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Success Stories

ALABAMA

ALABAMA A&M UNIVERSITY

Research: Scientists at Alabama A&M are partnering with local industry on a biodiesel initiative that converts used cooking oil into fuel, thereby conserving energy, lessening pollution, and expanding industrial research platforms for A&M students. The outcomes of the research also have implications for rural communities during disaster relief. More than 2,000 gallons of used cooking oil harvested from the cafeterias of Toyota Motor Manufacturing in Huntsville, Ala., have been converted into biodiesel fuel and used to run the auto maker's in-house fleet that transports vehicles within the Toyota plant. The cooking oil is refined in an Alabama A&M laboratory manned by professors and students from the Department of Biological and Environmental Sciences within the College of Agricultural, Life and Natural Sciences. University researchers use a *Springboard Biodiesel BioPro*[™] 190 unit, about the size of a stand-up arcade game, to produce fuel that meets the standard of the American Society for Testing and Materials (ASTM). One 55-gallon drum -- about a month's worth -- of used cooking oil from Toyota cafeterias, supplies about 30 gallons of non-petroleum-based, cleaner-burning biodiesel. The oil not only helps run the company's intra-fleet of vehicles, but is also used in Alabama A&M's transit system buses with plans to expand it in the future to other campus vehicles, including small tractor engines and irrigation pumps. Researchers seek to expand the technology by developing a conversion process that is simple and cost effective enough to be used by rural communities, in disaster relief efforts, or in developing counties. Toyota is also interested in working with A&M researchers on using byproducts from the biodiesel refining process to create such other products as soaps, to use at the company's local plant.

Extension: The Alabama Cooperative Extension System's Urban Affairs and New Nontraditional Programs unit located on the campus of Alabama Agricultural and Mechanical University uses educational resources such as rain barrel workshops, rain catchment systems, and a 36-foot mobile lab to inform consumers about the importance of water conservation. In 2012, the Home Grounds team educated more than 18,520 adults about the importance of water conservation. Due to these efforts, approximately 50,825 gallons of water was collected from rainwater saving more than \$50,000. In addition, 5,439 pounds of produce was harvested from rainwater dependency, and 475 adults adopted xeriscaping management practices by incorporating desert landscapes or drought tolerant plants such as the rainwater project on the Jack-O-Lantern Farms.

Jack-O-Lantern Farms located in Muscle Shoals, Ala. needed an alternative and cost-effective water source to provide water for their hydroponic production houses. The Urban Affairs Home Grounds team provided training and resource materials that aided in the installation of two 5,000 gallon above-ground cisterns, plumbing, and rainwater collection conduits to one of their hydroponic production houses. Today, the system collects approximately 55,000 gallons of rainwater a year for an annual savings of \$80,000.

TUSKEGEE UNIVERSITY

Research: Gastrointestinal (GI) parasites present the greatest danger to the goat and sheep industry in the southern United States. Infected animals have lower growth rates, reduced reproductive performance, and have higher rates of illness and death. In the past, sheep and goat producers relied heavily on anti-parasitic drugs. Unfortunately, GI parasites have become increasingly resistant to many of the drugs. Alternative methods of GI parasite control for animals raised primarily on forages are vital for the sustainability and profitability of sheep and goat farms in the southeastern U.S. Consequently, alternative, sustainable, and affordable methods of parasitic control are required.

Researchers at Tuskegee University found potential benefits of pine bark (PB) supplementation on anti-parasitic effects and improved feed efficiency. Pine bark is one of the abundant forest by-products in the southern U.S. On-farm research with six local farmers also has shown that goats on a PB diet had 74 percent lower fecal egg counts and 5 percent better animal weight gain compared to control diets during three-month trials. Ground PB as a feed ingredient has the potential to improve animal performance while decreasing internal parasites and coccidian infection. Thus, developing plant-based alternatives such as PB and other natural resources for GI parasites control would be expected to have a greater impact on the goat and sheep industries. The development of natural resources allows development of Best Management Practices to prevent or treat GI parasites in ruminant livestock. Ultimately, by raising sheep and goats primarily on forage, farmers can reduce feed costs.

Extension: Socially and Historically Disadvantaged Farmers (SHDFs) in the Alabama Black Belt Region counties have toiled the land for many years. Tuskegee University is assisting farmers during the growing and harvesting season of pink-eyed, purple hull peas, greens (collards, kale, mustard, turnip), and watermelons. University faculty and staff partnered with USDA/NRCS to lend their expertise in soils, irrigation and solar power. Through this collaboration, a \$1 million competitive grant provided micro-irrigation and solar powered pumps to targeted SHDFs to sustain yields and quality during periods of low rainfall.

All SHDFs were certified via Good Agricultural Practices (GAP) and Good Handling Practices (GHP) for each crop, indicating that best practices were in place to ensure safe food. The collaborative partnerships with USDA/NRCS and USDA/Risk Management, along with funding from the Walmart Foundation led area farmers to organize the Small Farmers Agricultural Cooperative. This cooperative has allowed seasoned farmers to mentor beginning farmers, and strengthen their ability produce a quality product at the volume that attracts larger retailers such as Walmart and Whole foods. New processing and distribution centers have been added, which allow the farmers to get their fresh produce to retailers at a faster and more efficient pace.

ARKANSAS

UNIVERSITY OF ARKANSAS AT PINE BLUFF

Extension: Commercial catfish farming has endured difficult economic conditions, resulting in a 70 percent decrease in acreage in Arkansas. Yet, producers are seeking innovations to retain family farms where the ponds are located. The split-pond aquaculture production system has emerged as a new technology, and producers of other fish species have also expressed strong interest in this system. Research verification by the University of Arkansas at Pine Bluff Aquaculture/Fisheries Center is providing farmers with data from commercial catfish split-ponds. Production costs and returns, returns on investment, and financial risk are being determined. Extension personnel are working with farmers on split-ponds for sport fish and baitfish. Engineering studies are improving the paddlewheel for split-ponds. Night-time oxygenated zones within split-ponds and traditional ponds are being mapped.

Extension verification trials have documented catfish yields from commercial split ponds that are two to three times higher than typical yields. Economic analyses indicate that the new system has potential to reduce catfish production costs by approximately 10 cents per pound as compared to costs in traditional ponds. Analyses show breakeven yields for split-pond systems for catfish to provide guidance for farmers on management strategies necessary to achieve the potential cost savings.

Research: Viral diseases affect sweet potato, an economically important crop in Arkansas, causing significant damage to yield. However, information on viral infections on sweet potatoes grown in Arkansas is not available, so the University of Arkansas at Pine Bluff is working to identify major viruses that infect the crop in the state. Leaf samples were collected from 15 locations in southeast Arkansas. RNA and DNA were isolated and Real-time Polymerase Chain Reaction was used to identify major viruses. Assays indicated that Sweet potato Virus G was found in 96.7 percent of samples analyzed, followed by Sweet potato Leaf Curl Virus (83.3 percent), Ipomoea Vein Mosaic Virus (67.8 percent), Sweet potato Feathery Mottle Virus (66.7 percent) and Sweet potato Chlorotic Stunt Virus (58.2 percent). The third generation leaf samples from Ashley County showed higher infection levels for all the major viruses tested than the first generation samples. Samples from Lee County, where producers used their own seeds over a period of time, showed clear accumulation of all the major viruses.

As a result of the study UAPB researchers can now advise producers to not use their own seeds over a period of time as higher accumulation of viruses may lead to yield loss. This knowledge could save producers thousands of dollars over a period of time.

DELAWARE

DELAWARE STATE UNIVERSITY

Extension: For decades, demographers have predicted the “browning” of America, which by 2050 will be absent a true ethnic majority. Although the population of minorities in the United States is growing, educational statistics indicate a continued cause for concern, especially for Black males. Nationally, only

18 percent of Black males are proficient in math by the fourth grade, compared to 55 percent and 64 percent of their White and Asian peers, according to Advancing the Success of Boys and Men of Color in Education, a report from seven centers that rigorously investigate the educational experiences of boys and men of color. In Delaware, statistics regarding Black male academic persistence are also grim, with fewer than 60 percent of African American males graduating high school. Delaware State University (DSU) Cooperative Extension hosts year-round activities for underserved youths in Kent and Sussex counties through the 4-H and Youth Development program. Extracurricular activities foster and boost interest in STEM career fields as well as in life skills and leadership training. The summer Surprise Adventure Camp extends this training for young males, adding a natural resources appreciation component in an environment without electronic devices to distract millennial generation campers. Last year, nearly 1,000 Delaware youth benefited from DSU 4-H activities. Through evaluations, they indicated that they learned more about their capabilities and now understand that education is the gateway to rewarding careers and lives. These positive experiences lead more than half of the graduating 4-H program participants to attend college each year, with roughly 25 percent choosing to attend DSU.

Research: By 2050, when the world population is expected to reach 9 billion people, the issue of balanced land use for both housing and food cultivation will become even more pressing than it currently is. Agriculture scientists understand the critical need to protect such food crops as common bean (*Phaseolus vulgaris L.*), an important legume in many developing countries worldwide that is high in protein and dietary fiber. Recent advances in common bean genome sequencing have spurred Delaware State University researchers to examine the interaction between resistance genes in hosts and avirulence genes in pathogens. The research that will provide better insight into how to prevent disease in important food crops such as common bean. Their goals are to identify the *Crg* gene, located in a 250kb stretch on chromosome 10, and to locate the *Ur-3* gene, which is believed to be contained at the distal end of chromosome 11 and confers resistance to more than 40 of the 89 curated races of fungal rust at USDA-ARS in Beltsville, Maryland. With the availability of the genome sequence of common bean cultivar G19833, DSU researchers are now able to use a global approach to understanding genes responsible for rust resistance in common bean, which will aid in protecting worldwide crop production.

Along with new genetic discovery, this project has provided training and learning experiences to undergraduate and graduate students, as well as visiting faculty and staff from several collaborating universities and institutes. Several of the undergraduate students who have participated in the past and current research have gone on to complete their bachelor's degrees and attend graduate school.

GEORGIA

FORT VALLEY STATE UNIVERSITY

Research: Low income families spend more than 15 percent of their income on energy to operate their homes. Simple energy efficiency improvements can cut energy costs by more than 40 percent. To increase the knowledge base of community members, Fort Valley State University instituted the GREEN (Georgia Residential Energy Efficiency Network) Project. The GREEN Project provided energy audits,

energy kits and compact fluorescent lamps (CFL's) free of charge to Georgia residents. Technical publications, workshops and traveling exhibits about the proper use and disposal of CFL's were also provided at no cost to residents. The energy kits, valued at \$1,429.12, contained CFL's, low flow shower heads, programmable thermostats, toilet tummy, foam gaskets and vent deflectors. Through the GREEN Project, 14 residents that received energy kits to install in their homes saved approximately \$20,000 in energy-efficient equipment upgrades. In addition to the kits, the residents received 12 free energy audits providing for an additional savings of \$4,800. Georgia residents also received 484 CFLs for their homes during the previous year, and experienced a \$32,525 energy efficient equipment cost savings.

Extension: Small, limited-resource farmers are looking for profit generating sustainable production options. Researchers at Fort Valley State University are developing a low-cost, sustainable farming method that can generate income by using idle land also called marginal soil. Researchers are conducting field experiments at FVSU's Agricultural Research Station growing sweet sorghum and biomass sorghum on marginal land previously maintained as pasture. The dry matter yields of sweet sorghum and high biomass sorghum ranged from 7.0 to 8.0 U.S. dry ton per acre and 6.0- to 8.0 U.S. dry ton, per acre, respectively. The juice yield of sweet sorghum ranged from 523 to 1,043 gallons /acre while sugar yield ranged from 714 to 1,606 pounds/acre. The results suggest that both biomass and sweet sorghum can be produced for bioenergy with minimal outside inputs. This information could be critical to small farmers looking for ways to make money and be sustainable.

FLORIDA

FLORIDA A&M UNIVERSITY

In our research to develop new and improved grape cultivars for fresh fruit, wine and value-added products for Florida and the southeastern region, we use traditional breeding techniques as well as genomics proteomics, and bioinformatics to identify viticulturally important genetic markers and understanding of the biosynthetic pathways of important attributes that will facilitate the breeding and selection process. Our research is also developing new techniques to increase the level of phytochemicals, namely antioxidants such as resveratrol in muscadine grapes to enhance their utility and economic importance in the food and pharmaceutical industry.

The college is also involved in production and distribution of healthy grapevine planting materials as a member of the USDA National Clean Plant Network. In the entomology and biological control arena, researchers have made significant breakthroughs of using fungal pathogens to control the *Varroa* mites in honey bee colonies and tracing the history of the Redbay Ambrosia Beetle in southeastern US. Over the years, our entomology program has amassed the largest collection of aquatic insects in the world, containing over 1 million specimens of mayflies, midges, and stoneflies that attract scholars and researchers from universities throughout the world. Researchers in the Water and Air Quality Program in the college have also developed a thermochemical method for biochar production and is working on developing a low-cost and user friendly production system that can be used by farmers to promote carbon sequestration and a sustainable farming system. In a related research, we have developed innovative methods to characterize and trace the source of particulate matter (smoke) in prescribed burning and

forest fires that impact air quality and health related issues that are becoming increasingly important to rural, urban, and city dwellers. To assist farmers combat soil erosion, we have developed mesh-pad technology that is applicable to a wide range of field conditions that will allow farmers to observe soil loss and soil re-deposition in their fields. There is also the Automated Decision Support Interface Model that could be interfaced with the Watershed Assessment Model that could simulate the impact to surface waters of implementing various management practices and assist farmers to identify the most effective and cost efficient management practices. Considerable efforts are also being made in other areas of research such as the biological control of invasive plants and insects, and small ruminant production, and sharing our scientific knowledge with small limited resource farmers to help solve many of their on-farm production and marketing problems.

These are some of the research accomplishments that the College of Agriculture and Food Sciences at Florida A&M University have and are contributing to address present and future challenges for a better world, made possible through the collaborative partnership and support of state and federal agencies and institutions.

LOUISIANA

SOUTHERN UNIVERSITY AND A&M COLLEGE

Food Desert Project: Dual food issues of obesity and lack of access to nutritious food are issues being addressed through innovative programs at Southern University. The 2008 Farm Bill defines a “food desert” as an area in the United States with limited access to affordable and nutritious food, particularly prevalent in predominantly low-income neighborhoods and communities. Obesity, which is linked to non-nutritious foods, is a drain on individuals’ health as well as the health care industry, employers and the government. Obesity and correlated health conditions have a \$100 billion a year impact on the U.S. health care system, and Southern is responding with an Extension-based initiative “Eradicating Food Deserts in Neighborhoods through the Development of School Gardens.” Three area schools and 500 students have been reached.

School participants in this project were introduced to a variety of nutrition-related technology, gardening, and physical fitness activities. Successes include: increased nutritional awareness that help prevent and control obesity; saving money in low-income households; increase leadership-development skills and self-esteem; and decreased health risks associated with diabetes and heart disease. Overall, youth participants identify with the “Plant it-Grow it, Try it-Like it” Concept promoted through community gardening. Students have ownership of their school garden spaces and have easy access to fresh vegetables. Being able to plant and harvest their fresh-grown produce further encourages youth to eat healthier. Adults with a household member who participated in one of the community gardens consumed fruits and vegetables 1.4 more times, per day, than those who did not participate. Through this unique program, Extension agents and associates also will certify students, ages 13-17 as Youth Master Gardeners, as there is no existing curriculum which certifies youth with mastery level gardening skills.

Obesity Project: Louisiana spends up to \$2 billion annually treating obesity and related diseases such as diabetes, and Southern is responding with research-based initiatives through the project “Combating Childhood Obesity with Caregivers as Change Agents.” Through the program, 26 people lost a total of up to 62 pounds, within 24 weeks. A treatment group lost weight drinking shakes containing whey protein

and resistant starch, whose properties and benefits have been explored by researchers at Southern. Exercise and nutrition education were also components of the project. Some of the participants have reduced prescription medicines. The weight loss and nutrition management have also helped prevent other health issues, therefore helping them to stay in the workforce and maintain an economic status without reliance on taxpayer-maintained public assistance.

MARYLAND

UNIVERSITY OF MARYLAND – EASTERN SHORE

Research: Seafood is responsible for 26.5 percent of all foodborne disease outbreaks and many sporadic cases in the United States, with a significant number of these illnesses being associated with the consumption of molluscan shellfish contaminated with naturally occurring *Vibrio* bacteria (*V. vulnificus* and *V. parahaemolyticus*). In response, UMES researcher and principal investigator Dr. Salina Parveen, along with her team, investigated the effect of storage temperature on the growth and survival of human foodborne pathogenic *Vibrio* bacteria in oysters. The results of the project has filled data gaps in international risk assessment for the pathogens in oysters and will be used by the Food and Agriculture Organization of the United Nations, the World Health Organization, the United States Food and Drug Administration, and organizations in other countries to develop more accurate risk management practices. Moreover, the FDA is planning to use the research findings in designing and implementing a *Vibrio* control plan.

Extension: UMES researcher and principle investigator Dr. Virginie Zoumenou purports that the prevention of childhood obesity should start at an early age such as age 3. She also reasons that a multi-level program has the potential to result in a more sustainable behavior change. As a certified nutrition specialist, licensed dietician, and program leader and in response to the national obesity crisis, Zoumenou and her team have partnered with several Head Start child care centers to develop programs. For the last 4 years, Zoumenou has planned and implemented a multi-level program including preschoolers, caregivers, teachers, cafeteria staff, farmers, and community nutrition educators in the Princess Anne Head Start Center in Somerset County, Md. Through the program preschoolers have increased their knowledge of healthful eating and exercise, and caregivers and siblings of the preschool audience have also developed more knowledge of good practices. Monthly workshops have been offered to the parents and guardians of the preschoolers. Parents have improved their perceived benefits and readiness as it relates to consuming fruits and vegetables. This has been measured using EFNEP's food behavior checklist survey adapted from Townsend and Keiser (2003 checklist). Preschoolers have been taught the Eagle Books curriculum and have been exposed to indoor and high tunnel gardening. Fresh fruits and vegetables have been introduced in their daily menu. The children's awareness of the importance of eating fresh fruits and vegetables has been assessed based on the surveys taken before and after curriculum instruction.

MISSISSIPPI

ALCORN STATE UNIVERSITY

Extension: Counties in Southwest Mississippi surrounding Alcorn State University have overweight and obesity rates that are higher than the national average, according to a 2012 Centers for Disease Control report. To combat these issues, the Alcorn State University Extension Program (ASUEP) has established a Health and Wellness Program that focuses on home and community gardening, nutrition and physical activity.

ASUEP implemented a six-week program targeting faith-based organizations. During that period, participants started container gardens at home, prepared nutritious meals using their home-grown produce, and reduced their weight and body mass index through increased physical activity. Participants have also engaged their communities in adopting similar lifestyle changes.

Testimonials from participants show that the program has benefited the community by reducing the amount of medication they require, introducing them to the concept of reading labels, and increasing physical activity.

ASUEP also hosted a 5K Run/Walk & Health Fair in Natchez, Mississippi. The goal of this event was to get families engaged in physical activity and to provide information to facilitate healthy lifestyles. The Health Fair reached more than 70 registered participants who collected valuable information to improve the quality of their health. Approximately 40 individuals also participated in the race, ranging from teenagers through senior citizens.

Testimonials from participants show that the program has benefited the community by introducing them to the concept of reading labels and being physically active.

Extension: In the preliminary report of the 2012 Census of Agriculture, the USDA found that a majority of the farmers in the United States are 55 and older. Alcorn State University's Small Farm Outreach Training and Technical Assistance Project (2501) works to improve the number of socially disadvantaged farmers and ranchers, and veteran farmers and ranchers that participate in USDA programs. The 4-H Youth junior livestock program's objective is to use live animals to develop participants' productivity skills. ASUEP 2501 and 4-H programs worked together to help four youth apply for USDA Farm Service Agency youth loans totaling \$20,000 to purchase livestock. The youth have been able to work with their sponsor to learn more about their livestock and how they can expand their operation in the future.

MISSOURI

LINCOLN UNIVERSITY

Extension: The Innovative Small Farmers' Outreach Program (ISFOP) at Lincoln University Cooperative Extension (LUCE) helps the small farmers and ranchers of Missouri, especially those who are socially disadvantaged and underserved, to raise the level of efficiency on their farms while taking good care of the soil, water and the environment. ISFOP makes farmers aware of many resources and assists them in accessing those resources. The information provided by ISFOP to small farmers helps them adapt to a rapidly changing economy. The ISFOP works in partnership with the USDA and state agencies, and non-governmental organizations to provide research-based information on various farm topics on a one-to-one basis or at workshops. These topics and workshop include information on more than a dozen outreaches from community gardening to keeping records.

In addition to working with the small farmers and ranchers, the ISFOP also focuses on urban food production in the two largest cities in our state - Kansas City and St. Louis. The ISFOP helps limited-resource minority residents, especially the elderly, get access to fresh, nutritious produce. The ISFOP has partnerships with various groups and community garden organizations that promote urban agriculture.

Research: Aquaculture is the fastest growing segment of the U.S. agricultural industry and Missouri is one of the leading aquaculture states in the Midwest. An increasing job market is developing in this area. Lincoln University Cooperative Extension and Research (LUCER) has carved out a leadership role in developing aquaculture in the state with the most aquaculture facilities; the best equipped and supported aquaculture research program; and the only academic program in aquaculture. The aquaculture program focuses on the research of sunfish, because these fish are native species of the state and regarded as a very promising aquaculture species. The studies include genetic selection of fast-growing fish suitable for food-fish production, development of efficient production systems for fish production, and determination of the nutrient requirements and metabolism of sunfish. Missourians have opportunities to develop aquaculture on farms with one of the 400,000 farm ponds in the state. Empty farm buildings, such as hog or turkey barns, make excellent aquaculture facilities. It does not take a lot of high technology equipment and design to enter into aquaculture. The aquaculture program offers advice on setting up production systems, and provides tours, workshops or seminars on the topic. Missouri entrepreneurs are seeking opportunities in the aquaculture area for the following reasons:

Wild fisheries are declining and becoming contaminated while demand for aquaculture products are increasing. Per capita consumption of seafood in the U.S. has risen to 16.3 lbs per person. Seafood demand is met currently by importing aquaculture products from other countries. The seafood trade deficit is \$8 billion. Numerous small impoundments exist on nearly every farm. Groundwater is plentiful. The movement to buy local is increasing the market for Missouri producers. Small farmers can cash in on the often under-utilized aquaculture area to create market niches to increase income opportunities.

NORTH CAROLINA

NORTH CAROLINA A&T STATE UNIVERSITY

Research: A food science breakthrough begun at North Carolina Agricultural and Technical State University is making peanuts more accessible to peanut-allergy sufferers, which include about 2.8 million people in the United States. Hypoallergenic peanuts, peanut butter and other peanut products are a step closer to grocery stores with the signing of an exclusive licensing agreement between N.C. A&T State University and an industry partner, for the patented process that reduces allergens in peanuts by 98 percent. The process was developed by Dr. Jianmei Yu, a food and nutrition researcher in A&T's School of Agriculture and Environmental Sciences, and two former A&T faculty members, Dr. Mohamed Ahmedna and Dr. Ipek Goktepe, both of whom are now at Qatar University. N.C. A&T is partnered with Xemerge, a Toronto-based firm that commercializes emerging technologies in food, agriculture, and a variety of other fields.

In contrast to various other approaches to eliminating peanut allergens, the N.C. A&T process doesn't involve chemicals or irradiation, and uses commonly available food-processing equipment. The process treats roasted peanuts, removed from the shell and skin, with food-grade enzymes commonly used in food processing. The treatment consists of soaking the peanuts in an enzymatic solution, which reduces two key allergens, Ara h 1 to undetectable levels and Ara h 2 by up to 98 percent. The peanuts are not genetically modified, and look and taste like roasted peanuts. In collaboration with Xemerge, Dr. Yu continues to refine the process by testing the effectiveness of additional food-grade enzymes. Serious allergic reactions to peanuts affects nearly 1 percent of the U.S. population, just under 3 million people, with reactions that range from difficulty breathing and swelling, to death – in extreme cases.

Extension: In the decade since it was developed at North Carolina Agricultural and Technical State University, the Parenting Matters Program has helped more than 3,000 participants across 58 North Carolina counties. Developed from a curriculum created by Dr. Jean Baldwin, retired specialist with The Cooperative Extension Program at N.C. A&T, Parenting Matters is designed for parents who need, often by mandate, to improve their parenting skills and strengthen their relationships with their children. Parents in the program are often referred through judicial, health or social service programs as part of sentencing, treatment or custodial requirements, and others are self motivated. Many participants initially attend grudgingly but later give the program high marks for helping them improve their parenting. Results include salvaged relationships, improved communication and interaction among parent and child, decreases in truancy and delinquency and other successes. Considering that every five minutes, another child is abused or neglected in North Carolina, Parenting Matters practitioners cite the program's effectiveness at helping teach new parenting behaviors, including using "time out" as a disciplinary measure; and parents report spending 30 minutes or more, per day, with their children.

TENNESSEE

TENNESSEE STATE UNIVERSITY

Research: As adults over 60 age, physical changes lead to weakened immune systems and lower levels of stomach acid, making it increasingly difficult to prevent foodborne illness. To ensure their safety, older adults are strongly encouraged to follow recommended food safety practices from the time food is purchased until consumption (or later in the case of leftover storage). This change in behavior is sometimes difficult, partially due to habits that have been formed over a lifetime. Researchers in the Department of Family and Consumer Sciences at Tennessee State University used funding from the FDA and the USDA National Integrated Food Safety Initiative, to conduct a national survey of U.S. adults, examining consumer practices related to the storage and consumption of 10 categories of refrigerated ready-to-eat foods. Tennessee State University coordinated with a team of scientists from RTI International and Kansas State University on the project. The research has led to the development of materials that address food safety for older adults, including: *Take Control of Food Safety*, a comprehensive booklet and interactive website; *Food Safety Because You Care*, a booklet and website for caregivers and health care providers; and *Tasty and Safe: A Perfect Combination*, a cookbook that includes food safety instructions within recipes, plus section dividers that contain food safety reminders. The *Because You Care* booklet/website, that targeted nurses and caregivers, has had more than 37,000 hits and more than 16,000 pages downloaded. *Because You Care* booklets have also been distributed to approximately 10,000 health professionals, caregivers and older adults. A high-ranking USDA official has recommended that the format of including food-safety practices within recipe instructions be followed for future recipes that are published by the agency. This practice could result in a potential outreach to millions of individuals. The *Take Control* booklet has served as an educational tool for the Tennessee Commission on Aging and Disability, the Tennessee AARP, County Extension agents, and community leaders. In other successes, 306 older adults participated in the cookbook program and of those who reported following the unsafe practices at baseline, 51 percent of respondents started following practices to prevent cross-contamination when using a cutting board; 44 percent started safely storing raw meat, poultry, and seafood in the refrigerator; 27 percent purchased a food thermometer; and 6 percent started cleaning the inside of the refrigerator weekly. Of the respondents who reported consuming the potentially risky food at baseline, 29 percent reported not consuming soft cheeses since exposure to the intervention and 28 percent reported not consuming cold deli meats without reheating. Thus, both health care providers and older adults reported significant changes in attitudes, knowledge, and actions following the educational interventions. These changes could reduce the incidence of food borne illness, saving health care costs and, potentially, lives over time.

Extension: The Tennessee State University Cooperative Extension Program, the major outreach and engagement arm of the University that provides research-based, practical and useful information, has expanded from serving only three Tennessee counties in 1972 to the current 50 counties that serve the limited-resource, hard-to-reach and socially disadvantaged audiences of Tennessee. Examples of TSU Extension success include: the Master Meat Goat Producer Program that provides education, information and insight to broaden production management skills and improve competitiveness in the market place in order to increase profitability for meat goat producers. Over the last 10 years, this program has led Tennessee to become the second largest goat-producing state in the country with over 5,000 producers. Through TSU's Nutrition Education Program, participants in the Supplemental Nutrition Assistance Program Education (SNAP-Ed), reported losing 10 pounds from September 2013 through August 2014 after following the Choose My Plate menu planning guidelines taught by the nutrition educator. And in Extension STEM, hundreds of youth have learned about science through animal and plant science day

camps. In addition, youth have increased their knowledge of engineering and mathematics by learning how to build and program robots.

TEXAS

PRAIRIE VIEW A&M UNIVERSITY

Research: Peanuts contribute more than 4 billion dollars annually to the United States economy. However, there is a concern about a component in the peanut known as arachins, which is undesirable because of the health risks to many peanut consumers. Arachins are the allergenic proteins of peanuts and due to the proprietary dependence of genetically modified food, Prairie View A&M University's College of Agriculture and Human Science decided to develop a general-purpose biotechnology for producing an allergen-free peanut. The general-purpose biotechnology would enable limited-resource farmers to produce the allergen-free peanut, thereby increasing farm income.

Extension: In 1986, California Agriculture magazine published an article with the headline "Students show low awareness of agriculture careers." Nearly 30 years later and in other states across the United States, including Texas, that concern is still an issue especially among a growing population of minority students. For this reason, the 4-H Goat Giveaway Program at Prairie View A&M University has been providing kid goats to the community since 1987. The International Goat Research Center (IGRC) at the University conducts a program in which it provides a female kid goat to a qualifying high school student in the area to raise to adulthood and within two years when it has offspring they are expected to give IGRC a kid from the litter which will be given to the next qualifying applicant.

The purpose of the program is to promote goat-related agriculture in Texas and to provide area youth who are interested in Agriculture with a chance to become familiar with goats and raising livestock. Following a simple application process selected participants are required to attend a training session during which they learn the basics of goat care. The young people that are selected are also required to maintain quarterly records of the goat's growth and development.

The 4-H Goat Giveaway Program has provided rural youth in more than 59 counties in Texas with more than 500 goats since its inception. The program not only provides an opportunity to gain experience raising goats and goat breeding, but it also promotes the development of important skills, such as, responsibility and dedication. The program also promotes the Texas goat industry and increasing the number of goats being raised in the state.

VIRGINIA

VIRGINIA STATE UNIVERSITY

#1: After years of systematic crossings and extensive evaluation at many sites, breeders at Virginia State University have released three varieties of edamame (vegetable soybean): Asmara, Owens and Randolph. VSU has received United States Plant Protection Certificates from USDA for the three varieties, which are being introduced to the U.S. market through an agreement with a private company. In addition, seeds from the three edamame varieties are currently available to small farmers in southwest Virginia through a grant from the Virginia Tobacco Indemnification and Community and Revitalization Commission, allowing them to grow edamame for sale in the fresh market. Most of the edamame consumed in the U.S. is imported; the availability of these adapted varieties will facilitate production in the U.S., thus meeting demand by consumers for locally grown food. Edamame holds a great deal of promise as a high-value specialty crop for small producers in Virginia as they continue to transition away from tobacco production.

#2: Small-scale producers of tomatoes in greenhouses struggle against two whitefly species that damage their crops. The common greenhouse whitefly had been successfully controlled for years, without pesticides, by a small parasitoid wasp, but this wasp was unable to reproduce in the slightly smaller sweet potato whitefly host, which has recently appeared on the scene. Struggling with loss of crops and rising costs, some growers resorted to pesticides to combat the whiteflies. After a broad search, entomologists at Virginia State University found a strain of the original parasitoid wasp, coming from the Nile River Valley that was able to use both whitefly species as a host for reproducing. The new wasp is as effective in pest control as the original one and is also available commercially. As part of the ongoing effort to educate growers about biological control in tomato greenhouses, VSU has set up a web site detailing this information and much more about greenhouse pests: <http://www.agriculture.vsu.edu/resources/tomato-greenhouse/index.php>

WEST VIRGINIA

WEST VIRGINIA STATE UNIVERSITY

Research: The prevalence of obesity, heart disease, cancer and diabetes in West Virginia is among the highest in the nation. To combat these statistics, there has been an increase in demand for fruits and vegetables richer in healthful compounds like capsaicin and beta-carotene. The future production of cultivated crops depends on improving their genetics and developing new, superior varieties rich in disease-resistant traits and higher in nutritional value. Genomics (DNA sequencing) research trials at West Virginia State University have led to the development of new varieties of peppers, squash and melons with improved resistance to disease and value-added traits known to help in reducing the risk of cancer and cardiovascular disease. Plant breeding projects are developing these crops while adapting them to local conditions suitable for adoption by local farmers.

Extension: Nationally known as being among the unhealthiest cities in the United States, Huntington, W.Va., has a high childhood obesity rate; coupling that with a high crime rate, it is difficult for children in inner-city neighborhoods to have safe, fun and educational communal areas for recreational activity. West Virginia State University Extension Service's community and youth-based efforts in blighted areas of the city are addressing these concerns by repurposing abandoned lots into demonstration gardens that expose inner-city youth to sustainable agriculture and economic development. Through the SCRATCH (Sustainable Community Revitalization in Appalachia Through Children's Hands) Project, youth are building and tending to fruit and vegetable gardens and supplying their families with fresh produce while also selling their crops through local farmers markets and to restaurants, using the proceeds to sustain the project. Local police have also reported lower crime rates in neighborhoods where the gardens have been developed.