Long Island Nitrogen Action Plan (LINAP) Newsletter

In this issue of the LINAP newsletter, we highlight the ongoing efforts of our agriculture community to reduce nitrogen pollution and safeguard our water resources. We'll explore Best Management Practices (BMPs) and spotlight the innovative work being done at Cornell Cooperative Extension of Suffolk County.

Agriculture Best Management Practices on Long Island

On Long Island, where the balance between environmental stewardship and economic viability is paramount, farmers employ various Best Management Practices (BMPs) to safeguard water quality. Crops need nitrogen to achieve maximum yield, but excess nitrogen can cause environmental concerns for our waterbodies, as it can easily be leached out of the root zone increasing levels in groundwater or runoff into our surface waterbodies. BMPs serve as critical tools for farmers, enabling them to mitigate nutrient loading of water sources while maintaining, and enhancing agricultural productivity.

Examples of BMPs include:

Controlled Release Nitrogen Fertilizer (CRNF): Utilizing CRNF technology can minimize nitrate loading in groundwater by extending nitrogen availability for plant uptake while reducing leaching risks. This technology offers a more controlled and efficient release of nitrogen, aligning with crop demand and minimizing environmental impact.

Split Nitrogen Applications: Splitting nitrogen applications throughout the growing season allows for better synchronization between nutrient availability and crop demand. By avoiding excessive nitrogen inputs at any one time, farmers can optimize plant uptake and minimize losses through leaching or runoff.

Cover Crops and Crop Rotation: Implementing cover crops and rotating crops can help improve soil health, reduce erosion, and enhance nutrient retention. Cover crops can capture excess nitrogen, preventing it from leaching into groundwater, while crop rotation breaks pest and disease cycles and promotes overall ecosystem balance.

Soil Health Management: Practices that promote soil health, such as reduced tillage, organic amendments, and compost applications, enhance soil structure, water infiltration, and nutrient retention. Healthy soils are better equipped to absorb and retain nutrients, reducing the risk of nutrient runoff and leaching.

Nutrient Management Planning: Developing comprehensive Nutrient Management Plans tailored to specific farm operations helps optimize fertilizer use, minimize nutrient losses, and protect water quality. By carefully monitoring soil nutrient levels and crop requirements, farmers can make informed decisions to optimize nutrient application while minimizing environmental risks.

By implementing BMPs tailored to Long Island's agricultural landscape, farmers can effectively protect water quality while ensuring the sustainability of their farming systems for future generations.

Spotlight on Controlled Release Nitrogen Fertilizer

Cornell Cooperative Extension of Suffolk County (CCE) plays a vital role in supporting local farmers through research, education, on-farm demonstrations, and outreach programs. Their initiatives aim to enhance agricultural practices that protect water quality, promote environmental sustainability, and strengthen community engagement. They work with farmers to reduce nutrient and pesticide loading from agricultural lands to the ground and surface waters of Suffolk County while maintaining a strong, viable agricultural industry.

In our pursuit to spotlight the efforts of local farmers in safeguarding the environment, we had the privilege to sit down with Sandra Menasha, a Vegetable/Potato Specialist at CCE, whose work with Controlled Release Nitrogen Fertilizer (CRNF) has been transformative.

Over the past 15 years CCE has been investigating the use of CRNF as a BMP in vegetable crop production. Through research, pilot projects, and on-farm trials, CNRFs have demonstrated their worth, leading to a significant uptick in their use over the last eight years. These fertilizers, designed to release nutrients in sync with a plant's growth needs, are proving pivotal in reducing environmental impact, particularly in terms of groundwater nitrate pollution.

"Adoption of new practices in farming is always a cautious process due to the inherent risks to a farmer’s livelihood," Sandra explains. “However, once we had really good data the next step was to do on-farm pilot projects with the grower, in collaboration with our Agricultural Stewardship Program, where we would provide him with the controlled release fertilizer, removing some of the financial risk.”

Technicians fertilize sweet corn in a controlled release nitrogen on-farm evaluation. Photo credit: CCE

Side-by-side comparisons in the field were done where half the field would be planted with controlled release fertilizer, and the other half with standard fertilizer. This way farmers could see how CRNF performed at their own farm. “Once the grower had those on-farm demonstrations and they liked the product, they became our best advocates among the grower community,” Sandra adds. Today about 80 percent of Long Island sweet corn growers use CRNF.

Sandra's excitement is clear as she talks about broadening the use of CRNF beyond traditional crops. Initially developed for agronomic row crops like soybeans, corn, wheat, and cotton, with longer growth cycles, the technology's sustained release duration was too long for many other crops. As the technology evolved, shorter release profiles have become available making it suitable for crops that have quicker growth cycles. This advancement in technology enabled CCE to conduct more extensive studies across various crops, providing valuable data to farmers. Recent studies have looked into how CRNF performs with vegetables, including pumpkins, watermelons, zucchini, beets, cauliflower, broccoli, tomatoes, green beans, kale, and lettuce. This versatility has inspired more farmers to try CRNF on different crops, further integrating sustainable practices into the community. "With advancements in CRNF technology, we're able to extend our research to a wider variety of crops," Sandra says. "This expansion allows us to equip growers with the necessary data to encourage its adoption across their farms."

Looking ahead, Sandra stresses the need for a multifaceted approach to sustainability. Integrating various tools and practices tailored to individual farms is essential, along with continued funding for research and personalized support for farmers. "Farmers recognize the importance of sustainability for the long-term viability of their operations," Sandra observes. "There's a strong sense of community and collaboration among growers in advancing sustainable practices *in addition* to the use of CRNF." Sandra notes that on Long Island BMPs for nutrient management are being used on 95 percent of all vegetable farms.

Sandra explains that there is a growing awareness among farmers about the importance of soil health in mitigating environmental impact and practices like reduced tillage and cover cropping, among others, are gaining traction, reflecting a broader commitment to sustainable agriculture. "Soil health is key to reducing environmental impact," Sandra states. Understanding the dynamic and complex nature of soil, including its texture, organic matter content, and pH, is important for managing soil health. "Growers are increasingly adopting practices that minimize negative impacts on the environment. There's no one-size-fits-all solution; instead, a multifaceted approach tailored to individual farms and conditions is essential. We need to continue investing in research and education to support growers in adopting sustainable practices," Sandra emphasizes.

Sandra's insights and the broader efforts of CCE highlight the transformative potential of sustainable farming practices. As we look to the future, it's clear that with commitment, innovation, and community support, agriculture can be a powerful force for environmental conservation.

More information about CRNF can be obtained by contacting Sandra Menasha at srm45@cornell.edu or for more information on CCE's efforts to reduce nitrate and pesticide loading in our ground and surface waters contact Emily Lindback of the Agriculture Stewardship Program at el684@cornell.edu.