



**FERTILIZER CANADA**  
**FERTILISANTS CANADA**

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May 24, 2017

Ms. Madhu Malhotra, Manager  
Ministry of the Environment and Climate Change  
Climate Change and Environmental Policy Division  
Land and Water Policy Branch  
40 St. Clair Avenue West, Floor 10  
Toronto, Ontario  
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**RE: Request for Comments on the Canada-Ontario Draft Action Plan “Partnering in Phosphorus Control: Achieving Phosphorus Reductions in Lake Erie from Canadian Sources.”**

Dear Ms. Malhotra;

The co-signers of this submission are pleased to have an opportunity to provide comments on the Canada-Ontario Draft Action Plan “Partnering in Phosphorus Control: Achieving Phosphorus Reductions in Lake Erie from Canadian Sources.” 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 (Right Source @ Right Rate, Right Time, Right Place®) in coordination with conservation practices. We support this effort through stakeholder engaged initiatives, education and research.

Efforts by industry in partnership with crop and conservation organizations are growing and leading to successful implementation of practices on the farm. 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. The government has a unique opportunity to take advantage of the progress made by this collaboration, and to develop a plan that balances environmental and economic performance.



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 selection of Best Management Practices (BMPs) varies by location, and those chosen for a given farm are dependent on local soil and climatic conditions, crop, management conditions and other site-specific factors. A process that allows for flexibility to achieve the desired outcome is necessary.

Additionally, it is important to recognize 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 at this time risks undermining innovation, reduces the incentive to go beyond minimum requirements and is 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 Jarvie<sup>1</sup> 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 findings<sup>2</sup> 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 around Lake Erie. **In the last five years, 4R efforts in have significantly increased; programs in place now were not a part of the solution a decade ago. Specifically, these efforts include substantial 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 BMP adoption.

**4R Certification Program** 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 under a 4R Certification Program. The program certifies agronomic service providers (including fertilizer retail locations and independent crop advisors) based on third-



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party audit procedures, verifying program requirements including employee education, customer education and 4R practice recommendations and adoption by their farmer customers.

In 2016, the 4R Ontario Agri-Retail Certification Pilot project was launched 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 U.S. 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. Fertilizer Canada collaborated with the Ontario CCA Board on development of a 4R Nutrient Management Specialty Certification Exam and Resource Study Guide in Ontario. 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. Those with the 4R Nutrient Management Specialty Certification must complete a minimum of 7.5 Continuing Education Units in the areas of nutrient management and Soil and Water Management in each two-year cycle. Currently, the specialty certification is also offered in multiple states along Lake Erie including Indiana, Michigan, and Ohio. There are now almost 200 CCAs certified in North America on 4R Nutrient Management – 89 of which are based in Ontario.

**Surveying** Partnering with Stratus Ag Research under the 4R Ontario MOC, Fertilizer Canada surveyed over 500 growers in Ontario to assess fertilizer practice adoption in 2016. Financial support for ongoing surveying, assessment and reporting to achieve greater adoption of 4R practices will be necessary to continue the momentum achieved to date and demonstrates a positive partnership with the farm community to achieve results.

The survey captured baseline fertilizer and manure use practices on over 5 per cent of the total acres of corn and soybean crops in Ontario. Just under half of the growers that participated were in the Western and Central Lake Erie basins. The 4R principles outlined below, such as subsurface application practices, optimizes the crop nutrient uptake and reduces risks of nutrient losses through runoff.

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



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

**4R Research** Over the last seven years industry, government, academia and NGOs have invested a total of \$5.63 million in support of research to demonstrate how 4R Nutrient Stewardship plays a critical role in reducing environmental impacts from the application of fertilizer. In 2013, fertilizer industry members in Canada and the U.S. initiated an effort committing funds to the 4R Research Fund in support of efforts to understand the impacts of fertilizer BMPs. 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.

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.

**Environmental Farm Planning** In 2016, the inaugural National Environmental Farm Plan Summit came to order in an effort to take all provincial environmental farm plans (EFPs) and form the framework for a Canadian-wide approach to the EFP. As an outcome of this summit, the parties agreed that 4R Nutrient Stewardship could become integrated as the recognized sustainable approach to the nutrient management component of the EFP, thereby supporting environmental sustainability of Canadian farmers. With some provinces such as Saskatchewan already recognizing the 4Rs in the language of the province's EFP workbook, this initiative is already in motion. A pilot program on the Alberta EFP is in development to set the stage for national implementation of 4R Nutrient Stewardship and how that translates to the EFP in terms of fulfilling its requirements for environmental sustainability.



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Given the awareness, uptake and traceability of the EFP by Canadian farmers, Fertilizer Canada is undertaking this effort which strategically supports the Stewardship Vision 2020 goal of 20 Million acres measured and recognized under 4R Nutrient Stewardship.

**Lawn and Garden** 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. While the Greener World program teaches the importance of how to best use and apply fertilizer safely to maintain a healthy lawn, it is that healthy lawn which becomes one of the most effective tools in minimizing potential for urban runoff. 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. The vast majority of lawn fertilizer sales for these companies are for mature lawns, which do not contain phosphorous.

**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 and farmers.

- 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)*.
- 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.
- 4R Nutrient Stewardship has been endorsed by the International Joint Commission (IJC). In the both 2014 report on the Lake Erie ecosystem, *A Balanced Diet for Lake Erie: Reducing Phosphorus Loadings and Harmful Algal Blooms* and the 2016 Progress Report of the Parties, 4R Nutrient Stewardship was identified for accelerated implementation:

*“The 4R program – the right fertilizer source, right rate, right time and right place – provides a useful framework for guiding fertilizer application in the Lake Erie Basin and beyond. The 4Rs can be effective in reducing nutrient export from fields, while meeting plant nutrition needs and therefore maximizing crop yields.”*



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## Recommendations

- Recognize the voluntary actions undertaken by the fertilizer industry, farmers and stakeholders through the 4R Nutrient Stewardship program, and formally adopt 4R Nutrient Stewardship as the recommended approach to nutrient management in the Canada-Ontario Action Plan for Lake Erie;
- We recommend that the 4R Nutrient Stewardship ‘Right Time’ terminology is adopted in the Canada-Ontario Action Plan for Lake Erie if winter spreading restrictions are introduced into legislation or recommendations;
- Continued government support and recognition of the research accomplishments of the Canadian 4R Research Network is essential, providing the necessary of knowledge of soil fertility and nutrient management through 4R Nutrient Stewardship to inform best management practices and recommendations for Ontario;
- Clarify wording to change from “Reducing Phosphorus to Minimize Algal Blooms in Lake Erie” to “Reducing Phosphorus Loading to Minimize Algal Blooms in Lake Erie”; and
- Ensure adequate consultation and consideration is given in the development of a Canada-Ontario Action Plan for Lake Erie, to ensure alignment with 4R Nutrient Stewardship programming.

We appreciate the opportunity to provide comments. 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. 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 the action plan. If you have questions or comments regarding the items expressed above, please contact Cassandra Cotton, Director of Sustainability at Fertilizer Canada ([ccotton@fertilizercanada.ca](mailto:ccotton@fertilizercanada.ca), 613-762-8178).

**Fertilizer Canada**  
**Ontario Agri Business Association**  
**Grain Farmers of Ontario**  
**Ontario Federation of Agriculture**  
**Christian Farmers Federation of Ontario**  
**The Nature Conservancy – OHIO**

## References

1. Jarvie, Helen P, LT Johnson, AN Sharpley, DR Smith, DB Baker, TW Bruulsema, R Confesor. 2016. Increased Soluble Phosphorus Loads to Lake Erie: Unintended Consequences of Conservation Practices? Journal of Environmental Quality doi:10.2134/jeq2016.07.0248
2. Williams, M.R., K.W. King, W.I. Ford, A.R. Buda, and C.D. Kennedy. 2016. Effect of tillage on macropore flow and phosphorus transport to tile drains. Water Resources Research 52: 2868-2882.