

April 13, 2017

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RE: January 18, 2017 Request for Comments on the Draft Report “First Triennial Assessment of Progress on Great Lakes Water Quality”

To Whom It May Concern,

The co-signers of this submission are pleased to have an opportunity to provide comments on the draft report “First Triennial Assessment of Progress on Great Lakes Water Quality.” The participating organizations and our members are working to advance development and implementation of new technologies and scientifically-based management practices for agricultural cropping systems to better meet social, environmental and economic goals.

Whether from organic or commercial sources, fertilizer nutrients are a key component of sustainable crop production systems. Fertilizer is a key ingredient in feeding a growing global population, which is expected to surpass 9.7 billion people by 2050. Half of all food produced around the world today is made possible through the use of fertilizer. As demand continues to grow, farmers around the world will continue to rely on fertilizer to increase production efficiency to produce more food while optimizing inputs. Fertilizers play an essential role in replenishing nutrients in the soil that are used by plants each growing season, raising soil productivity, and improving soil health; but incorrect nutrient use may lead to negative impacts on a grower’s return on investment and risks increased impacts on the environment.

We are committed to researching, designing and implementing 4R Nutrient Stewardship (utilizing the Right Nutrient Source at the Right Rate, at the Right Time, and in the Right Place) in coordination with supporting conservation practices. We support this effort through stakeholder engaged initiatives and research.

Comments

Collectively, we are concerned with the narrow view of the following two statements occurring in pages 44 through 46 of the report.

“Over the past ten to 15 years, governments at all levels have focused on incentive-based and voluntary programs to reduce nutrient loadings in the western basin of Lake Erie. These voluntary programs include funding and support for implementation of best management practices on agricultural lands, the leading source of bioavailable phosphorus in the western Lake Erie basin. But frequent HABs in the last ten years suggest that the voluntary programs are not sufficient in achieving target loadings set by the Parties in 2016.”

“CONCLUSIONS Excess phosphorus loadings to the western Lake Erie basin remain a critical problem. The Parties are meeting GLWQA deadlines for targets and domestic action plans, but a greater sense of urgency and inclusion of regulatory protections in domestic action plans are needed.”

Specifically, in agriculture, non-governmental voluntary efforts for nutrient stewardship to address water quality have increased significantly in the last five years, and they should be recognized for their contribution to addressing Lake Erie water quality. Efforts by industry in partnership with crop and conservation organizations are growing and leading to successful implementation of practices on the farm.

In March 2016, the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) released the Conservation Effects Assessment Project (CEAP) report, [Effects of Conservation Practice Adoption on Cultivated Cropland Acres in Western Lake Erie Basin, 2003-2006 and 2012](#). The report used survey points within the basin to assess conservation and nutrient management practice adoption on cropland acres and to model environmental outcomes. While the report provides details regarding both structural and cultural conservation practices, nutrient management, and specifically the 4Rs, are highlighted in chapter 2, pages 14-24 and point to increased adoption of the following practices.

- Between 2003-2006 and 2012, there was a marked increase in the adoption of application methods in which each nitrogen application is incorporated; acres of incorporation increased from 29 to 43 percent.
- More nitrogen was removed at harvest than was applied as fertilizer on 22 percent of the acres.
- In 2003-2006 and 2012, split nitrogen applications occurred on 51 and 63 percent of the acres, respectively.
- Between 2003-2006 and 2012, the use of a nitrogen inhibitor increased from 8 to 30 percent of acres.
- Between 2003-2006 and 2012, there was a marked increase in the adoption of application methods in which each phosphorus application is incorporated; acres with incorporation increased from 45 to 60 percent. Broadcast without incorporation fell from 55 to 40 percent.
- In 2003-2006 and 2012, 52 and 58 percent of acres received less phosphorus than was removed with harvest, respectively.
- GPS mapping of soil properties increased from use on 8 to 36 percent of cropland acres between 2003-2006 and 2012.
- The majority of cropland acres are managed with moderately high or high nutrient management levels for both nitrogen and phosphorus.

Partnering with Stratus Ag Research under a 4R Ontario Memorandum of Cooperation, Fertilizer Canada surveyed over 500 growers in Ontario to assess fertilizer practice adoption in 2016. The survey captured practices on just under 400,000 acres of corn and soybean crops. Just under half of the growers that participated were in the Western and Central Lake Erie basins.

- In the Western and Central Lake Erie Basins, growers are 4.6 percent more aware of 4R Nutrient Stewardship, and 5.1 percent more familiar with the 4Rs relative to growers in the rest of Ontario.

- Agri-retailers are the predominant source of information about the 4R program for growers in Ontario, particularly in the Western and Central Lake Erie basin, where 10 percent more growers ranked agri-retailers as their top resource for 4Rs.
- Forty-three and one-half percent of Ontario growers soil test for nitrogen every three years or more frequently, and just over 63 percent of Ontario growers soil test for phosphorus every three years or more frequently.
- The most common timing of phosphorus fertilizer is in the spring at planting.
- The most common placement of phosphorus fertilizer is broadcast followed by incorporation which was higher in the Western and Central Lake Erie Basin (43.7 percent crop acres) compared to the rest of Ontario (27.9 percent crop acres). Phosphorus fertilizer placement as side banding at planting or by the seed were the next two most common placement practices.
- Forty-three percent of corn growers applied manure to over 30 percent of corn acres; mostly in the fall or in the spring before planting. Only 10 percent of soybean growers applied manure to just 13 percent of soybean acres; mostly in the fall or in the spring before planting. The most common placement for manure (liquid and solid) is on surface and incorporated within one to two days.

With increased industry and stakeholder efforts to further advance 4R adoption since 2011, on-farm implementation continues to grow (see 4R Certification below). While 4R related programs and actions are based on best available science, it is important to recognize the complexities surrounding practice adoption impacts on dissolved phosphorus load reductions. **Given the complexities, we must look at practice-based metrics in conjunction with performance-based metrics when assessing results.**

The voluntary efforts described in these comments rely on the best available science, while recognizing the need to continually evolve based on new research and data. **A two pronged approach of leading voluntary efforts and funding supporting research allows for adaptive management and more direct stakeholder input into changes to program criteria.** Mandatory regulations risk undermining innovation, reduce the incentive to go beyond minimum requirements and are time consuming and difficult to update and modify.

The Science of Practice Change is Being Studied

Recent assessments point to the complexities of practice change, and evolving research suggests opportunities to create change. For example, an international team of research scientists led by Dr. Helen Jarvie¹ concluded that increases in dissolved phosphorus loading to the western basin of Lake Erie since 2002 could be attributed partly to water flow increases, partly to unintended consequences of conservation tillage practices intended to reduce loading of particulate forms of phosphorus, and partly to other factors not yet well understood. If specific tillage practices had been made mandatory, consequences could have been worse, and more difficult to change. Alternatively, voluntary programs that include an adaptive research component, measuring edge-of-field losses from actual farms where practices have been implemented, can quickly correct misperceptions regarding practice efficacy. For example, reported findings² from a multidisciplinary study supported by the fertilizer industry's 4R Research Fund point to "right place" application of phosphorus fertilizer as a practice with greater likelihood of reducing losses of dissolved phosphorus. This study is continuing to inform a wider range of practice criteria for the 4R Certification Program described below.

Voluntary Programs are Leading the Way

The fertilizer industry and conservation partners are working together to advance 4R Nutrient Stewardship (<http://www.nutrientstewardship.com/>) around Lake Erie. **In the last five years, 4R efforts in the United States and Canada have significantly increased; programs in place now were not a part of the solution a decade ago. Specifically, these efforts include significant research, education, outreach and advocacy all geared towards increasing adoption of nutrient stewardship on the farm. And, they are yielding results.** Below are descriptions of multiple voluntary initiatives focused on the Lake Erie region and their growing impact on fertilizer best management practice (BMP) adoption.

4R Certification Program The 4R Certification Program (<http://4rcertified.org/>) was initiated in the Western Lake Erie Basin (WLEB) watershed (encompassing portions of Ohio, Michigan and Indiana) in March 2014, and it has since expanded to the whole state of Ohio and is being adapted for the province of Ontario, Canada. The program certifies agronomic service providers (including fertilizer retail locations and independent crop advisors) based on third-party audit procedures, verifying program requirements including employee education, customer education and 4R practice recommendations and adoption by their farmer customers. The effort was initiated in partnership with the fertilizer industry, grower organizations, state and federal agencies, and conservation groups. Operating with stakeholder committee guidance, the program is led by local fertilizer industry organizations.

Within three years, the WLEB and Ohio program have resulted in 39 agronomic service providers earning certification who provide services to 5,200 grower customers, covering approximately 2.8 million acres which is equivalent to 37 percent of the WLEB cropped acres.

In Ontario, collaboration is underway with the Nutrient Stewardship Council, Ohio Agri-Business Association and The Fertilizer Institute in the U.S. to ensure alignment between cross-border efforts to implement 4R Nutrient Stewardship and reduce nutrient losses.

Formalized in 2015, Fertilizer Canada signed a 4R Memorandum of Cooperation (MOC) with the Ontario Ministry of Agriculture, Food and Rural Affairs and the Ontario Agri Business Association (OABA). Additional collaboration under this agreement includes the Ministry of Environment and Climate Change; Grain Farmers of Ontario; the Ontario Federation of Agriculture; the Christian Farmers Federation of Ontario; Conservation Ontario; The Nature Conservancy – OHIO; the International Plant Nutrition Institute; the Ontario Certified Crop Advisor Board and Ontario agri-retailers. In 2016, the 4R Ontario Agri-Retail Certification Pilot project was launched under this agreement to evaluate the validity, suitability and accountability of the 4R Certification model for implementation in the Ontario marketplace. In year one, four Ontario agri-retail locations in the Western Basin of Lake Erie volunteered to participate in the audit program. Audits were conducted by the lead auditor from the US based program in the fall of 2016. Ontario agri-retailers will be implementing the 4R Certification program province-wide December 2017, allowing Fertilizer Canada to count the acres under 4R Nutrient Stewardship and demonstrate the tangible commitment being made by Ontario's agricultural industry.

Certified Crop Advisor 4R Nutrient Management Specialty Certification In September 2014, the North American Certified Crop Adviser board unanimously approved a plan to develop a specialty certification for Certified Crop Advisers (CCAs) who wanted and needed to demonstrate a higher level of expertise in the area of nutrient management. This specialty certification utilizes the 4Rs as the foundation for nutrient management and protecting soil and water. Individuals who have attained certification as a

CCA 4R Nutrient Management Specialist have taken special training and passed an additional exam to ensure they are promoting practices that optimize nutrient use by the plant and minimize loss to the environment. To become certified, crop advisers are taking a significant step to demonstrate their competency in specialized nutrient, soil and water management and will share this knowledge with their farmer clientele and other stakeholders. Currently the specialty certification is offered in multiple states and providences along Lake Erie, including Indiana, Michigan, Ohio and Ontario. Fertilizer Canada collaborated with the Ontario CCA Board on development of a 4R Nutrient Management Specialty Certification Exam and Resource Study Guide in Ontario. There are now over 200 CCAs certified in North America on 4R Nutrient Management.

4R Research In 2013, fertilizer industry members in the U.S. and Canada initiated an effort committing funds to the 4R Research Fund in support of efforts to understand the impacts of fertilizer BMPs collectively known as 4R Nutrient Stewardship. Specifically, the funds are used to inform knowledge gaps related to quantifying the role fertilizer BMPs have on water and air quality, climate change, soil health, nutrient cycling and productivity.

In Ontario, research efforts have been endorsed by the Government of Canada, who invested \$1.1-million matched by industry to further quantify the outcomes of 4R Nutrient Stewardship application. Under this project, nine leading Canadian researchers are conducting 10 projects to quantify economic, social and environmental benefits resulting from 4R Nutrient Stewardship. We expect additional economic and environmental outcomes such as reductions in greenhouse gas emissions, nitrogen losses to the atmosphere and groundwater, phosphorus losses to surface waters and improved productivity, efficiency and profitability of production. Ontario is home to three of the Canadian 4R Researchers, providing leading research on the environmental, economic, and social benefits of 4R Nutrient Stewardship for optimal nutrient management of major Ontario crops.

In the United States, the research funds have awarded \$2.8 million for projects that have been matched by \$2.1M in government and stakeholder funds. One of the supported projects is based in Ohio and is evaluating 4R Nutrient Stewardship practices and effects of 4R Certification Program implementation. Results from the study will be used to inform practice selection to reduce nutrient loss by crop advisors and their grower costumers.

Additional Efforts Signees to these comments are engaged with a number of stakeholder partners to develop a wide range of national and regional 4R-based programs which further expand voluntary efforts with agribusiness, farmers and homeowners.

- The Michigan Agri-Business Association has initiated the Michigan Certified Fertilizer Application program, voluntary effort providing training and certification for custom fertilizer applicators in the implementation of nutrient management practices, equipment safety and operation, and application technology. Certification is based on annual accumulation of credits obtained from training and educational sessions provided by MABA and individual companies. In 2016, the program's first year, 450 applicators in the state accumulated credits, representing 38 individual agribusinesses and 45 large farms. 270 applicators achieved full accreditation in the program. Already in 2017, more than 430 applicators have attended training events, with over 265 achieving full accreditation.

- The Ontario Government has embraced 4R Nutrient Stewardship as an important tool to meet agricultural and environmental goals, referenced in government publications such as *A Phosphorus Primer* and *Soil Fertility Handbook (OMAFRA Publication 611)*.
- The US government has embraced 4R Nutrient Stewardship as an important tool to meet agricultural and environmental resource goals, as referenced in the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) 590 practice standard for nutrient management.
- Implementation of 21 4R Demonstration farms in Canada since 2015 mobilizing knowledge on the 4R program with government, agri-retailers, growers, conservation authorities and soil science researchers.
- In 2016, over 115 Ontario growers, representing over 113,000 acres of cropland, were reached through 4R Nutrient Stewardship workshops. An online 4R Nutrient Stewardship Ontario course is in development to provide training on how the 4R framework fits into the Ontario geography, cropping systems and regulatory environment.
- Through The Fertilizer Institute's 4R Advocate Program, we have identified 30 pairs of growers and crop advisors who have worked collectively to implement 4R practices on 144,425 acres in 17 states.
- Fertilizer Canada's Greener World program teaches home gardeners how best to fertilize lawns and gardens using the 4R principles. Healthy grass makes several important contributions to the environment. It reduces pollution, absorbs the greenhouse gas carbon dioxide and supplies oxygen. Lawns also clean water through filtration, reduce soil erosion and reduce water run-off. Phosphorus specifically, is important for establishing new lawns because it promotes the development of strong, healthy roots, vibrant flowers, seeds, early maturity, and a normal healthy green color. Within Canada, Fertilizer Canada members have kept phosphorus in its starter-fertilizer products for new lawns, but have voluntarily eliminated phosphorus from mature lawn fertilizer products.

We appreciate the opportunity to provide comments on the draft version of this report. Our primary view is that in agriculture, non-governmental voluntary efforts for nutrient stewardship to address water quality have increased significantly in the last five years, and they should be recognized for their contribution to addressing Lake Erie water quality. Further, a two pronged approach of leading voluntary efforts and funding supporting research will allow for adaptive management and more direct stakeholder input into changes to program criteria. If you have questions or comments regarding the items expressed above, please contact Lara Moody, Senior Director of Stewardship and Sustainability at The Fertilizer Institute (lmoody@tfi.org, 202-515-2721).

Agribusiness Council of Indiana
Fertilizer Canada
International Plant Nutrition Institute

Michigan Agribusiness Association
Ohio Agribusiness Association
The Fertilizer Institute

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