

ANNUAL REPORT
**NEW JERSEY
AGRICULTURAL
EXPERIMENT
STATION** | **20
24**



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RUTGERS

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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.

OUR VISION

To be the leading public research and service based institution for the development and delivery of practical science-based solutions that contribute to the vitality, health and sustainability of agriculture, environments, people and communities of New Jersey.



JONATHAN HOLLOWAY
PRESIDENT

Rutgers University–New Brunswick is the land-grant institution of New Jersey. With the charge to conduct research to be disseminated to the public, Rutgers NJAES engages with communities by listening to their needs, conducting applied research to solve their real-world problems, and delivering meaningful outreach and extension programs in a sustainable and substantive manner.



FRANCINE CONWAY
CHANCELLOR

Rutgers University–New Brunswick is defining the future of higher education, guided by our Academic Master Plan and its Four Pillars of Excellence: Scholarly Leadership, Innovative Research, Student Success, and Community Engagement. Rutgers NJAES plays a vital role in fulfilling that vision-especially by fostering interdisciplinary partnerships across our Rutgers-New Brunswick schools and bringing the transformative power of our education, research, and service to the people who need it most.



LAURA LAWSON
EXECUTIVE DIRECTOR/EXECUTIVE DEAN

Our work bears fruit when we engage in meaningful, innovative research that engages stakeholders, colleagues from across disciplines, and students. By doing so, we support diverse, scholarly communities that are committed to serving the public good. With the people, skills, resources, and cutting-edge tools in hand, Rutgers NJAES is well-positioned to meet the needs of the state of New Jersey for a healthy and sustainable future.



RUTGERS

is Developing a Sweeter, Firmer

Blueberry for New Jersey Growers



“Consumers don’t want tart, sour flavor. They want a sweeter, larger berry that’s going to have a better shelf life, so it won’t rot in a few days.”
Sideli said.



There hasn’t been a new blueberry cultivar introduced in the Northeast in about 30 years. Rutgers aims to change that.

possible: sequencing of genomes, building genotyping platforms, and performing genetic studies to determine genetic control of traits.

Gina Sideli, assistant professor of plant biology, was hired in 2023 to head the breeding program at the Rutgers’ Philip E. Marucci Center for Blueberry and Cranberry Research and Extension in Chatsworth, NJ. Sideli and a team of four full-time staff, collaborating with both Rutgers and USDA researchers, are midway through a decade-long research project in search of a new blueberry variety that can produce a sweeter, firmer fruit for Garden State growers. Research funding is based on competitive grants through USDA. A collaborative group, VacCAP (Vaccinium Coordinated Agricultural Project), has been working on developing genomic resources for Vaccinium

The process of breeding a new blueberry cultivar is a painstaking one. It involves selecting parents with economically desirable traits, making crosses, planting seeds, and waiting 2-3 years before progeny plants can begin to be evaluated. Progeny plants are phenotypically evaluated, i.e., by measuring traits that are seen, and genotypically evaluated, i.e., by performing sequencing. If the progeny demonstrate the desired traits, they are planted in trials throughout the growing region in a commercial setting and evaluated for market potential. After rigorous review, only one to two will be selected to move forward to become available for farmers to grow.

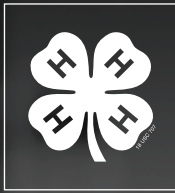
species, including blueberries. Their efforts have made genomic studies

The ideal outcome sought by the Rutgers trial is a new blueberry cultivar that yields a bigger, less-sour-tasting, firmer fruit that would lead to significant economic benefits for local growers who are trying to cater to ever-changing consumer tastes.

Some impactful Blueberry stats:
USDA National Agricultural Statistics Service New Jersey statistics (as of 2023)

35 to 45 million pounds per year
Crop valued at **\$92.1 million**
Total acreage: **10,800**
Average yield per acre: **4,660 pounds**
National rank: **5th in harvested acreage**





APPLE & 4H

EDUCATE A NEW GENERATION OF LEARNERS



“When they see someone that looks like them and is close to their age teach these advanced topics in a relatable way, they think, ‘If they can do it, why can’t I?’”
Rodrigo Sanchez



The 2024 summer STEM Explorers camp in Trenton for dozens of students in grades 7 to 9 is part of a transformative collaboration between Rutgers 4-H and Apple to make an impact in communities that are traditionally underserved in technology. The camp provided the youth access to a series of iPad-based workshops in digital media, robotics, coding, and engineering.

The digital media week featured a learning lab based on Apple’s Everyone Can Create curriculum and culminated with each camper designing a project to bring awareness to environmental issues.

Apple launched its Community Education Initiative—part of a broader commitment to education and educational equity—in 2019 in an effort to provide coding, creativity, and career opportunities to students. In a far-reaching collaboration with national 4-H, which sought to better integrate technology into its programming for youth across the U.S., Apple first brought its cutting-edge technology to 4-H in the state of Ohio. Apple has since expanded its outreach to New Jersey, Michigan, and Florida, including programming at Historically Black Colleges and Universities.

In New Jersey, Apple first partnered with Rutgers University-Newark and 4-H clubs in 2021 through the 4-H Computer Science Pathways project, which uses peer mentors from college and high school to engage young people and build skills in STEM.

Rutgers 4-H program associate Rodrigo Sanchez Hernandez is part of the team that guided youth learners through Apple’s curriculum at the 2024 summer STEM Explorers camp.

“When they see someone that looks like them and is close to their age teach these advanced topics in a relatable way, they think, ‘If they can do it, why can’t I?’”

This dynamic Rutgers 4-H team includes Marissa Staffen, county agent; Jennie Thomas, community assistant; Brianna Boyd, program associate; and Mamadee Keita, community assistant.



RUTGERS STORMWATER MANAGEMENT

Rutgers researchers are leading green infrastructure, community engagement, education and planning initiatives as part of a \$72.5 million federal grant that will empower New Jersey to become more resilient to climate change.

The National Oceanic and Atmospheric Administration awarded the grant—for “Building a Climate Ready New Jersey” program—to the New Jersey Department of Environmental Protection, which contracted Rutgers for \$16 million to lead several program components. The five-year initiative aims to enhance climate resilience across the state’s 16 coastal counties, managing stormwater and mitigating flooding.

“Building a Climate Ready New Jersey”

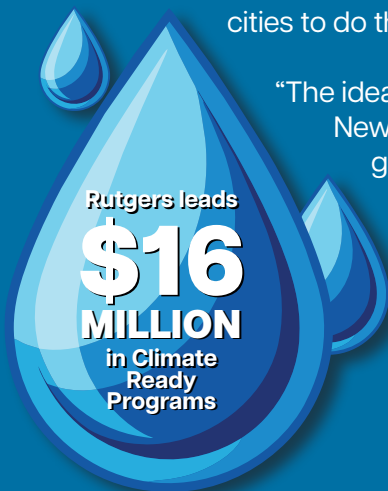
Christopher Obropta, the extension specialist in water resources with Rutgers Cooperative Extension and a professor with the Department of Environmental Sciences at the Rutgers School of Environmental and Biological Sciences, is leading a team of 12, equipped with \$10 million in funding.

Many urban areas in the state have combined sewer systems where stormwater and sewage flow through the same pipes. During heavy rainfall, untreated sewage overflows into local waterways and streets. Chris Obropta’s team designs green infrastructure such as rain gardens that are built into curb bump-outs and vacant lots, pervious pavement that allows water to seep underground, and rainwater capture that feeds into urban farms – projects that mitigate flooding while creating economic opportunities.

Those opportunities come about through workforce development. Obropta’s team helps train people in communities with combined sewer systems, who start their own companies to get contracted by their cities to do the work.

“The idea is to pay people in the city to do the work,” said Obropta, who is collaborating with Newark Greenworks to implement a national green infrastructure certification program. “It’s a great opportunity to get folks engaged in this and make a living doing it. It’s a career path.”

In addition to building physical resilience, the funds will develop the next generation of climate resilience experts by providing hands-on experience for Rutgers graduate and undergraduate students across these projects.



NEW JERSEY
FLOODMAPPER

NJFloodMapper, led by Rick Lathrop, director of the Center for Remote Sensing and Spatial Analysis, received \$1.3 million in funding.

The interactive mapping visualization tool provides a fuller picture of vulnerability to flooding hazards to municipalities and non-profit partners so they can implement projects that support resilience, ecosystem health, and carbon sequestration.

It uses high-resolution mapping of land surface elevation to model areas vulnerable to sea level rise, combined with FEMA Preliminary Flood Insurance Rate Maps, coastal evacuation routes, state- and municipal-level infrastructure and socio-demographic information

SCAN FOR MORE INFO ABOUT FLOODMAPPER



USDA-NIFA NEXTGEN

GRANTS
SUPPORT
ANIMAL AND
PLANT
SCIENCES

RUTGERS IS THE RECIPIENT OF TWO GRANTS from the U.S. Department of Agriculture National Institute of Food and Agriculture NextGen program that will enable the School of Environmental and Biological Sciences (SEBS) to partner with two colleges – CUNY-based LaGuardia Community College (LAGCC) and Bergen County Community College (BCCC).

Both grants—each \$4.5 million—provide a summer residential experiential learning program, a scholarship pipeline, and make it easier for students with an associate’s degree to transfer to Rutgers for their undergraduate degree.

LAGCC students will study animal science while BCCC students will study plant science and sustainable farming. Under the program, students gain research credits that will apply to their experiential learning requirements after transferring to SEBS.

Last summer marked the inaugural launch of the experiential learning programs for both plant science and animal science students from BCCC and LAGCC. Students were paired with Ph.D. students for one-on-one laboratory research project mentoring. Multiple lab spaces have been updated in anticipation of the project.



\$9M
AWARDED BY
THE USDA NIFA
NEXTGEN
GRANT



\$262.5 M
TO SUPPORT
FUTURE FOOD AND
AGRICULTURAL
LEADERS



20-25
STUDENTS
EACH YEAR
PARTICIPATE

PARTNERSHIP SERVES agricultural AND food businesses

A \$232,000 USDA grant enables NJAES to connect farmers and food-related businesses, as well as the communities that depend on these businesses, with the vast resources at the New Brunswick campus and the NJAES food and agricultural facilities in rural South Jersey.

Funded under USDA’s Rural Utilities Service Distance Learning and Tele-medicine Loan and Grant Program, the project equips two hub sites and two end-user sites with state-of-the-art distance learning equipment. Rutgers Cooperative Extension personnel will provide critical education and training on topics like plant diseases, soil health, health and nutrition, food safety, risk management, regulatory compliance, value-added products, and business development.



RUTGERS AWARDED Innovation and Economic Prosperity DESIGNATION

The Association of Public and Land-grant Universities designated Rutgers as an Innovation and Economic Prosperity University in recognition of its substantial and sustained commitment to economic engagement in the region.

The national designation acknowledges Rutgers’ role as an economic catalyst through transformative innovations in academic initiatives, pioneering research, and impactful community outreach programs. This includes business incubators that have launched thousands of startups, technologies addressing agricultural challenges and the university’s participation in the New Jersey Health and Life Science Exchange in downtown New Brunswick, which is set to become a leading hub for research, commercialization, and education.

FOOD INNOVATION CENTER

COMMERCIALIZED
500+
PRODUCTS

SUPPORTED
3,500+
FOOD AND AG STARTUPS



NATIONAL LAUNCH OF
THE IMPOSSIBLE™ BURGER



JIN+JA
BENEFITED FROM
RUTGERS FIC BUSINESS
AND TECHNOLOGY
EXPERTISE

COLLABORATIVE 2024

New Jersey FoodTech Conference

Food industry stakeholders from across the country gathered at the second annual Collaborative NJ FoodTech Conference in June 2024 to promote growth and innovation in NJ’s food technology sector through discussions on pressing industry topics including sustainability, AI, alternate proteins, and food as medicine. The conference, a partnership between the Food Innovation Center, the New Jersey Economic Development Authority, and Middlesex County, highlighted business retention capacity in the state, which is host to 22 million square feet of lab space that is expected to grow 27% by 2026.



Dr. Juan Salinas
CC '91, GSNB '94, GSNB '00

LEVERAGING AI AND GENETICS IN TURFGRASS INNOVATION

Bingru Huang's team is developing AI-guided water conservation programs that have far-reaching implications that could extend to pesticide management.

Distinguished plant biologists at the Rutgers School of Environmental and Biological Sciences have led innovative research projects in sustainable turfgrass and the technology used to cultivate and maintain it.

Turfgrass is critical for preventing soil erosion, regulating temperature in urban spaces, sports and recreation, carbon sequestration and water filtration.

Leading a \$4 million research project, funded by the U.S. Department of Agriculture-National Institute of Food and Agriculture, Rutgers is creating efficiencies in water-saving irrigation practices. Results are expected to provide more sustainable turfgrasses that are resistant to heat and drought, as well as a more profitable turfgrass industry.

Water availability for turfgrass irrigation is increasingly limited and costly due to shortages of fresh water supplies and declining precipitation, so Huang's team is developing AI-guided water conservation programs that have far-reaching implications that could extend to pesticide management.

"This technology, using remote imagery sensing and AI, are able to evaluate turfgrass performance under conditions related to climate change so it can develop greater resilience," said Bingru Huang, distinguished professor in the Department of Plant Biology. "Another aspect is precision. You can use this technology to determine what hole to irrigate, for example, so it can lead to water conservation, much better than typical

irrigation. You don't always know how much is needed or where it is needed."

The project involves a transdisciplinary team from three academic institutions—Rutgers University, University of Georgia, and University of California, Riverside, and a private industry partner—Siemens Corporate Technology, that includes turfgrass scientists and breeders, mechanical/automation/artificial intelligence engineers, economists and extension specialists.

Rutgers researchers are approaching turfgrass innovation both technologically and genetically. Stacy Boños, professor of plant breeding and genetics, leads the turfgrass breeding program—one of the strongest in the country. Her research creates genetically stress tolerant turfgrasses by focusing on integrating classical genetics and genomics-based marker-assisted breeding throughout the development process.

Her team leads specific research projects on breeding for disease resistance, salt tolerance and low maintenance in numerous turfgrass species. She currently works with 11 different cool-season turfgrass species.



Regional SHELLFISH SEED BIOSECURITY PROGRAM



This growing program provides a science-based pathway to improved biosecurity with respect to pathogens that afflict shellfish

Shellfish harvests contribute more than \$1 billion annually to the New Jersey economy. Wild caught harvests are sustainable but maxed out, and face threats from climate change as well as competing interests for the resource or access to the resource. Shellfish aquaculture, a form of farming, provides a viable alternative and is growing rapidly in New Jersey and elsewhere.

The growth of shellfish aquaculture relies on the hatchery production of seed (juvenile shellfish) to support increasing numbers of farms along the East Coast, including in New Jersey. The interstate transfer of seed stock is crucial to regional commerce and production; however, the spread of disease has been associated with the transfer of shellfish stocks in the past leading many regulators to be cautious about permitting the importation of shellfish from outside their jurisdictions.

The regulation of seed transfers is done by individual states, but shellfish disease distributions do not respect state or national boundaries. Therefore, the introduction of disease in this lucrative industry is



a concern for shellfish farmers, fishers, and resource managers worldwide.

Established with support from various NOAA and USDA programs, the Regional Shellfish Seed Biosecurity Program (RSSBP) was created to streamline the permitting process for transfers of bivalve shellfish seed, fostering enhanced biosecurity throughout the broader regional industry without compromising commerce. RSSBP is comprised of university, industry, state and federal partners, and led by David Bushek at the Rutgers Haskin Shellfish Research Laboratory and Ryan Carnegie at the Virginia Institute of Marine Science.

Research shows that there is negligible risk of disease transfer associated with small seed maintained on filtered water during the hatchery phase of production. This provides a biosecure product that is safe for transfer among states because larvae and young seed have had limited opportunity to contract parasites and pathogens that afflict shellfish.

RSSBP develops critical tools for producers and regulators to ensure biosecurity, and conducts audits of best management practices at hatcheries to streamline interstate permitting for shellfish seed and larvae being sold directly out of hatchery facilities. It has matured into an impactful program along the East Coast, and with additional funding from the NOAA Sea Grant Aquaculture HUBS program and USDA APHIS, it has reached into the shellfish aquaculture industry in the Gulf of Mexico.



“Rutgers Haskin Lab and VIMS Shellfish Pathology Lab work with regulators and producers to develop safe and secure mechanisms to produce and transfer shellfish for aquaculture. Several states are looking to the RSSBP to help protect their shellfish resources and industry.”

Dr. David Bushek



Sean Towers
Hatchery Manager of the New Jersey Aquaculture Innovation Center at Rutgers pictured with shellfish (clam) seed

THE NEW WAVE OFFSHORE WIND ENERGY DEVELOPMENT IN NEW JERSEY

Rutgers researchers have been at the forefront of an emerging energy sector, helping to lead NJ to its goal of 100 percent clean energy by 2050.

The state has become a focal point for offshore wind energy (OWE) due to the high winds off its coastline, a shallow ocean depth for ocean floor-based turbines, and a dense population in need of energy. Rutgers is supporting these innovations by launching research projects, promoting collaborations, and facilitating conversation across disciplines and industries.

The Offshore Wind Energy Collaborative, launched in 2022 and made up of 75 faculty from Rutgers and other NJ colleges and universities, secured a two-year, \$125,000 grant from the New Jersey Economic Development Authority (NJEDA) and hosted the first Rutgers Offshore Wind Energy Symposium in 2023. NJEDA later provided a \$282,000 grant to create the New Jersey Wind Institute Fellowship Program for student research and workforce development.

In 2024, Rutgers launched a research project that includes two key components—the design of a Net-Zero Wind Energy Test (WET) Center, a large testing facility near the Jersey Shore, and the creation of a smaller WET Lab on its main campus.

In the fall, Rutgers and the NJ Academic Alliance for Offshore Wind Energy hosted a weeklong North American Wind Energy Academy/WindTech 2024 conference where representatives from 18 countries representing academia, government, and industry held discussions on pressing research topics.

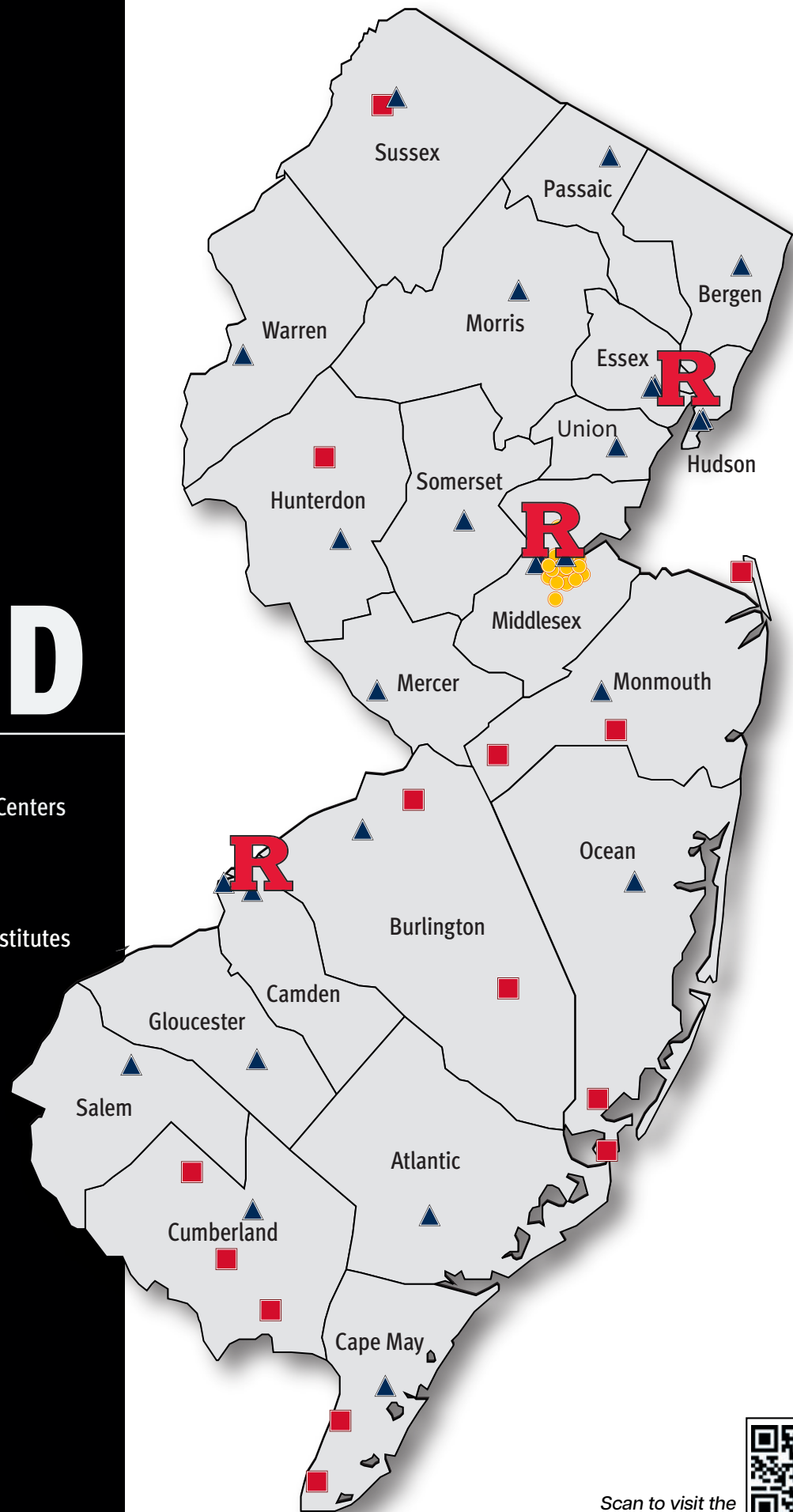


“Through the Rutgers Offshore Wind Collaborative, our faculty, staff, and students are leading critical collaborative research that will inform the responsible development of offshore wind.”

Dr. Josh Kohut

WE HAVE THE STATE COVERED

- Off-Campus Research Farms, Stations, and Centers
- ▲ County Cooperative Extension Offices
- New Brunswick-Based NJAES Centers and Institutes
- R Rutgers University Campuses



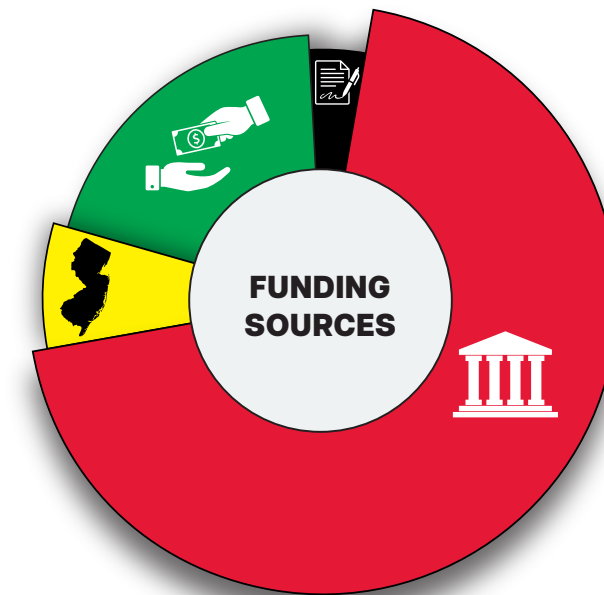
NJAES/SEBS FINANCIAL NOTE

NJAES relies on a variety of public and private funding sources to address critical issues in New Jersey. The experiment station received \$57.3 million from grants and contracts; Rutgers University support (fringe and operational); and state, federal, and local government funding; as well as gifts, endowment revenue, income from sales and service activities, and patent and plant licensing revenue.

3.46%
OTHER GRANTS
AND CONTRACTS

19.65%
NON-GOVERNMENTAL
GRANTS

7.34%
STATE AND
MUNICIPAL
GRANTS



69.55%
FEDERAL
GRANTS

554,000+ VOLUNTEER HOURS AT RUTGERS COOPERATIVE EXTENSION | **258,000+** PEOPLE
REACHED THROUGH DIRECT DELIVERY OF RUTGERS COOPERATIVE EXTENSION PROGRAMS, RESOURCES, AND SERVICES

\$7,582,403 OTHER REVENUE PATENT AND ROYALTY | **\$42,211,445** FEDERAL GRANTS AND CONTRACTS
(SEBS and NJAES, does not include federal appropriation)

\$11,552 SOIL TESTING

NEW JERSEY AGRICULTURAL EXPERIMENT STATION | 88 LIPMAN DRIVE, NEW BRUNSWICK, NEW JERSEY 08901

