

EXECUTIVE DEAN
OF AGRICULTURE AND NATURAL RESOURCES

Report to the New Jersey State Board of Agriculture
February 2011

Reducing Impact on Our Waters: New Jersey's New Fertilizer Law

In January, New Jersey Governor Chris Christie signed what is widely viewed as the most restrictive fertilizer law in the nation. Rutgers played a key role, providing much of the science used in the process of developing balanced legislation that protects New Jersey waters while allowing for maintenance of healthy lawns. Further, Rutgers is responsible for implementing a streamlined training and certification program for professional fertilizer applicators, as required by the new law.

The potential of the new fertilizer law to lead to healthier waterways and aquatic communities will be a boon to fisheries in New Jersey, as excessive nitrogen, considered an important contributor to water pollution, leads to algae blooms that deprive water of oxygen and kill fish and other marine life.

New Jersey Waterways under Stress – Case Study: Barnegat Bay

How is it that one of the most wonderful estuaries on the east coast, Barnegat Bay in Ocean County, is now one of the most impaired coastal water bodies in the U.S.? Designated by the US Environmental Protection Agency as a National Estuary Program site in 1995 – one of 28 such estuaries of significance in the U.S. – Barnegat Bay hosts a variety of environmentally sensitive habitats such as sand beaches, bay islands, seagrass meadows, finfish nursery areas, shellfish



Michael Kennish collecting water sample

beds, and waterfowl nesting grounds. These features are also what attract the thousands of recreational visitors to its beaches and waters each year.

Over the years, Rutgers research professor **Michael Kennish** (Marine and Coastal Sciences) has witnessed the decline of Barnegat Bay both in regard to its habitats and biotic communities. Kennish explains that unlike open estuarine systems like the Delaware where nutrients and chemical contaminants flush out to sea, the Barnegat is nearly totally enclosed by barrier islands that host our popular beach towns. As a

result, bay water does not flush very well to the open ocean but can remain in the bay for months before exiting. It then has lots of time to accumulate in bottom sediments and organisms inhabiting the estuary. Over-enrichment of nitrogen in the estuary leads to excessive plant growth and eutrophication of the system. All New Jersey waterways receive some nutrient inputs, but Barnegat's enclosed water body and the activities of an escalating coastal population have contributed to the bay's decline.

To sum up the impacts on the bay is complex, since not every biotic community is under stress, but Kennish provides some dire examples. The once thriving Barnegat Bay shellfisheries are



basically gone. The hard clams that were prolific in the 1960's and 1970's are in major decline. In 1975, Barnegat Bay supplied 1.4 million pounds of clam meats, which by 2005 had dropped to nearly zero. The formerly abundant bay scallops also are scarce or nonexistent. The seagrass on the bottom of the bay, which supports numerous organisms, has diminished dramatically during the past decade due to algal blooms and other factors.

The bay's impairment is due to multiple causes, one of which is the overload of nitrogen. Much of this load derives from human activities in Ocean County. Population growth in the county has more than doubled since 1970. Today the population of year-round residents exceeds 575,000; this number explodes to more than 1.2 million in the summer. Nitrogen concentrations in the bay are twice as high in the summer than in the winter. One potential source of nitrogen is lawn



Water runoff from sparsely vegetated landscapes erodes soil, carrying sediments and nutrients to storm drains, eventually flushing into streams and rivers. Photo: Jim Murphy

fertilizer that enters the bay from runoff and stormwater. Nitrogen deposition from the atmosphere, generated from automobile emissions and fossil-fuel power plants, adds to the load. Groundwater contributes as well. Much of the total nitrogen entering the bay derives from surface water runoff in Ocean County, followed by atmospheric deposition and then from ground-water discharge.

Development has significantly altered the natural land cover in Ocean County. This has facilitated runoff of nitrogen into tributaries that drain into Barnegat Bay. Compacted soils, impervious cover, and inadequate stormwater systems have exacerbated the nitrogen enrichment problem. To

remediate a system like Barnegat Bay that is heavily impacted by nitrogen enrichment and eutrophication, it is necessary to reduce the nitrogen load to the water body.

The New Jersey Fertilizer Law

Initiated by local environmentalists, new legislation was proposed in 2010 to protect the bay. Among the new legislative efforts was a fertilizer bill that would place restrictions on fertilizer products and application to reduce nitrogen from damaging New Jersey's coastal waterways, and phosphorus from damaging fresh waterways.

Rutgers NJAES participated in the process of developing the legislation. Director of Cooperative Research **Brad Hillman** describes Rutgers' role as deriving an outcome that was not a "mish mash" to appease opposing agendas, but a reasonable compromise between groups.



In addition, NJAES hosted and co-sponsored a Fertilizer Summit, organized and led by **Jim Murphy** (extension specialist in turf management), on the role of nutrient management in urban and suburban landscapes in nutrient loading of surface and ground waters. According to the summit report, over 70 percent of New Jersey's assessed waters do not attain "trout or aquatic life use objectives," which are numerical stream quality objectives for the protection of aquatic life. The report also highlights how healthy lawns that are not over-fertilized can reduce runoff and nutrient loading into waterways.

The fertilizer law impacts the entire state of New Jersey, establishes standards for certain fertilizer applications, requires certification of professional fertilizer applicators, and regulates labeling and sale of certain fertilizers.

Rutgers NJAES future role in this legislation will be in the education and certification of landscape professionals in the proper use of fertilizers. Murphy cites Rutgers role of educating on best



Eroded particles in water, referred to as TSS (total suspended solids), are the predominant non-point-source pollutant of stormwater flushing into streams and rivers. Photo Jim Murphy

management practices as a continuation of the extension's ongoing outreach, but with added emphasis on the law's regulations and fines. It also expands the opportunity to engage homeowners in the educational outreach.

The certification, which will be implemented one year from the signing of the bill, is being developed by Murphy and NJAES. The most cost-effective and convenient way to provide the training is to provide an on-line training and certification program. Murphy cites the benefits of this

system: allowing clients to use it from their home or office, limiting the number of extension staff required to conduct the program, and reducing costs and paperwork. The number of New Jersey landscape professionals that will be required to be trained and certified is approximately 15,000 according to the New Jersey Department of Environmental Protection.

A further role of the experiment station will be to integrate the law's regulations in the recommendations of the Rutgers NJAES Soil Testing Lab (STL). **Stephanie Murphy** (director, STL) emphasizes the importance of soil testing – required by the law to determine the need for phosphorus – in order to maximize efficiency of fertilizers and their application. Murphy's lab will continue to inform the public and professionals on the relationship between fertilizer's effectiveness and proper pH, and how their selection of the right fertilizers, such as slow release, has potential to decrease the amount of nitrogen that can escape from lawns and end up in New Jersey's waterways.



Faculty and Staff Activities and Accomplishments

FIC Poised To Expand "Jersey Fresh" To New Jersey Schools

The Rutgers **Food Innovation Center** (FIC) will spend the next year developing innovative and healthy ways of integrating New Jersey grown produce into the state's school food program. Under the terms of the \$51,215 federal grant to create new food items derived from New Jersey



agricultural products for use in the National School Lunch Program, the NJDA and the FIC will "create new value-added agricultural products that meet the nutritional needs of children in New Jersey schools, which also will provide benefits to New Jersey farmers and agricultural producers." These value-added products may include portion-controlled products that meet the nutritional guidelines of New Jersey schools, such as fresh-cut fruit and vegetable snacks, healthy beverages, soups, entrees, and desserts, all derived from produce harvested from New Jersey farms. New legislation signed into law by Governor Chris Christie on January 5 expands

the state's 'Jersey Fresh' program to include foods made with New Jersey Department of Agriculture quality-graded products. The law provides for the designation of baked goods and other food products prepared with 'Jersey Fresh' produce as 'Made with Jersey Fresh.' It also encourages the purchase of 'Made with Jersey Fresh' products by the New Jersey Division of Purchase and Property and at service areas along the Garden State Parkway, New Jersey Turnpike and Atlantic City Expressway operated by the New Jersey Turnpike Authority and South Jersey Transportation Authority.

Peter Nitzsche (agricultural and resource management agent, Morris County) and New Jersey Small Fruits Council were awarded \$16,716 from the New Jersey Department of Agriculture's Specialty Crop Grant Program for "Farm scale testing of new strawberry selections for New Jersey." Collaborators include Greg Donaldson, president of the council, **William Hlubik** (agricultural and resource management agent, Middlesex County), and **Win Cowgill** (agricultural and resource management agent, Hunterdon County).

Outreach Efforts: Public/Community Service

Jerome L. Frecon (agricultural and resource management agent, Gloucester County) developed and organized the South Jersey Landscape Conference and Nursery Growers Meeting held on November 30 in Glassboro, in conjunction with the New Jersey Nursery and Landscape Association. Rutgers NJAES presenters included **James Lacombe** (specialist in ornamental plant management); **Ann Gould** (specialist in ornamental pathology); **Salvatore Mangiafico** (environmental and resource management agent, Salem and Cumberland counties); **Pat Hastings** (pest management coordinator); **Laura Gladney** (risk management program assistant). **Jerome L. Frecon** and **Mary Cummings** (agriculture program associate, Gloucester County) served as moderators for individual landscape and nursery sessions.

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Rutgers Cooperative Extension personnel continue to collaborate with the New Jersey Environmental Federation, New Jersey Department of Environmental Protection and others to develop and conduct IPM training focusing on the landscape and turf component for school district IPM programs. Recent trainings were held in November and January, with upcoming sessions on March 18 in Mahwah, NJ, and May 13 in Clayton, NJ.

Michelle Casella (agricultural and resource management agent, Gloucester County) selected to represent NJAES on the State Agricultural Development Committee to develop Agriculture Management Practices for on-farm direct marketing.

Mark Your Calendars!

On-Farm Energy Use and Efficiency (South Jersey)

WHEN: February 25, 2011, 9 a.m. to 1 p.m.

WHERE: Rutgers Cooperative Extension of Gloucester County, Clayton, NJ.

WHAT: Co-sponsored with the New Jersey Farm Bureau, this program outline strategies for managing and reducing on-farm electricity costs.

MORE INFO: Contact the New Jersey Farm Bureau, 609-393-7163.

Extension Update: Vegetable and Fruit Production

WHEN: March 1, 2011, 8:30 a.m. to 3:30 p.m.

WHERE: Rutgers Cooperative Extension of Mercer County, Trenton, NJ.

WHAT: Update on various topics, including stinkbug IPM on fruit, the RCE vegetable IPM 2011 program, pumpkin variety trial results, and pesticide safety, among others.

MORE INFO: Contact Meredith Melendez, 609-989-6830.

North Jersey Fruit Meeting (for commercial fruit growers only)

WHEN: March 7, 2010, 8:30 a.m. to 4 15 p.m.

WHERE: Warren Grange No. 110, Asbury-Broadway Road, Asbury, NJ.

WHAT: Topics to include insect, disease, and weed control, among others.

MORE INFO: Contact Win Cowgill, 908-788-1339.

Grape Expectations

WHEN: March 12, 2011, 8:30 a.m. A New Jersey Wine Showcase begins at 4:15 p.m.

WHERE: Forsgate Country Club, 375 Forsgate Drive, Jamesburg, NJ.

WHAT: A viticultural and enological symposium, co-sponsored by Rutgers NJAES, the New Jersey Wine Industry Advisory Council, and the Garden State Winegrowers Association.

MORE INFO: Contact Gary Pavlis, 609-625-0056.

This report is produced by the Office of Communications and is available online at <http://execdeanagriculture.rutgers.edu/boa/>.

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