>
<tr>
<td>1973</td>
<td>5,330</td>
<td>102</td>
</tr>
<tr>
<td>1974</td>
<td>5,592</td>
<td>101</td>
</tr>
</tbody>
</table>

* Includes 252 beds in the Clemson House.
### NUMBER OF TEACHERS

(Full-Time Equivalent Teaching Faculty)

<table>
<thead>
<tr>
<th>Year</th>
<th>Teachers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970</td>
<td>571.2</td>
</tr>
<tr>
<td>1971</td>
<td>580.1</td>
</tr>
<tr>
<td>1972</td>
<td>614.8</td>
</tr>
<tr>
<td>1973</td>
<td>578.4</td>
</tr>
<tr>
<td>1974</td>
<td>591.8</td>
</tr>
</tbody>
</table>

### NUMBER IN FRESHMAN CLASS

(New Students)

<table>
<thead>
<tr>
<th>Year</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1950</td>
<td>640</td>
</tr>
<tr>
<td>1960</td>
<td>1,363</td>
</tr>
<tr>
<td>1965</td>
<td>1,479</td>
</tr>
<tr>
<td>1966</td>
<td>1,388</td>
</tr>
<tr>
<td>1967</td>
<td>1,559</td>
</tr>
<tr>
<td>1968</td>
<td>1,632</td>
</tr>
<tr>
<td>1969</td>
<td>1,468</td>
</tr>
<tr>
<td>1970</td>
<td>1,774</td>
</tr>
<tr>
<td>1971</td>
<td>1,853</td>
</tr>
<tr>
<td>1972</td>
<td>1,919</td>
</tr>
<tr>
<td>1973</td>
<td>2,034</td>
</tr>
<tr>
<td>1974</td>
<td>1,949</td>
</tr>
</tbody>
</table>

### ACCEPTANCE RATE OF APPLICANTS

<table>
<thead>
<tr>
<th>Year</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1967</td>
<td>79%</td>
</tr>
<tr>
<td>1968</td>
<td>79</td>
</tr>
<tr>
<td>1969</td>
<td>79</td>
</tr>
<tr>
<td>1970</td>
<td>87</td>
</tr>
<tr>
<td>1971</td>
<td>87</td>
</tr>
<tr>
<td>1972</td>
<td>83</td>
</tr>
<tr>
<td>1973</td>
<td>83</td>
</tr>
<tr>
<td>1974</td>
<td>84</td>
</tr>
</tbody>
</table>
RETENTION RATE OF STUDENTS
(Freshman Class)

<table>
<thead>
<tr>
<th>Year</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1965</td>
<td>77%</td>
</tr>
<tr>
<td>1966</td>
<td>79</td>
</tr>
<tr>
<td>1967</td>
<td>76</td>
</tr>
<tr>
<td>1968</td>
<td>80</td>
</tr>
<tr>
<td>1969</td>
<td>82</td>
</tr>
<tr>
<td>1970</td>
<td>78</td>
</tr>
<tr>
<td>1971</td>
<td>84</td>
</tr>
<tr>
<td>1972</td>
<td>82</td>
</tr>
<tr>
<td>1974</td>
<td>83</td>
</tr>
</tbody>
</table>

CURRENT OPERATING FUNDS

REVENUES BY SOURCE

<table>
<thead>
<tr>
<th>Source</th>
<th>Amount</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student Fees</td>
<td>$3,574,294</td>
<td>6.3%</td>
</tr>
<tr>
<td>State Appropriations:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Educational &amp; General</td>
<td>22,362,845</td>
<td>39.2%</td>
</tr>
<tr>
<td>Agricultural Research &amp; Public Service Activities</td>
<td>9,994,182</td>
<td>17.5%</td>
</tr>
<tr>
<td>Federal Appropriations:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Educational &amp; General</td>
<td>108,816</td>
<td>.2%</td>
</tr>
<tr>
<td>Agricultural Research and Public Service Activities</td>
<td>6,307,280</td>
<td>11.1%</td>
</tr>
<tr>
<td>Gifts and Private Grants</td>
<td>301,906</td>
<td>.5%</td>
</tr>
<tr>
<td>Research Grants &amp; Contracts, Institutes and Training Grants</td>
<td>3,437,832</td>
<td>6.0%</td>
</tr>
<tr>
<td>Sale of Farm and Forest Products</td>
<td>939,201</td>
<td>1.7%</td>
</tr>
<tr>
<td>Federal Appropriations:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Educational &amp; General</td>
<td>108,816</td>
<td>.2%</td>
</tr>
<tr>
<td>Agricultural Research and Public Service Activities</td>
<td>6,307,280</td>
<td>11.1%</td>
</tr>
<tr>
<td>Gifts and Private Grants</td>
<td>301,906</td>
<td>.5%</td>
</tr>
<tr>
<td>Research Grants &amp; Contracts, Institutes and Training Grants</td>
<td>3,437,832</td>
<td>6.0%</td>
</tr>
<tr>
<td>Sale of Farm and Forest Products</td>
<td>939,201</td>
<td>1.7%</td>
</tr>
<tr>
<td>Other Sales, Services and Miscellaneous Revenues</td>
<td>1,597,487</td>
<td>2.8%</td>
</tr>
<tr>
<td>Auxiliary Enterprises and Related Activities</td>
<td>8,374,510</td>
<td>14.7%</td>
</tr>
<tr>
<td>TOTAL REVENUES</td>
<td>$56,998,353</td>
<td>100.0%</td>
</tr>
<tr>
<td>Funds brought forward from 1972-73 for:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Encumbrances and Restricted Funds Balance</td>
<td>2,630,210</td>
<td></td>
</tr>
<tr>
<td>TOTAL FUNDS AVAILABLE</td>
<td>$59,628,563</td>
<td></td>
</tr>
</tbody>
</table>

EXPENDITURES BY FUNCTION AND TRANSFERS

<table>
<thead>
<tr>
<th>Function</th>
<th>Amount</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instruction and Departmental Research</td>
<td>$14,265,715</td>
<td>25.9%</td>
</tr>
<tr>
<td>Organized Activities Related to Educational Departments</td>
<td>3,056,220</td>
<td>1.1%</td>
</tr>
<tr>
<td>Sponsored Research Experiment Station</td>
<td>307,869</td>
<td>.6%</td>
</tr>
<tr>
<td>Other Separately Budgeted Research (excluding Agricultural</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experiment Station)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other Sponsored Programs</td>
<td>863,655</td>
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</tr>
<tr>
<td>Libraries</td>
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<tr>
<td>Student Services</td>
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<tr>
<td>Physical Plant Operation and Maintenance</td>
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<tr>
<td>Administration and General Expense</td>
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<tr>
<td>Agricultural Research</td>
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<tr>
<td>Agricultural Extension Service</td>
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<tr>
<td>Livestock-Poultry Health Service</td>
<td>1,603,443</td>
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<tr>
<td>Fertilizer Inspection and Analysis</td>
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<tr>
<td>Plant Pests Regulatory and Disease Eradication Programs</td>
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<tr>
<td>Other Public Service Activities</td>
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<tr>
<td>Auxiliary Enterprises and Related Activities</td>
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<td>TOTAL EXPENDITURES</td>
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<td>Transfers to Other Fund Groups</td>
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<td>TOTAL EXPENDITURES AND TRANSFERS</td>
<td>$55,105,917</td>
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<td>Encumbrances and Restricted Funds Balance</td>
<td>4,522,646</td>
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<tr>
<td>TOTAL EXPENDITURES, TRANSFERS AND BALANCE</td>
<td>$59,628,563</td>
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47
STUDENT AID FUNDS

REVENUE

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
<th>Percentage</th>
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</thead>
<tbody>
<tr>
<td>Loan and Interest Payments</td>
<td>$53,591</td>
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</tr>
<tr>
<td>Gifts/Grants for Scholarships, Fellowships, Other Stipends</td>
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<tr>
<td>Investment Income</td>
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<tr>
<td><strong>TOTAL</strong></td>
<td>$1,180,792</td>
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DISBURSEMENTS

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<tr>
<th>Description</th>
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</thead>
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<tr>
<td>Educational Loans</td>
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<td>Grants for Scholarships, Fellowships and Special Purpose Stipends (including Grants-In-Aid)</td>
<td>$738,586</td>
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</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>$912,611</td>
<td>100.0%</td>
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</tbody>
</table>

Does not include student financing through United Student Aid Funds, Inc., commercial educational lending agencies, or scholarships/grants not administered by the University. Funds received and expended for graduate assistantships are reflected in “Current Operating Funds.”

PUBLIC SERVICE PROGRAMS
OF THE
COLLEGE OF AGRICULTURAL SCIENCES

L. P. ANDERSON, Dean

In addition to its program for Resident Instruction, reported elsewhere in this report, the College of Agricultural Sciences also administers the public service programs of South Carolina Agricultural Experiment Station, the Cooperative Extension Service, the Division of Regulatory and Public Service Programs, and the Livestock-Poultry Health Department. Reports for these divisions follow.

SOUTH CAROLINA AGRICULTURAL EXPERIMENT STATION

O. B. GARRISON, Director

The South Carolina Agricultural Experiment Station was established by the State in 1889 under Federal laws; Morrill Act of 1862, Hatch Act of 1887, and subsequent acts.

As the research and development division of Clemson University’s College of Agricultural Sciences, the Experiment Station operates under State control with annual State appropriations supplemented with annual Federal appropriations.

The Station is charged with conducting basic and applied research in agriculture and related sciences for the benefit of all segments of society. Its programs encompass interdisciplinary and interagency research in 11 departments at six Experiment Stations and at Winthrop College.

Branch Experiment Stations located off the main Clemson University campus conduct research that has relevance to the entire State, but they are particularly useful in solving problems com-
mon to their own geographic and climatic areas. The Simpson Station pinpoints problems common to the Piedmont; the Edisto Station serves the Savannah Valley area; and the Pee Dee Station emphasizes research on crops of the middle and lower Coastal Plain. The Sandhill, Coast, and Truck Stations conduct research on special problems peculiar to the area in which they are located. Home economics research is conducted on a cooperative basis with the staff of Winthrop College.

HIGHLIGHTS AND ACCOMPLISHMENTS

The brief, highlighted summary of research emphasis which follows reflects only a small portion of the overall program of the South Carolina Agricultural Experiment Station for the period of July 1, 1973, to June 30, 1974.

Agricultural Economics and Rural Sociology: Experiment Station economists and sociologists are concerned with the business management, public policy and social aspects of the agribusiness, rural, and natural resource sectors of South Carolina on a local and statewide basis. Their primary responsibility is to aid in the orderly development of the State's agricultural, natural and human resources.

Studies seeking more efficient production and marketing techniques for farm commodities have strengthened the State's agribusiness community and have contributed to a plentiful food supply. A continuation of this effort offers solutions for producers and consumers caught together in the squeeze of rising production costs, reduced farm prices, and inflated marketing overhead.

Concern for the standard of living and the environment has prompted balanced research projects investigating ways to boost economic development while maintaining environmental quality.

Clemson specialists responded to urgent requests in the past year with studies to ascertain the farm level costs of milk production in South Carolina and with plans for allocating scarce fuel supplies.

Agricultural Engineering: Agricultural engineers made significant progress during the year in the mechanization and processing of food, feed and fiber production; in the conservation and management of water and other natural resources; in the simulation of cropping systems; and in the management of animal waste.
low-profile tobacco harvester was proven during on farm field trials. Clemson University plans to release the machine for commercial production and marketing prior to the 1975 growing season. The harvester is projected to cost only one-fourth the price of harvesters now on the market, making it practical for small farm operators.

Two new prototype fruit harvesters were successfully tested on peaches. Test results from both the over-the-row and the tractor mounted harvester are being coordinated with other interdisciplinary research on post-harvest handling, automatic color sorting, chemical growth regulators, tree spacing, pathological effects and marketing.

With the transition of agricultural land into industrial and residential areas, conflict often arises between developers and nearby dairymen. The increasing urgency of this problem has accelerated waste management studies. Clemson's research emphasizes utilization as the key in handling animal waste.

**Agronomy and Soils:** Intensified effort by agronomists to find better ways to control weeds in the agronomics crops, cotton, soybeans, tobacco and forages, has resulted in higher yields with less labor and lower production costs. New chemicals are being screened for time and rate of application that give promise of controlling some of the most difficult weeds such as cocklebur, johnsongrass and nutsedge. Research efforts are being stepped up to find better weed control methods in energy saving minimum tillage and no-tillage crops.

Progress is also being made by plant breeders who are seeking to improve all major crops for better yielding potential through increased disease resistance and/or insect resistance.

Research in forages continues to be emphasized and is very relevant during this period of scarce and costly feed grains. Efforts are underway to find better grazing systems and new plants species for grazing in the Coastal Plain.

Tillman, a clover released jointly by the Experiment Station and the United States Department of Agriculture, continues to be one of the better varieties of white clover. Studies are in progress to improve the flowering qualities in Tillman and to isolate virus resistant lines of clover.

**Animal Science:** Cost-cutting studies highlight the efforts of scientists trying to improve the efficiency of beef and pork operations.
A major breakthrough for the State's number two cash crop, tobacco, was made as the practicality of the Clemson developed in the State. The researchers see more efficient production practices as the key to maintaining adequate supplies of meat for the consumer and as the best way for producers to survive the depressed livestock price situation.

Livestock production efficiency centers on reproductive ability. A series of crossbreeding studies combined with investigations of hormones that control the breeding period and research into ways to increase the number of offspring points the way to more efficient livestock management.

Feeding trials with different rations are under way to determine which ration produces the greatest rate of gain at the lowest cost to the producer. Taste panelists are used in conjunction with this research to insure that the consumer receives quality beef and pork that is low in fat and high in lean meat content.

Dairy Science: Both qualitative and quantitative aspects of milk production by dairy animals are of primary concern to dairy scientists.

Qualitatively, efforts are being made to determine the effect of somatic cell concentrations in raw milk on flavor and shelf life after processing. The shelf life of milk as influenced by packaging, and materials used in packaging are also under investigation.

Mastitis continues to be a major financial problem in South Carolina dairymen since treatment necessitates discarding the milk due to antibiotic contamination. Progress was made in evaluating the effect of antibiotic preparations, dosage levels, and frequency of treatment required to control the problem.

Quantitatively, the effects of inorganic and organic amino acid precursors on productive efficiency of dairy animals has received research emphasis. Another experiment underway seeks to determine the economic and nutritional feasibility of adding grain to forage at ensiling to make a complete feed and to compare its nutritional value to the components fed separately.

Dairy scientists also have ecological concerns as shown by intensive investigations of the effect of dairy feed lot runoff on stream water quality.

Entomology and Economic Zoology: Highlighting entomological research efforts on noxious pests for all crops and animals were studies of important predators on soybean pests and their possible
use for biological control. Progress in the area of natural controls was also made in turkey leucoctozoon disease research. Recent work has shown several species of nematodes, protozoa, fungi, and anthropods may be effective biological control agents for black fly vectors.

On other fronts, new insecticides and application techniques are being developed for control of the pecan weevil and spittlebug. Peach insects continue to receive research attention including a broad program of biology, ecology, and control of several species. A cooperative project with the United States Department of Agriculture and neighboring states is employing sex attractants for control of the peach tree borer.

Research was expanded during the year in the fisheries research area and two new areas of study were initiated. They include research in the areas of upland game and marine biology.

Food Science: Food science research conducted by Experiment Station scientists is as diverse as it is complex. Participation in numerous interdisciplinary projects indicates the role this discipline plays in a well coordinated research program.

In cooperative studies with the Animal Science Department, researchers demonstrated that a specific hormone could induce parturition in gilts and sows within 30 to 50 hours after administration when the compound was given three or four days before the expected date of parturition. Such a practice appears promising as a swine management tool.

Investigations of peanut flake storage properties suggest that the flakes possess unusual stability properties. Subsequent studies have demonstrated a complex enzyme system in peanuts which could be of significance in prolonging the shelf life of foods in which rancidity is a problem.

A potentially significant research finding was made in the area of animal nutrition that may have implications for human infant nutrition. Dietary fats fed to female laboratory animals during gestation and lactation were demonstrated to influence the behavior of the offspring. The offspring from females receiving safflower oil, an oil high in linoleic acid, were of particular interest because of the observed altered behavior patterns that were judged to be detrimental as compared to offspring from females receiving normal diets.
Home Economics: Research highly relevant to the needs of consumers today is conducted on a cooperative basis with the School of Home Economics at Winthrop College.

In a continuing program of carpet evaluation and consumer product acceptance, arrangements were made with several retail carpet dealers to obtain names and addresses of customers and to obtain corresponding carpet samples for tests. Information gained from this research will aid carpet manufacturers and consumers alike.

Other textile related studies include the comparison of consumer and laboratory evaluations of flame retardant children's sleepwear.

A new project underway is directed toward the assessment of existing provisions and needs for child care services in the Carolinas. Researchers hope that the study will reveal how mothers' released time, provided by child care services, could contribute to increased participation in developmental activities which would benefit their families and communities.

Horticulture: Horticulture is an area of the agricultural sciences that touches the lives of everyone each day, both in terms of providing food and adding beauty to our surroundings.

A dynamic research program is carried on in each of the major areas of horticultural responsibility—fruits, vegetables, ornamental horticulture, floriculture, and turf. The overall objective of this research is to improve the efficiency of production, handling, transportation, and storage of all horticultural commodities.

As the state's number one horticultural crop, peaches receive major research emphasis. Significant progress was made during the year in understanding the problem of peach tree short life and in the development of a peach rootstock, resistant to the peach tree borer. Efforts continued to establish a peach rootstock certification program for the state's growers.

Innovative research is also being conducted by the Department of Horticulture in such new areas as hortitherapy, the use of horticultural appeal and methods for human improvement and mental well being.

Plant Pathology and Physiology: Significant research progress has been made by plant pathologists and physiologists in solving plant disease and pest problems that threaten the State's leading economic crops.
The 10-point program released in 1972 to growers for reducing losses from peach tree short life appears to offer practical relief from the problem, based on preliminary field tests. Experimental plots established under this program lost very few trees, while similar plots where the program was not followed have already lost a large number of trees.

A combination of nematicides and sub-soiling was recommended for control of the Columbia lance nematode on cotton and soybeans after extensive research efforts. This program has been widely adopted by farmers in areas where this and other nematodes are problems and is providing effective relief for growers using the program.

The persistence of certain pesticides in the environment has been and continues to be a serious problem. A study of several individual herbicides that are commonly used in South Carolina indicates that they are biodegradable in the soil. Based on this research, scientists have concluded that these specific herbicides do not constitute a long term problem.

**Poultry Science:** Research in poultry science has emphasized solutions to major problems of the commercial egg producer and turkey producer. Effort has also been directed toward solution of problems of the broiler and game bird industries. New studies have been initiated with pigeons and guineas which are considered gourmet items with high profit potential.

Recycling waste from large turkey and chicken farms has received major attention. With the increasing scarcity and cost of feedstuffs, the reuse of nitrogen becomes highly important as a means of holding down production costs.

Diseases of chickens and turkeys continued to claim attention of the research staff. The fowl cholera vaccine developed by this department continues to serve the turkey industry well and refinements on its use are being made through additional research.

Problems relating to poultry housing and environmental control continued to receive research attention.
### FUNDS FOR THE EXPERIMENT STATION OTHER THAN THOSE FROM FEDERAL SOURCES

Classification of Expenditures and Receipts for 1973-74

<table>
<thead>
<tr>
<th>Item</th>
<th>Agricultural Research</th>
<th>Operating Revenue</th>
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<tbody>
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<td>Personal Services</td>
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<td>Freight, Express and Deliveries</td>
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<td>Travel</td>
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<td>Utility Services</td>
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<td>Land and Structures</td>
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### Expenditures

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<th>Item</th>
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<td>Expenditures</td>
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### Receipts from State Treasurer

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<td>(Regular Appropriation)</td>
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<td>Operating Revenue Receipts</td>
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<td>Unexpended Balance Brought Forward</td>
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### Balance Forward

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<td>Balance Forward</td>
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FEDERAL FUNDS
THE SOUTH CAROLINA AGRICULTURAL
EXPERIMENT STATION, 1973-74

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<tr>
<th>Item</th>
<th>Hatch</th>
<th>Regional Research Funds</th>
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<td>Travel</td>
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<td>Communications Services</td>
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<td>Contracted Services</td>
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<td>Utility Services</td>
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<td>Other Contractual Services</td>
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<td>Supplies and Materials</td>
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<tr>
<td>Rents and Fixed Charges</td>
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<tr>
<td>Equipment</td>
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<td><strong>Expenditures</strong></td>
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<td><strong>Receipts for the Year from the Treasurer of the United States</strong></td>
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<td>$252,320</td>
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ACTIVE RESEARCH PROJECTS, 1973-74

AGRICULTURAL ECONOMICS AND RURAL SOCIOLOGY

Economic Appraisal of Farming Adjustment Opportunities
Cotton Quality Survey
Variations in Value of Agricultural Land in Cotton-Producing Areas
Develop and Operate an Information Filter Center to Aid in Marketing
Egg Marketing Systems for the South
Evaluation of the Beef Production Industry in the South
Providing Basic Agricultural Marketing Information for Program and Facility Planning
Economic Evaluation of Market Organization and Policy in the South Carolina Dairy Industry
Economic Study of Alternative Systems for Distributing Water Supplies in a Decentralized Urban-Industrial Area
Market Organization, Power, Policies and Programs in the Dairy Industry
Economic Evaluation of Alternative Forms of Vertical Coordination in the Livestock-Meat Industry

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Predicted Effects of Selected Policy and Technology Changes in the Grain Marketing System

Social Impact of Economic and Population Change in Transitional South Carolina Counties

Analysis of Demographic Data for the Human Resources of South Carolina

Demand for Environmental Quality: Theory and Measurement

A Study of Factors Affecting Costs of Marketing Cotton in South Carolina

An Analysis of Rural Development in the Southeastern United States

Development of Human Resource Potentials of Rural Youth in the South and their Patterns of Mobility

Effects of Selected Changes in the Real Property Tax System on Agricultural Land Use and Tax Revenues in South Carolina

Economic and Sociological Aspects of Comprehensive Land-Use Planning in South Carolina

Feasibility of Marketing Cooperatives in the South Carolina Sea-food Industry

A Farm-Oriented Economic Appraisal of Potential Technological and Institutional Changes in South Carolina Agriculture

Market and Production Potential for South Carolina Ornamental Crops

Systems Analysis of the Vegetable Subsector of the Food Industry of the South

Optimizing the South Carolina Community Hospital System for Improving Access by Rural Residents

Appraising Farmer Needs, Attitudes and Participants in Selecting Cooperatives in South Carolina

Contract Marketing of Cotton

An Economic Analysis of Adjustments in Rural Human Resources as New Technology is Adapted

The Economic and Social Effects of Farm Resource Transfers out of the Dairy Industry in South Carolina

A Study of Demands and Utilization of Cotton by Textile Mills

Economic Analysis of the Opportunities to Develop Rural Tidelands Industries through Improved Financial Management

Consumer Preference for Pork Cuts with Varying Degrees of Marbling

Economic Analysis of Harvesting, Handling, and Storing Hay

57
AGRICULTURAL ENGINEERING

Hydrology of Piedmont Agricultural Watersheds
Mechanizing the Production of Vegetables
Physical Properties and Quality of Fruits and Vegetables
Waste Disposal from Food Processing Plants in South Carolina
Mechanical Harvesting and Handling of Peaches and Apples
Factors in Drainage Evaluation and Design
Factors Affecting Water Yields from Shallow Ground Aquifers
Mechanical Okra Harvesting
Physical, Social and Economic Aspects of Functional Housing for Low Income Families in the Southern Region
Engineering Systems for Cotton Production
Dairy Farm Waste-Management Characterization and Disposal
Dynamic Modeling of Weed Control in Cotton Production
Soil Water Management Decision Making
Methods and Equipment for Optimum Herbicide Placement
Crop Mechanization
Animal Waste Treatment and Recycling Systems
Root Zone Water Management Systems
Physical Properties of Fruits and Vegetables Relating to Automatic Sorting
Farm and Gin Community Evaluations of Machinery Complements for Harvesting and Hauling Seed Cotton
Quality Losses During Storage of Baled Coastal Bermudagrass Hay
Rate of Seed Moisture Uptake as Affected by Soil Moisture Availability and Seed Soil Contact
Engineering Systems for Cotton Production
Quality Housing Environment for Low Income Families
Poultry Farm Waste Management
Development and Evaluation of Mechanized Production Systems for Fresh Market Peaches
Simulation of Processes in the Rhizosphere
Oyster Mechanization
Nutrient Management of Poultry Waste with Biological Treatment Processes
AGRONOMY AND SOILS

Hybrid Corn Breeding
Breeding Fiber Quality in Cotton
Methods of Control of Tobacco Leaf Diseases with Special Reference to Blue Mold, Mosaic, Black Shank, and Nematodes
Improvement of Flue-Cured Tobacco by Development of More Adequate Fertilization and Cropping Systems
Pedological Studies in South Carolina
Variables Influencing Sward of Clover-Grass Pastures
Surfactant’s Influence on Herbicides’ Effectiveness
Cotton Breeding
Small Grains Breeding
Soybean Breeding
Permanent Pastures, with and without Interseed Species, for Beef Cow-Calf Production
Evaluation of Cotton Varieties and Advanced Experimental Strains
Evaluation of Corn Hybrids and Advanced Breeding Lines
Evaluation of Soybean Varieties and Advanced Experimental Strains
Evaluation of Grain Sorghum Hybrids and Advanced Breeding Lines
Cytology of Trifolium Species in the Section Amoria (Ascherson and Graebner)
Minimum Tillage and No Tillage in Production of Corn and Soybeans
Evaluation of the Micronutrient Status of Soils and Plant Response to Added Micronutrients
Calibration of Chemical Soil Tests with Expected Crop Response to Lime and Fertilizer
South Carolina Soybean Yields as Influenced by Row Spacing
Growing Cool-Season Pasture Species in Association with Coastal Bermudagrass
Soil Behavior under Different Levels of Management and Use
Herbicide Movement from Application Sites and Effects on Non-target Species
Evaluation of New Fertilizers as Sources of Plant Nutrients for South Carolina Crops

59
Evaluation of Selected Grain Sorghum Hybrids
Diagnosis and Correction of Zinc Problems in Corn and Rice Production
Development of Weed Control Practices in Corn, Cotton and Soybeans
Fertilizers and Organic Wastes Applied to Soils in Relation to Environmental Quality
Short Season Cotton Production as Affected by Variety Row Spacing, Nitrogen Rate and Harvest Method
Orchardgrass Improvement
Adaptation of Perennial Forage Grass Species
Sulfur Supply of Air, Rainwater, and Soil as Related to Agronomic and Horticultural Crop Needs
Interaction of Representative Pesticides in Cecil and Norfolk Soils
Adaption and Breeding of Cool-Season Forage Grass Species
Plant Analysis for Complementing Soil Tests in Evaluation of Nutrient Availability

ANIMAL SCIENCE
Response of Sire Progenies to Management and Feeding Procedures
Selection for Reproductive Efficiency and Weaning Performance in Beef Cattle
Influence of Exogenous Progesterins on Fertilization of Bovine Female
Corn Silage, Urea and Corn for Finishing Beef Cattle in Drylot
Protein Level Sequences for Pigs Fed to Heavier Weights
Litter Size as Affected by Nutrition and Management of Brood Sow
Cooked Soybeans in Diets for Growing Finishing Swine
Factors Responsible for Tenderness Variations in Meat
Wintering Cows on Synthetic and Natural Protein Supplements
Protein and Energy Studies with Early Weaned Pigs
Litter Size as Affected by Nutrition and Exogenous Hormones
Polyunsaturated Pork Products for the Consumer
Diets for Artificially Reared Pigs
Swine Arthritis
Reproduction Problems of Livestock
Control of Estrus and Parturition in the Bovine Using Prostaglandin $F_{2a}$

Corn Silage with Urea and Other Additives Plus High and Low Moisture Grain in Beef Cattle Dry Lot Finishing Systems

Ration Alternatives Using Cooked Soybeans for Growing-Finishing Swine

Effect of Early Weaning, Limited Suckling and Level Management on Straightbred and Crossbred Beef Cattle

**DAIRY SCIENCE**

Blue Cheese Manufacture as a Means of Utilizing Milk Produced in South Carolina

Practical Aspects of Urea Utilization by Ruminant Animals

Sex Steroids and Their Relationships to Fertility in the Bovine Female

The Role of Methionine and Sulfur in Rations Containing Urea When Fed to Ruminents

Waste Disposal in the Dairy Industry and Stream Pollution

Flavor Quality and Milk Consumption

Improving Reproduction Efficiency in South Carolina Dairy Herds

Management Factors and Decisions that are Different Between High and Low Producing Dairy Herds as Related to Udder Health

Accuracy of Milk Production Estimates by the Use of the AM-PM Method

The Role of Antibiotic Therapy in the Production of Normal Milk

Innovative Materials Handling for Packaging and Distributing Milk

Ensiled Complete Rations for Lactating Cattle

Waste Disposal Management in the Dairy Industry and Its Relation to Surface Water Quality

Feeding Value of Fermented Colostrum for Pre-Ruminant Calves

The Role of Energy Compounds and Hormones in Regulating Lipid Metabolism in Ruminants
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The Cooperative Extension Service is Clemson University’s outreach educational program for the people of South Carolina. Funded on a joint Federal-State basis, it was established as a part of the nationwide system in the early 1900’s in recognition of a need for trained field workers to carry education to the people.

This program enables Clemson University through its Extension Service to maintain an outreach office in each county seat of South Carolina, staffed by County Agent personnel and Extension Home Economists. The nerve center for this “off-campus” faculty is the University. There a professional staff of Extension subject matter specialists compiles information through research results, translating this into usable data for the people of South Carolina.

From the practical standpoint, this means a pipeline of information is continually going out to the individual counties and their residents.

In agriculture, the soybean producer, the cotton farmer, the beef cattleman, the dairy operator—whatever the commodity or product—is being constantly updated on ways to combat problems, increase production, or help control expenses.

It’s the same for the homemakers, and youth. Through the County Extension Home Economists and the Clemson specialist staff, homemakers are counseled on new developments in the food field, invited to sewing classes, organized into groups for weight control, given guidelines for budget-making, and helped on any of a hundred other fronts dealing with modern homemaking and family living.

Extension’s unique 4-H program offers the same broad programs for youth development, challenging them to progress along the realistic road of personal achievement through doing.

Extension began as an organization to help rural people, but in fulfilling its commitments—based on needs and demands of the public—it has had to expand to include many problems of urban and suburban areas. This expansion was brought about largely by a changing social structure, the economics of modern living, rapid expansion of communication and transportation systems.

Today, as rural and urban areas of South Carolina merge in a common main street of the State, people everywhere face about the same problems and have similar hopes and aspirations.
The Clemson University Cooperative Extension Service joins with these people in the development of educational programs which people themselves feel will help them increase incomes and maintain levels of living in communities where they live. Today’s Extension staff members are at home in any classroom, be it tobacco field, dairy barn, homemaker’s kitchen, or agribusiness office.

The total effort of Extension is organized into six broad program areas in order to intensify assistance and gain greatest utilization of special skills. These areas cover: Agricultural programs, 4-H and youth development; home economics; community and resource development; special programs; and 1890 programs.

Agricultural Programs

Scope of Activity: Authorities generally acknowledge that the agricultural arena today is under the greatest pressures of all time. A clear call and opportunity for greater production is being negated by competing factors of smothering inflationary input costs and stagnating market prices. It’s a cruel contradiction. It’s turning profit margins into crippling deficits for many row crop farmers and livestock producers alike.

This is the situation facing many segments of South Carolina’s agriculture in 1973-74, even as this ages-old industry remains the bedrock of the State’s economy. Agriculture through its production, marketing, and processing continues as a major employer of people and dominant force in the State’s economy. Marketings from crops and livestock in the State for 1973 are indicated at $754.8 million, up nearly $200 million from the previous year.

It’s a complex, demanding situation for agriculture and its people. The Extension Service is doing its best to help producers increase output when feasible, curb climbing costs where possible —do anything it can to keep a well-oiled machine moving forward to meet the challenge of the ages.

Again, Extension forces are organized along lines to provide maximum thrust for all segments of the agricultural arena. Expertise is concentrated in the disciplines of Economics, Agronomy, Animal Science, Dairy Science, Forestry, Food Science, Horticulture, Poultry Science, Agricultural Engineering, Insect and Disease Management and Marketing.

While departmental lines are observed for administrative and subject matter purposes, a team approach is stressed wherever there is an indicated need for multiple skills.
Item: When livestock producers were hit with the first shock waves from rising feed prices, the Director of Extension formed a Livestock Feed Committee. In keeping with the team approach, membership came from several disciplines with the College of Agricultural Sciences.

As weather problems and other factors compounded the 1974 crisis of feed shortages, Clemson’s Extension Livestock Feed Committee functioned as an educational service for South Carolina’s livestock producers. Economists delved into cost-price ratios of alternate feeds. Agronomists supplied guidelines for production. Livestock specialists advised on tightening management operations.

Other segments of the team acted in similar function to help tie together a complete advisory program for all South Carolina agricultural producers caught up in the bind of the feed cost situation. Information and materials were channeled out over the State through the County Extension offices, directly to producers, and through mass media outlets.

This committee advised livestock producers to consider increasing their own supplies of grains and forages, cull inefficient animals, and begin long-range planning toward strengthening forage and grain programs on their farms. Farmers in the state generally have responded and will harvest some 100,000 acres of corn more than during the previous year. Renewed interest in expanding forage capabilities is also widespread on livestock farms.

Even while that action was under way by the feed committee, Extension specialists and county workers were busy on scores of other fronts involved in agricultural production in this state.

Highlights of those activities included:

—The number of soil samples processed through laboratories at Clemson for the year totaled 49,444. This was considerably more than in previous years and is considered a direct result of two educational programs. The plant problem clinic operated by Extension is one of these programs. Through the many plant specimens submitted to this program from South Carolina farmers and homeowners, diagnosis indicated an acid soil condition as causing most of the problems. The other Clemson program stimulating more soil testing was a coordinated effort to help farmers make maximum use of available fertilizer. They were encouraged to use soil tests to determine grade and amount of fertilizer required for maximum production. The number of soil samples sent to the laboratory sug-
gests that South Carolina farmers are adopting the use of soil testing to increase production and reduce fertilizer costs when possible.

—The Sumter Demonstration Project where Extension personnel utilize plots to produce crops and show test results continues to serve a very useful purpose to bridge a time gap between research work and field production.

—Two successful one-day “Hay Day” demonstrations conducted in the State drew record-breaking crowds of producers seeking ways to increase mechanization and cut costs on this basic agricultural activity. Machinery manufacturers were able to demonstrate equipment for cutting, raking, stacking, transporting, and storage of large bales weighing 1,200 to 1,500 pounds.

—Staff members have worked closely with State agencies and producers on ways to utilize energy more efficiently in production agriculture. An educational exhibit, “Save Fuel—Save Money,” was used throughout at fairs and shopping centers. This exhibit won a national award presented by the American Society of Agricultural Engineers at Stillwater, Okla. in 1974.

—Ninety-one bulls were tested through Extension work in a year at the Clemson facilities and 77 were sold for an average of $1,035. There were also 4,908 beef cattle on the performance testing program, 502 more cattle than were on tests during 1972.

—The graded feeder pig sales were expanded. The Darlington demonstrational sale increased to two times monthly instead of once monthly, resulting in an increase to 2,200 to 2,500 pigs per month going through the sale. In addition, the teleauction system was started at the Darlington sale.

—Clemson’s Boar Test Station was completed and the first tested boars sold. Forty boars completed the test satisfactorily out of the 97 entered, and 38 were sold at the test station for an average of $263.

—The 1973 S. C. Legislature, at the request of dairymen, appropriated $50,000 to Clemson University to establish a Central Milk Testing Laboratory. This laboratory is used for Dairy Herd Improvement (DHI) butterfat testing, teaching, and research, as an aid to the State’s dairymen. It started operation in October, 1973 with milk samples being delivered to Clemson by United Parcel Service from dairymen on DHI programs. Initially, there were 6,000 samples per month tested for butterfat. By the end of December, the number had grown to 10,000. It’s expected to increase to about 28,000 by 1975.
—A dairy heifer project designed to interest youngsters in dairying and working with animals continues to show outstanding results. A total of 82 head of Guernsey, Holstein and Jersey heifer calves were sold to 82 youngsters July 3, 1973, to be raised, shown, bred, and returned for sale. A total of 130 boys and girls wanted calves, but only 82 animals that would meet requirements were selected to be sold under this project. Approximately 75 of these boys and girls were new 4-H dairy project members.

—Extension's production economics staff members are utilizing Clemson's computer to calculate and print information helpful to people in making farm decisions. Computer-aided analysis in the cost of production, farm financial planning and income tax management areas are examples.

—This year was one of the worst in history for the number one cattle pest in South Carolina, the face fly. An extensive effort was conducted by entomologists in all extension districts to get cattlemen to use dust stations properly. Demonstrations in many counties proved to agents and cattlemen that the dust station method works.

—Completion of the ninth year of the intensified statewide cotton pest management program has again shown South Carolina producers how they can use limited amount of insecticides and still produce good yields. A little over 400 cotton producers in 21 counties participated in organized, community-wide scouting programs in 1974. They had a total of 5,137 fields checked each week, with this total program involving 83,927 acres of cotton. Extension organized and supervised this program.

—In the area of Food Science, Extension developed and presented 13 talks and training lectures to associations and various groups on the prevention of food-borne illnesses, nutritional labeling and food handling sanitation.

—Extension Forestry is involved in an intensive inter-agency effort to increase reforestation in South Carolina. About one-third of the forest land in the State is considered either under-stocked or not stocked at all. At present, nine County Agents, a Forestry Specialist, an Information Specialist, and a task force member have been designated from the Extension Service to work with the task force on the reforestation program.

—A concentrated educational program has been conducted to teach producers the techniques and benefits of forward marketing.
This applies mainly to grains, cotton and livestock. On another marketing front, the staff of the Marketing Information Center is responsible for gathering and disseminating information on the supply-demand situation for peaches and cucumbers. Weekly reports during harvest are prepared and mailed to industry members in South Carolina and other major producing states. The staff also prepares an apple price information radio program three times weekly from mid-August through September, and issues regular newspaper stories.

—As animal waste handling and utilization have become topics of major concern during the past few years, Poultry Science Extension in cooperation with Agricultural Engineering has initiated a two-year field study to determine the physical qualities and handling techniques currently used in disposing of poultry wastes.

—Renewed interest in small poultry flocks by rural and urban populations has prompted a need for updated information on management of these flocks. A new bulletin dealing with this has been prepared and in-service training conducted for county personnel on this subject. Assistance to individuals has been provided through County Extension programs, correspondence and farm visits.

—in Pathology, efforts continue on the chemical-cultural systems approach to nematode problems of crops. Serious nematode pests of field, vegetable and fruit crops have been demonstrated on farms in many areas of the State. On-farm demonstrations, grower meetings, nematode soil analysis and publications are being used effectively to reduce losses to these pests.

—A ten-point program on the "peach short life" problem has been implemented. Plant pathological components of the program are being rapidly adopted in response to on-farm demonstrations, field meetings and tours, through publications, and news releases.

—While Extension efforts continue to focus on commercial agriculture in South Carolina, there has been accelerated demand and a resulting expansion of services relating to "homeowner" problems. Chief among these is the horticultural front. Home production of horticultural crops was at an all-time high in 1974. In an attempt to deliver educational information, a series of clinics was established in the more populated areas, first to describe early season techniques and later to answer problems gardeners may have encountered.

—One new approach toward helping to solve these homeowner problems was in the metropolitan area of Greenville where a plant
clinic was conducted by Extension in a shopping mall. It's estimated to have attracted 5,000 persons with plant or pest problems. Fourteen other problems or garden clinics were held at points over the state, many of them involving team specialists knowledgeable in answering questions regarding any aspect of gardening problems.

4-H and Youth Development

Scope of Activity: Four-H is the youth phase of the Cooperative Extension Service's work.

It's conducted by Extension personnel in the 46 counties through organized clubs in connection with school and community activities, and supplemented by special interest groups. Expanding 4-H to reach a greater number of youth between nine and 19 with a quality program has been the main thrust for 1973-74.

Enrollment for the year reached an all-time high of 103,775. Of that number, 49,069 or 47.3 per cent were white and 54,706 or 52.7 per cent were black. Participants included 60,584 in regular 4-H clubs, 6,229 in special interest groups, and 10,198 youths from low-income families reached through the youth phase of the Expanded Food and Nutrition Education Program.

Another 1,268 youth were reached in the 1890 program, and 25,055 were served through Educational TV.

As the population shift from farm to more rural non-farm and urban areas continues, Extension constantly revises project areas and activities to meet changing needs and aspirations of youth. Traditional programs are maintained, but new emphasis is given on appealing areas such as fashions for boys and girls, nutrition, horse clubs, aerospace, small engines and others.

An important part of the program now is volunteer leadership, calling on skilled individuals who lend a special talents for 4-H'ers under supervision of Extension professionals.

All counties have implemented procedures to obtain more volunteer leaders. A total of 1,206 adults and 613 teen leaders served during 1973-74, including 365 new adult leaders who were recruited. Intensive efforts to enlist more volunteers included personal contacts, mass media appeals, references from those serving, and leads from 4-H'ers. Letters also were sent to PTA groups, churches, S. C. Commission on Aging and civic organizations explaining the need for volunteer leaders and opportunity for service.
Citizenship in Action Grants

Ten South Carolina 4-H groups received $2,245 in national funds for special projects in their communities this year. Activities ranged from a day camp for underprivileged children to a workshop for youth on ways of improving the community.

The “Citizenship in Action” grants were made available by the Readers Digest Foundation through the National 4-H Foundation to encourage young people in creating citizenship projects in their communities. Funds were awarded to 42 groups in six states. The South Carolina clubs and activities by counties included:

Abbeville—Youth Together, Inc., $450 to landscape and beautify the area high school grounds; 4-H Leadership Club, $200 to conduct citizenship workshop to educate youth on ways of improving the community.

Greenwood 4-H Teen Leaders group, $70 to conduct a day camp for underprivileged children.

Orangeburg-Rowesville Youth Council, $105 to landscape community recreation area; Elloree Youth Council, $100 to decorate and furnish the local community center and landscape grounds; Eutawville Youth Council, $50 to furnish and decorate community youth center.

Sumter—Salvation Army 4-H Club, $150 to purchase gardening equipment and supplies for beautification; Catchall Community and Savage Glover Neighborhood Boys Club, $150 to initiate a lawn care and maintenance program for community.

Also receiving a $500 grant was the Santee Wateree 4-H Electric Club with members from Sumter, Lee, Kershaw and Clarendon counties for a project to restore and beautify the 4-H electric building at Camp Bob Cooper.

State 4-H Conference

Five hundred fifty-three 4-H’ers attended the annual State 4-H Conference at Clemson University July 31-August 2. The Conference is the highlight of the year for 4-H’ers, chosen for attendance on the basis of excellence in their project work over a period of years. Each is a county winner in their program area.

Citizenship Shortcourse

Thirty-four 4-H’ers from 13 counties in South Carolina attended a week-long Citizenship Shortcourse in Washington, D. C. July 14-20, for a closeup look at democracy in action.
Seminars and workshop sessions centered on "developing a deeper understanding of the role and responsibility of the individual in the democratic society." One of the highlights was a day on Capitol Hill with members of the South Carolina congressional delegation, observing House and Senate activity, and visiting the Supreme Court. Special tours to enhance the citizenship emphasis included the White House, Mount Vernon, Smithsonian Institute, Jefferson Memorial, and John F. Kennedy Center.

These 4-H'ers earned money for the trip by holding auctions, barbecues, bazaars, and other activities.

4-H Camping Program

The 4-H camping program remains a most important part of the youth program. During the summer of 1974, some 2,741 4-H'ers and 200 Extension agents and volunteer leaders attended regular 4-H camp for a period of one week, or one of the special interest camps.

The educational program included demonstrations in various areas, exhibits, environmental trails, horseback riding, in addition to citizenship and leadership training.

State 4-H Electric Congress

Nearly 90 county winners in the statewide 4-H electric program met in Charleston August 8-9 for the annual State 4-H Electric Congress, the 25th anniversary.

The Congress is the highlight of the year-round program on basics of electricity conducted by the Clemson University Extension Service and sponsored by Carolina Power & Light Company, Duke Power Company, and South Carolina Electric and Gas Company.

Some 3,963 4-H'ers were enrolled in the 4-H electric program during 1973-74.

State 4-H Teen Leader Retreat

The 1974 State 4-H Teen Leader Retreat was developed around "Wise Use of Leisure Time." The general learning objectives were to provide opportunities for 4-H teens to learn new skills in arts, crafts, and recreation that would be of personal benefit and would be a skill the teens could teach others in their home communities.

Eighty 4-H teens and six County Extension professionals assisted in planning the Retreat in areas of photography, woodworking,
crocheting, ceramics, leather-crafts, basic art and design for posters, patchwork quilting, candlemaking and recreation.

The 144 4-H teen leaders, 36 County Extension professionals, and three adult volunteer leaders participated in selected arts or crafts areas, and volunteered for some phase of the Retreat program. Each teen leader made commitments concerning plans for using the training with younger 4-H'ers, other teens, senior citizens, and the mentally and physically handicapped in their home communities.

4-H Citizen Ambassador Program

Four 4-H teens—Karen Fisk, Orangeburg; Karen Hill and Cindy Reeves, Berkeley; and Jimmy Babb, Cherokee—participated in the 4-H Citizen Ambassador Program during the summer of 1974. The young women spent 24 days in Europe; and Jimmy Babb had a 42-day trip to Europe, Russia, Austria and Hungary.

The Citizen Ambassador Program is a nationally approved People-to-People Program established by the late President Dwight D. Eisenhower in 1966 to further international understanding among people of all walks of life.

These 4-H'ers worked to earn money to finance their trips. Jimmy Babb made enough money from his 4-H beef project to finance his entire trip.

Home Economics

*Scope of Activity:* Extension Home Economics is a broad service covering the full gamut of today's homemaking activities.

Just as the modern housewife must extend interests and activities far beyond the kitchen, so must Extension's educational programs be designed to keep pace, to offer information and expertise in such diverse areas as budget-making, housing, child care, nutrition and others.

Home Economics is an area that affects all socio-economic areas of South Carolina. Affluent and disadvantage alike can use guidance in some phase of work carried out by Extension Home Economics. Whether rural or urban, homemakers caught up in pressures of expanding the horizons of their families while dealing with current inflationary problems look for ways to curb costs and still maintain a quality of life.

It is Extension Home Economists who provide information on this.
The county staffs backed up by Subject Matter Specialists from Clemson continue to meet with individual clubs, stage clinics, conduct classes and utilize mass media outlets to provide information and answers needed in coping with today's complex problems of homemaking and family living.

**Consumer Education**

Although standards of living for families continue to rise, all families are finding it more difficult to maintain the present level, especially those on fixed incomes and those in poverty.

Home Economics staff members, with assistance from Agricultural Economics and Marketing, have continued to prepare a periodic newsletter, "CONSUMERS WANT TO KNOW," for use by County Extension Home Economists through mass media and other methods. In early 1974, one issue covered a complete approach to energy conservation in the home. This information reached thousands of people and helped them to take the scientific approach to energy conservation.

A consumer education project for youth is now in progress with hopes for increased consumer competence during an age when they become high consumers and make many of their own decisions. There were also increasing requests in 1973-74 for lessons on the metric system in anticipation of a conversion to the system within the next few years.

Special interest series of lessons have emphasized money management, insurance, credit and estate planning, with young families as the largest audience. The families in the Expanded Food and Nutrition Education Program have begun simplified lessons individually or in groups on money management and credit. Many of the families are now showing better money management practices.

Another major consumer education project was in the clothing area.

Two regional Clothe-A-Rama events were conducted by Home Economists in shopping centers in Columbia and Greenville. Consumers from several surrounding counties in each area attended in large numbers. Educational exhibits on selection and construction of clothing were on display. Demonstrations in all areas of selection, construction and care were given. A simple leaflet on each lesson was available to participants. Fashion reviews also attracted a large number of men and women.
The demand is so great for clothing construction classes—men’s and women’s—that ways are being explored for reaching more people with professional personnel.

In one county, a training session for women who sew for the public was conducted. They were taught business aspects as well as modern and time-saving methods and techniques. Other means are being explored for training volunteers to teach clothing construction through vocational schools, technical centers and fabric shops.

**Food and Nutrition**

Extension Home Economics programs continue to have the largest participation—adults and youth—in food and nutrition.

Accelerated food prices brought far above average interest in food buying practices, such as selective shopping, protein supplements, food production and preservation. Special interest sessions in preparation of soybeans have been held by Extension all over the State, in spite of the fact that edible varieties are not available in the amount demanded.

Selective buying is taught through regular TV and radio programs and news releases at State and county level as well as special interest sessions and Extension homemaker club lessons. There is evidence that families are showing more discretion in food buying.

Not since the 1940’s has the present interest in food preservation prevailed. Information was provided almost constantly by County Home Economists and Extension Specialists to families by phone and publications. Clinics were held in laboratories, in shopping centers, farm markets and at farms which advertise “pick your own.” The one limitation on food preservation was the problem of obtaining canning supplies.

Overweight among all ages continues to be a health burden in South Carolina as the rest of the nation.

Extension designed and taught a 10-lesson series dealing with weight problems to one or more groups in 60 per cent of the counties between January and June, 1974. Varying degrees of success were reported.

A correspondence course on “Feeding the Preschool Child” was popular among young mothers in the State, and their response was encouraging.
The Expanded Food and Nutrition Program

This special Extension program observed its fifth year in 1974. Now extending to 27 counties in the State, it's designed for and continues to make a great impact on the nutritional status and food practices of low-income families.

Some 10,045 families participated during the year, with 7,782 enrolled in June, 1974. The youth phases reached 10,379 during the year, 4,551 of whom are new to the program. A total of 723 volunteers also were involved in working with the youth groups.

Families are reached in working home visits and small group meetings through the efforts of Extension Nutrition Program Assistants who live in the communities in which they work. Their major objective is to assist the families to improve their food practices and nutritional status. These Program Assistants are supervised by County Extension Home Economists who provide basic in-service training and regular weekly training and counseling. Members of the State Extension faculty develop subject matter materials and provide in-service training and guidance to the county staff.

The youth have bi-weekly or monthly meetings in which lessons on basic nutrition, meal planning, food preparation and buying are taught. Some groups have garden plots and preserve some of the food for future use.

The families show definite improvements in food practices, health, and sanitation after being enrolled in the program. They are also motivated to improve homes, seek employment, or take training for employment and to improve relationships between members of the family.

Housing

Homemakers or couples have participated in home maintenance and care programs. Training in this work was given to the 1890 Extension Program Assistants by the Home Economics Housing Specialist.

Special interest series, “More for Your Home Furnishing Dollar” continues to be taught extensively in the State. The lessons have been completely revised for 1974-75. Renovation and construction of home furnishings workshops have reached many different families and all income levels.

Attention and assistance is now being given by several County Extension staffs to housing for senior citizens.
Child Development

With the belief that increased influence of the family on the child is highly desirable if this influence can lead toward optimum development of the child, Extension Home Economics has strengthened education for parents of young children. All means available were used: study groups, special interest sessions, home study courses, Extension homemaker club lessons and mass media. Extension Home Economists and Extension Homemakers conducted a program of educational assistance for directors of preschool centers, especially those operated in the home.

Programs for Young Adults

A State committee is developing procedures for strengthening programs for young adults. State Extension faculty are cooperating to develop programs for this audience.

Correspondence courses and television series are being used along with the more traditional group methods of special interest series and Extension homemaker clubs. In addition, a bridal packet is distributed to young couples living in the county as a means of providing information they may need early in marriage. These materials also introduce them to Extension programs for adults.

Community and Resource Development

Scope of Activity: Extension's Community and Resource Development (CRD) Programs provide educational and technical assistance to local committees and organized groups to help bring about community improvement.

The program is projected at community efforts requiring collective action to improve facilities or services. Prominently among these are such projects as water systems, garbage disposal, fire protection, or economic improvement.

Because the program development process used in this State is based on participation of citizen committees, organization and leadership development continues to be a major thrust of the CRD program in South Carolina.

This process involves identification of interested citizens, organization of these citizens into program or action committees, and assistance to leaders in developing their skills in program activities.

Interested citizens normally begin by analyzing community needs and opportunities. The selection of a particular type of improvement or project on which people will work does not come until
opportunities have been studied and the group has selected a particular priority.

While the efforts of Extension workers result in community improvement, much of the work is aimed at leadership development which occurs simultaneously with particular community improvement and efforts.

Youth in Community and Resource Development

As a result of the special funding from Congress, a pilot project for the involvement of youth in community and resource development was initiated in Abbeville County during 1974. The program is conducted by an Assistant County Agent and four Volunteer Service Assistants, with support from 4-H and CRD specialists.

After one year, 11 4-H/CRD clubs have been organized. Total enrollment was 210 youths in the range of 13 to 19 years of age. Highlights of the first year's activity include: (1) obtaining a $450 Readers Digest Citizenship in Action grant for a club landscaping project for a new high school; (2) conducting a two-day community development workshop for 32 outstanding high school students selected by school administrators and teachers (a $200 Citizenship in Action grant was received for support of this workshop); (3) obtaining custody of a recreation center formerly used in the city of Abbeville recreation system; (4) conducting numerous community clean-up campaigns.

Some of the subjects investigated by CRD club members include local government, housing, solid waste disposal, fire protection, community relations, beautification, care for the aged, and other community facilities and services. Professional workers in the Cooperative Extension Service have shown a great deal of interest in following the progress of this pilot program that involves more youth in community and resource development efforts in Abbeville County.

Initiation of a Model Program

Title V of the Rural Development Act of 1972 provides for a pilot program of research and educational assistance to rural communities by institutions of higher education. This legislation gave the U.S. Department of Agriculture and the cooperating Land-Grant Universities new and expanded responsibilities for the development of rural areas.

Under guidelines for implementation of Title V, a plan was developed for a model program in South Carolina, combining re-
search, education, and technical assistance in a pilot project to demonstrate the contribution that institutions of higher education can make to the development of rural areas. On February 21, 1974, the President of Clemson University, the Dean of Agricultural Sciences, and the Directors for Extension and Research programs met with key leaders in Williamsburg County to explain the Title V program. Those leaders voted unanimously to invite Clemson University to initiate this pilot program in their county.

As a result, a model program has been established in which problems are to be identified and local citizens given an opportunity to receive assistance in finding acceptable solutions.

According to their own interests, local leaders will be organized to work on the problems of greatest priority. They will receive support from the Extension Community and Resource Development Program through appropriate research, education, and technical assistance.

**Housing Institute**

In the fall of 1973, President Robert C. Edwards announced the establishment of the Clemson University Housing Institute.

The Housing Institution grew out of a University Housing Committee created to provide advisory and technical assistance support to the housing education program of Clemson's Cooperative Extension Service. The committee—composed of representatives from five Colleges of the University—stimulated a significant amount of research and educational activities. This provided an interdisciplinary approach to various housing problems, and with establishment of the Housing Institute, the work of the Housing Committee will continue to serve as a vehicle for ideas and action.

As a result of research and educational programs in housing, a variety of topics for future work have been identified.

These include: (1) determining what constitutes minimum adequate housing; (2) how land-use planning affects the supply and demand for housing; (3) innovative designs for reducing construction and maintenance costs; (4) development of educational programs for housing consumers; (5) measuring the quality of housing; (6) legal problems involved in home ownership and transfers; and (7) rehabilitation of existing housing.

Housing Institute activities are directed by an Executive Board composed of representatives from five University Colleges. The Executive Board for 1973-74 included as director, Dr. Adger Car-
Special Programs

Scope of Activity: For six decades Extension Service has been diligently striving to translate scientific knowledge from University and Experiment Station research into useful application on farms, in homes, and in communities.

Despite the trend toward mechanized operations and greater sophistication of agriculture, small farms with limited incomes are still a way of life for many of South Carolina's rural residents. The family farm is still a part of agriculture, but many of them have inadequate income by today's standards.

According to the latest data available, 68 per cent of the farms in the State operated by full-time farmers grossed less than $10,000 annually. In many counties, more than half the smaller operators were grossing less than $5,000 annually.

These conditions and needs brought Extension's Special Programs into being. Ways were sought to reach and help those being swept aside by the mainstream of an advancing economy.

Special Help Provided

Through Special Programs, Area Agents (professionals) and Agriculture Science Assistants (para-professionals) were made available in some areas to work with County Extension Staffs in developing programs with small farmers and low-income clientele. Efforts have been expanded to serve more of these with educational information designed to improve living standards. Considerable time is being devoted to programs and projects in farm oriented and non-farm oriented areas. Areas in which problems were identified and objectives established included:

Farm Oriented—crop production, livestock production, marketing crops and livestock, housing, and skill development.

Non-Farm Oriented—food and nutrition, consumer education, youth development, housing, and family life.

In the farm-oriented areas, professionals and para-professionals are being utilized in developing "small farms" programs. The small farmer caught up in a technological age is faced with many prob-
lems for which he must find solutions if he is to remain on the farm. Any effort to improve his status must begin where he is—with the farm and the family. Basic to most of his problems is the lack of real income, directly related to a lack of knowledge and basic farm management techniques.

Extension’s education programs and personnel are uniquely qualified to equip the small farmer with knowledge of farm planning, land preparation and fertilization, livestock and poultry management, pest and disease control, harvesting, and marketing.

However, since any effort to improve the situation of the small family farmer must begin on a personal basis, more time is devoted to one-to-one contacts. These contacts are being made in geographic areas with concentrations of small farms and rural residents. Objectives are both short and long term.

**Short and Long Term Goals**

Short term goals are to improve farm efficiency by providing technological assistance, increase family income through efficient production systems, improve living standards through increased knowledge, and to increase use of available goods and services.

Long term objectives include creation of stable enterprises with small farmers, increasing farm profits and living standards, strengthening relationship between small farmer and Extension, and compiling and publishing educational materials dealing with educational methods.

In analyzing data from primary and secondary sources, it is found that some areas of the State have concentrations of rural poverty. Surveys of small farms point out the need for assistance with many problems, especially in developing more efficiency of their present enterprises and resources.

**Result Demonstrations Being Used**

To meet the demand for more efficiency on these farms, the old proven Extension method of result demonstrations are being used. These demonstrations recognize small farm problems and conditions and point up better ways to use the resources available to increase the efficiency of labor, equipment, and capital.

Demonstrations already established include:

—All-practice production of row crops through application of the latest scientific methods in herbicides, fertility, insect control, and harvesting.
—Feeder pig production for graded feeder pig markets.
—Swine feeding for top hog markets.
—Production of home gardens on individual and community basis in youth and adult programs.
—Production and marketing of vegetable and other horticultural crops.

1890 Extension Program

Scope of Activity: Another arm of the Extension program which reaches and provides leadership for rural families with limited resources is the 1890 Extension Program conducted by South Carolina State College in cooperation with the Clemson University Extension Service.

South Carolina State College is the 1890 Land-Grant College of South Carolina. The program is federally funded for 1890 institutions.

This coordinated effort provides another approach for grassroots education and outreach for segments of the population that are out of touch with traditional uplift programs.

The program is directed by a coordinator at South Carolina State College. The Clemson University Extension Service cooperates through joint use of resources and programs.

The 1890 Extension Program now operates in four counties: Chesterfield, Georgetown, Hampton and Marlboro.

The program provides leadership for limited resource rural families in improving their quality of life. Efforts are concentrated on three project areas: community resource development, family living and youth programs.

An integral part of the 1890 Extension work is direction and demonstrated teaching to motivate self-help for families. Efforts during the year required cooperative aid embracing social service agencies, county school boards, County Extension Agents, State Extension personnel and others working with the 1890 program staff.
DIVISION OF REGULATORY & PUBLIC SERVICE PROGRAMS

The Division of Regulatory and Public Service Programs of the College of Agricultural Sciences operates several consumer protection type programs. These are carried out by educational and regulatory means through the Departments of Fertilizer Inspection and Analysis, Seed Certification, and Plant Pest Regulatory Service. The major objectives are to assure that fertilizer, pesticides, and seed sold to consumers meet the standards of excellence required and to insure through the Crop Pest, Bee Disease and Abandoned Orchard Acts that quarantines and rules and regulations made pursuant to these acts are adequately and impartially enforced.

Expenditures for fertilizers, pesticides, and seeds constitute large cost items for South Carolina farmers. Misrepresentation or adulteration of these products predispose crops to poor health, reduced yields, and increased losses due to insects and plant diseases. The welfare of the agricultural economy is dependent upon the quality of the products involved.

The following report highlights the activities for the Division during 1973-74.

PLANT PEST REGULATORY SERVICE

Nursery Inspections: Five hundred and seventy-five nurseries, greenhouses and vegetable transplant growers were inspected and issued certificates indicating their plants were healthy and free of insects and diseases. Seventy-six of these were new nurseries. Dealer certificates were issued to 317 establishments or individuals handling nursery stock, bedding, and potted plants and vegetable transplants. Spot checks of dealers to insure compliance with the Nursery Regulations were made throughout the State. Plant material moving through the State Farmers Market in Columbia was checked and inspected periodically for display of proper certificates and freedom from plant pests.

Bee Inspections: Less than one per cent of 2,119 bee colonies inspected during this period were found to be infected with foulbrood disease. Instead of having these colonies burned, recommendations were made to treat the diseased colonies with terramycin, an antibiotic, thus preserving the colonies for future productivity.
Sweetpotato Inspections: Approximately 50 inspections, comprising storage, plant bed, and field inspections, were performed for 19 growers. Three growers were involved in growing certified sweetpotatoes for seed purposes under the program administered by the Seed Certification Department at Clemson. The objective of all inspections is to see that growers are maintaining seed stock free from diseases and insects and maintaining varieties that are true to type.

Phytosanitary Export Certificates: A phytosanitary export certificate, sometimes referred to as a “health certificate,” is issued to business firms or individuals shipping restricted plant material to foreign countries and certain states within the United States. This certificate states the plant material has been inspected by an authorized inspector and is free of injurious plant pests. Ninety-seven phytosanitary export certificates were issued during the year.

South Carolina Economics Poisons Law: A total of 358 companies registered 3,715 products under the Economic Poisons Law. The Department collected $61,240 in fees during the period. The total number of pesticide samples collected and analyzed was 1,638. Only 57 (3.48 per cent) were deficient in one or more components. The per cent deficiencies dropped 2 per cent from last year and is the lowest in the last five years. The majority of the deficiencies involved formulations containing methyl parathion and toxaphene.

Phony Peach: During the 1973 survey season, 1,976,500 peach trees were inspected for phony peach disease. The majority of the orchards in the Ridge Section and some counties in the Savannah Valley District were inspected. The total number of trees inspected increased 9 per cent over last year. Increases were primarily in Barnwell, Edgefield and Saluda counties. Three hundred and sixty-seven infected trees were destroyed as compared to 343 in 1972—a seven per cent increase above the previous year, but the overall per cent of infected trees is .046 per cent.

Potato Y Virus: The disease, Potato Y Virus, was found in a tobacco field again since being detected two years ago. Four farms, one each in Clarendon, Colleton, Darlington and Horry counties, were involved. The farm in Clarendon County was among those on which the disease was found two years ago. It is still not known whether the disease overwinters on a wild host plant or whether it is being brought in on vegetable or tobacco transplants.
Soybean Cyst Nematode: This pest was discovered for the first time in Horry County in 1971, and observed again in 1972. After the second observation, the Plant Pest Regulatory Service (PPRS) and Cooperative Extension Service, through a cooperative effort, aerially surveyed some 360 square miles in upper Horry County to determine the extent of the infestation. Working from aerial photographs, ground crews collected about 600 soil samples from suspect fields. Eleven samples were positive for the soybean cyst nematode. Problems were associated with the remaining suspect fields and were determined to be due to nutrient deficiencies, other nematodes, and water drainage. Most of the soybean cyst nematode infested fields were concentrated around Loris. More surveys are needed along the Marion County line.

The significance of the soybean cyst nematode is that 17 states and Canada currently have quarantines against the pest. Seedsmen, farmers, and nurserymen could be seriously restricted in shipping the regulated articles from the infested area if this nematode is not controlled.

COOPERATIVE STATE-FEDERAL PROGRAMS

Imported Fire Ant: The fall treatment control program for the imported fire ant was conducted in portions of Bamberg, Calhoun and Orangeburg counties in operations covering 437,728 acres. The chemical mirex bait was used, and continues to do an effective job. Imported fire ants were found for the first time in Greenville County at the Greenville Memorial Hospital. The source of infestation was thought to be infested nursery stock. Some 30 mounds were found in the landscaped area immediately adjacent to and surrounding the building. All known mounds were treated, and surveys indicated that 100 per cent control was achieved.

Witchweed, Japanese Beetle, and Gypsy Moth: Twenty-two new farms, totaling 632 acres, were found infested with witchweed during the 1973 survey season, compared with nine farms (224 acres) in 1972. Currently, only seven counties are infested. All of the new farms are within the general infested areas.

The U.S. Department of Agriculture, Animal and Plant Health Inspection Service (APHIS), does the majority of the trapping for Japanese Beetles and Gypsy Moths to detect new infestations. Some 1,200 Japanese Beetle traps were placed throughout the State on a biometric design. Extensions to known infestations were found in Dorchester and Kershaw counties.
Some 4,500 Gypsy Moth traps also were placed throughout the State by U.S. Department of Agriculture and State personnel. All traps were located at areas considered to be high priority or hazardous areas, i.e., State and private-owned campgrounds, truck stops, and Interstate Highway rest areas. Only one male moth was trapped, in Lexington County. At present the Gypsy Moth appears not to be established in the State.

Survey and Detection: The Cooperative Economic Insect Survey program recorded 68 new county records and one new State record for various beneficial and injurious insects.

Twenty-six cases of Rocky Mountain Spotted fever, a tick-transmitted disease, were confirmed in the State, including one fatality.

DEPARTMENT OF FERTILIZER INSPECTION & ANALYSIS

The Department of Fertilizer Inspection and Analysis is responsible for enforcing the provisions of the South Carolina Fertilizer Law, (R672, H1792) 1954, (R1189, H2415) 1970. Fertilizer use data and the major activities of the department for July 1, 1973-June 30, 1974 period are shown below:

Fertilizer usage data - tons .................................................. 965,043
Number of fertilizer samples procured & analyzed ........................ 4,958 *
Total number of samples not meeting guarantee ................................ 853
Per cent of samples deficient ................................................... 17.7
Number of irregularities other than underweight .............................. 6
Number of irregularities for underweight at dealers’ warehouses .................. 21
Penalties collected, payable to State Treasurer
   (Deficiencies where consumers not identifiable) .......................... $ 18,441.94
Fines collected, payable to State Treasurer ........................................ 1,495.00
Registration fees collected, payable to State Treasurer ........................ 3,981.00
Fertilizer taxes turned over to State Treasurer .................................. 256,725.24
Total monies sent to State Treasurer ........................................... $280,643.18

Marketing Trends: World demand for fertilizer increased sharply during the 1973-74 period. During the early part of the year the price of domestic fertilizer was governed by a price freeze. High overseas prices and low U.S. prices invited manufacturers to move

* The difference between samples procured (4958) and samples reported (4808) is attributable to lime samples and unofficial fertilizer samples being included in the total.
away from U.S. sales and go into foreign trade. A serious shortage of fertilizer available to U.S. farmers was inevitable. A major shortage of railcars also hampered the movement of lime and fertilizer.

A world shortage of grain and soybeans influenced U.S. Department of Agriculture to lift restrictions on acreage and allowed farmers to increase planted acreage. This increased demand for fertilizer and the short supplies added to the price pressure. As a result, farmers' fertilizer costs increased to extremely high levels.

The price ceiling was lifted on fertilizer in October, 1973. Domestic prices on all mixed fertilizers and materials were raised immediately. Prices continued to rise throughout the year, and prices of some products tripled in six months. As the season progressed, South Carolina farmers were able to purchase most of the fertilizer they needed, but sharply elevated prices resulted in stepped up costs that made the 1974 crops the most expensive in history.

The Fertilizer Inspection and Analysis Department was very active in keeping members of State Legislature informed of the overall situation and offered suggestions which might be helpful. A statement was released on September 12, 1973, before the lifting of the price freeze. Other releases to inform the public of the situation were made throughout the year. Copies of monthly letters showing movement and trends were also sent to members of Congress and other interested persons.

**Fertilizer Movement, 1973-74:** Fertilizer supplies during the period were always tight. Practically no inventory was carried over from the previous year and there was no chance of build up of supplies. Despite this situation there was a 7.3 per cent increase in total tonnage compared with 1972-73 due primarily to keeping the S. C. industry informed of the situation.

Although farmers were concerned about nitrogen supply and had problems locating their needs, the total nitrogen used during the year was 103,751 tons—the highest annual nitrogen tonnage on record. Total tonnage of primary plant nutrients was 291,968 tons, also a record. Farmers were advised to determine their next crop nutrient needs early in the fall of 1973 and to order fertilizer at that time. Many farmers contacted dealers early, making possible early winter shipments and an orderly flow during the winter and spring months of 1974. Since fertilizer movement was spread over a longer period, inspectors were able to take more samples which
more adequately represented the quality of products moved to farms during the year.

**Fertilizer Deficiencies:** The number of deficiencies found in samples was 17.7 per cent compared with 14.2 per cent for 1972-73 and 18.1 per cent in 1971-72. The record was disappointing after such an improvement in 1972-73. Part of the cause was attributed to a lack of certain raw materials needed for high quality fertilizer. There were complaints of low quality materials and lack of dependable labor. The Department worked closely with the industry to determine quality control problems. Due to a short supply of nitrogen solutions, a strong demand and high prices, farmers were more suspicious of deficiencies than in the past. Fertilizer inspectors took more nitrogen solution samples than usual to lessen the possibility of farmers buying solutions which had less nitrogen content than that guaranteed.

**DEPARTMENT OF SEED CERTIFICATION**

Seed certification is basically a program of standards imposed on seed and plant production that insures high varietal purity and germination. Participation in the program is voluntary. The Department of Seed Certification is designated by law as the official agency for certifying seed and plants in South Carolina.

Field work of the Department involved inspection of 62,309 acres of crops on 442 farms in 1973-74. This was the most acreage of crops ever inspected for certification in South Carolina—a 32 per cent increase over the previous year. Field inspections were made for 74 varieties of 15 crops. Each field was inspected to determine that the crop was true to variety and free of noxious weeds. The following table shows major crops with acreage increases in 1973-74 compared with 1972-73.

<table>
<thead>
<tr>
<th>Crop</th>
<th>1972-73</th>
<th>1973-74</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soybeans</td>
<td>16,356</td>
<td>28,944</td>
</tr>
<tr>
<td>Cotton</td>
<td>18,219</td>
<td>23,072</td>
</tr>
<tr>
<td>Wheat</td>
<td>4,833</td>
<td>5,080</td>
</tr>
<tr>
<td>Rye</td>
<td>2,823</td>
<td>3,673</td>
</tr>
</tbody>
</table>

In addition to field inspection work, the Department issued certification tags for 870,000 bushels of certified seed in 1973-74. Certified seed tags are issued only for seed which has met field requirements and germination and pure seed requirements after the seed has been harvested and processed. Certification tags were
issued for 370,000 bushels of soybeans, approximately 35 per cent of the seed required to plant the 1974 crop in South Carolina. Considerable South Carolina certified cottonseed is exported to other states. Certification tags were issued for 5,087 tons of cottonseed, or about 225 per cent the amount of seed needed to plant the South Carolina crop in 1974.

Several significant seed problems were investigated in 1973-74.

In July, 1973, it was noted that germinations of Keowee barley—the leading barley variety in South Carolina—were abnormally low. Germinations of other varieties were good—and in several cases on the same farms where Keowee was being grown. Laboratory examination by the Department of Plant Pathology revealed that the Keowee seed showed a high incidence of an organism, Helminthosporium sorokinianum. This seed-borne organism was causing seedling blight, leaf spotting, reduced plant vigor, reduced yields, and reduced grain test weight in addition to poor germinating seed. Leading varieties of barley other than Keowee apparently had a degree of resistance sufficient to prevent a build up of the organism during plant growth and subsequent carryover onto the seed.

As a result of the ban on the use of Mercury fungicides on small grain seed, many seedsmen discontinued seed treatment altogether. Following these findings, all County Extension Leaders were alerted to notify their producers of barley to use recommended seed treatment materials to control this organism.

By January 1 it was apparent that, in spite of ideal harvest weather during the fall, South Carolina certified cottonseed germinations were running substandard. Much of the blame for low cottonseed germinations in 1971 and 1972 had been attributed to excessive rainfall, especially high-moisture conditions during harvest. It became clear in 1973 that mechanical damage in harvesting and ginning was probably the main cause of the substandard cottonseed germinations experienced in recent years. Because of these problems, the minimum germination standard for certified cottonseed was lowered in virtually all southeastern states for three consecutive years. It is possible that the recent development of a new picker than does not require passage of the cotton through a fan will minimize damage and help to improve cottonseed quality.

Several fields of the new soybean variety, Hutton, had too many off-type plants to meet certification standards when inspected in the fall of 1973. These fields were subsequently approved for cer-
tification when the off-type plants were removed. Problems arose, however, when laboratory analysis of the seed harvested from these fields showed too high an incidence of off-type beans. A greenhouse study was made to determine whether the variability observed was the result of genetically impure seed or mechanical mixing with other varieties during harvesting and storage. Observation of plant hypocotyl color, bloom color, plant pubescence color, and seed produced by the plants revealed that the problem was the result of cross-pollination with other varieties in two generations preceding the 1973 crop. The lot of seed involved was rejected for further use in certification.

In late June, 1974, a few farmers reported poor emergence of soybeans planted with certified seed. Seed of the lots in question had germinated satisfactorily in the laboratory and continued to do so even after stand problems showed up in the field. It was determined that these lots had been harvested during abnormally low moisture conditions in late fall, 1973, resulting in considerable mechanical damage. However, even with the more than normal seed coat cracking and separation of cotyledons inside seed coats, these seed germinated well under the relatively sterile conditions of the S. C. Department of Agriculture Seed Testing Laboratory. In the soil, however, the seed with damaged seed coats were quickly subjected to disease-causing organisms and, as a result, many plants did not survive. A field study involving 12 problem lots showed an average of 25 per cent less plants in the field than germination in the laboratory. This situation showed that laboratory germination is probably not an accurate indication of stands that can be expected from mechanically-damaged seed.

LIVESTOCK-POULTRY HEALTH DEPARTMENT

The Livestock-Poultry Health Department had its beginning in 1901 when the State Legislature authorized Clemson College to hire one veterinarian to investigate livestock diseases in the State. Because of the demands of an expanding livestock industry, the economic necessity of healthy livestock, and the improvement in diagnostic procedures, the responsibilities of this Department have increased greatly and personnel are located throughout the State to provide the inspection services required by law. The Department has three main areas of responsibility: the Diagnostic Laboratory, the Livestock Regulatory Program, and the administration of the State Meat and Poultry Inspection Program.
The statute authorities which set up and define the duties of the State Veterinarian and the responsibilities of this Department in regard to animal health are Title 6, Chapter 5, Section 6-331 to 6-337, and 6-401 to 6-609 of the Code of Laws of South Carolina 1962, including general and specific disease provisions on animal sanitation and health, stockyards and livestock dealers. The "South Carolina Meat and Meat Food Regulations and Inspection Law of 1967" which became effective July 1, 1967, and the "South Carolina Poultry Products Inspection Act of 1969" which became effective July 1, 1969, are the authorities under which this Department carries out the Meat and Poultry Inspection Programs. The Livestock-Poultry Health Department also cooperates with the Animal and Plant Health Inspection Service, U.S. Department of Agriculture, in carrying out certain animal disease eradication programs which are being conducted on a national basis.

PROGRAM HIGHLIGHTS

Hog Cholera
No hog cholera has been diagnosed in South Carolina since November 1972, but the Department continues inspection of sick hogs and on-the-farm inspections of swine moving to feeder and breeder sales. The objective is to isolate the disease before it has time to spread to additional herds, if any foci of infection still exist.

The South Carolina Garbage Feeding Law became effective July 1, 1973. The law prohibits the feeding of garbage to swine because of the danger of hog cholera virus being spread to susceptible hogs in this manner.

Brucellosis
South Carolina was declared Certified Brucellosis-Free effective March 31, 1972, by the U.S. Department of Agriculture. Extensive use of two screening programs to find infected herds—Market Cattle Identification and Brucellosis Ring Test—played an important role in eradicating brucellosis in South Carolina. These two programs will be continued to screen cattle for brucellosis to assure that the disease is quickly eradicated if it is introduced from other areas.

Tuberculosis
No case of bovine tuberculosis has been diagnosed in the State since March 1972. State Public Health Regulations require all
dairy herds to have a tuberculosis test at least every three years as a periodic check on the status of the herd.

**Equine Infectious Anemia**

A test for Equine Infectious Anemia was recently developed. Since this disease has been of concern to a number of horse owners in the State, a regulation concerning it was approved by the Board of Trustees of Clemson University. It requires all horses being imported into the State to be negative to an EIA test within six months prior to entry. The regulation became effective July 1, 1974.

**Meat and Poultry Inspection**

One hundred and thirty-three red meat plants in 43 counties and 49 poultry plants in 17 counties were under State inspection at the end of the fiscal year. The standards of inspection which are applied to red meat and poultry are identical to those which are being imposed in federally inspection plants. However, the South Carolina Meat Packers and poultry processors felt that a program administered at the local State level would be more efficient and that local administrators would better understand the problems of the packer and would be able to work with them more effectively. The General Assembly agreed with this philosophy both in 1967 and 1969 and approved the passage of the State Meat and Poultry Inspection Laws. The federal government, through cooperative contracts, provides matching funds to carry out the approved programs.

**APPROPRIATIONS FOR EXTENSION SERVICE**

**1973-1974**

<table>
<thead>
<tr>
<th>Appropriations</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>State Appropriations</td>
<td>$3,718,212</td>
</tr>
<tr>
<td>Federal Smith-Lever</td>
<td>2,810,789</td>
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<tr>
<td>Federal Resource Conservation</td>
<td>13,574</td>
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<tr>
<td>Federal Smith-Lever Rural Development</td>
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<tr>
<td>Federal Nutrition Fund</td>
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<td>Federal AMA</td>
<td>5,103</td>
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<td>Federal Smith-Lever 1890 College</td>
<td>560,037</td>
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<tr>
<td>DDT Safeguard Project</td>
<td>36,535</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>$8,606,350</strong></td>
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# EXPENDITURES BY PROJECTS

## 1973-1974

<table>
<thead>
<tr>
<th>Project</th>
<th>Expenditure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administration &amp; Supervision</td>
<td>$388,103</td>
</tr>
<tr>
<td>Ag. Communications</td>
<td>$379,640</td>
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<tr>
<td>Plant Sciences</td>
<td>$591,117</td>
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<tr>
<td>Animal Sciences</td>
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<tr>
<td>Ag. Economics</td>
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<tr>
<td>Ag. Engineering</td>
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<td>Conservation</td>
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<td>Home Economics</td>
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<td>Four-H Club</td>
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<tr>
<td>Community &amp; Resources Development</td>
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<tr>
<td>Federal Nutrition Program</td>
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<tr>
<td>1890 College Program</td>
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<tr>
<td>County Operations</td>
<td>$3,733,921</td>
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</tbody>
</table>

**Total Expenditure:** $8,066,835

**Unexpended Balance June 30, 1974:** $539,515

**Total:** $8,606,350