RUTGERS
New Jersey Agricultural Experiment Station

NEW JERSEY AGRICULTURAL EXPERIMENT STATION

2013 Annual Report

Our Mission

To enhance the vitality, health, sustainability, and overall quality of life in New Jersey by developing and delivering practical, effective solutions to current and emerging challenges relating to agriculture; fisheries; food; natural resources; the environment; public health; as well as economic, community and youth development.

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Did you know?

Rutgers Cooperative Extension has been serving New Jersey for over 100 years.

Rutgers NJAES: Then and Now

The Rutgers New Jersey Agricultural Experiment Station (NJAES) was established in 1880 to fulfill federal and state mandates to bring science-based solutions and education to residents of New Jersey. Recent and upcoming anniversaries offer us the opportunity to reflect on the deeply rooted agricultural history of our state and the ways in which the experiment station has evolved to serve the residents of a state no longer largely agricultural. In 2012, we marked the 150th anniversary of the Morrill Act that established land-grant universities across the nation. In 2014, we celebrate 150 years since the designation of Rutgers as New Jersey's land-grant institution. In addition, 2014 marks the 100th anniversary of the Smith-Lever Act that created the Cooperative Extension Service across the U.S. For well over a century, NJAES has been growing in both size and stature, but its mission of service and outreach remains relevant to the lives and wellbeing of New Jersey residents, communities, and businesses.

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NJAES PLAYS A SIGNIFICANT ROLE IN NEW JERSEY'S ECONOMIC GROWTH BY:

- Funding innovative research and technology development
- Fostering transfer of innovation and technologies to farms and industry
- Supporting the launch of start-up enterprises through incubators and business development
- Providing a well-educated, highly skilled workforce
- Developing sustainable growth strategies for urban and rural communities

Yet, the county, state, and federal commitment to support New Jersey Agricultural Experiment Station and Rutgers Cooperative Extension programs has steadily declined.

NJAES receives core funding from the State of New Jersey and from the U.S. Department of Agriculture; these funds support the infrastructure needed to develop and implement our research and extension programs. The state appropriation for 2013 totaled $21.742 million, remaining unchanged since FY2011. Federal formula funds for 2013 declined below our 2012 appropriation as a result of federal budget sequestration.

Declines in state and federal funding over time have made NJAES researchers and extension educators much more dependent on funding from competitive grants and contracts to support and enhance their research and education programs. "Other" funding, which includes restricted and unrestricted gifts, income from sales and service activities, and patent and plant licensing income is also an increasingly important source of support for these programs.

County appropriations include salaries paid by individual counties to Rutgers Cooperative Extension (RCE) faculty and staff. We gratefully acknowledge the personnel, facilities, and other support provided by our county partners through their county extension offices.

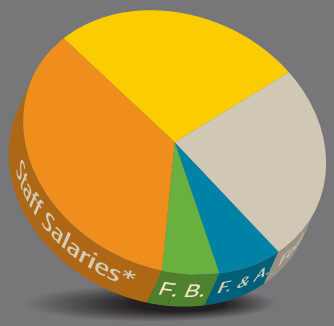
In FY2013, NJAES expended a total of $95.3 million to support research and extension activities; this represents a 4% increase in spending over FY2012.

Grant income is the primary source of support for our nutritional assistance programs; national pesticide testing and pest management services; and continuing professional education programs for New Jersey's farmers, businesses, and residents. Grant income in FY2013 also supported important research and extension initiatives in horticulture and plant pathology; climate change; water quality; and other environmental research as well as basic research into metabolic and other influences on human and animal health and wellbeing.

Funding Sources

- 44.3% Grants & Contracts
- 24.1% State Appropriations
- 16.1% Other (Gifts and Sales/Service Fees)
- 9.7% Federal Appropriations
- 5.8% County Appropriations

Expenditure Breakdown



- 35.4% Staff Salaries*
- 26.9% Operating Expenses
- 24.3% Faculty Salaries*
- 7.4% Facilities & Administration (F. & A.)**
- 6.0% Fringe Benefits (F. B.)

* Includes in kind salaries paid by counties to Rutgers Cooperative Extension faculty and staff.

** Facilities and Administration Costs (F. & A.) were previously referred to as Indirect Costs. These are costs that are incurred for common or joint objectives and therefore cannot be identified readily and specifically with a particular sponsored project, instructional activity, or any other institutional activity. Facilities costs include building and equipment depreciation, operation and maintenance expenses, and interest on debt and library expenses. Administration costs include general administration and general expenses, departmental administration, sponsored projects administration, and student administration and services.

Commercial Agriculture

Farming in a densely populated, highly regulated, high land-value state like New Jersey requires a resourcefulness that characterizes our tradition of mostly small, independent family farms whose yields rank high in productivity and profitability. The breadth and scope of its research and outreach ensure that the Rutgers New Jersey Agricultural Experiment Station plays a key role in preserving agriculture for future generations. Its county-based extension agents form the first line of response in areas like invasive species, integrated pest management, and wildlife damage control. NJAES is at the center of meaningful discussions around new revenue streams for agriculture, equine management, alternative energy sources, land and resource conservation, and continual improvements to food safety and biosecurity. NJAES focuses its resources in commercial agriculture to meet the needs of a new generation of farmers and business operators and a more engaged consumer.

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MEETING GROWER PEST MANAGEMENT NEEDS

In 1963, the IR-4 Project was established by the directors of the state agricultural experiment stations and the USDA to assist growers of fruits, vegetables, herbs, and other specialty crops with their critical pest management needs. In 2013, the IR-4 project celebrated 50 years at Rutgers. The research performed by IR-4 scientists has facilitated more than 30,000 registrations of conventional pesticides and biopesticides for food and ornamental crops. The majority of these registrations were approved by the U.S. Environmental Protection Agency in the last 10 years, with most classified as reduced risk. IR-4 research also addresses new invasive species that challenge existing pest management protocols. Two new pests of specialty crops that are of major concern are the brown marmorated stink bug (BMSB), which has severely affected New Jersey and the Mid-Atlantic states, and the Spotted Wing Drosophila, which has national impact. In New Jersey and elsewhere, IR-4 is coordinating with state, regional, and national experts to provide growers with pest management products to manage these destructive pests of food and ornamental crops. Scientists in the Rutgers Department of Entomology are also actively engaged in investigating new protocols to manage stink bugs. Anne Nielsen, assistant extension specialist in entomology, has focused her research on developing integrated pest management solutions in peaches, which require increased use of insecticide to control BMSB. Nielsen's goal is to identify the most effective time to apply compounds to eradicate stink bugs, as their susceptibility changes seasonally. This allows compounds under use restrictions to be applied when they are most effective. Nielsen, along with Dean Polk, fruit IPM coordinator, and other colleagues completed a two-year grower collaborative project that evaluated insecticide application to orchard borders to manage BMSB in peaches. This results in approximately a 75% reduction in insecticide use and protects non-target insects while providing equal BMSB control.

Robert M. Goodman
Executive Director of NJAES

NJAES continues to thrive and do its important work on behalf of New Jersey residents, despite deepening fiscal constraints. Our commitment to cranberry improvement has really taken off—with bog renovations in Wisconsin and New Jersey and new acreage in North and South America. This is but one recent example of how NJAES balances long-term investments with more immediate, emerging needs such as invasive pests and pathogens.

BREEDING BETTER BERRIES

NJAES has made significant investment in helping small fruit growers develop better strawberries and cranberries. Many years of breeding by Professor Emeritus Gojko Jelenkovic led to new selections of strawberries with unique characteristics, and these are being further evaluated by Agricultural Agents Peter Nitzsche and Bill Hlubik on 10 New Jersey farms, including two organic farms. Hlubik and Nitzsche also started two replicated research trials in New Jersey and developed cooperative research partnerships with North Carolina State University, the University of Maryland, and The Ohio State University. Research and farm trials are identifying strawberry lines with superior fruit flavor and adaptability to local environmental conditions. The goal is to help expand markets for commercial strawberry growers and provide new, improved choices for consumers and home gardeners. Another small fruit with extensive focus at NJAES is the cranberry. Early cranberry breeding efforts centered on varieties with enhanced yield potential and high fruit anthocyanin content, which is the flavonoid that gives cranberries their rich color and is a dietary antioxidant. The increase in disease and insect pressure in recent years has focused the cranberry breeding program at the Marucci Blueberry and Cranberry Research and Extension Center in Burlington County on developing varieties with increased resistance to fruit rot diseases and insects. Entomology specialist Cesar Rodriguez-Saona is screening cranberry germplasm to identify insect resistance. In addition, cranberry breeding for enhanced phytonutrients is also being explored. Nicholi Vorsa, director of the NJAES Marucci Center, was named a 2013 NJ Inventor of the Year by the New Jersey Inventors Hall of Fame for his scientific research and monumental contributions to disease-resistant cranberries and the cranberry industry.

Commercial Agriculture

IMPROVING FARM FOOD SAFETY

Foodborne illness affects one in six Americans each year, with a reported 48 million illnesses, 128,000 hospitalizations, and 3,000 deaths, according to the latest data from the Centers for Disease Control and Prevention. In an effort to promote food safety of products grown on New Jersey farms, NJAES has implemented the Rutgers Food Safety Educational Program. This initiative is designed to work with growers to develop food safety plans for their farms, including a written manual outlining the farm's standard operating procedures. The objective is to improve food safety on the farm and in the food distribution chain. The introduction of wholesale buyer mandates, the Food Safety Modernization Act, as well as general consumer concerns have created a need for education on good agricultural and handling practices, a key component of the food safety program. Over the past three years, Senior Program Coordinator Meredith Melendez and Agricultural Agent Wesley Kline have reached a diverse group of New Jersey fruit and vegetable producers. Since 1999, Kline has coordinated food safety training for a total of 3,800 New Jersey growers, with more than 1,200 completing third-party audit training. These trainings have changed growers' perspectives on how crops should be fertilized, irrigated, grown, harvested, packed, and handled. Kline and Melendez have worked together to develop an innovative, multi-level approach to training growers that includes a wholesale third-party audit manual, a farm plan template, an educational website, and weekly food safety articles for the *Plant and Pest Advisory*. These materials will ultimately be available on tablets and smartphones. Following the completion of food safety plans, Melendez and Kline review them with growers and conduct walk-throughs of their facilities to verify compliance of risk assessments and standard operating procedures. Close to 50 farm visits, plus food safety questionnaires and audit preparation, have been completed in the last three years. The NJAES data show that growers who have taken advantage of the individual consultations provided by the extension agents have passed the stringent audit requirements, ensuring a safer food environment that benefits all New Jersey residents.

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Did you know?

Food and agriculture is New Jersey's third largest industry, bringing in billions of dollars in revenue.

ENABLING SPECIAL INTEREST CONSTITUENTS

NJAES research and extension activities broadly support commercial agriculture, but several of its programs target specific constituents. Farmers who suffer some form of disability following a farm accident and wish to return to farming are the target audience for a program called the Mid-Atlantic AgrAbility program, which was launched in 2010. Agricultural Agent Ray Samulis represents Rutgers NJAES in a partnership with the University of Delaware and the University of Maryland to coordinate AgrAbility, which helps farmers with disabilities continue farming through specialized techniques and equipment. AgrAbility partners with national organizations like Goodwill and Easter Seals to provide assistance to farmers. Another constituent group benefiting from NJAES outreach is beekeepers, whose ranks are growing thanks to New Jersey Department of Agriculture incentives and practical training delivered by the NJAES Office of Continuing Professional Education (OCPE). Since 2005, more than 2,050 people have taken OCPE's beginner beekeeping class and more than 190 have completed advanced training. An estimated 5,000 beekeepers in New Jersey–commercial and hobbyist–maintain upwards of 18,000 colonies, representing a $2.5 million industry. With a typical hive pollinating 28 square miles, many farmers and gardeners benefit from area beekeepers. Without these bees, the state's $200 million fruit and vegetable crop harvests would suffer. The beekeeping industry was dealt a devastating blow with last winter's massive bee die-offs in New Jersey. However, OCPE's ongoing beekeeper training programs are helping to sustain bee populations and their pollination services that support New Jersey agriculture, wildlife, and backyard gardens.

Environment and Natural Resources

New Jersey's total landmass ranks as the fourth smallest of the 50 U.S. states, but its relatively small landmass supports an abundant natural environment in which its urban, suburban, and rural landscapes include forests, rivers, streams, beaches, wetlands, estuaries, bays, and the ocean in a dynamic relationship shaped by human uses. NJAES scientists and specialists, in collaboration with businesses; local, county, state, and federal agencies; and citizen scientists and residents, help to devise an array of programs designed for sustainable management of New Jersey's natural resources. From environmental remediation efforts and ecological assessments and research, to air and water quality monitoring and restoration of coastal shorelines and riparian buffers to streams, NJAES is on the forefront of research and best practices to manage, conserve, and protect New Jersey's environment.

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LEADING U.S. ATMOSPHERIC STUDY

Degraded air quality threatens public health and climate change impacts on our ecosystems are showing up more readily in our atmosphere. Developing strategies to alleviate the impact of degraded air quality and climate change requires an understanding of the complex and interconnected atmospheric chemistry that both regulates and responds to pollution. In the summer of 2013, Assistant Professor Annmarie Carlton led a six-week, $20 million atmospheric study in the southeastern U.S. to help untangle the intricate details of atmospheric chemistry. The collaborative Southern Oxidant and Aerosol Study (SOAS), which was funded by the National Science Foundation, the U.S. Environmental and Protection Agency, NOAA, and the Electric Power Research Institute, addressed various components of air quality. The study looked at chemical and aerosol constituent evolution over that U.S. region, which has not warmed, unlike the rest of the continental U.S. and the globe. Natural emissions of organic compounds in the southeastern U.S. are high, rivaling rates in tropical areas. The proximity of these natural emissions to a variety of man-made pollution sources made the southeastern region of the U.S. ideal for studying biosphere-atmosphere interactions. SOAS brought together hundreds of scientists to investigate the sources and processes that control the fate of biogenic compounds in environments influenced by human activity coupled with the impact of climate and air quality on the environment. Carlton and colleagues logged hundreds of hours in airplanes, overflying the southern states of Alabama, Tennessee, and North Carolina, and collecting samples of gases and particles in an effort to chemically characterize the atmosphere. The results from the study and the multi-agency collaboration to analyze the high-resolution measurements obtained in the field will yield more accurate models, leading to improved air quality management and climate forecasts that will benefit New Jersey, the rest of the U.S., and beyond.

Robert L. Barchi
Rutgers University President

Rutgers is proud to be New Jersey's land-grant institution. Our research has contributed to virtually every major agricultural policy initiative, from farmland assessment to farmland preservation to right-to-farm legislation—and the role of NJAES has grown to include fisheries and aquaculture, environmental preservation and water management, nutrition, community wellness, master gardeners, 4-H, and much more.

BUILDING SUSTAINABLE WATER RESOURCES

Our modern infrastructure of paved surfaces, sewage and waste disposal systems, and industrial and agricultural production allows us to manipulate our landscape to achieve our standard of living. But this landscape development has disrupted the natural ways in which water cycles through the environment. As a result, flooding and water contamination are byproducts of our modern way of life. The mission of the Rutgers Water Resources Program (WRP) is to address community water resource issues using sustainable and practical science-based solutions. This is accomplished through research, project development, assessment, and extension as well as the collaborative efforts of regional, national, and international partners. Since New Jersey's water resource issues are vast, the program focuses on agricultural water management, stormwater management and green infrastructure, and watershed planning and restoration. WRP projects in 2013 focused on green infrastructure, a cost-effective, sustainable, and environmentally friendly wet-weather management approach to capture and reuse stormwater to maintain or restore natural hydrology. WRP's statewide green infrastructure programs include projects with the Passaic Valley Sewerage Commission (PVSC) and the cities of Newark and Camden. The PVSC is working with the WRP to pilot a green infrastructure municipal outreach program for 48 municipalities. The Camden Green Infrastructure Initiative, now in its third year, includes 40 priority demonstration green infrastructure projects that focus on reducing negative impacts to waterways and combined sewer overflows, flooding, and sewer backups on private properties, improving the quality of life of the residents of Camden. The partnership in Newark involves working with grassroots organizations to effect change with regard to stormwater management and the implementation of green infrastructure.

Environment and Natural Resources

SHORE PROTECTION IN A POST-SANDY ERA

The highly developed nature of New Jersey's coastline, barrier island, and lagoon communities makes them particularly vulnerable to storm surge, sea level rise, and flooding. The devastating environmental and economic effects of Superstorm Sandy on these coastal communities has heightened public awareness of the risks we face. A collaborative project at Rutgers among the Jacques Cousteau National Estuarine Research Reserve, the Center for Remote Sensing and Spatial Analysis, and the Bloustein School of Planning and Public Policy integrates geospatial and analytical tools on coastal hazards into ongoing community engagement and regional planning efforts to advance and promote Hazard Resilient Communities. Two integrated web-based tools are being further developed to assist coastal communities in visualizing and planning for future local impacts of climate change. In addition, a geospatial and analytical platform will be developed to provide a cohesive and comprehensive set of tools to assist planning for and responding to events associated with climate change impacts. As sea level rise threatens coastal marshes that serve as a buffer to protect forests, farms, and municipalities from storms, Rutgers researchers at the Haskin Shellfish Research Laboratory and the Aquaculture Innovation Center are developing innovative methods to protect our shorelines. The effort involves cultivating ribbed marsh mussels to use as part of living shorelines, where ecological processes facilitate increased sedimentation and accumulation to form new marsh surface. Marshes historically have increased in size at a pace that matched sea level change; however, sea level in recent years has been rising faster than marshes can keep up. To help stabilize the shoreline, researchers have been engaged in living shoreline projects using logs made of coconut husk fibers that are planted with marsh grass seedlings and juvenile mussels. The mussels deposit sediments that they filter from the water column, which in turn fertilize the grasses. As the fiber log deteriorates, the marsh mussel complex grows vertically as a natural levee, serving as a living shoreline that protects the marsh and the coastal environment, including shore communities.

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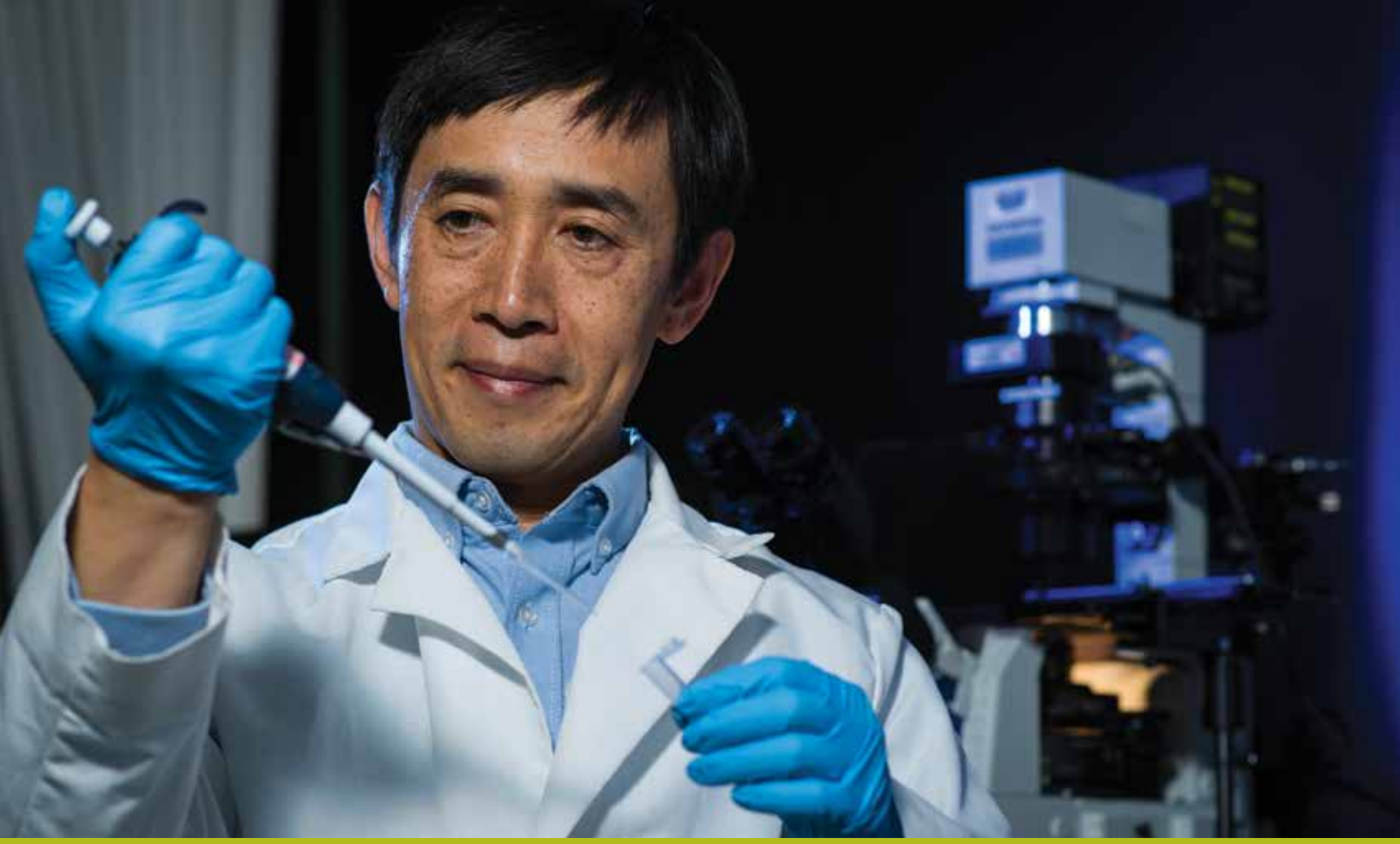
Did you know?

The southern pine beetle has spread in the Pinelands due to the recent lack of bitter cold winters.

INVASIVE SPECIES AND FOREST DECLINE

The diversity and overall health of New Jersey's forests have felt the impact of invasive pests and pathogens, which weaken trees and can cause widespread die-offs. Oak leaf scorch, caused by the bacterium *Xylella fastidiosa*, which is spread between plants primarily by insects, has reached epidemic proportions in New Jersey and the northeast. Initial symptoms of the disease appear as necrotic margins around leaves, but systemic spread of the pathogen over time results in decline and eventual death of the tree. The pathogen has a broad range of hosts, leading to concern of its spread to multiple species of shade trees and food crops. NJAES researchers are using genetic and genomic approaches to evaluate the diversity of strains causing oak leaf scorch. These studies will shed light on how the disease spreads, the major insect vectors involved, and other plant hosts that serve as pathogen reservoirs. In addition, several invasive insects have led to devastating decline of New Jersey's hardwood trees. Hemlock has largely been lost to the hemlock wooly adelgid and elongate scale. Oak continues to be defoliated by the gypsy moth, and other hardwood trees are constantly under threat by the Asian long-horned beetle. The combined impact of these known invasive insects, including the newly established viburnum leaf beetle and the emerging threat of the emerald ash borer, leads to loss of diversity in New Jersey's forest habitats. The most recent threat is the rapid spread of the tree-killing southern pine beetle in the New Jersey Pinelands. In 2013, NJAES entomologists initiated a southern pine beetle trapping program that established baseline population densities of these pests and their predators, so that any signs of increasing density of the beetle will serve as an early warning system for local landowners to begin surveying for newly damaged trees.



Fisheries and Aquaculture

New Jersey is home to six major commercial fishing ports, four ranked among the top 50 ports in the nation in terms of value of the harvest. Its coastal waterways sustain commercial and recreational fishery and aquaculture that contribute about $3 billion annually to the state's economy. Rutgers NJAES has made strategic investments in the growth and culture of finfish and shellfish as well as training and outreach on species of commercial importance to New Jersey. NJAES marine extension agents are deeply engaged in educating residents on species and habitats, from providing hands-on opportunities to restore shellfish to bay habitats, to promoting community-supported fishery programs to better connect fishermen and local communities. The wide-ranging research and extension activities of NJAES help to promote a vibrant aquaculture and fishery industry as well as strengthen New Jersey's coastal environment and economy.

njaes.rutgers.edu/fisheries

STRENGTHENING THE SHELLFISH INDUSTRY

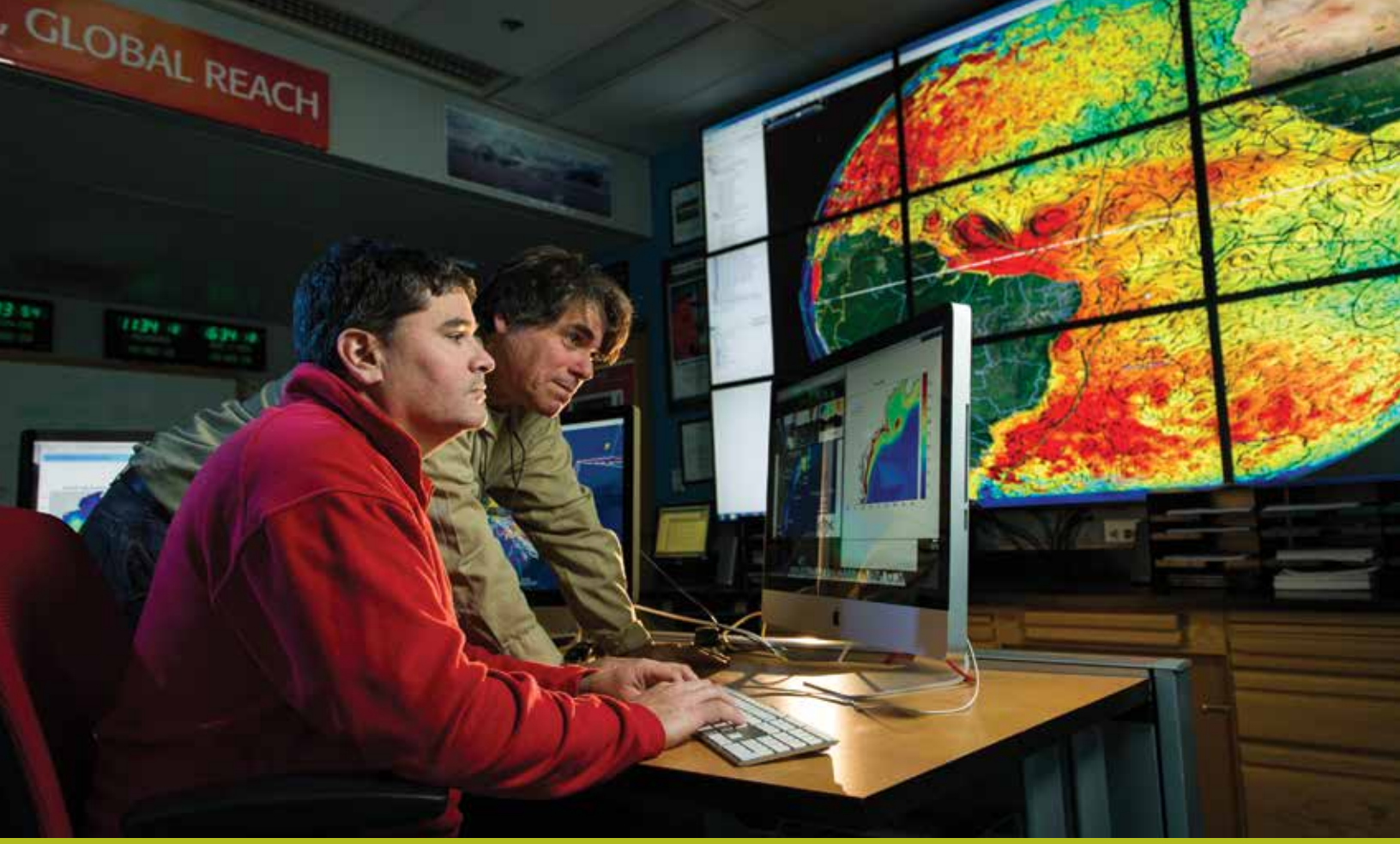
The Haskin Shellfish Research Laboratory (HSRL), located in Cumberland County, develops disease-resistant, fast-growing seed oysters to sustain and grow New Jersey's oyster industry. Rutgers' importance to the industry was highlighted when HSRL shellfish geneticist Ximing Guo was named a 2013 Inventor of the Year by the New Jersey Inventors Hall of Fame for helping decode the genome of the native eastern oyster to identify the genes responsible for disease resistance. In 2013, the Rutgers Aquaculture Innovation Center (AIC) in Cape May County initiated several pilot projects involving ribbed mussels, whelk, and horseshoe crabs. One such initiative involved the culture of horseshoe crabs to boost their stock in the Delaware Bay and promote public restoration efforts in our estuaries. The 25th anniversary of National Estuaries Day was observed on September 28, and to mark the occasion, AIC and its project partners released young horseshoe crabs into the Delaware Bay. Hatched at the AIC from eggs, the crabs offered scientists the opportunity to learn more about their early life history and the benefits they provide to the fishing industry, migratory shorebirds, and the biomedical industry. Joining AIC in promoting public awareness of the importance of the horseshoe crabs and stewardship of our estuaries were several Rutgers units, including the Cape Shore Laboratory; the Jacques Cousteau National Estuarine Research Reserve; the Haskin Shellfish Research Laboratory; and Rutgers Cooperative Extension of Cape May County, along with the Cape May County Vocational-Technical School; The Nature Conservancy; The Wetlands Institute; The Nature Center of Cape May/New Jersey Audubon Society; Stockton College; and the New Jersey Sea Grant program. More than 250,000 crab hatchlings were released over the summer through funding by DuPont's Clear Into the Future®, a community-based conservation program.

OUTREACH IN SHELLFISH AQUACULTURE

Hosted by the Haskin Shellfish Research Laboratory, a Harold Haskin Fisherman's Forum that serves local fishery and aquaculture featured seminars on improving the quality of farmed shellfish. The series was created in honor of former Laboratory Director Hal Haskin through a gift from his classmates, Rutgers Class of 1936. Oyster enthusiasts in the Philadelphia area will now have more opportunities to enjoy farm-raised Cape May oysters thanks to the newly formed Cape May Oyster Cooperative, which will bring together oyster farmers to enhance production and distribution of their distinctive, high-quality oysters. The Co-op, guided by Rutgers NJAES, the Food Innovation Center, and the Aquaculture Innovation Center, with support from USDA Rural Development, will tap a growing desire for locally produced seafood. Another NJAES activity that supports New Jersey shellfisheries is the Barnegat Bay Shellfish Restoration Program (BBSRP), which trained a new round of volunteers in 2013 to conduct educational outreach and expand the effort to grow hard clams and oysters in land-based nurseries along the bay. Now in its eighth year, BBSRP is jointly run by Rutgers Cooperative Extension of Ocean County and the NJDEP Division of Fish and Wildlife's Bureau of Shellfisheries. This year, the program is growing one million clam seeds and 200,000 oyster seeds. While BBSRP conducts shellfish restoration, it is also an environmental stewardship program that focuses on the impact of human activity in the watershed on Barnegat Bay. Volunteers from BBSRP and ReClam the Bay assisted full-time commercial shellfish growers in Barnegat and Little Egg Harbor bays who could not harvest their crop from early November 2012 until Easter 2013 due to the devastation of Superstorm Sandy. The program donated a portion of this year's crop to these baymen to offset the economic losses they suffered during the winter months.

Douglas H. Fisher
New Jersey Secretary of Agriculture

New Jersey has a diverse, thriving agriculture industry. Through working with partners such as NJAES, the Department of Agriculture continues its mission to help grow and strengthen the agriculture industry. One particular growth area is aquaculture, where our shellfish growers are exploring new opportunities in the local food marketplace.



Fisheries and Aquaculture

OCEAN OBSERVING TECHNOLOGY AIDS FISHERIES ASSESSMENT

Physical processes in the coastal ocean are highly variable and play a critical role in the coupled biological and chemical processes that define marine ecosystems. The physical ocean, in the form of fronts and eddies, changes over time scales of hours to days, up through years, decades, and beyond. For the past five years, Josh Kohut, assistant professor in the Rutgers Department of Marine and Coastal Sciences, and John Masterson, research ecologist at the National Oceanic and Atmospheric Administration (NOAA), have been using ocean observing technologies to better understand the dynamic processes of the physical ocean. For example, the progression in the relative distribution of warm and cold water masses in the coastal ocean influences the timing and location of seasonal fish migration. How to define the open sea habitat conditions that are important to these migratory fish is very challenging to scientists because of the complex interaction between the marine food web and the variability of the ocean itself. With NOAA support, a large network that includes fisheries scientists, oceanographers, managers, social scientists, and representatives of the commercial fishing industry is working together to build the next generation of single-species habitat models. The models characterize changing habitat conditions through ocean parameters like bottom water temperature in a way that allows the true dynamic nature of the habitat to be tracked over time. These models highlight the importance of water temperature fronts and ocean current eddies in determining the changing seascape of preferred fish habitat. The initial target species whose migration is being tracked is the butterfish, because of its important role as a forage species in the Mid-Atlantic Bight and in anticipation of an upcoming stock assessment. Stock assessments play a critical role in guiding management decisions that are aimed at sustaining a fishery. The models developed by the network will add value to the assessment process, as the dynamics of the butterfish habitat will be able to be quantified and considered in the assessment of this important fisheries resource. This valuable contribution to the process is enabled by federal funding of cutting-edge ocean observing technologies and the effective working partnership of scientists, assessment modelers, managers, and the fishing industry.

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Did you know?

New Jersey is one of the leading suppliers of surf clams, Atlantic mackerel, and ocean quahogs to the U.S. and the world.

ESTUARINE FISH AND SHELLFISH RESEARCH

New Jersey's coastal waters support a network of fisheries and aquaculture enterprises. Coastal areas provide teeming habitats for spawning, nurseries, and feeding for species like bluefish, weakfish, summer flounder, winter flounder, and striped bass. Insight into the role of estuaries as spawning and nursery habitats has been provided by weekly monitoring of larval supply in the Great Bay–Barnegat Bay estuaries by the Rutgers University Marine Field Station in Ocean County. In 1989, Professor Ken Able began the monitoring, which has led to increased understanding of many species and how a changing climate influences estuarine fishes. This, plus sampling in the Mullica River–Great Bay estuary—considered the cleanest in the northeastern U.S.—provides a baseline for comparison with estuaries that have sustained greater environmental impact. Vast clam populations living on the Mid-Atlantic continental shelf are the basis of a major fishing industry and an important part of the marine ecosystem. In state waters, oysters in Delaware Bay have provided a sustainable fishery resource and critical reef habitat, and contributed to the local economy for centuries. With the goal being the long-term sustainability of clam fishery, Assistant Professor Daphne Munroe of the Rutgers Haskin Shellfish Research Laboratory in Cumberland County has been studying what climate-driven range shifts mean to the biology, fishery, management, and socio-economics of the surf clam. Munroe performed oyster metapopulation simulations to describe the biology and physics of the Delaware Bay system and how those interact with oyster growth, larval mixing among populations, and genetic evolution of the stock. These modeling experiments help to improve oyster and shellfisheries management.

Food, Nutrition, and Health

The Rutgers New Jersey Agricultural Experiment Station provides a broad range of research and educational programs that address the urgent and growing challenges to nutrition and human health. One of Rutgers' signature initiatives, the New Jersey Institute for Food, Nutrition, and Health, focuses on society's pressing challenges in cardio-inflammatory disease, cancer, and obesity. The institute will benefit New Jersey communities–from educating a new cadre of professionals, to generating and disseminating new knowledge, to formulating new policy related to food security and access, and implementing intervention programs based on the best available scientific evidence. Educators within the Department of Family and Community Health Sciences of Rutgers Cooperative Extension promote community-based nutrition, health, and family wellness programs to help guide New Jersey residents to better health and wealth.

njaes.rutgers.edu/health

INSTITUTE FOR FOOD, NUTRITION, AND HEALTH

With the official groundbreaking this summer on the Rutgers George H. Cook Campus in New Brunswick, the New Jersey Institute for Food, Nutrition, and Health (IFNH) transitioned from vision into reality. The creation of the institute provides a physical space where interdisciplinary research, teaching, and outreach to the community will take place. The new, iconic three-story facility will include modular open-space research laboratories supported by clinical research facilities, a human performance center, a childhood nutrition learning center, a conference center, and a healthy eating courtyard. It will also be the location of a new student health center that has a special focus on nutrition and healthy lifestyle counseling. With construction on track for completion in May 2015, the institute is finalizing its organizational structure and developing exciting programs across multiple disciplines under the leadership of Founding Director Peter Gillies. The IFNH already supports multiple centers of excellence that bring together students, staff, and faculty from across the university. Notably, opportunities are now unfolding for students to actively engage with the institute. For example, the IFNH has sent students to Spain to talk about their research in food science and to Brazil to learn firsthand what it means to be a nutritionist in a third world country battling both malnutrition and childhood obesity. In addition, the institute provides unique internships for students. These are special educational opportunities to work closely with IFNH leaders as they build the institute and chart new directions in the area of food, nutrition, and health. The IFNH was made possible through a $10 million building grant by the Robert Wood Johnson Foundation and a $36 million grant from New Jersey's "Build Our Future Bond Act." The institute's $10 million Endowed Research Fund that supports critical program development was the generous gift of an anonymous donor.

Bradley I. Hillman
Director, Cooperative Research

The experiment station model elevates application-based research in agricultural, biological, and environmental sciences, and connects it to academic instruction and extension practice for greatest possible impact. Year after year, NJAES research positively affects lives throughout the state, nation, and the world in the form of innovative products and ideas.

HEALTHY HABITS AT SCHOOL AND WORK

Promoting healthy school and work environments is an important focus of Rutgers Family and Community Health Sciences (FCHS) educators. Under its *Grow Healthy* program, FCHS educators trained elementary school staff in the use of the School Health Index (SHI), an assessment tool established by the Centers for Disease Control and Prevention. The SHI addresses several areas of coordinated school health, including school foods, nutrition and health education, physical activity, community engagement, and staff wellness. One component of the *Grow Healthy* program, the Team Nutrition initiative that began as a collaborative USDA project in 2010 by FCHS and the New Jersey Department of Agriculture, was awarded a two-year $324,351 grant renewal through 2014. The new funding adds early-care and education centers to the initiative in order to engage the state's youngest learners, with eight early-care and education centers selected as *Grow Healthy* Team Nutrition sites. FCHS educators train child care center staff to incorporate vegetable gardening and taste tests into nutrition education, evaluate and improve wellness policies, and better engage families in activities that promote healthy role modeling. About 800 children, 2–5 years old, benefited from *Grow Healthy* in 2013. FCHS also developed a Get Moving–Get Healthy New Jersey Workforce program to help employees live healthier lifestyles. Employees receive health-focused, weekly online messages, and the *Healthy on the Job!* worksite wellness newsletter. Data suggests that employees are increasing their consumption of fruits, vegetables, and water, engaging in more physical activity, and decreasing their intake of sugar-sweetened beverages. In 2013, FCHS also developed "Working Well in NJ," a customized worksite wellness toolkit that provides resources and technical assistance for employers to create a culture of wellness in their worksite.

Food, Nutrition, and Health

EXPLORING THE LINK BETWEEN OBESITY AND MOSQUITO PREVALENCE

A multitude of factors are implicated in the rising incidence of overweight children in the U.S., including low levels of outdoor physical activity that can be limited by environmental factors such as the presence of bees or mosquitoes. Since children's available outdoor playtime is greater in the summer, scientists at Rutgers tested the hypothesis that day-biting mosquitoes might indirectly contribute to the incidence of weight gain in children by reducing the amount of outdoor play. A multi-year study, titled "Mosquito Abatement and Increased Outdoor Physical Activity," was conducted by principal investigator John Worobey, professor of nutritional sciences, and colleagues Dina Fonseca and Randy Gaugler of the Rutgers Center for Vector Biology. Funding support was provided by the Robert Wood Johnson Foundation's Active Living Research program and USDA Agricultural Research Service (USDA-ARS). They compared the prevalence of Asian tiger mosquito, *Aedes albopictus*—a difficult species to control because of the ubiquity and proximity to humans of its larval habitats—on child outdoor physical activity in two matched suburban communities in Monmouth County, one treated for mosquito abatement and one untreated. In the summer of 2009, a group of 1,000 contiguous private resident yards in Cliffwood Beach were selected as the intervention site, and an equivalent number of yards in the matching town, Union Beach, were left untreated for comparison. In 2011, intervention and untreated communities were reversed. The findings unveiled in 2013 from the parental-report data showed that the children, aged 8–12, spent an estimated 63% less time playing outdoors than they would have if mosquitoes were not a persistent annoyance. Not surprisingly, the study identified that locations in which there is systematic mosquito abatement, more time was spent playing outdoors. With USDA-ARS funding, the Center for Vector Biology at Rutgers collaborated with the Mercer County Mosquito Control, the Monmouth County Mosquito Extermination Commission, and economists from the Heller School of Public Health, Brandeis University to assess the most cost-effective ways to control *Aedes albopictus*. The study found that outreach education to homeowners by mosquito control programs can significantly decrease the number of nuisance adult *Aedes albopictus* in their backyards.

njaes.rutgers.edu/health

Did you know?

On any given day, 30–40% of children and adolescents eat some form of fast food.

PROMOTING ACCESS TO FRESH FOOD

Despite the abundance of food, a public health issue in New Jersey is limited access to and knowledge of healthy food, and NJAES is trying to change that. In 2013, New Jersey welcomed its first class of FoodCorps Service Members under the shared leadership of Rutgers Cooperative Extension and the New Jersey Farm to School Network. FoodCorps is a national non-profit organization that places leaders in limited-resource communities for a year of service, with the goal of connecting kids to real food to help them grow up healthy. FoodCorps Service Members are placed with partner service sites throughout the state to participate in activities known as the "three pillars" of FoodCorps: engaging kids and school staff in school gardens, teaching kids about healthy food, and improving farm-to-school access. In 2013, NJAES also played a central role in the launch of the first Fresh Grocer supermarket in New Jersey. Located in the City of New Brunswick, the urban supermarket chain engaged NJAES food safety specialists in the training of its frontline workers. In addition to providing access to food for city residents, the Fresh Grocer supermarket provides new careers paths in food service for workers like the pizza maker and sushi roller who've become behind-the-counter chefs to the thousands of customers who buy prepared supermarket meals. While important, quality food is not just about taste. Every day, food handlers must also protect customers from foodborne illness; and the stakes are high as one simple mistake is potentially deadly. That's why the NJAES Office of Continuing Professional Education has partnered with the New Jersey Food Council since 1997 to deliver food safety training to more than 11,500 workers, including the newest hires of the Fresh Grocer.

Home, Lawn, and Garden

New Jersey residents have come to rely on a wide array of services and educational programs offered by Rutgers, ranging from lawn care and landscaping, soil testing, pesticide training, community and urban gardening, and care and maintenance of trees and shrubs to the challenges of garden and household pests, insects, weeds, and wildlife. Rutgers Cooperative Extension provides a responsive corps of county-based personnel, extensive continuing professional training programs, and highly dedicated volunteers like Rutgers Master Gardeners who are on the frontlines providing information to residents through fact sheets, helplines, and workshops. With its varied urban, suburban, and rural landscapes, New Jersey is a laboratory for Rutgers specialists to develop meaningful research and for field-based personnel to implement a range of demonstration projects and timely intervention strategies for the home, lawn, and garden.

njaes.rutgers.edu/garden

HOMEOWNER SERVICES AND RESEARCH

New Jersey residents have come to rely on a wide range of home intervention strategies and educational outreach developed by NJAES. Bed bugs and radon are but two examples. Bed bug infestations have been a growing problem in urban communities and New Jersey is among the most heavily infested states, due in part to its high population density and diversity. Assistant Extension Specialist Changlu Wang launched an aggressive campaign to fight bed bugs through education, research, and demonstration. He's developed robust tools like videos, publications, and a website to help the public identify, understand, and treat bed bugs. Wang's research has identified the first effective bed bug lure, cost-effective monitoring methods, and a model bed bug management program. In one low-income community in Jersey City, N.J., his research team helped reduce bed bug infestations by 87% over the course of one year. In 2013 alone, Wang won four competitive grants totaling $443,000 to educate the public on bed bug prevention and control, investigate bed bug biology, develop more cost-effective control methods, and reduce bed bug infestations. Homeowners have also benefited from NJAES efforts to combat radon, an odorless, colorless, naturally occurring gas, which is the second leading cause of lung cancer across the country. The U.S. Surgeon General warns that radon causes upwards of 21,000 deaths each year, and New Jersey's geology generates some of the highest radon concentrations in the nation. In response—in basements and attics from Maine to Florida—an army of environmental professionals is battling this silent killer, armed with skills learned through NJAES training. The Office of Continuing Professional Education (OCPE) became a nationwide leader in training professionals to measure and reduce radon concentrations in homes, schools, and office buildings. OCPE's Eastern Regional Radon Training Center (ERRTC) is one of four university-based radon training centers in the U.S. In 2013, ERRTC expanded its service area to include the states of North Carolina, South Carolina, Georgia, and Florida.

RCE LEADS IN ORGANIC LAND CARE

The growing popularity of organic gardening and an increased concern by the public for the broad use of pesticides around the home prompted the Rutgers Organic Land Care working group to develop an Organic Land Care initiative. Environmental Agents Michele Bakacs and Amy Rowe, Senior Program Coordinator Jan Zientek, and Agricultural Agent William Hlubik developed the initiative to serve as a resource for homeowners and landscapers interested in incorporating organic land care practices. Organic land care is not simply about the type of fertilizer or pesticide used on a landscape. Rather, it is a holistic approach that restores and enhances biological cycles involving soil microorganisms, plants, and animals. For both professionals and homeowners, making the transition to organic land care can be intimidating or overwhelming. Questions about whether "that stuff really works" or fears of the yard turning into a hotbed of weeds and pests are legitimate concerns. An organic land care website has been developed as a resource for homeowners, landscapers, and other professionals. Homeowners who wish to incorporate organic land care practices can also attend a series of workshops offered through several Rutgers Cooperative Extension offices. While there are no federal standards for organic land care, the initiative includes an Organic Land Care Certificate Program that offers a five-day class for landscapers and land care providers. More than 20 Extension professionals and industry practitioners teach in this new program. Upon completion of the course, participants are awarded certificates and are listed on the website as having successfully met the requirements of the Rutgers Organic Land Care Certificate Program.

Larry S. Katz
Director, Cooperative Extension

From the first extension efforts of a century ago, Rutgers Cooperative Extension continues to focus on assisting communities in agriculture and allied industries. In 2014, as we celebrate the 100th anniversary of the passage of the Smith-Lever Act that began the federal partnership with states and counties, in New Jersey we will honor our past and look ahead to promoting community wellbeing for the next 100 years.

Home, Lawn, and Garden

VOLUNTEERING WITH RUTGERS MASTER GARDENERS

An integral part of the Rutgers Master Gardener program is the volunteer component. All across the state, master gardeners are helping to "green" their communities. In Newark, Branch Brook Park is home to the largest collection of flowering cherry trees in the country. In 2013 alone, Rutgers Master Gardeners from Essex County undertook a significant part in the pruning of 700 of the park's 4,300 trees, contributing more than 300 hours of volunteer labor. Until the master gardeners developed a pruning team, the trees in the park had not been well maintained, but since March 2012, close to 1,800 trees in total have been pruned. The Rutgers Masters Gardeners of Essex County have also restored flower beds at Glenmont, the former home of inventor Thomas Edison in the Edison National Historic Park. When the master gardeners began the project in the spring of 2009, the Edison National Historic Park had only one full-time worker responsible for maintaining the grounds, and only remnants of the extensive gardens remained. The Rutgers Master Gardeners revived a large bed of cannas at the rear of the house, created a companion bed of perennials and annuals, filled an antique concrete planter, and designed and planted a prominent oval flower bed along the main drive, which had been bare for years. These plantings greet visitors through three seasons of the year with a colorful mix of flowers. The Rutgers Master Gardeners of Monmouth County drew on skills acquired from their local rain garden projects to help create a maritime barrier forest, which forms a useful natural storm barrier for lakes, at Fletcher Lake in Bradley Beach, which had been filled with debris and flooded during Superstorm Sandy. The master gardeners provided supervision, knowledge, and labor over three days of installing sand dune berms and vegetative barriers of pines, cedars, junipers, maples, 15 different native shrubs, and 7,500 plugs of beach grass. The Rutgers Master Gardeners of Monmouth County proved invaluable to the project, advising more than 150 novice volunteers, correctly planting 200-pound trees, and staging thousands of other plants in 10 different sections. The one-acre site transformed a compacted parking lot into a beautiful mini-park that functions to reduce damage from storms, which cause stormwater and sand surges that clog the coastal lake drainage systems.

njaes.rutgers.edu/garden

Did you know?

The first Rutgers Master Gardener program was established in 1984, with over 8,000 residents trained since then.

YOUTH HYDROPONICS PROGRAM

School gardens are fun and educational, but can present pest and other problems that school personnel are not equipped to handle. "Growing with Water" is a hydroponic program developed to maximize the benefits and minimize the challenges that school gardens pose for educators. To this end, the goals of the project were to teach students to use a hydroponics system to grow healthy foods as well as to increase their knowledge, skills, abilities, and positive attitudes towards science without encountering the challenges of weather, maintenance, and pest control. More than 120 students in the Lakewood Middle School participated in 14 hours of instruction as part of the Ocean County 4-H "Growing with Water" program. The diverse group of students, ranging from grades 6-8, who were in regular, advanced, or remedial-level science classes. Experimentation and youth-led inquiry were integral parts of this program as they developed experiments to address questions and solve challenges posed to inspire learning. From germination to bounty, youth participated in long-term and short-term experiments each week. Very few students had any previous gardening experience and none of them had ever used a hydroponic unit. The unit and diverse teaching style inspired many of the students, as evaluations showed notable growth in a number of scientific areas including documentation, graphing, measuring, and designing experiments, plus communication and being comfortable playing the role of scientist. In addition, evaluation results showed that youth were now more likely to eat healthy foods and choose to garden in an environmentally friendly manner.

Youth and Community Development

The wide range of programs offered by Rutgers Cooperative Extension (RCE), from helping to build productive futures for youth to supporting families of deployed military personnel, demonstrates just how much the experiment station has evolved to respond to the needs of New Jersey's diverse communities and constituents. Building on the 100-year model of Cooperative Extension, Rutgers continues to serve New Jersey residents through traditional, evidence-based programs in all 21 counties and has expanded its programming to serve emerging needs in previously under-served communities. A dedicated corps of RCE specialists, agents, and educators provide Garden State residents with tools and opportunities to build community and develop life skills through its 4-H youth activities and camps; parenting information and workshops; health and nutrition education; and programs that engage our elder population and urban youth.

njaes.rutgers.edu/youth

CAMPUS TO COMMUNITY INITIATIVES

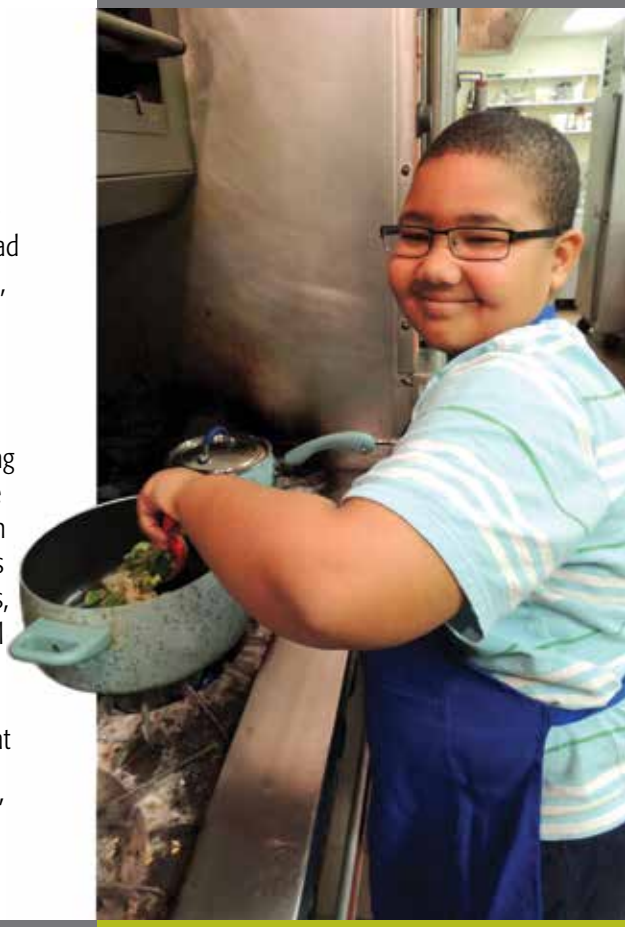
The City of New Brunswick, home to Rutgers' oldest and largest campus, is known for its restaurants, theaters, businesses, and hospitals. Despite its diversity and culture, New Brunswick is considered one of 134 "food deserts" in New Jersey. Rutgers partners with Johnson & Johnson and the City of New Brunswick to improve city residents' access to healthy and affordable food through the New Brunswick Community Farmers Market (NBCFM). The market opened its third location this year in Kilmer Square and maintains its initial location on Jones Avenue and second location on the George H. Cook Campus. Part of NBCFM's strategy is to serve the diverse groups that make up New Brunswick's growing population. The Jones Avenue location is within walking distance of low-income neighborhoods. The Cook Campus location allows students on the Cook and Douglass campuses to buy farm fresh produce. In the newest location, downtown workers and city residents, in addition to Rutgers College Avenue Campus students, faculty, and staff, have easy access to a farmer's market. To increase the availability of fresh produce in the city, volunteers from Elijah's Promise, the New Brunswick Community Food Alliance, local residents, plus faculty and staff from Rutgers, planted an orchard of 40 apple trees and installed 90 feet of support trellis at the Shiloh Community Garden. Mark Robson, dean of agricultural and urban programs, enlisted Win Cowgill, fruit agent with Rutgers Cooperative Extension to design and implement the orchard project. Cowgill selected disease-resistant apple varieties with high fruit quality that were developed through a joint Purdue University/Rutgers/University of Illinois apple breeding program and varieties that carry the apple scab resistance gene developed at Rutgers. The apples will be community fruit to be shared among volunteer gardeners, the Elijah's Promise soup kitchen and culinary school, and members of the community. The apple trees are expected to bear fruit in fall 2014.

Did you know?

The 4-H Name and Emblem is a protected Federal mark and is entrusted by Congress to the Secretary of Agriculture.

RUTGERS 4-H SPECIAL INTEREST GROUPS

More than 800 youth from military families participate annually in Rutgers 4-H clubs located on five New Jersey military installation sites. A variety of projects from gardening to robotics are facilitated by 4-H volunteers who are also military staff. The "Fun 4 Guards" 4-H club was started by parent volunteers in the National Guard for N.J. Air & Army Guard families. Rutgers 4-H faculty and staff also lead NJ Operation Military Kids (OMK), a statewide team representing the military branches, youth organizations, and community groups. In 2013, more than 175 community volunteers contributed approximately 2,515 hours delivering a wide range of programs to 588 military families. OMK reaches these families through yellow ribbon welcome home events, deployment meetings, camps, teen programs, and Family Day special events. The New Brunswick 4-H Program, open to all city youth, is committed to serving the growing Latino community, sponsoring a multicultural dance club that is run by the Rutgers Multicultural Dance program and providing materials translated into Spanish. In addition, New Brunswick 4-H operates multiple clubs for community youth in the areas of robotics, environmental science, arts and crafts, dance, leadership, sports and fitness, and general science. One example, the 4-H Green Titans club, focuses on environmental science, leadership, and community service as well as peer education for younger kids in food, nutrition, and exercise. New Brunswick 4-H clubs, led by Rutgers students and adult community volunteers, engage with multiple Rutgers administrative programs that provide resources, educational program support, and volunteers. Internships are also available for Rutgers students enrolled in the "Introduction to Professional Youth Work" class and volunteers from AmeriCorps. Rutgers statewide 4-H Youth Development is a highly valued resource for youth educational and life skills programs.



Youth and Community Development

4-H STEM EDUCATION FOR NEW JERSEY YOUTH

A range of Rutgers programming in science, technology, engineering, and mathematics (STEM) topics offers opportunities for youth in New Jersey to see themselves as successful future scientists and engineers. The 4-H Rutgerscience Saturdays program is designed to enrich young people's interest and competency in STEM by having direct interaction with Rutgers faculty and graduate and undergraduate students. The day-long program is offered during the fall and spring semesters, primarily on the George H. Cook Campus in New Brunswick, and is a combination of demonstrations, tours, field experiences, and hands-on activities focused on different STEM themes. The objective is to create opportunities for young people to experience skills used in a specific STEM discipline, with the assistance and guidance of Rutgers scientists. Since its launch in 2009, it has offered programs in topics such as geology, entomology, oceanography, food sciences, and environmental sciences. 4-H Rutgerscience Saturdays has also partnered with non-profit youth groups, such as the Atlantic City Be Unlimited program, to bring large numbers of underserved youth to its STEM programs. The Lindley G. Cook 4-H Camp, a residential youth development facility located in Stokes State Forest in Sussex County and managed by Rutgers Cooperative Extension, launched its first annual SET (science, engineering, and technology) Camp in 2008. For four days during the early summer, students from grades 5–8 enjoy an overnight camp experience combined with interactive learning experiences in a scientific course area of their choosing. SET concentrations range from an Ocean Robotics class focused on water ecology and the construction of remotely operated vehicles to a Crazy Contraptions course focused on building Rube Goldberg-esque machines from common items. In addition to achieving mastery in science courses, campers also enjoy classic summer outdoor camp experiences as well as the vital social lessons of living with peers in a communal setting. Facilitators have found that youth who are introduced to camp through their SET experience choose to return to Lindley G. Cook for the week-long Summer Camp program, testimony to the impact of the engaging youth programming offered by Rutgers 4-H.

njaes.rutgers.edu/youth

Did you know?

Students who do not graduate high school are more likely to live in poverty, be unemployed, and be incarcerated.

THE LIPMAN LEGACY TO URBAN YOUTH

Teenagers struggling to rise above urban violence and poverty are finding both help and hope from an unlikely source—a family with deep roots in agriculture and the New Jersey Agricultural Experiment Station (NJAES) that date back more than 100 years. Edward V. (Ned) Lipman Jr., a part-time cranberry farmer and former full-time director of the NJAES Office of Continuing Professional Education (OCPE), created its Youth Division to open new horizons for urban and at-risk youth in the Garden State. Lipman, who retired as OCPE director in 2013 after serving 38 years at Rutgers, is the grandson of Jacob Lipman, dean of the New Jersey College of Agriculture from 1915–1939, and the son of Edward Lipman, former president of the New Jersey Board of Agriculture and the NJAES Board of Managers. As the director of OCPE, Ned Lipman saw the opportunity to inspire urban youth by connecting them to the wonders of the natural world. He was unwaveringly supported in this effort by Joe Robles, his idealistic teacher's assistant in Agricultural Economics at the university. Their strong efforts led to the creation of "Careers in the Green Industry," a unique activity at the time that first introduced urban teenagers in 1992 to topics ranging from butterfly reproduction to park renovation. Youth from urban communities throughout the state were actively engaged in the fields, forests, and wetlands of New Jersey. Today, under the direction of Kenneth Karamichael, a former student of Ned's, you'll still see city youth romping through swamps and exploring ecosystems in places like Island Beach State Park. This is a lasting legacy to the influence of the Lipman family and their collective contributions to educating generations of New Jersey residents for more than a century.

Economic Development

The NJAES Office of Economic Development connects constituencies across New Jersey to resources that build and support viable businesses, develop vibrant communities, and improve workforce skills. Present in all 21 counties, NJAES is well positioned to identify emerging economic issues, provide solutions, and build the economic resiliency of the state's industries and communities. NJAES has a long history of facilitating partnerships, which are strengthened by a robust network of internal Rutgers expertise and supported by external capabilities. Key economic development activities take place at the Food Innovation Center in Cumberland County, the EcoComplex in Burlington County, the Aquaculture Innovation Center in Cape May County, and the Marucci Center for Blueberry and Cranberry Research and Extension in Burlington County. These Rutgers centers conduct research and outreach that help boost New Jersey's economy.

njaes.rutgers.edu/economic-development

SENSORY TESTING AND ANALYSIS

Taste is king and the Rutgers Food Innovation Center (FIC-South) in Bridgeton, N.J., is working with many of its clients to ensure that the sensory aspects of their food products are meeting or exceeding consumer expectations. In 2013, FIC launched a new service that uses the leading sensory evaluation software, SIMS 2000, which enables clients to understand if their product makes the grade. Armed with this tool, the Food Innovation Center now offers a sensory program to assist clients with understanding the likability of a product, evaluating flavor, aroma, appearance, and texture. FIC provides sensory testing services and analysis on a variety of food products, including bacon, crackers, and yogurt fruit parfaits. In addition, the center provides food-based testing vehicles for biopharma companies. Using the capability afforded by the SIMS 2000 software, FIC is able to tap into many different slices of the population to serve on taste panels. The range of demographic sampling for the panels includes school-aged children; students, faculty, and staff drawn from Rutgers campuses; and of course, the vast potential of tasters selected from among the public. The reach of FIC's sensory program has been extended across the U.S. through collaboration with various sensory programs at other state universities to support projects requiring national or regional analysis. Being among the most ethnically diverse universities in America, Rutgers has the opportunity to test wide-ranging, culturally linked foods on campus with panelists most familiar with these products. In addition to preference and difference type testing, the Food Innovation Center is also adept at conducting home-use testing and focus group panels supporting clients with deeper understanding of consumer attitudes, likes, dislikes, and purchase intentions to guide their new product development. The goal is to perfect the taste, aroma, texture, and appearance of these foods to help clients drive success in the market.

Margaret Brennan Tonetta
Director, Economic Development

Through a strong network of internal Rutgers resources bolstered by statewide and national expertise, NJAES has long served as an economic engine for New Jersey. Among its goals are building viable businesses and industry sectors, developing sustainable and vibrant communities, increasing workforce preparation and retention, and attracting and retaining innovative, fast-growing companies in the state.

MELTING POT OF FOOD ENTREPRENEURS

The rich diversity of immigrant populations defines the landscape of New Jersey's melting pot and serves as the driving force behind the extraordinary product mix that the Rutgers Food Innovation Center (FIC) is guiding to market. From business planning to commercialization and distribution, the center provides comprehensive support for the successful launch and growth of an expansive menu of specialty food businesses. Reflecting Rutgers' status as one of most diverse, comprehensive public higher education institutions in the U.S., FIC has increased its array of ethnically diverse specialty food and beverage products being brought to market by its clientele. From Beyond the Spice's all-natural gourmet Indian Simmer Sauces and The Flying Meatballs line of authentically prepared specialty Italian meatballs in traditional gravy to the Jin+Ja Drink, which won the industry gold standard Specialty Outstanding Food Innovation sofi™ Award in 2013, the Rutgers Food Innovation Center has been a critical resource in the establishment and growth of many local and global businesses. Additionally, this year FIC was awarded the distinctive honor as a "soft landings" incubator by the National Business Incubation Association (NBIA). NBIA's Soft Landings program recognizes incubation programs that will attract new international clients and differentiate their programs as specially designed to work with these unique non-domestic clients. These programs offer services that make it easier for client companies to establish businesses in countries other than the clients' countries of origin. This distinction will enable FIC to enhance its reach to attract global food companies to the Garden State. The soft landing of Dr. Schar USA, Europe's number-one gluten-free food brand, was the premiere soft landing success of the center and underscores its growing global influence in the field of food innovation.

Supporting NJAES

Since NJAES was established in 1880, it has provided the people of New Jersey access to education and research, and delivered scientifically based information in matters relating to food, agriculture, and the environment, through Rutgers Cooperative Extension. NJAES has evolved during its 134-year existence, but its mission and goals have remained remarkably stable. NJAES continues to be an engine of economic growth and job creation in the agricultural, food, and environmental sectors of New Jersey's economy. Base funding from state and federal sources provides the foundation for development and delivery of NJAES programs, while competitive contracts, grants, and private gifts increase the scope and impact of research and education programs. Increasingly, donor gifts sustain the infrastructure of NJAES, grow its programs, and serve state residents as taxpayer-based support has steadily declined in recent decades.

njaes.rutgers.edu/development

URBAN YOUTH IN AGRICULTURAL ENTERPRISE

Youth in Asbury Park spent the summer months operating a farm stand that provided fresh produce to local residents while learning vital entrepreneurial and customer service skills. Activities like the youth farm stand are designed to engage out-of-school youths in urban centers across New Jersey and reconnect them with meaningful opportunities that prepare them for productive lives. Guided by Rutgers Transitional Education and Employment Management (T.E.E.M.) Gateway, part of the NJAES Office of Continuing Professional Education, out-of-school youth are connected through innovative programs to a variety of educational, vocational, and employment opportunities. T.E.E.M Gateway created its flagship Youth Education and Employment Success (YE^2S) Center in Newark in 2008 as a safe haven for 14–25 year olds. Since then, the center model has grown by three in the cities of Trenton and Camden and has reengaged more than 7,000 young people. A fifth YE^2S Center will open in Salem County in 2014. Due to the success of the youth center model, T.E.E.M. Gateway has attracted partners such as the Nicholson Foundation, the Victoria Foundation, and United Way, which have provided financial resources to facilitate innovative collaborations and increase the network of partners working to change the lives of young people. For example, the YE^2S Center received a Social Innovation Fund grant from the Corporation for National and Community Service, administered by the Mayor's Fund to Advance New York, to operate a GED preparation and work placement program known as Project Rise. T.E.E.M. Gateway continues to refine its offerings for at-risk youth through its strategic partnerships with the Berklee College of Music's "City Music Network," America's Promise Alliance, and the National League of Cities Institute for Youth Education and Families. By increasing ongoing private support and establishing effective partnerships, T.E.E.M. Gateway will continue "Building Productive Futures for the Youth of New Jersey."

Kelly L. Watts
Director of Development

This year, the NJAES was the recipient of many first-time gifts, allowing work in many areas to continue and expand. Whether it is with an outright gift or perhaps a planned gift or bequest intention, private support from individuals, corporations, and foundations provides needed resources to our faculty and students, allowing them to serve the residents of New Jersey.

OSTERMAN TRAVEL FUND SUPPORTS RCE

Rutgers Cooperative Extension (RCE) figures prominently in the lives of donors Ken and Jenny Osterman, who live in Martinsville, Somerset County. Ken owns and operates Osterman Nursery Inc., a wholesale nursery and landscape design & build business. Ken has been associated with RCE in one way or another since 1988, when he joined the Somerset County Board of Agriculture. He helped establish the Somerset County RCE Advisory Board in 1992 and has been a member ever since. Ken is a former president of the NJAES Board of Managers, where he is currently serving his third term on this Rutgers advisory body. A longtime advocate for a robust agricultural experiment station, Ken received the 2013 Distinguished Service to Agriculture Award from the New Jersey State Board of Agriculture and the 2013 national Epsilon Sigma Phi Friend of Extension award. After decades of service to RCE, the couple was motivated to give financial support to RCE. They have a history of giving to Rutgers, starting with the Osterman Family Scholarship at the School of Environmental and Biological Sciences, a scholarship that was established in 2004 by the Gardeners of Somerset Valley in honor of Ken's father, George. The couple recently made a new gift to help promote the national presence of RCE. Designated the Osterman Travel Fund, this gift will allow RCE faculty and staff to travel to out-of-state symposia; conferences; collaborative efforts with other universities; speaking engagements; and other academic, research, and outreach activities associated with the experiment station. Ken and Jenny have also decided to make their association with and support of RCE one that outlasts them. This past year, they joined the ranks of the Colonel Henry Rutgers Society, a generous group of donors who passionately support the university and have included Rutgers in their estate plans, ensuring that the Osterman legacy of service to RCE will live on in perpetuity.

We Have the State Covered

BOARD OF MANAGERS

The New Jersey Agricultural Experiment Station Board of Managers, appointed by the Rutgers Board of Governors, is an advisory group to the executive dean of agriculture and natural resources and executive director of NJAES. The board consists of a representative from each county nominated by the County Board of Agriculture or Board of Chosen Freeholders, and a six-member statewide advisory committee.
The president of Rutgers, the executive director of NJAES, and the state secretary of agriculture serve as ex officio members.

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OFF-CAMPUS STATIONS

Clifford E. and Melda C. Snyder Research and Extension Farm (Rutgers Center for Sustainable Agriculture), Pittstown
snyderfarm.rutgers.edu

Haskin Shellfish Research Laboratory, Bivalve
hsrl.rutgers.edu

Lindley G. Cook 4-H Youth Center for Outdoor Education, Branchville
nj4hcamp.rutgers.edu

Philip E. Marucci Center for Blueberry and Cranberry Research and Extension, Chatsworth
pemaruccicenter.rutgers.edu

Rutgers Agricultural Research and Extension Center, Upper Deerfield
njaes.rutgers.edu/rarec

Rutgers EcoComplex (Rutgers Environmental Research and Extension Center), Bordentown
ecocomplex.rutgers.edu

Rutgers Food Innovation Center–South, Bridgeton
foodinnovation.rutgers.edu

Rutgers Food Innovation Center–North, Piscataway
foodinnovation.rutgers.edu

Rutgers Fruit and Ornamental Research Extension Center, Cream Ridge
njaes.rutgers.edu/creamridge

Rutgers Plant Science Research and Extension Farm, Adelphia
njaes.rutgers.edu/plantscience

Rutgers University Marine Field Station, Tuckerton
marine.rutgers.edu/rumfs

CENTERS AND INSTITUTES

Aquaculture Innovation Center
marine.rutgers.edu/main/New-Jersey-Multispecies-Aquaculture-Demonstration-Facility.html

Center for Deep-Sea Ecology and Biotechnology
deepseacenter.rutgers.edu

Center for Endocrine Studies
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Center for Remote Sensing and Spatial Analysis
crssa.rutgers.edu

Center for Turfgrass Science
turf.rutgers.edu

Center for Vector Biology
vectorbio.rutgers.edu

Equine Science Center
esc.rutgers.edu

IR-4 Project: Center for Minor Crop Pest Management
ir4.rutgers.edu

Water Resources Research Institute
njwrri.rutgers.edu

Wildlife Damage Control Center
njaes.rutgers.edu/wdcc

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sebs.rutgers.edu

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2013 Annual Report Environmental Savings

2
Trees preserved for the future

90 lbs
Of solid waste **not** generated

6 lbs
of waterborne waste **not** created

816 gallons
of wastewater flow saved

178 lbs
of net greenhouse gases saved

1,360,000 BTUs
of saved energy

The savings above are achieved when post consumer recycled fiber is used in place of virgin fiber. This project, based on a production run of 3,500 pieces, used 2,500 lbs of paper, which has a post consumer recycled percentage of 10%.

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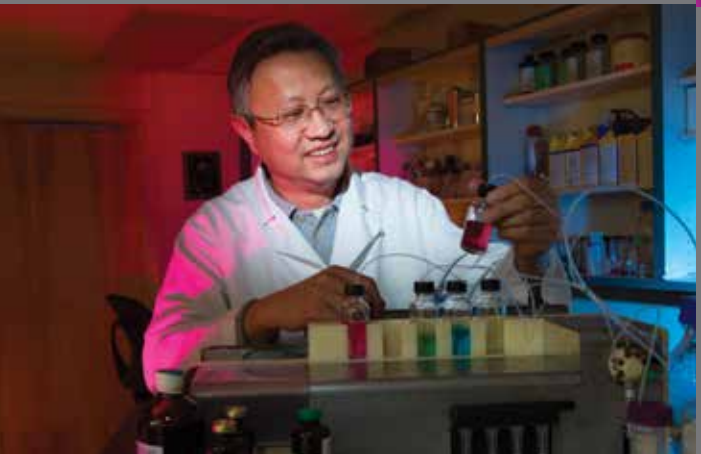

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