KIC Progress Report
September 2013

KIC 2025
Keep It for the Crop by 2025

C-BMP
Illinois Council on Best Management Practices

This report highlights progress during the months of March through September 2013, including:

Dr. Howard Brown Assists CBMP as Director of Nutrient Utilization & Research Priorities

In March 2013, Dr. Howard Brown, Director of Agronomy Services with GROWMARK, Inc. joined CBMP as Interim Director of Nutrient Utilization & Research Priorities. Dr. Brown remains an employee of GROWMARK, but is allocating the majority of his time to CBMP to help us manage information collected from the N-WATCH soil nitrate testing program and to coordinate additional science-based initiatives within CBMP to assure progress toward reducing nutrient losses from the agricultural sector.

Dr. Brown, pictured smiling in the center of this photo assisting CBMP at the July 2013 CTIC "Conservation in Action" tour in Livingston County, is also assisting Dan Schaefer, CBMP Director of Nutrient Stewardship to provide critical outreach and education to ag retailers, crop advisors and farmers on the **MOM** approach to nutrient management: **M**inimize Environmental Impact, **O**ptimize Harvest Yield and **M**aximize Input Utilization (MOM).

Dr. Brown will also help coordinate CBMP programs to strengthen our relationship with state universities and community colleges. This assures that the ag industry stays deeply engaged in collaborative and peer reviewed nutrient research programs as well as in mentoring students to involve them in CBMP projects and future opportunities in nutrient and crop management stewardship.

Nitrogen Rate Trials Honing in on the "4Rs"

By Dan Schaefer, CBMP Director of Nutrient Stewardship

I felt pretty good in 2012 when we reached agreements with seven farmers in the priority watersheds to conduct nitrogen rate trials on their farmers. When a farmer agrees to a KIC N rate trial, CBMP provides a $1,000 payment to the farmer to help compensate for yield loss in the 0 lbs/acre strips that are needed in the research protocol. These rate trials will help farmers establish a reliable, defensible nitrogen rate trial for their farm. While the Maximum Return to Nitrogen (MRTN) calculator developed by the land grant universities is a great tool that recommends N rates based on the region, soil type and the price of fertilizer and corn, farmers are always wanting to learn what truly works best in their individuals fields. These on-farm trials, with protocols written by UI, will help further refine the MRTN and we share the results with Dr. Nafziger at UI to help continually improve the MRTN calculator.

In 2013, we increased farmer participation in the N rate trials by 400% by establishing **35** N rate trials in the priority watersheds. This was possible with financial support from the Nutrient Research & Education Council; we were able to lease a tractor and John Deere provided us with a anhydrous ammonia application tool bar (pictured above). Some farmers and ag retailers already have this equipment, but in cases where they did not, KIC was able to assist in setting out these trials so we didn't turn anyone away. The trials are GIS mapped so that when the farmer harvests the plots, we can link the data from his yield monitor to the exact location of the N rate trial in the field. Using software we can also visually display what we learn in graphs and maps, helping further our educational efforts in presentations and meetings.

Another exciting thing we are able to do in the N rate trials is to conduct split nitrogen applications. This focuses on the RIGHT SOURCE and RIGHT TIME part of the 4Rs. We apply a portion of the nitrogen rate in the fall in the form of anhydrous ammonia stabilized with N-Serve®, the 2nd split with liquid nitrogen at spring planting time with the herbicide tank mix, and the third application using top-dressed liquid nitrogen or dry fertilizer treated with AGROTAIN®. The picture to the right is a small dry spreader (also donated by John Deere) applying a third split of dry fertilizer on a N rate trial in the Indian Creek watershed. Below that, a high clearance applicator applies a 3rd application of liquid nitrogen.

I am looking forward to sharing what we learn after harvest. I will work with UI to compile the results so that we can share the information learned with the participating farmers, with the ag industry as a whole and with our fellow nutrient stakeholders. I expect farmer interest in refining N rates for their fields will continue to grow, helping in our goal to determine the RIGHT RATE component of the 4Rs.

CBMP promotes managing nitrogen as a system, and in that endeavor we must be flexible. By that I mean we must utilize the nitrogen products and equipment that the ag retailers have available. Logistics and application technology are a big part of nitrogen management; over time we believe that managing nitrogen with split applications will prove to minimize environmental impact, optimize harvest yield and maximize input utilization (MOM). It will take some time to make these investments statewide, but given our progress so far, I am very optimistic about the adoption of these 4Rs principles statewide.

By Dr. Howard Brown, Interim Director of Nutrient Utilization & Research Programs

As we strive to achieve higher corn harvest yields to meet the feed grain demand of a growing world population we must be remain vigilant of our surrounding environment and use of natural resources to make such yield improvements sustainable. A new program launched by GROWMARK and the Illinois Council for Best Management Practices focuses on better management of applied nitrogen (N) to improve the long-term profitability of farming while minimizing environmental impact of applied nitrogen by enhancing its efficient use by plants. **The program is N-WATCH.**

N-WATCH is a management tool designed to inventory, track, and verify plant-available N in the soil. It provides the farmer a way to approximate the concentration of plant available N at a point in a field over time. It is a management tool designed to inventory, track, and verify plant-available N but does not replace current N recommendation systems.

Some of the questions N WATCH helps to address are:

How much N is lost from early applications?
Do N stabilizers really delay nitrification?
How much N is left in the soil profile prior to post-emerge applications?
Is there any residual N left that can be captured by planting a cover crop?

These and other questions are being addressed with N-WATCH. N-WATCH serves as a valuable tool for farmers that are changing to N management as a system rather than just an application. Farmers that participate in N-WATCH identify a place in a field that is easy to access and represents a significant part of the remaining field. A template and extended tube soil probe are used to collect samples. Each site is geo-referenced and sites are re-sampled periodically until the soil freezes. Sampling is restarted when the soil thaws in the spring and continues into the growing season until the last opportunity to apply post-emerge N. Participants in the N-WATCH program have gained a new appreciation for what happens to applied N over time. It has not answered all the questions: in fact, it has generated more, but isn't that what learning is all about? Advancements in science demand that we have the ability to learn, unlearn, and relearn and N-WATCH can be viewed as a possible example.

N-WATCH provides the participant a new way to view the behavior of the second greatest input cost for non-irrigated corn production—nitrogen. It has provided a way to estimate N losses at a specific point, and put economics into the decision-making equation. It has brought renewed attention to managing N utilizing the 4R Approach (Right source, Right rate, Right time, and Right place). It has also provided a reason for a farmer to consider using a cover crop following corn (to attempt to trap high residual nitrate-N for the next crop).

Sharing Result with Nutrient Stakeholders

N-WATCH has also enabled CBMP to better communicate trends not only to farmer and ag retailers, but to our fellow nutrient stakeholders. N-WATCH samples taken following the harvest last fall revealed that there was a significant amount of plant available nitrogen remaining in the soil profile. As we tracked the nitrogen, we knew that heavy rainfall in the early spring had the potential to move these nitrates into surface water supplies. We did not keep that information to ourselves: CBMP hosted a webinar in April 2013 with the water supply officials in the KIC priority watersheds, explaining the N-WATCH program and sharing our results with them. Agriculture took ownership of the nitrogen challenges facing our industry and the public water supplies. We intend to continue this open dialogue with our nutrient stakeholders as we launch N-WATCH again following the harvest of 2013.

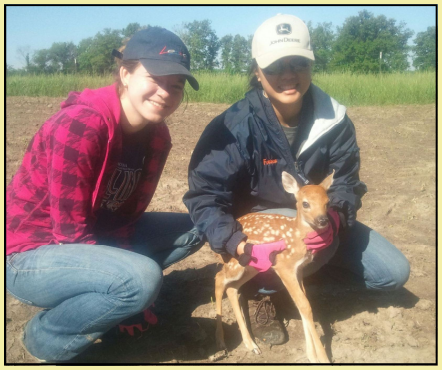
I am happy to answer questions about this program and how it helps to move the KIC program forward. You can reach me at hbrown@growmark.com or at 217.649.3527.

Nutrient Stewardship: The Next Generation

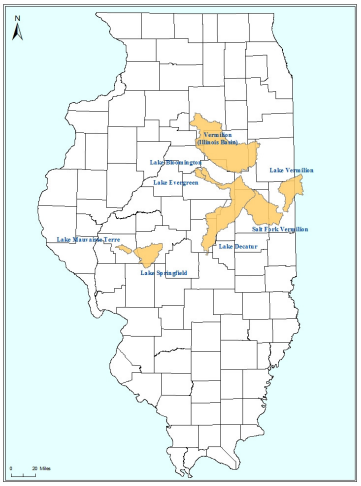
In the KIC strategy document, CBMP makes it a point to engage in educating the next generation on nutrient stewardship, to assure that we continue to make progress toward our goals of improving water quality and improving agricultural production. This past summer, two young men assisted Dan Schaefer with on-farm work. Jason Solberg, pictured right, recently graduated from Illinois State University with a degree in environmental science/health and is assisting Dan with the N rate trials. Kyle Case, a student at SIU-Carbondale, assisted with the N-WATCH program pulling soil samples (below) and helped develop the GIS maps and shape files that CBMP uses to lay out the N rate trials which we upload to the tractor cab, automatically logging the locations of the trials in the field as well as the sample sites for the N-WATCH program.

This fall, CBMP plans to coordinate water sample collections in the Lake Springfield Watershed, engaging students in the Lincoln Land Community College Ag program in this effort.

These young people work very hard and are enthusiastic about bringing new innovations and technology to nutrient stewardship. And there are also the perks of working outside, as these two young students from the University of Illinois discovered on a spring day at the University of Illinois Orr Farm in Western Illinois, where they also helped Dan with the N-WATCH soil sampling program. Their work was briefly interrupted by nature, but they didn't mind. The fawn was shortly reunited with her mom—not to be confused with the MOM we talk about within CBMP!



KIC Outreach Activities



As awareness of the KIC program continues to grow, we have taken advantage of nearly every opportunity to present information on nitrogen management systems, cover crops, N rate trials and the N WATCH program. We also recently asked IEPA for permission to add Lake Evergreen and Lake Springfield to the KIC priority watersheds, and they agreed (see new KIC priority watershed map).

Below left, Dan Schaefer and Steve Stierwalt (a farmer in Champaign Cty and member of the Champaign County SWCD) discuss nitrogen management and MOM at the CTIC "Conservation in Action" tour. Mike Plumer, Howard Brown and Jean Payne from IFCA also spoke at the CTIC event. Mike, who is also the CBMP Coordinator, has been extremely busy this summer teaching management of cover crops, and both Mike and Dan spent three hot days at the Farm Progress Show visiting with participants about CBMP, KIC, MOM and cover crops. We are all looking forward to harvest and what the 2013 crop will teach us with regard to nutrient management and corresponding yields. Economics are a key driver to the success of our program and we must show that nutrient management is a win for the pocket book and for the environment.