



Smart agriculture:

Helping smallholder farmers feed the world

by Garth Whyte, **President & CEO, Fertilizer Canada**

By 2050, farmers around the globe will be tasked with feeding 9.7 billion people – a challenge requiring a 70% increase in crop production. The mission of today is to develop a plan to meet this need in a way that is sustainable and climate-smart, which can only be done by increasing the productivity of farmland in a manner that is environmentally responsible.

There are half a billion people living on small farms around the world, mostly in sub-Saharan Africa and Southeast Asia. These small farms produce 80% of the food in developing countries, employ 62% of their populations and generate 27% of their annual GDP.

Fertilizer Canada believes these smallholder farmers have the potential to play a key role in the mission of feeding the world. By implementing the latest in sustainable agriculture practices, these farmers can boost crop yields and profitability – contributing more agri-food products to the global market.

Through a Memorandum of Understanding with the Canadian Co-operative Association (CCA), Fertilizer Canada has committed to increasing food security for smallholder farmers in developing countries. Pending federal government approval, our proposed collaboration, the 4R Solution project, will promote 4R Nutrient Stewardship (right source at right rate, right time and right Place) in five developing countries, including: Colombia, Ethiopia, Ghana, Senegal and one in Southeast Asia.

The proposal focuses on educating smallholder farmers on the most efficient and climate-smart uses of fertilizer products on-farm and also on gaining increased integration of these best management practices (BMPs) into official agricultural policies and programs. The project aims to improve farm productivity and the profitability of 120,000 smallholder farmers, 40% of whom are women.

The 4R Solution

The 4R Solution tackles two common challenges for smallholder farmers in these five developing countries: low agricultural productivity and limited agricultural extension capacity.

Addressing these issues will help increase resilience, incomes and food security while reducing poverty for men, women and children. By utilizing nutrient management practices like 4R Nutrient Stewardship, smallholder farmers working through their own co-operatives will be able to grow more nutritious and marketable crops while at the same time limiting the environmental impacts of their farms.

Individually, farmers will benefit from boosted crop yields and access to markets while co-operatives will increase their business, production and handling capacity.

The 4R Solution is built upon two mutually reinforcing pillars: the improved

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“Africa’s smallholders are more than capable of feeding the continent – so long as they boost crop yields by using the latest agronomic practices in combination with appropriately adapted seeds and fertilizer.”

Kofi Annan, former United Nations Secretary-General.

The four key principles of 4R Nutrient Stewardship:

- Use the Right Source of fertilizers that are in – or are easily converted to – compounds best used by the target crop.
- Apply the Right Rate of fertilizer to match nutrient supply with crop requirements.
- Apply fertilizer at the Right Time so nutrients will be available when crop demand is high.
- Apply or maintain fertilizer in the Right Place where the crop can access the nutrients most effectively.

use by smallholder farmers of sustainable agricultural practices with a focus on nutrient management and support from the integration of these BMPs into official agricultural policies and programs.

In North America, research shows emphasis on appropriate fertilizer application ensures soils are optimized for crop growth, thus improving agricultural productivity. 4R Nutrient Stewardship, with its globally universal yet locally adaptable framework, is not limited by environmental conditions – making it the ideal program to be applied to smallholder farms in developing countries to significantly change and improve growing conditions.

By the end of this proposed project, it is anticipated that co-operative and smallholder farmer-owned enterprises will increase the productivity and profitability of targeted cash and food crops to the benefit of their own country’s economy and the global agricultural industry.

Working together

The 4R Solution is an innovative private-public sector partnership that will leverage Canadian expertise in co-operative enterprise development

through the Canadian Co-operative Association, with the technical capabilities of Canada’s world-class fertilizer industry through Fertilizer Canada and the International Plant Nutrition Institute (IPNI).

To implement the project, Fertilizer Canada and the Canadian Co-operative Association will work closely with governments, companies, research institutions and smallholder farmers organized into co-operatives.

Direct support from these partners to farmers and their enterprises’ needs will be complemented by efforts to integrate 4R Nutrient Stewardship into official policy and practice, by drawing where possible on lessons and evidence of results on farm. These results will be garnered in part by a methodology of lead farmers and demonstration plots, where participants in the 4R Solution project will observe the results of correct and incorrect use of fertilizer products and other progressive agricultural practices on targeted crops.

These new partnerships will benefit smallholder farmers in developing countries and also support the achievement of key United Nations Sustainable Development Goals.

The 4R Solution proposal will also contribute to all six pillars of Canada’s international assistance policy. In addition to placing special emphasis on improving women’s access to financial resources and agriculture technologies and programming to address

literacy, gender-based violence and masculinities, the project also combines 4R Nutrient Stewardship to improve yields with conservation agriculture to improve climate change adaptation and reduce land degradation.

Globally sustainable agriculture

The intent of the proposed 4R Solution project is to ensure increased crop production in developing countries is sustainable, climate-smart and translates to the improved livelihoods of their citizens, rather than simply generating a larger supply of crops that could lead to lower prices at the farm gate.

Ultimately, Fertilizer Canada believes that by working together, measurable economic, societal and environmental benefits can be achieved for smallholder farmers in developing countries around the world.

By implementing nutrient management practices like 4R Nutrient Stewardship on existing farmland and gaining access to international markets, smallholder farmers can contribute to the global supply of food for the growing population.

Through the 4R Solution project, this mutually beneficial partnership could have the potential to utilize existing farmland while minimizing unwanted environmental impacts – feeding the world in a truly sustainable way. ■

Fertilizer Canada represents manufacturers, wholesale and retail distributors of nitrogen, phosphate, potash and sulphur fertilizers. The fertilizer industry plays an essential role in Canada’s economy, contributing over USD12 billion annually and 12,000 jobs. The association is committed to supporting the fertilizer industry with innovative research and programming, while advocating sustainability, stewardship, safety and security through standards and Codes of Practice. As the foundation of Canada’s agri-food sector, Fertilizer Canada continues to make changes that positively impact the environment, the economy and the social fabrics of Canadian life.