



FERTILIZER CANADA
FERTILISANTS CANADA



Association professionnelle
en nutrition des cultures
Professional Association
in Crop Nutrition

MEMORANDUM OF COOPERATION 4R NUTRIENT STEWARDSHIP PROGRAM

THIS MEMORANDUM OF COOPERATION made this 22nd day of **August**, 2018.

BETWEEN : **FERTILIZER CANADA** a non-profit corporation incorporated under Part II of the *Canadian Corporations Act*, having its head office located at Ottawa, Ontario.

(hereinafter referred to as "FERTILIZER CANADA")

AND : **PROFESSIONAL ASSOCIATION IN CROP NUTRITION** a non-profit corporation incorporated under Part Three of *The Business Corporations Act*, having its head office located at Sainte-Hyacinthe, Québec.

(hereinafter referred to as "PACN")



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1. PURPOSE

The purpose of this Memorandum of Cooperation (the “MOC”) is to outline areas of collaboration between FERTILIZER CANADA, and PACN, (the “Parties”) in regards to:

- a. The implementation of FERTILIZER CANADA's voluntary nutrient stewardship initiative in Québec, known as *4R Nutrient Stewardship - Right Source @ Right Rate, Right Time, Right Place®* program (the “Program”), in support of promoting the sustainability of Québec's agricultural resources; and
- b. Adapting the Program's best management practices to Québec's agricultural production systems and unique regional climatic, soil, and operational conditions to ensure that it is effective.

2. OBJECTIVES

- a. To improve nutrient management and the protection and conservation of Québec's agricultural soils through the implementation of the Program, as described in Schedule 1 of this MOC.
- b. To establish mechanisms to assist in the pursuit of common objectives related to the implementation of the Program that reflects the priorities of the Parties with respect to soil health and nutrient management.

3. PRINCIPLES

- a. The Parties acknowledge that healthy soils are essential to economic and environmental sustainability and that the proper application of nutrients is important to soil health and crop nutrition; however, the application of nutrients in excess of crop requirements is not desirable.
- b. The Parties recognize that voluntary nutrient management programs based on sound science, expert advice and public education are one component of a comprehensive approach towards a solution to reducing negative environmental impacts including nutrient loading to Québec's waterways.
- c. The Parties recognize that crop nutrient best management practices (“BMPs”) must be science-based and that a variety of BMPs may be required to deliver the right nutrient source at the right rate, time and place.



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- d. The Parties recognize the important role of trained and qualified professionals in the development and implementation of sustainable nutrient stewardship programs for Québec farmers.
- e. The Parties understand the value of measurement to monitor progress and ensure continuous improvement and recognize that measures must be reflective of the long-term economic, social, and environmental impact of crop nutrient BMPs adopted by Québec farmers.
- f. The Parties understand that nutrient stewardship planning for crop production is an essential component of agro-environmental fertilization planning.
- g. The Parties recognize that other steps may also be needed to achieve sustainable soil health and crop nutrition.

4. COMMITMENTS OF THE PARTIES

Commitments of all Parties

(1) The Parties make the following commitments:

- a. The Parties are committed to achieving sustainability in partnership with the agricultural sector.
- b. The Parties are committed to continuing to strengthen environmental stewardship by helping farmers to adopt science-based BMPs.
- c. All Parties agree to work in collaboration to promote the adoption of voluntary nutrient management plans based on the principles of the Program, where possible.
- d. The Parties are committed to promoting the measurement of the impacts of these efforts on the economy, environment and society.
- e. The Parties will make in-kind contributions toward this effort as detailed in Schedule 2 to this MOC.
- f. All Parties agree to work in collaboration with producers, recognized and qualified specialists conservation authorities and government specialists towards the adoption of a sustainable 4R Nutrient Stewardship Program.
- g. The Parties will work with stakeholders to establish appropriate metrics for the adoption of the 4R Nutrient Stewardship Program.



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- h. The Parties will work towards developing effective on-going and long-term monitoring of the effectiveness of the 4R Nutrient Stewardship Program; and
- i. All Parties agree to support the development and implementation of a 4R Nutrient Stewardship Designation Program in Québec.
- j. All Parties agree to support the development of a 4R Specialty accreditation for qualified specialists in Québec.

(2) Each Party shall determine the nature and extent of each commitment it has made under subsection (1).

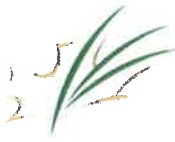
Commitments:

- a. FERTILIZER CANADA and PACN will develop a system to identify areas of cropland being managed under the 4R Nutrient Stewardship Program towards demonstrating the tangible commitment being made by the agricultural industry to environmental sustainability.
- b. FERTILIZER CANADA and PACN will provide financial support to enable pursuit of this MOC's objectives as set out in Schedule 2 to this MOC.

5. IMPLEMENTATION OF MOC

The Parties will jointly establish a 4R Nutrient Stewardship Advisory Committee (the "Committee"). The Committee will be comprised of up to three members from each of the Parties and other members as mutually agreed to by all the Parties. The chair of the Committee and its members will be mutually agreed on by the Parties. Work under the Committee may include, but is not limited to:

- Providing and reporting on 4R Nutrient Stewardship training for recognized and qualified specialists;
- Supporting recognized and qualified specialists in providing 4R Nutrient Stewardship planning services to Québec's farmers, including training and workshops;
- Develop web-based training materials for farmers on the eLearning website to increase farmer adoption of BMPs within the performance areas of the 4Rs;



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- Support the development and implementation of 4R designation in Québec, with the support of 4R trained specialists to help farmers complete 4R Nutrient Stewardship Management Plans and provide 4R consistent agronomic advice.
- The Parties agree that the Committee cannot bind the Parties.

6. TERM OF MOC

The term of this MOC shall commence on the **22nd** day of **August, 2018**, and end on the **31st** day of **December, 2021**.

7. MEASURES AND OBLIGATIONS

Nothing in the MOC creates any funding obligations for any of the Parties.

The activities carried out under this MOC must be consistent with the 4R Nutrient Stewardship principles, and must not conflict with any requirements established through regulation under the *Agricultural Operations Regulation - Environment Quality Act, 2002* or any other statutory authority.

Nothing in the MOC precludes any of the Parties from exercising any authority or complying with any obligations prescribed under the laws of Québec or Canada.

8. AMENDMENTS

The MOC may be amended in writing with the consent of all Parties.

9. TERMINATION

Any of the Parties can terminate participation in the MOC by providing not less than thirty days written notice to each of the other signatories.

10. NOT LEGALLY BINDING

For greater certainty, this MOC, including the Schedules, does not create legally binding obligations on the Parties.



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Dated: August 22, 2018

IN WITNESS WHEREOF the parties thereto have executed this Memorandum of Cooperation as of the day and year above written.

SIGNED, SEALED & DELIVERED) FERTILIZER CANADA

in the presence of:)

Annick Landeau)

Garth Whyte)

) Garth Whyte, President and
) Chief Executive Officer

SIGNED, SEALED & DELIVERED) PROFESSIONAL ASSOCIATION IN CROP

in the presence of:) **NUTRITION**

Annick Landeau)

Yvan Lacroix)

) Yvan Lacroix, President - Chief Executive
) Officer, Secretary-Treasurer



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SCHEDULE 1:

Background

1) Bio-food Policy 2018-2025

The objective of the Politique bioalimentaire 2018–2025 (Bio-food Policy) proposed last April by the Ministry of Agriculture, Fisheries and Food of Québec (MAPAQ) is twofold: to better meet the needs of consumers while providing enhanced support to businesses and organizations working in the farming sector.

Seven principles helped shape the policy and will serve to guide its implementation:

- Invest \$15B in agriculture and aquaculture production, fisheries and food processing;
- Increase Quebec's international bio-food exports by \$6B;
- Inject \$10B of Quebec content into bio-food products purchased in Quebec;
- Increase the proportion of Quebec farms and food processing businesses that have implemented responsible business practices;
- Double the acreage of organic food production;
- Increase the proportion of eco-certified Quebec seafood products from 52 to 70%;
- Improve the nutritional value of processed foods in Quebec.

The policy is founded on four key priorities:

- A selection of products that meets the needs of consumers;
- Successful, sustainable and innovative businesses;
- Attractive and responsible businesses;
- Dynamic regions that contribute to the prosperity of bio-food.

2) Departmental Action Plan for the Sustainable Development of the Grain Sector

The 2015-2020 Sustainable Development Action Plan is designed to implement measures for the integration of sustainable development considerations into the growth strategies of the various production sectors. The Departmental Action Plan for the Sustainable Development of the Grain Sector was produced in this context.

The objective of the plan is to support the grain sector in order to improve:

- Its productivity;
- Its profitability;
- Its environmental balance sheet; and
- Its social acceptability



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The plan includes about thirty actions, divided into three pillars:

1. Improve the competitiveness of the sectors, specifically:
 - 1.1. Increase the productivity of farms
 - 1.2. Increase the economic profitability and sustainability of farms
2. Improve the environmental balance sheet of grain production in Quebec; and
3. Improve the social acceptability of grain production

3) The Québec Agri-Food Sector (source: MAPAQ web site)

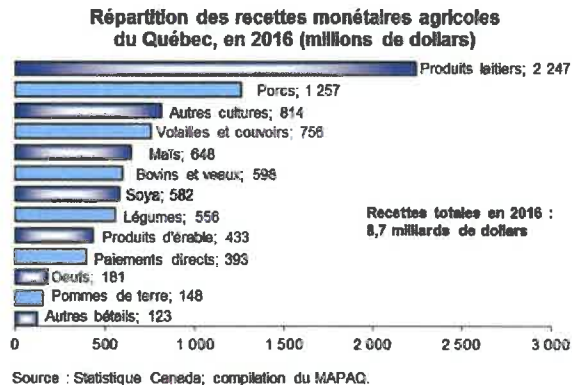
The agri-food sector plays a major role in the economy of Québec contributing more than 487 000 jobs or one out of every 8 jobs in Quebec (12 %).

There are approximately 28,000 farms in the Québec agricultural sector. In 2016, Québec agricultural producers took in more than \$8.7 billion in sales - a seven per cent increase over 2015.

These good results are mainly due to **crop production**. Sales grew by 18% compared to 2015 to reach \$3.2 billion in 2016. Among the crops, corn, soybeans, field vegetables and maple products represent 67% of the sales from this sector making up the largest share.

As of 2017-2018, nearly 1,100 agronomists are dedicated to crop production, soil health and the environment.

The Province is self-sufficient in animal feed with an annual production that varies from 4.5 to 5 million tonnes. There are few imports (seven to ten percent) or exports of animal feed from the Province. Products supplied must be of high quality to ensure the growth of the animals that consume them. The grain sector regularly consults with the animal production sector to confirm their satisfaction. Working by sector is therefore very important.





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4) Grain Crops (source: MAPAQ web site)

Data for 2016 documents a production of 5,500,000 metric tonnes for Québec. The most important crops are:

- Corn
- Soybeans
- Cereal crops (wheat, barley, oats)
- Canola

A large acreage of Québec's arable land was used to grow small grains representing one million hectares.

Fertilizers and supplements are important agricultural inputs. These nutrients are used on crops and help farmers feed an ever growing population. Fertilizers can help replace essential soil nutrients. When used efficiently along with other good soil health management practices, they can help maximize crop yields and minimize environmental impacts.

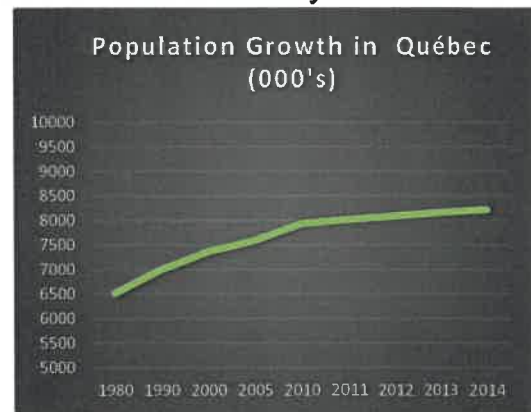
5) 4R Nutrient Stewardship (source : Fertilizer Canada web site)

Environmental stewardship is a priority for the Québec fertilizer industry. In order to ensure an efficient and responsible use of nutrients by farmers, PACN wishes to work in cooperation with Fertilizer Canada to develop and deploy science-based fertilizer management practices under the 4R Nutrient Stewardship Program (Right Source, Right Rate, Right Time, Right Place®).

With a population that should reach 9.2 million in 2031, Quebec needs sustainable agriculture.

The 4R Nutrient Stewardship Program provides a framework that allows increased production, increased farm profitability and improved environmental protection and sustainability.

To meet these objectives, the 4R Program recommends the use of the **Right Source** of fertilizer, whether integrated with or converted into nutrients, based on the target crop. It considers the use of the **Right Rate** in order to meet the plant's nutrient requirements. Fertilizers are applied at the **Right Time** so the nutrients will be available when the plant really needs them, and at the **Right Place** where the plants can absorb them more efficiently.





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How do we accomplish this without a **massive** expansion of farmland?

77% of future growth in crop production is expected to come from increased yields - of which fertilizer is key.



By adopting sustainable measures, we can protect our soil, our water and our air for the benefit of society, increase production and farm profitability and ensure the future of the agricultural industry.

6) The Strategic Framework of 4R Nutrient Stewardship – The Professional Association in Crop Nutrition (PACN)

The fertilizer industry established the 4R Nutrient Stewardship Program in cooperation with governments, researchers, clients and the public. Adjustments to plant nutrients, their application rate, the time of application and placement can significantly decrease the risk of nutrient loss.

a) Objectives

- Optimize the absorption of nutrients by crops and minimize nutrient loss;
 - Increase farm profitability
- Create long-term positive effects on water bodies associated with agricultural areas
- Encourage the sharing of information on the responsible management of nutrients between suppliers of crop nutrition services
 - Improve the consistency of agronomic knowledge communication
- Help the agricultural sector adapt to new research findings and technologies in the field of nutrient management.
- Create a common training program for crop nutrition professionals
- Promote best practices and public education



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b) General Work Plan

Year 1 - Training

Service suppliers are trained on the principles of the 4R Nutrient Stewardship Program.

- Training of plant nutrition professionals on the 4R Nutrient Stewardship Program
- Production of handouts and promotional materials
- Communications and promotion

Year 2 – Implementation of 4R planning

Implementation of 4R principles and practices is documented and monitored. Progress of the implementation timeline is evaluated.

- Continuation of 4R Nutrient Stewardship training for professionals
 - Implementation of training for producers
 - Meetings and promotional material
- Maintenance of registries for tracking acres adopting 4R Nutrient Stewardship
- Soil tests
- Communications and promotion

Year 3 – 4R Program Evaluation

Nutrients are recommended and applied with the objective of maximizing absorption by crops (crop yield objectives are calculated and included) while minimizing loss of nutrients in the environment.

- Evaluation of results
 - Economic performance
 - Social performance
 - Environmental performance

7) PACN - Contribution to the Economy of Québec

PACN members operate under five different banners in five separate distribution centres and more than 100 fertilizer mixing plants and warehouses located throughout the agricultural regions of Québec. They also own an important fleet of fertilizer transportation and spreading equipment made available to agricultural producers.

The industry also offers technical and scientific expertise allowing producers to apply, monitor and measure the effectiveness of their fertilization plan. Members of the PACN



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own all the infrastructure needed including labs, measuring equipment, software and geomatic equipment to support them.

PACN encourages the improvement of the manufacturing distribution and application of fertilizers by using techniques and equipment at the cutting edge of technology.

Advisers working for PACN members assist farmers in the following areas: seeding and threshing, crop protection monitoring, scouting, recommendations, etc.



SCHEDULE 2:

Financial Commitment of the Parties

This MOC does not impose any legally binding financial obligations on the Parties, but in recognition of the resources required to launch a voluntary 4R Nutrient Stewardship program in Québec, the Parties to this MOC have agreed to try and meet the following commitments.

Industry Commitments

- a. FERTILIZER CANADA will provide financial support of up to \$50,000 per year for three years from the date of signing up until December 31, 2021 to enable pursuit of this MOU's objectives. FERTILIZER CANADA will contract with and make payments directly to service providers.
- b. PACN will provide financial support of up to \$50,000 per year for three years from the date of signing up until July 31, 2021 to enable pursuit of this MOC's objectives.

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