

1996

COLLEGE OF AGRICULTURE
ANNUAL REPORT
AUBURN UNIVERSITY





1996 College of Agriculture Annual Report

ADMINISTRATIVE OFFICERS

William V. Muse, President
Paul F. Parks, Provost
James E. Marion, Dean and Director
Robert A. Voitle, Associate Dean
Ronald L. Shumack, Associate Dean
Richard L. Guthrie, Associate Dean
William J. Alverson, Assistant Dean

CONTENTS

Dean's Comments	1
Introduction	2
Food	3
Environment	5
Money	7
Knowledge	9
Financial Highlights	12

This report was produced by the Office of
Research Information

James R. Roberson, Editor
Catherine L. Smith, Associate Editor
Robyn Hearn, Associate Editor
Teresa Rodriguez, Designer

*The information contained herein
is available to all regardless of race,
color, sex, or national origin.*

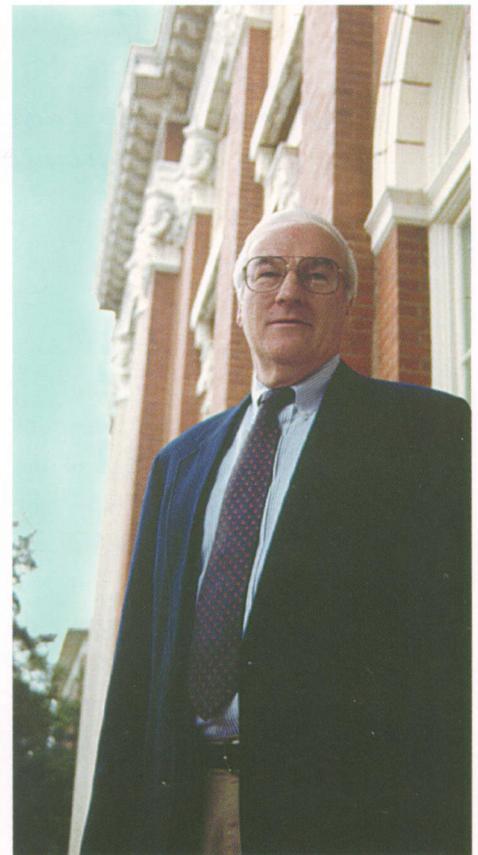
DEANS'S COMMENTS

Indeed, we now think we are experiencing the best and worst of times at Auburn University, especially in agriculture. Let us deal with the worst of times. Upon reflection, there is no doubt that Auburn University and the agricultural programs have faced times much worse than we have now. Such times were in the 1800s as Auburn programs faltered and almost failed, especially during the War Between The States and the next decade which followed. Bad times were experienced during the depression years of the 1930s and during the war years of the 1940s. Our "worst" times now pale in comparison to some of these stresses at Auburn over the years.

We do find ourselves needing more funds for salaries, programs, buildings, and scholarships. Competition is greater than ever for students, research dollars, and resources for extension. Yet, we have dedicated people who not only compete, but cause Auburn to prosper in times when needs are great and resources scarce.

This report highlights many of the "best" things at Auburn University, all the way from growing student numbers, job placement, research which pays big dividends, and extension programs which are changing to meet agricultural, natural resources, and environmental needs.

Why are things looking up in agriculture at Auburn University? In addition to dedicated faculty and staff, we have strong clientele support for our programs. Never have we experienced the level of giving for Auburn programs as has happened recently. The gifts for scholarships, endowments, facilities, etc. will allow us to "grow" ag programs over the years. Next, we have administrative support on the Auburn campus for ag programs that carries into the state legislature. As an example, President Muse's budget request to the legislature asked for a higher percentage increase for the Alabama Agricultural Experiment Station funds than for other budget categories.



Dean James E. Marion

We are launching a new building program for agriculture which has support from many different individuals and organizations. Before retiring, Senator Heflin coordinated efforts to obtain \$6 million in USDA funds for a new poultry building, the Ala. Farmers Federation pledged \$5 million for a new Lab Services Building, and the Ms. Ann Upchurch estate provided \$2.4 million to renovate the Animal and Dairy Sciences Building. These gifts will be matched with a bond issue from the Alabama Legislature and with gifts from others.

Times are both good and bad, but the good far outweighs the bad. However, of most importance, the best is yet to come. My personal thanks to all of you for making Auburn agricultural programs the best ever.

INTRODUCTION

overview of teaching, extension, research, and international accomplishments

Auburn University's College of Agriculture is truly one of the foundations on which East Alabama Male College, later Alabama Polytechnic Institute, and now Auburn was founded. The College's roots run deep with names like Duggar, Petrie, and Mell. The paths of excellence set forth by the early pioneers of scientific agriculture have been closely followed by today's teachers, researchers, and extension leaders.

Auburn's College of Agriculture has played a historic role in the development of the state's agricultural industry—which in one way or another touches each of us everyday. Though only about two percent of our state's population is actively involved in production agriculture, another 16-18 percent are employed in agri-related industries. The College of Agriculture, as is the Land Grant Model, is divided among teaching, research, and extension components; invariably these components work together as one homogeneous family. As individual members of the family grow, so grows the family.

In 1996, the agricultural family made some tremendous growth, despite some rather austere budgetary conditions.

Enrollment in the College of Agriculture reached a five-year high in 1996, with well over 1,100 students. Many of these students came to Auburn from high schools around the state and nation. However, many came from other schools and colleges on campus. The common attractions were: "I feel like I'm now a part of something here—a sense of family," "Their system of faculty advisors makes me more confident that I can succeed here," "The scholarship

opportunities are so much better here," and, of course, "I feel there are much better job opportunities for me when I graduate."

Impact of the College of Agriculture doesn't stop at the baccalaureate degree, nor at state or national borders. The College currently has 242 graduate students pursuing degrees in nine separate departments. "Anchored" by an internationally renown foreign program in freshwater fisheries and aquaculture, Auburn has developed a well-rounded international program. Students from every continent, except Antarctica, have graduated from Auburn's College of Agriculture, establishing an international presence that War Eagles encounter when traveling the far corners of the world.

The research and extension components of the College of Agriculture are so closely tied that many outside Auburn University don't recognize the distinction. Indeed, research and extension work hand-in-hand in the College, and the benefits in 1996 were bountiful.

In 1996, fisheries researchers at Auburn showed the world the first red snapper spawned and grown in captivity. Though significant in that scientists worldwide had tried and failed to do this for over 20 years, the real significance is the model, which may be extended to other species and ultimately change the face of protein-enriched fish production and consumption worldwide.

Two years ago, in 1995, Alabama cotton farmers had a miserable year—drought, and worst of all, tobacco budworms turned a beautiful early crop into an autumn disaster. Last year, research developed technology, was promoted and extended to growers statewide in the form of a genetically altered cotton variety that

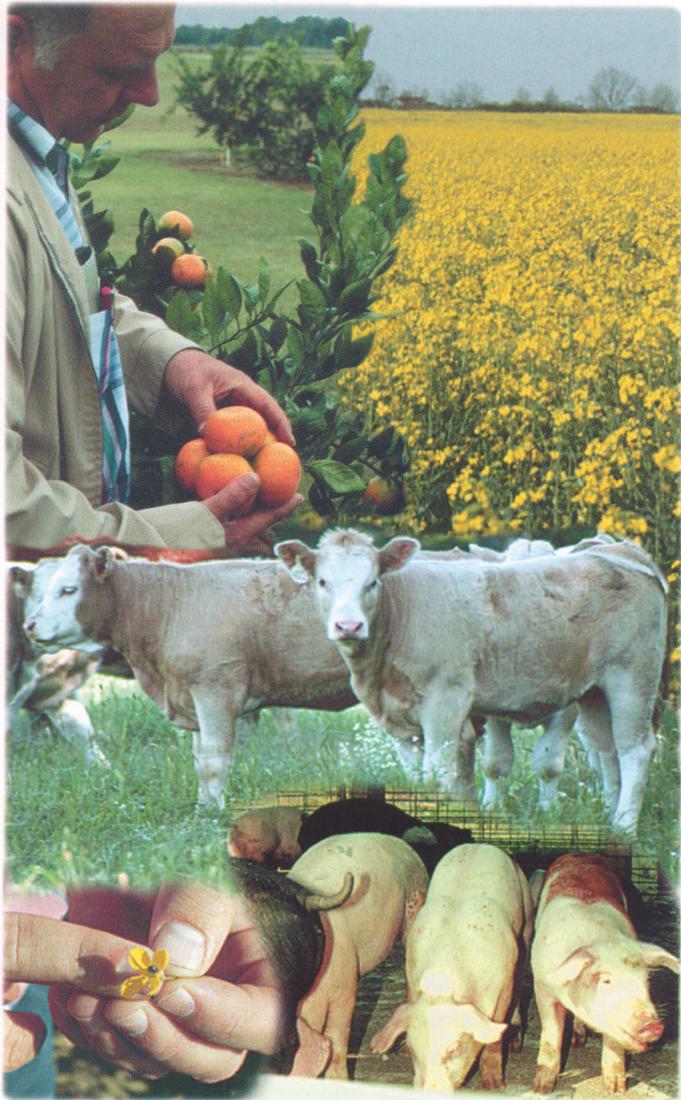
carried a naturally-occurring killer of tobacco budworms. This cotton variety, which included a gene carrying *bacillus thuringiensis*, benign to humans, but death to tobacco budworms, helped Alabama cotton farmers produce a near record crop in 1996. Though available throughout the cotton-producing belt in the United States, thanks to tireless efforts by Extension personnel, Alabama led the nation in percentage of Bt cotton planted. And, not incidentally helped Alabama cotton farmers produce one of the top five crops of the century.

Agricultural teaching, research, and extension is at a dangerous crossroad. Technology has advanced to the point that scientists—and industry—can shoot genes from one plant into the cells of genes of a foreign plant. And, genes from one animal species can be added to another to gain maximum benefit from the two species. Agriculture is high tech! To survive and to continue to lead the way for Alabama's number one industry and to continue to provide an improving standard of living for all Alabamians, the College of Agriculture must venture into this high tech world. However, to continue to support all the programs in the College—TODAY, there must be some basic, or "low tech" work. The balancing act is precarious, but vital to the College of Agriculture's ability to lead the state's agricultural industry into the next millennium.

The following report is a but a synopsis of the work done in the College of Agriculture in 1996. For every success story reported here, there are dozens of others equally as impressive in the classroom, in research endeavors, and via the College's outreach program in Extension.

FOOD

a safe plentiful food supply



PASTURE TO RAIL PROMOTES BETTER BEEF IN ALABAMA

The quality reputation and marketability of Alabama beef cattle are now on the upswing, thanks to a program organized by AU animal scientists, called Pasture to Rail. The program allows producers to retain ownership of small lots of calves sent for custom feeding at a midwestern feedlot and get valuable data on the calves' rates of gain and final carcass quality. Over the past three years, the program has shown these Alabama beef cattle to be as healthy, grow as well, and provide carcass quality equal to cattle grown in other parts of the U.S.

In the past, a widespread perception that Alabama and other Southeastern cattle were of inferior quality has led to marketing difficulties and discounted prices. The Pasture to Rail program is helping overcome this perception,

leading to enhanced desirability of Alabama cattle among buyers and feedlot owners.

Participating cattle producers, including in 1995-96 almost 100 purebred, commercial and junior producers, get assistance from AU in using the information gained to further improve herd health and genetic quality. Some have been able to use the feedlot records on post-weaning performance to get higher prices for their feeder calves. And some are continuing on their own successfully, sending all of their calves through custom finishing.

MORE MEAT FOR THE MONEY—SWINE PRODUCTION PROMISING

Consumers are no longer quite as enthusiastic about eating "high on the hog" because of the association with plentiful backfat. This is a major reason Alabama's swine industry declined in the 1980s. Now, however,

Auburn animal scientists and ag economists are helping producers use genetic selection and other improved management practices to reduce production costs and provide the higher quality, leaner pork consumers demand and will pay for.

AU faculty have also worked with agribusiness leaders, lenders, county and state officials, and state and regional development agencies to rebuild lost infrastructure and set the stage for creation of new production facilities taking advantage of the latest technology. In the last year, 22 new swine units installed on four farms boosted state production by about 60,000 pigs per year. Interest is especially high in West Alabama, where new facilities in the planning stage could produce as many as 180,000 pigs a year for Alabama and out-of-state markets.

Increased pork production, boosted by AU efforts, promises better profits for producers, expansion of the state's economy, and higher quality food for Alabama consumers.

LEANER BEEF FOR A HEALTH CONSCIOUS WORLD

Awareness of the health benefits of a low-fat diet has led many consumers to select only the leanest meat products. AU research is pointing the way toward new methods of satisfying the demand for leaner beef while at the same time fattening returns for Alabama cattle producers.

Culled cows, removed from the production herd because of lowered productivity, account for about one fourth of the typical cattle producer's income. Studies have shown that feeding these cows for a time, instead of sending them directly to market, can result in increased value. AU studies underway indicate that use of metabolic modifiers, which release growth hormones, can result in even greater gains in lean yield of fed cull cows, with reduced fat.

While the exact extent of the improvement

in lean yield is still under analysis and its pay-off value to producers will depend on particular market conditions, this technology seems destined to become a valuable alternative for cattle producers seeking higher returns and a source of higher quality, low-fat beef for consumers.

RAISING EVEN MORE DELICIOUS AND SAFE-TO-EAT OYSTERS

Oysters are generally safe to eat. Occasionally, however, they carry bacteria that can be dangerous, especially for susceptible individuals. In investigating this problem, Auburn scientists, working together with FDA personnel, have developed a method of growing safer oysters. Further, these oysters are preferred by many consumers over conventionally-harvested ones.

The research team harvested oysters in Mobile Bay and transported them about three miles offshore, suspending them in baskets from oil rigs. In the colder and saltier offshore water, the oysters purged themselves of harmful bacteria within seven to 14 days. They also developed a saltier tang that was more appealing to many oyster fanciers.

Oysters are a very popular seafood, yet many oyster lovers have become a little less ready to indulge because of food safety concerns. This combination of factors makes it a safe bet that the AU oyster findings will be explored for possible commercial development.

CANOLA FOR OIL AND COSMETICS

Most canola, grown as the source of the cooking oil that has become the preferred choice of many consumers, has up to now been produced in Canada. In recent years, however, AU faculty have conducted canola variety tests and established a production center in South Alabama. This program is demonstrating Alabama-grown canola to be quite competitive with Canadian-grown and is an excellent winter rotation crop.

The program is in its third year, with over 5,000 acres in production, mostly on a contract basis. Especially since choices of profitable winter rotation crops are limited, and with prices this year at \$7 per bushel, this successful demonstration is likely to make canola

a popular choice with South Alabama farmers looking for alternative crops.

An even more valuable potential for canola is production of oils for cosmetic and industrial use through genetic engineering. This route, including production of laurate, an ingredient in better shampoos, is also being pursued at the production center. Alabama consumers may soon be finding even more Alabama-grown products in several sections of the supermarket.

SATSUMAS: ALABAMA'S HEAVENLY TANGERINE ALIVE AND WELL

Revival of a once-lost Alabama citrus industry is now a distinct possibility, thanks to findings of AU researchers. Satsumas, the "heavenly tangerine," were grown in large quantities in South Alabama for local and northern markets in the early part of this century. Successive deep freezes in the 1930s, however, killed the trees and the industry. Researchers planted the world's largest satsuma test orchard at the Gulf Coast Substation in 1990, and have found means of saving the trees, if not the fruit, in temperatures as low as the teens.

Protection is provided by banking soil around the tree trunks and mist-irrigating to coat the trees with insulating ice in sub-freezing weather. Severe cold spells in the last several winters have provided ample opportunities for testing several variations of the protection system, and trees have been saved. Preliminary results indicate that even fruit may be protected during brief winter temperature drops into the 20s, which historically are more typical for the Gulf Coast.

REDUCING BACTERIAL RISK IN POULTRY

AU poultry scientists have developed a new test to readily evaluate anti-bacterial treatments used in poultry processing, and have gone the further step of developing methods to enhance the effectiveness of treatments to reduce or eliminate potential pathogens.

Current poultry sanitation procedures have generally produced an entirely safe food product. Under some circumstances, however,

microbes such as salmonella can attach themselves to the chicken skin in such a way that they are difficult to eliminate. The AU "skin attachment model," or SAM test, and the innovation of combining transdermal agents, such as emulsifiers and surfactants, with anti-bacterial organic acids, work together to overcome this problem.

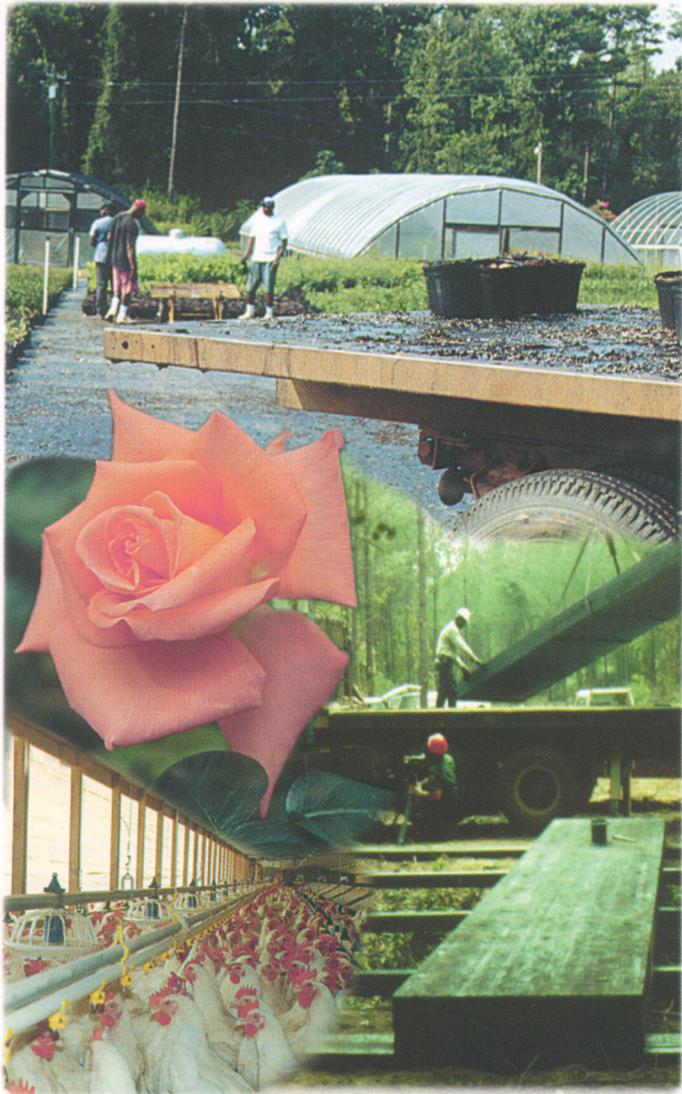
The new approach shows results very promising for commercial application, with very low concentrations of acids required. Researchers are refining the technique, which should help the industry comply with future stringent food safety regulations and provide consumers even greater assurance of receiving high quality poultry products.

CATFISH PROGRAM ASSURES QUALITY

A microbial testing program conducted at AU's Alabama Fish Farming Center helps the state's catfish industry assure consumers of wholesomeness and high quality in the marketing of this very popular seafood. The pilot project, now in its fourth year, is funded by cooperating producers and processors and operated by Auburn technicians. It demonstrates efficient methods of meeting and even surpassing stringent quality control requirements to be enforced by new FDA regulations in 1997.

The program has been highly successful, with participation by many producers and by the state's largest processor, along with several smaller plants. In carrying out the project, AU fisheries specialists have put Alabama's industry ahead of most other states in getting ready for the new FDA rules. One benefit seen already has been opening of additional market opportunities with large catfish buyers who have had their own quality assurance requirements.

The cooperative project will end in 1997, having successfully achieved its purpose in preparing the industry to conduct its own program. AU research and extension faculty will continue to provide scientific advances and technical assistance in support of continued industry expansion and assurance of plentiful supplies of top-quality catfish for consumers.



ENVIRONMENT

better quality of life

POULTRY WASTES BECOME VALUABLE BY-PRODUCTS

Alabama's leading agricultural industry, poultry production, also produces large amounts of waste materials which could pose serious environmental consequences if not disposed of properly. AU faculty have assisted the poultry industry not only in proper disposal but in conversion of wastes into valuable by-products.

Normal bird mortalities in the past have mostly been disposed of in pits, now banned by environmental regulations. AU agricultural engineers and poultry scientists have assisted producers in meeting the need for a better way. Now, most of the 800 tons of normal bird mortalities occurring every week in Alabama's 10,000 poultry houses are treated in AU-designed composters. This economical and environmentally safe method yields a valuable soil-building material, not waste.

AU's nationally-recognized waste conversion program also includes research and demonstration of environmentally and agronomically sound uses of spent broiler litter, the bedding material used in poultry houses. These and other by-products that would otherwise blight the environment are increasingly being shown to be valuable to farmers and others.

TEXTILE WASTE GROWS BETTER COTTON

What better way to deal with wastes could there be than recycling them back into production of the materials they originated from? That's what Auburn scientists have done with textile wastes: used them as a soil amendment for growing cotton.

Research carried out over several years at the E.V. Smith Research Center has shown textile mill wastewater treatment sludge to

result in impressive yield increases when applied to cotton. The sludge is high in nitrogen and can be applied with no EPA restrictions. The exact response of cotton to this waste application depends on several factors, including weather. No negative effects have been found, however, and under favorable conditions sludge-treated plots out-yielded conventionally fertilized plots by as much as 73 percent. In addition to providing nitrogen fertilization, the wastes improve the soil by adding organic matter and increasing soil water-holding capacity. Further, treatments provide residual nitrogen in succeeding years, lessening amounts of commercial fertilizers needed. Results similar to those seen for cotton were found when the textile wastes were used on coastal bermudagrass.

PRECISION FARMING POINTS TO FUTURE

Traditional farming practice bases field operations on generalized, average conditions across the field. New technologies, including satellite global positioning, bio-sensors, and computerized controls are now making space-age precision possible for farmers. Using the new tools, farmers can evaluate factors such as soil fertility and moisture, plant growth and health, and harvest yields from point to point over a field. They then can adjust operations such as irrigation, fertilization, and pest control on an equally precise basis for maximum benefit at least cost.

Auburn scientists are currently testing and demonstrating precision farming techniques in Morgan, Lawrence, and Calhoun counties on about 1,600 total acres planted in wheat, corn, and soybeans. Yield mapping of these fields to identify problem areas was completed in 1996, and the investigation continues, focusing on areas such as satellite and aerial surveillance to detect plant stress conditions.

The precision revolution aims primarily

at much more efficient agricultural production. By providing precise control to assure that no spot in any field receives potentially contaminating excess amounts of fertilizer or pesticide, precision farming also promises great environmental benefits.

BUILDING ENVIRONMENTAL BRIDGES

Auburn agricultural engineering has developed and successfully demonstrated portable timber bridges for use in forest harvesting operations. The bridges incorporate innovative designs of glued-laminated timbers for maximum strength with economical use of materials. One design innovation is the use of T-section bridge panels. This design enables bridges to support very heavy logging equipment over longer spans, while remaining light enough to be portable and easily installed and removed. To date, bridges designed to carry log truck traffic have been tested in lengths up to 40 feet.

In demonstration use now by several companies, the bridges contribute to improved efficiency in logging operations and enable loggers to avoid causing water quality degradation at stream crossings. The need to cross streams is common in logging, and constructed fords and culverts often cause unacceptable adverse water quality effects. The bridges have also been shown to be cost-competitive with use of fords and culverts.

The portable bridge designs can also be used for temporary heavy equipment crossings over light-duty bridges on rural roads, thus giving loggers access to otherwise difficult to reach areas. The bridges may also find use as temporary replacements for washed-out or deteriorated permanent bridges in rural areas.

MASTER GARDENERS IMPROVE AND PROTECT COMMUNITY AND HOME ENVIRONMENT

The Alabama Master Gardener program greatly multiplies the effectiveness of AU extension efforts in horticultural and environmental education. In the 15-year history of the program, almost 3,000 Master Gardeners in 34 counties have been certified. The intensive training program includes principles of inte-

grated pest management and vegetable and landscape gardening. Each Master Gardener commits to sharing his or her horticultural expertise as a teacher in the community.

Many individuals across the state who otherwise might not have been reached now do a better job of growing their own vegetables and beautifying their own home grounds with flowers, shrubs, and trees, all with lowered pesticide impacts on the environment. The program has also proven successful in organizing local citizens for community improvement. Some recent activities include involvement with young persons from Calhoun County's Coosa Valley Youth Services in a tree nursery, a Baldwin County residential water quality improvement program, Madison County's Roadside Pride Project, a Mobile County school program called Introducing Gardening to youth, and Habitat for Humanity home landscaping projects in many counties.

PLANT DOCTORS PROVIDE BETTER WAYS TO BEAUTIFUL

Plant nursery and landscaping operations contribute hundreds of millions of dollars to the state's economy and help homeowners and businesses maintain more beautiful surroundings. Auburn faculty contribute the scientific knowledge needed to make Alabama more beautiful — at lowest cost and with minimum impact on the environment. Just a few recent advances include:

Hybrid tea rose researchers have shown that alternating fungicide applications with horticultural oil controls rose blackspot as well or better than fungicides alone. Further, use of film-forming antitranspirants can stretch needed treatment intervals from once a week to every two weeks. Findings are good news for both commercial and home rose growers, reducing labor, cost, and chemical impacts.

Critical knowledge of how to get along with Mother Nature includes knowing what can't be done. Annual vinca (periwinkle) has been a common and easily-maintained Alabama landscape flower, but in the last several years has been devastated by a parasitic *Phytophthora* fungus. AU plant pathologists have shown that no available fungicides offer a

practical solution for the vinca problem. On the positive side, researchers have shown that many other selections, including ageratum, begonia, geranium, and zinnia, are *Phytophthora*-resistant and provide an economical and effective alternative.

Flowering dogwood is one of the most popular landscape beautifiers across Alabama, but powdery mildew often spoils their looks. Researchers have identified resistant cultivars enabling commercial and home landscapers to enjoy the beauty of their dogwoods without using costly and labor-intensive chemicals.

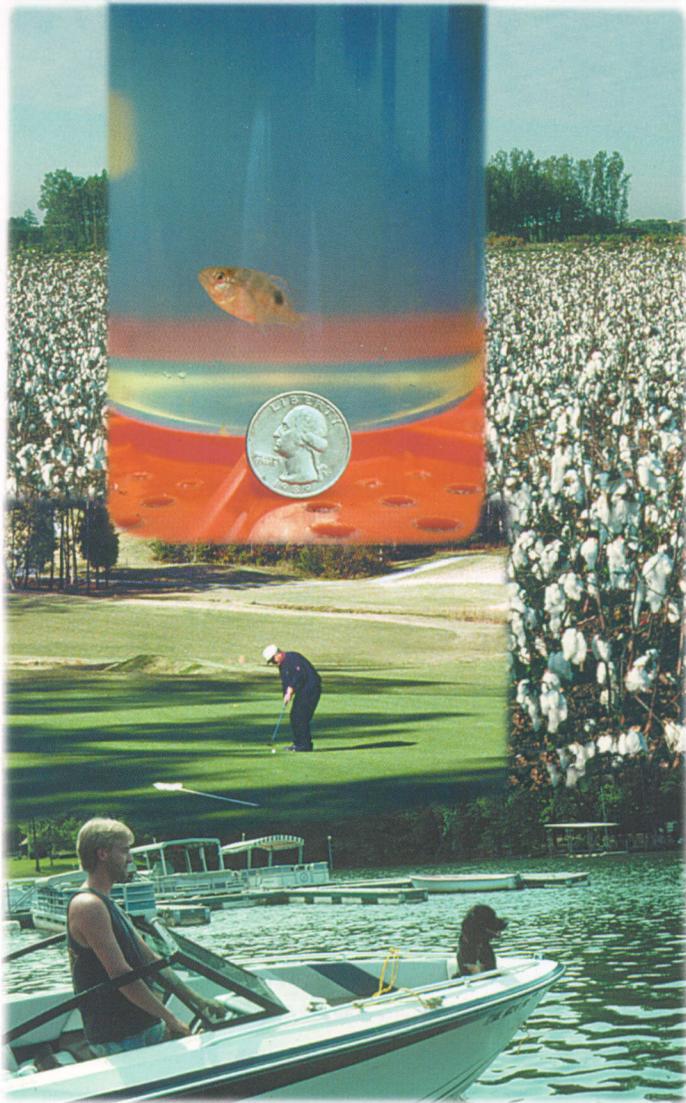
URBAN PEST MANAGEMENT GETS SMART

AU studies and demonstrations show that smarter pest control measures can in many cases yield better control of insect pests in home and commercial landscapes, with drastically reduced amounts of pesticides. Benefits include much lower costs and reduced environmental impact.

Smokybrown cockroaches, a common home pest, were studied by researchers applying Integrated Pest Management tactics, including targeted rather than area treatments, and use of pelletized and gel baits. Cockroaches were controlled, with a 90 percent reduction in insecticide amounts, compared with conventional area treatments.

Red imported fire ant infestations have been adequately controlled in various landscape settings by mapping infestations, establishing priority areas, and applying only perimeter treatments with baits. A successful pilot program in a business landscape setting reduced labor and chemical control costs by 90 percent. The approach is also useful for golf courses, athletic fields, and home landscapes larger than one acre.

Dreaded subterranean termites in the past could be controlled only by using hundreds of gallons of pesticides in soil drenches. Demonstration projects in Alabama carried out in cooperation with commercial pest control companies show that newly-developed chemical baits, used in amounts measured in small fractions of an ounce, can do the job as well or better. In three tests, termite activity around structures ceased after an average treatment time of four months.



MONEY

economic development and opportunities

Associations provide the information and tools farmers need to evaluate profitability of their farm operations and make sound business decisions under complex and changing conditions.

Alabama's Farm Analysis Association program began in 1980, the first to be established in the Southeast. In this self-supporting, fee-based program, AU personnel give one-on-one managerial assistance on top of a full package of mostly computer-based procedures for budgeting, enterprise and market analysis, and financial and tax planning. Most participants take care of recordkeeping and business basics on their own computers, calling on the Auburn field representatives for help with more complicated problems.

The program allows producers to compare financial aspects of their operation with statewide averages for similar operations, spot possible problem areas, and make needed adjustments. Business decisions are enhanced by complex "what-if?" calculations which forecast results of possible changes in farm operations or outside conditions. Few Alabama farmers are able to carry out such analyses on their own. The Alabama Farm Analysis Association gives any farmer a much better chance at a healthy and sustainable bottom line.

WATER HARVESTING MAY BENEFIT RURAL AREAS AND FARMERS

Alabama is generally a water-rich state — but water isn't necessarily plentiful where you happen to be located, or during the time of year you have need for water. Addressing the problem of unequal geographical and seasonal water distribution is the aim of a combined research and extension demonstration project in North Alabama.

The \$1.5 million project, begun in Limestone County in 1994 in cooperation

ALABAMA'S FIRST Bt COTTON CROP NEAR ALL-TIME RECORD

Aided by an intensive Auburn information and monitoring effort, Alabama growers far and away led the entire cotton belt in taking advantage of a newly-available variety almost entirely immune to cotton's current worst insect enemy, the tobacco budworm. The genetically-engineered Bt cotton, which carries insecticidal properties, had been thoroughly tested by AU scientists for three previous years. Thus the stage was set for its wide adoption, with an estimated 1996 statewide cotton lint yield of 750 pounds per acre. This would be the second highest cotton yield in Alabama history.

Growers used the Bt cotton as part of an AU-recommended Integrated Pest Management program. Tools include use of beneficial

insects, limited pesticide use, and measures to prevent development of insect resistance to controls used, including the Bt variety. A contributing factor was the previous success of a region-wide boll weevil eradication program. In 1996, less than 20 percent of Alabama's cotton acreage received a single insecticide spray, the lowest since synthetic insecticides became available in the 1940s. Cost savings statewide, even including the fee growers pay for use of the Bt technology, totaled an estimated \$46 million.

FARM ANALYSIS HELPS IMPROVE BOTTOM LINE

The farming way of life cannot be sustained unless the farm is operated as a sustainable business venture. A statewide organization and four regional Farm Analysis

with the Tennessee Valley Authority, calls for pumping water from a stream during winter and spring when flow rates are high and water demand is low. The water is stored in a constructed reservoir for later use when stream flows are low and water demand is high. The result is an alternative water supply source that is reliable, environmentally sustainable, and does not compete with other water uses or needs.

The project is now in operation, with a 13-acre, 140 acre-foot reservoir filled from Limestone Creek and in use for cotton irrigation research. Such "water-harvesting" installations offer potential not only for expanded agricultural production but for meeting critical industrial and municipal water supply needs as Alabama continues to grow.

MAKING THE MOST OF ALABAMA'S NATURAL RESOURCES

Recent Auburn research has shown Alabama's natural resources to be far more valuable than most people imagine. For example, nearly 800,000 residents went fishing in 1994, adding about \$2.15 billion to the state's economy and supporting almost 42,000 jobs. Over 300,000 hunters generated \$650 million and 17,000 jobs. Thus, a substantial portion of the population is participating in activities that extract a renewable resource and at the same time have very large economic impacts. Prior to this research, little was known about the economics of such uses of our forest and water resources.

The research findings also indicate a significant net transfer of income from urban to rural areas. Since agricultural production is also concentrated in the areas where hunting and fishing are likely to be taking place, efforts aimed at helping farmers adopt environmentally-sustainable practices must also be seen in a new economic light. That is, not only wildlife and fisheries programs, but agricultural waste management and pesticide reduction programs have

added economic value by protecting our recreational resources.

Our abundant forest and water resources are not just idle land or scenic attractions. They are important economic contributors to Alabama wealth.

MAKING HAY WITH AU RUSSELL BERMUDAGRASS

A new, AU-released variety of bermudagrass is demonstrating huge advantages over coastal bermuda, the old standard variety. In over seven years of testing by Auburn research and extension faculty, Russell bermudagrass has consistently shown a full one-ton per acre yield advantage over Coastal. Russell is also proving superior in ease of establishment, winterhardiness, and disease resistance, as compared to coastal. The new forage variety has undergone thorough testing, with over 15 demonstrations established in Alabama, and it is currently being grown on over 8,000 additional acres.

What is the potential payoff? The more than 10,000 total acres planted so far are a small fraction of the acreage Alabama cattle producers and others currently have planted in coastal. But at a typical hay value of \$60 per ton, the one-ton yield increase on the small acreage in existence at present is worth more than half a million dollars. Now that ain't just hay, that's Russell bermudagrass!

PUTTING A BETTER GREEN IN ALABAMA PUTTING GREENS

Golfing is not just a popular pastime for Alabamians and visitors, it's a big and growing business with some 270 courses making a \$400 million a year impact on the state's economy. Turfgrass research underway at several Alabama golf courses could give the industry a considerable boost. Several varieties of bermudagrass being tested by AU turfgrass specialists are showing traits very well suited to golf course use, and may replace bentgrass greens, which are very expensive to maintain, in Alabama and much of the Southeast

Bermudagrass requires much less care than bentgrass, which is a cool-climate grass not generally well adapted for Alabama conditions. If the currently tested bermuda varieties prove out in use, it could mean fewer fungicide applications, less fertilizer use and tremendous dollar savings for golf courses. For example, fungicide sprays can cost a course \$500 per application and up to \$10,000 per year.

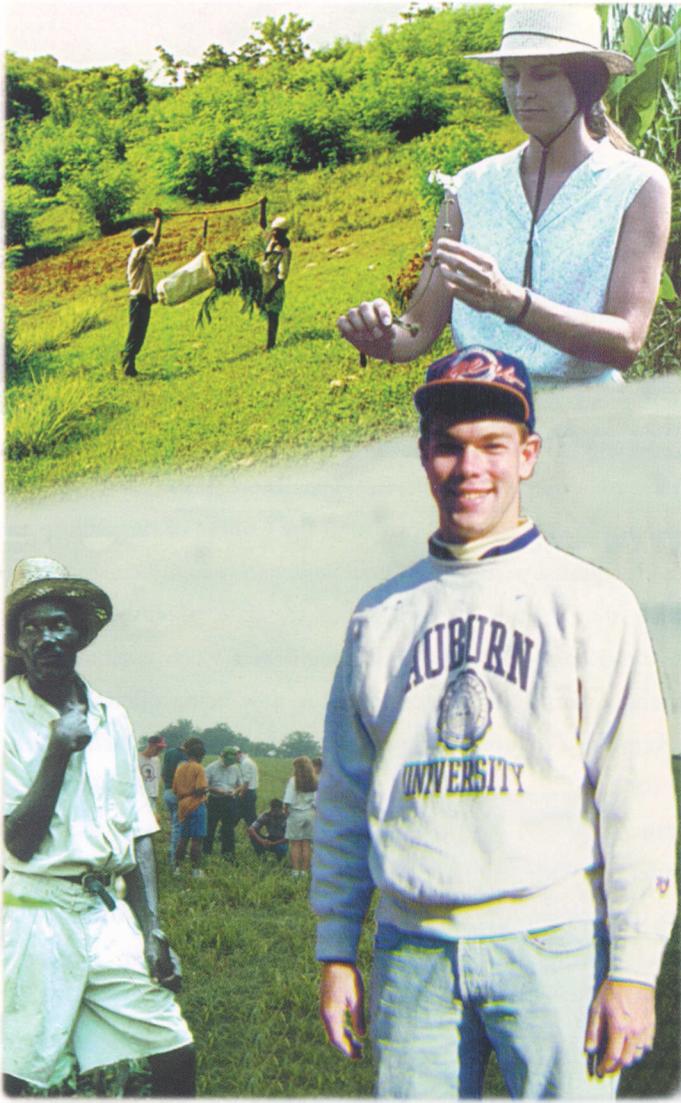
A golf course-adapted bermudagrass could also boost the state's turfgrass production sector, since bermuda is much easier to grow in Alabama than bentgrass. In addition to variety tests, Auburn offers a full range of research, extension, and education support for the expanding golf industry.

FARM-RAISED RED SNAPPER NOW POSSIBLE IN ALABAMA

Auburn fisheries researchers, working together with state Marine Resources Division scientists, have achieved a major breakthrough: artificially spawning red snappers and raising the snapper fry to viable size. In previous attempts in Alabama and elsewhere, the young snapper could not be kept alive for more than a few weeks.

The researchers achieved success by placing Gulf-caught red snapper in tanks stocked with various algae and small crustaceans to recreate the complex natural food chain needed by the tiny snapper hatchlings. The development opens the way to raising the fish in captivity on a commercial basis. Red snapper are over-fished throughout the world, and commercial production of the fish in captivity would serve a huge market for the high-value, high-demand seafood species. Continuing research focuses on refining techniques for raising the fish.

The discovery is expected also to help the commercial and recreational fishing industries. Raising the snapper in captivity allows marine biologists to learn much more about the characteristics and needs of young snapper, and apply this knowledge to protect wild snapper habitats.



KNOWLEDGE

*"Knowledge is power."
...Francis Bacon*

ment programs in the state aimed at introducing high school students to the College's programs. These meetings are co-sponsored by the Ag Alumni Association, which works hand-in-hand with the faculty and staff to support the College's programs.

The College also co-sponsors a highly successful event each fall working with the state's agricultural commodity groups. The Ag Alumni Association's Fall Roundup and Taste of Alabama Agriculture introduces both potential students and all Alabama citizens to the contributions of Alabama agriculture and the College of Agriculture. In 1996, more than 1,000 people attended the event, which included fun and games, great food, down-home music, and lots of educational opportunities.

COLLEGE ENROLLMENT ON THE GROW

Enrollment in the College of Agriculture has been growing by leaps and bounds. In 1996, nearly 840 students were enrolled in the College's undergraduate program, which represents more than a 70 percent increase in enrollment over the past five years. In addition to students enrolled in College of Agriculture majors, many students from other colleges and schools across campus take College of Agriculture courses to enhance their educations.

Students in the College also have the chance to continue their education through the College's masters and Ph.D. programs.

In 1996, more than 240 students were enrolled in graduate-level programs within the College.

The popularity of the College's programs is further illustrated by the support its students receive from the agricultural community and alumni. In 1996, more than \$312,000 in scholarships, many of which are donated by former students and ag-related businesses and industries, were awarded to undergraduates in the College of Agriculture.

Recruitment of new students also is a priority for College of Agriculture faculty and staff. The College's Ag Ambassadors, a group of students who serve as hosts for the College, join faculty members at recruit-

MENTORING IS FOUNDATION OF COLLEGE'S EFFORTS

One reason for the growth in enrollment in the College of Agriculture is the diversity and quality of the classes and instructors. But another reason can be found in the mentoring approach that the College has taken toward its students.

The College's faculty members have always taken a personal interest in the students they teach. Today, that spirit of support continues. Each department has developed a formal advising program that is staffed by faculty members who volunteer for the assignment.

Advisors follow students throughout their college career and these relationships furnish students not only with professional guidance, but also often evolve into surro-

"I can sincerely say that my education in Auburn University's College of Agriculture was definitely worth the investment!"

*Shannon Kown
Environmental
Engineer/USDA-
Natural Resources
Conservation Service*

gate parents and life-long friendships. The College's mentoring program is so exceptional that a recent report from AU's Student Government

Association cited the College of Agriculture's advising program as the best on campus.

And as graduation nears, the help continues. The placement rate for College of Agriculture graduates is more than 95 percent, an exceptional average compared to the rest of the university and to the national average.

KNOWLEDGE NOT LIMITED TO CAMPUS BORDERS

The College of Agriculture's educational programs are not limited to the campus of Auburn University or to traditional college students. Extension and outreach efforts help reach "students" across the state by providing valuable information to residents, business people, industries, and policy makers in Alabama.

Extension efforts help educate Alabama's agricultural producers and homeowners about environmental, health, and economic issues affecting the state and its people. For example, an Extension education program for non-point source pollution has helped inform and train more than 6,000 residents of a single watershed about water quality issues and has helped them protect their water supply from future problems.

Alabama's 18,000 row crop and produce farmers use an estimated 3.6 million acres of

Alabama soil to produce soybeans, corn, grain sorghum, wheat, peanuts, pecans, vegetables, and various fruits.

Thanks to extension efforts in the state, a large percentage of these farmers have adopted integrated pest management (IPM) systems that include use of biological control measures and other environmentally-friendly forms of pest management. For example, 77 percent of the peanut and 68 percent of the pecan acreage in the state are now under IPM systems. This results in cost savings to producers and a safer environment for all Alabamians. It also is helping Alabama producers meet federally mandated IPM requirements.

EDUCATING FROM A DISTANCE

Innovative uses of new and traditional technology has allowed the College of Agriculture to reach students from a distance all across the state and the world.

Distance education services make College of Agriculture classes available to all Alabamians literally in their homes thanks to correspondence courses that can be delivered through the postal service, via satellite, and over the internet.

One example of this is an organic gardening class that has become extremely popular for students both on and off campus. The class was first taught in 1990 and drew some 100 students to a classroom on campus. In 1996, more than 3,600 students from within the College of Agriculture and from many other schools and colleges across campus took the class. Recently, the course was also taught as a video satellite conference and it is now being offered through AU's Distance Education Outreach program

where students can access the class material through the World Wide Web or receive it through the mail.

Another example of using technology and resources to educate the world is the information clearing-house that has been instituted to help with international work in Haiti. The technical information service has been arranged through a local library in Haiti through access to Auburn University's Ralph Brown Draughon Library to address technical problems raised by collaborating institutions or individuals in Haiti. A bilingual newsletter, *Info-Plus*, also is published in French and English and reports results and information from a sustainable agriculture project underway in Haiti.

"AU's College of Agriculture prepared me very well for a job in industry. The longer I am out of Auburn, the more I appreciate the education I received here."

*Andy Lamb
Horticulturist/Bateman
Seaborn Landscape*

*"I do not believe
there are finer educators
or finer people at any
other university in the
world."*

*Steven R. Frazier
Account Executive/
First South Production
Credit Association*

COLLEGE OF AGRICULTURE SPANNING THE GLOBE

The College's education efforts also reach outside the borders of the United States. AU College of Agriculture faculty and staff travel to all corners of the world to share their expertise with peoples of other countries, thus helping the global community obtain information to advance their cultures and enhance their lives.

In 1996, two professors in the College of Agriculture received Fulbright Scholarships that allowed them to share their expertise with the fisheries industry in Brazil and the poultry industry in Russia. Many other faculty and staff in the College travel frequently around the world to such places as Haiti, Latin America, Asia, and Europe to share their expertise through University and U.S. Agency for International Development (USAID) cooperative programs.

The International Center for Aquaculture and Aquatic Environments (ICAAE), has had tremendous influence on fisheries and aquaculture programs worldwide. More than one-third of the 800 students who have completed advanced degrees in fisheries (214 master's and 60 Ph.D. degrees) have been from developing countries and another 250 international students have received either bachelor's or nondegree training. These students are providing the leadership for the growth of aquaculture in developing countries.

Auburn University has had extensive experience providing both short- and

long-term technical assistance in agriculture to developing countries.

Currently College of Agriculture faculty are involved in international outreach and research projects in many countries worldwide.

In Haiti, College faculty are working with issues related to peanut production, soil management, and agroforestry. Much of the work underway in Haiti is aimed at protecting the country's natural resources. The College of Agriculture is cooperating with USAID projects there that are helping the Haitian people maximize the production potential of their hillside agriculture. Faculty are helping these people protect their soil and water resources and teaching Haitian farmers better ways to cultivate their land.

College of Agriculture faculty also are involved in bean and cowpea research in Cameroon. Aquacultural interchanges are underway in Kenya, Honduras, Vietnam, Thailand, Brazil, and Ecuador. Animal and poultry science and horticulture faculty are involved in projects in Vietnam, Russia, China, Mexico, Cuba, and Guatemala.

In addition, Auburn University has signed academic interchange agreements with more than 40 institutions in 17 countries. Faculty also are making inroads into many other countries where they are providing assistance with everything from basic science to marketing.

HOME AGAIN - PROGRAMS SUPPORT LEADERS IN THE MAKING

In 1996, 30 new participants began a two-year educational program through the Alabama Agriculture and Forestry Leaders Program, an outreach program supported by the College and designed to help agricultural producers and agribusiness people hone their leadership skills.

Since it began in 1984, the Leaders program has graduated 138 participants, and those graduates have proven the value of the program. A number of these graduates have reached the highest levels of leadership within their commodity and farm organizations. Many more graduates have become active in their local communities, serving on school boards, as city and county officials, and in other leadership positions. The Leaders program is contributing to the future of Alabama by encouraging people take knowledge and expertise back home to their own communities.

In addition to helping Alabama farmers become leaders in the state, the College of Agriculture also is working with farmers from other countries through a farmer exchange program. In 1996, the College co-sponsored and participated in two farmer exchanges with the Havelland Farmers Association, a group of agriculturists from eastern Germany. Alabama farm leaders and College of Agriculture faculty members visited Germany and Poland, and later a delegation of German farmers came to Alabama to learn more about our agricultural system.

FINANCIAL HIGHLIGHTS

TOTAL FUNDING FOR COLLEGE OF AGRICULTURE



SOURCE OF FUNDS

