

A REPORT FROM THE
EXECUTIVE DEAN
OF AGRICULTURE AND NATURAL RESOURCES

Report to the New Jersey State Board of Agriculture
May 2018



Valentin field-testing equipment while implementing eDNA surveillance methods.



Valentin setting up a blacklight trap on a farm in New Hampshire.

Rutgers graduate student **Rafael Valentin** along with researchers from the departments of Entomology and Ecology, Evolution, and Natural Resources, professor **Dina Fonseca**, extension specialist **Anne Nielsen**, and professor **Julie Lockwood**, plus USDA scientist Tracy Leskey, developed a CSI-type method for tracking the invasive brown marmorated stink bug (BMSB). Known as environmental DNA (eDNA), it can detect trace amounts of DNA left as an insect feeds and walks on host plants. Modifying the eDNA technique originally developed for aquatic systems, Valentin filters produce wash water to find DNA. Because this "footprint" DNA is present in small quantities, samples are assayed with a process that allows highly sensitive detection of minute DNA fragments. This

method represents a powerful tool for detecting the presence of agricultural pests when they are at very low levels. Using peaches grown at RAREC as a positive control, Valentin determined that BMSB eDNA could be detected on produce. He then travelled to a farm in New Hampshire with no previous detection of BMSB and compared the ability of eDNA to detect BMSB to the performance of black light traps and aggregation pheromone traps. The eDNA technique detected BMSB, whereas the other two sampling methods rarely did so. In May, this research was published in *Frontiers in Ecology and the Environment* and highlighted in *Nature* magazine. This group of researchers is currently working to expand this methodology to other invasive insect species, including the spotted lanternfly and emerald ash borer.

On May 15, the NJAES Board of Managers (BOM) held its first meeting with incoming Rutgers–New Brunswick Chancellor **Debashish "Deba" Dutta**. Dutta stated that he considers the land-grant model of higher education to be one of America's greatest innovations. Since beginning his tenure on July 1, he has participated in farm visits arranged by Dean **Bob Goodman**, and also met with Secretary of Ag Doug Fisher, and New Jersey Farm Bureau leaders Peter Furey and Ryck Suydam. NJAES state funding was the focus of the discussion with the BOM. Dutta previously met with Senate President Steve Sweeney, who voiced support for the state meeting its obligation. The BOM has been conducting tours for legislators to bolster support for NJAES and getting county boards of ag to conduct local letter-writing campaigns. The counties, in turn, have provided additional support to fund extension positions. The board affirmed that funding is also needed for continued research projects and needed upgrades to the research facilities and outlying stations. State funding for NJAES has been flat for the past 30 years and an additional \$10 million is being requested this year. Chancellor Dutta plans to continue a dialogue with the BOM by meeting twice-per-year.

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A small pilot study by Rutgers' Equine Science Center (ESC), involving nine horses and seven military veterans diagnosed with post-traumatic stress disorder (PTSD), examined how therapy horses are affected when helping others. The study, "The Effects of Equine-Assisted Therapy on Plasma Cortisol and Oxytocin Concentrations and Heart Rate Variability in Horses and Measures of Symptoms of PTSD in Veterans," concluded that the therapy sessions were not perceived as being stressful to the horses. This was one of the first trials conducted that focused not only on the human side of this type of therapy, but also how the therapeutic interactions affected the horse. ESC director **Karyn Malinowski** and colleagues recommend further study with a larger sample of horses to determine the long-term impact of the therapy sessions.

A Specialty Crop Block Grant in the amount of \$38,515 has been awarded for "Summer and Fall Strawberry Production for New Jersey Using the Long-day Cultivar 'Albion'" for fiscal year 2019. Principal investigators on the grant are associate professor **Ed Durner** (lead PI), Department of Plant Biology, and county agricultural agents **Bill Sciarappa** (Monmouth) and **Peter Nitzsche** (Morris).

In the News

The article, "Protect Crops by Amending Soils with Silicon" by extension specialist in soil fertility **Joe Heckman**, Department of Plant Biology, was published in *Growing Produce* in April. Based on years of field and greenhouse research conducted at NJAES, it was determined that the benefits of enhanced silicon nutrition include resistance to pathogens and better tolerance of environmental stress. One of the most significant benefits is its ability to suppress powdery mildew disease. Crops susceptible to this disease include pumpkin, cucumber, wheat, Kentucky bluegrass, and dogwood. Most soil silicon is locked in the structure of soil minerals with little available for crop uptake. The most effective material for supplying plant available Si is wollastonite, which also can neutralize soil acidity.

In April, **Doug Zemeckis**, marine agent for Ocean/Atlantic/Monmouth counties, was featured in *The Sandpaper* and on *Comcast Newsmakers*. Zemeckis replaced retired RCE agent Gef Flimlin last September. He brings his own experience in research and working with commercial and recreational fishermen on coastal resource issues. On *Comcast Newsmakers* Zemeckis discussed the economic value of the fisheries industry in New Jersey. He conducted a recent collaborative study involving a tagging program to estimate catch and release mortality rate of black sea bass both by commercial and recreational fishermen, which will result in best management practices for handling the catches.

Of Interest:

Now available on NJAES Publications: FS1283 Ultra-Niche Crops Series: Basil Postharvest Handling and Food Safety. **Melendez, M.**, njaes.rutgers.edu/fs1283.

Events:

Grow, Process, Market, Eat--Value-Added Organic Grains! June 26, 2018, 4-7:30 pm, Rutgers Snyder Research Farm, 140 Locust Grove Rd, Pittstown, NJ. Contact edyck@ogrin.org.

