FERTILIZER CANADA
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Re: Response to the consultation on the priorities and work of the Food and Agriculture Organization of the United Nations.

On behalf of Fertilizer Canada and our members, thank you for the opportunity to provide feedback on the priorities and work of the Food and Agriculture Organization of the United Nations (FAO). Fertilizer Canada is an industry association which represents manufacturers, wholesale and retail distributors of nitrogen, phosphate, potash and sulphur fertilizers.

Working in close collaboration with the International Fertilizer Association, the International Plant Nutrition Institute, regional fertilizer associations, fertilizer companies, agri-business, development agencies, government agencies, environmental groups and farm organizations, the global fertilizer industry is helping to shape agricultural advancement by improving the way farmers deliver essential nutrients to crops.

Fertilizer Canada is supportive of the outcomes of the 2017 Climate Change Conference (COP21) held in Paris. Achieving these goals will require all to contribute towards both mitigation and adoption of new practices. Sustainable agriculture underpins development, health, and growth across economies. Agriculture needs to be included in efforts to limit and reduce the negative impacts of climate change. Innovations in practices and technologies can help achieve those objectives without compromising productivity and food security, making agriculture more sustainable, more productive, and more resilient.

Feeding the world with climate-smart agriculture, as defined by the FAO, is a priority for Fertilizer Canada. Global crop production must increase by 70 per cent to feed nine billion people by 2050. This must be accomplished in the context of a shrinking availability of arable land. As noted by the FAO, the average amount of cropland and pasture per capita has decreased from 0.4 and 0.8 hectares respectively in the 1970s to 0.2 and 0.5 hectares by the 2000s. (FAOSTAT, 2013) Climate change makes this challenge all the more significant, as it threatens productivity and livelihoods and forces quicker adaptation in farming systems. Meeting the demand for nutritious food will require the efficient use of valuable resources.

Reducing Environmental Impacts
Identifying technologies and practices that can make fertilizer use more efficient can help significantly reduce emissions of nitrous oxide and unwanted nutrient loading in in lakes and rivers. It can also help farmers grow more food by improving applications so crops benefit most from the fertilizer, while improving farmers' income through more effective spending on inputs and reducing waste. Responsible use of fertilizer plays a significant role in sustainable agricultural intensification. Fertilizer Canada, in collaboration with the International Plant Nutrition Institute (IPNI), The Fertilizer Institute, the International Fertilizer Industry Association (IFA), and other partners, developed a framework that enables better use of fertilizer: 4R Nutrient Stewardship (Right Source @ Right Rate, Right Time, Right Place ®).

4R Nutrient Stewardship Framework
4R Nutrient Stewardship is a science-based framework that promotes economic, social, and environmental sustainability on the farm by considering collectively the source, rate, time, and place practices for fertilizer and other crop nutrients. 4R Nutrient Stewardship is based on four key principles:

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- The **Right Source** means ensuring a balanced supply of essential plant nutrients including granular or liquid fertilizers or manures.
- The **Right Rate** is applying just enough fertilizer to meet the needs of the plant while accounting for nutrients already in the soil.
- The **Right Time** means applying fertilizer when the plant will get the most benefit and avoiding times when fertilizer can be lost to the environment.
- The **Right Place** is applying fertilizer where the plants can easily access the fertilizer and where it is less likely to be lost to the water or air.

4R Nutrient Stewardship requires the implementation of site-specific BMPs that optimize the efficiency of fertilizer use. The goal of fertilizer BMPs is to match nutrient supply with crop requirements and to minimize nutrient losses from fields. Selection of BMPs varies by location, depending on local soil and climatic conditions, crop, management conditions, and other site-specific factors.

Canadian farms which are currently implementing 4R Nutrient Stewardship demonstrate improved fertilizer efficiency while increasing the quantity produced per acre for each unit of nutrient applied, without sacrificing yield potential. Using 4R Nutrient Stewardship can substantially reduce the nitrous oxide emissions per unit of crop produced by 15 to 25 per cent and in some cases by up to half. To do this, the world-leading Nitrous Oxide Emissions Reduction Protocol (NERP) was developed which employs the 4R principles and generates saleable offsets for farmers. NERP was developed in Canada and coupled with government support and broader adoption, will make the country a leader in climate-smart agriculture.

In addition to reducing greenhouse gas emissions, broad-scale implementation of NERP could:

- Increase food security and prosperity for the country
- Deploy precision farming in the agricultural supply chain by employing variable rate nitrogen fertilizer application, along with other inputs
- Improve soil health and water quality through the application of regionally-specific BMPs
- Provide domestic emission reductions, contributing to Canada's Paris commitment as identified in the Pan Canadian Framework on Clean Growth and Climate Change (PCF)

4R Nutrient Stewardship and NERP are applicable globally

The principles that underpin 4R Nutrient Stewardship can be applied in any geography and farming system. While the NERP protocol was developed initially for Canada, it uses a modification of Canada's internationally accepted and peer reviewed Tier II inventory method to estimate nitrous oxide emissions at the farm level. NERP can also easily be adapted to temperate region cropping systems outside Canada (for example the United States, Europe, and the Russian Federation) using Tier I or localized Tier II emission factors. In other regions, the protocol could be adapted to match the reporting systems and the crop systems of different countries.

Identifying technologies and practices, such as 4R Nutrient Stewardship and the NERP, that can make fertilizer use more efficient, is critical to ensuring all countries control and adapt to climate change and move to a more economically and environmentally sustainable agriculture system.

No one organization can do this alone. This is why partnerships between governments, international organizations, foundations, not-for-profits, and the private sector will be critical to meeting the Sustainable Development Goals set by the United Nations. Recently, the NERP and 4R Nutrient Stewardship were recognized in the SDG Industry Matrix, published by the UN Global Compact, as an example solution to Climate Change and a global good practice.

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Leveraging the expertise of partners will make greater strides in ensuring social, economic and environmental goals are met in developing countries.

A shared-value partnership

Fertilizer Canada and the Co-operative Development Foundation of Canada (CDF) have formed an innovative partnership and currently have a project proposal under consideration with Global Affairs Canada. The Canadian Climate Smart Fertilizer Solutions (4R Solution) project aims to improve agricultural productivity and sustainability for smallholder farmers in Ghana, Ethiopia and Senegal over the next five years. The collaboration focuses on knowledge sharing and training in best practices in fertilizer management using 4R Nutrient Stewardship principles for smallholder farmers. The training is delivered through an extension services network and in each country will also involve governments, agricultural input companies, research institutions, and small farmers organized in co-operatives. The objective is to enable smallholder farmers, working through their own co-operatives, to grow more nutritious, and marketable crops, benefiting from better agricultural practices.

Half a billion people live on small farms, most of which are in Sub-Saharan Africa. These small farms, of which the majority are managed by women, produce 80 per cent of food in developing countries, employ 62 per cent of the population, and generate 27 per cent of GDP. Three key issues faced by smallholder farmers are: (1) The limited quality of their production, resulting from depleted soils, unsustainable agricultural practices, especially fertilizer usage; (2) Poor post-harvest handling and; (3) Limited access to markets. These challenges are even more intense for women farmers who are further constrained by limited and unreliable access to land, labour, financial services and training opportunities. Addressing these issues will help increase resilience, incomes, and food security, and reduce poverty for men, women and children.

Because of cultural attitudes, discrimination, and a lack of recognition of their role in food production, women experience barriers to accessing inputs and technologies, and have limited or no access to extension services and training on new technologies (FarmingFirst). Female farmers receive only 5% of all agricultural extension services, only 15% of the world's extension agents are women, and only 10% of total aid for agriculture, forestry, and fishing goes to women (FarmingFirst).

Evidence from previous programs led by our project partner, indicates that direct engagement with women farmers is key to increased sustainable agricultural production and improved farm management, thus attention is paid to underlying gender issues such as access to credit, technical extension training, inputs, and decision-making agency. Designed in consultation with women smallholders and their representative (co-op) organizations, this project includes many initiatives that improve their access and agency:

(1) 4R training will include women farmers and extension agents, while specific trainings that target women's interests will be conducted (i.e. demo plots will be on women's farms and will feature traditional "women's crops" where applicable).

(2) The project will improve the production and post-production capacity of agricultural enterprises to better address the needs and interests of women smallholders. Assessments will identify gaps in business plans, training programs, and equipment and infrastructure with respect to women's equal participation and access. Gender strategies will be developed to improve gender equality within these enterprises.

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(3) The project will integrate a gender-sensitive approach in visibility activities, stakeholder meetings, communications products, 4R tools, and project publications, especially those involving government. Case studies and study tours will include a focus on women smallholders and project advisory committees for each country will be gender inclusive.

(4) Gender Model Families improve labour distribution / decision making authority within the home.

(5) Women will be encouraged and promoted into leadership positions in their co-operatives and be included in advocacy work with local, regional, national and international agencies.

The Government of Canada has a unique opportunity to capitalize on advancements made by the global fertilizer industry, and develop policies, goals and indicators that balance environmental and economic performance. The Government of Canada should consider the following when identifying the priorities and work of the FAO:

- Support Fertilizer Canada and the CDF's project entitled *Canadian Climate Smart Fertilizer Solutions (4R Solution)*, a project that promotes sustainable agricultural development of smallholder farmers through improved farm productivity and profitability;
- Adoption of science-based decision-making on matters affecting agricultural productivity and food security;
- Adoption and promotion of the 4R Nutrient Stewardship program as a solution to help increase agricultural productivity and protect water quality in developing countries;
- Recognition of the actions undertaken by the global fertilizer industry to promote the principles of 4R Nutrient Stewardship as a means to end hunger, achieve food security and improved nutrition, and promote sustainable agriculture;
- Support and promote the Nitrous Oxide Emission Reduction Protocol (NERP) as a solution to help integrate climate change measures into national policies, strategies and planning;
- Promote public-private partnerships to expand international trade opportunities and capitalize on the expertise to bring innovation and new technologies to developing countries; and
- Support partnerships which have demonstrated potential to improve the lives of members, in particular women, by providing an income resulting in self-reliance and improved self-confidence.

Fertilizer Canada stands ready to work with the Government of Canada and we welcome the opportunity to further discuss how our industry's leadership can be part of the solution.

Regards,

Clyde Graham
Senior Vice President