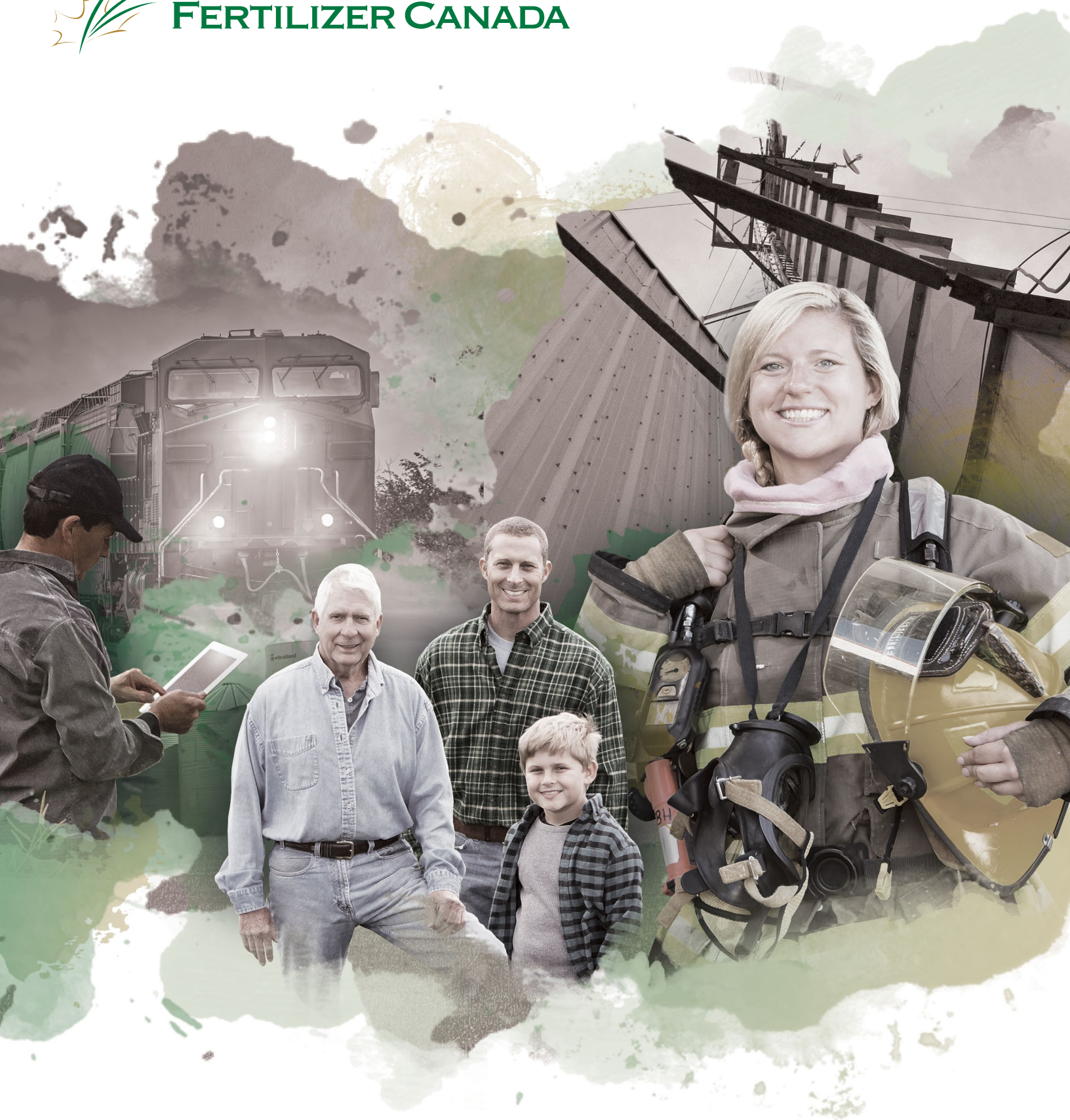
FERTILIZER CANADA



Annual Report **2017**

INvested in Advancement

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Who We Are

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 $12 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.

Nitrogen (N) makes up about 78 per cent of the air we breathe. It is inert and insoluble in this form meaning plants can not use it. To manufacture nitrogen fertilizer, it must be removed from the air and combined with hydrogen to make ammonia. Ammonia is used in two ways: it is applied directly to crops as a nitrogen fertilizer, or it is used as a building block to make other nitrogen fertilizer products. Different nitrogen products have different properties and levels of nitrogen that can be used in various climates and cropping patterns found around the world.

Phosphorus (P) is present in all living cells and is essential to all forms of life. Found throughout our bodies, it is concentrated in our teeth and bones. The source of phosphorus in fertilizer is phosphate rock, which is typically mined from the earth's crust then reacted with different kinds of acids to produce different phosphate products. The largest deposits occur in the United States, North Africa, and China.

Potassium (K) is also found throughout nature and is found in our bodies in muscles, skin, and the digestive tract. Good health requires sufficient intake of potassium, and plants get it from potash fertilizers. Plants use potassium for functions like photosynthesis, protein formation, and water use. Potassium, or potash, is mined from naturally occurring ore bodies that were formed as seawater evaporated. The deposits are a mixture of crystals of potassium chloride and sodium chloride, also known as table salt. After it is mined, the potassium chloride is separated from the mixture and results in a granular fertilizer. Most of the world's potash deposits are found in Canada, Russia, Belarus, Germany, and the United States.

Sulphur (S) is essential for the production of amino acids, which are the building blocks of proteins found in all living things. Sulphur also helps give crops like onion, mustard and radishes their characteristic colour. While it can be found naturally in the soil, it is not always in a form plants can use.

Leading the Way

Message from the Chair

As the foundation of agriculture, the fertilizer industry has reached a tipping point. With agricultural production on the rise to feed a growing global population, expected to reach 9.7 billion by 2050, the fertilizer industry must be ready to provide growers with the support they need. Efficient production and transportation of fertilizer products to retailers and farmers is critical, but even more important is the continued innovation and implementation of sustainable fertilizer practices to ensure future agriculture productivity.

The Canadian fertilizer industry is already recognized as a world leader in these areas. Fertilizer Canada, as a representative of this sector, is at the forefront of developing and generating support for sustainable practices – such as **4R Nutrient Stewardship (Right Source @ Right Rate, Right Time, Right Place®)** – that increase crop productivity and profitability while conserving environmental resources like air, water and soil.

Fertilizer Canada takes pride in the pivotal role the fertilizer industry plays in achieving Canada's economic, social and environmental goals and will continue to work toward furthering its position as a leader on a global scale.

- **Advancing Safety and Security**

  With two best-in-class Codes of Practice already in place to regulate ammonium nitrate and anhydrous ammonia, Fertilizer Canada is leading the way in safety and security. Our association is always working to update these codes to provide the highest quality information to manufacturers, retailers and users of fertilizer products.

Fertilizer Canada is also developing a Calcium Ammonium Nitrate (CAN) Security Code of Practice, which will place audited security requirements on Canadian sites where it is sold or stored. This new code is a proactive approach to the anticipated review of Natural Resources Canada's *Explosives Regulations*, announced in this year's federal budget, which could trigger a review for the inclusion of CAN as a matter of public safety.

- **Getting Sustainability Right**

  Canada's fertilizer industry is one of the most environmentally responsible in the world. By advocating the principles of 4R Nutrient Stewardship – a globally applicable yet locally focused, science-based nutrient management system that increases crop productivity while conserving the environment – Fertilizer Canada has seen steady advancement in agricultural sustainability nationally and globally.

  In 2017, Fertilizer Canada completed its first 4R Nutrient Stewardship Sustainability Report, *Getting 4R Sustainability Right*, which outlines our association's progress to date and continued commitment to driving sustainability in agriculture. This document serves as a roadmap as Fertilizer Canada continues to work towards the goal of attaining 20 million 4R acres (acres managed under the principles of 4R Nutrient Stewardship) in Canada by 2020.

- **Taking a Lead on Climate Change**

  As the world turns its attention toward reducing greenhouse gasses on a global scale, the Canadian fertilizer industry is proud of its manufacturers' place among the top quartile performers in energy efficiency and reduced emissions.

  With manufacturing efficiencies already in place, Fertilizer Canada is focused on reducing greenhouse gas emissions on-farm. Using the principles of 4R Nutrient Stewardship, the Nitrous Oxide Emission Reduction Protocol (NERP) – developed in Alberta – provides growers with the ability to reduce on-farm emissions by up to 25 per cent. In 2016, Fertilizer Canada had the opportunity to highlight this protocol as a best practice for governments to achieve greenhouse gas emission reductions from agriculture sources during the United Nations Climate Change Conference (COP22). Through this and other initiatives, NERP is quickly being recognized as an innovative climate-smart agriculture solution.

- **Strengthening Trade**

  Canada's fertilizer industry is heavily dependent on international trade. Nearly 80 per cent of fertilizer produced within our borders is exported to more than 70 countries worldwide, accounting for 12 per cent of global fertilizer supply.

  With several new trade opportunities on the horizon, Fertilizer Canada is working to ensure our industry's voice remains heard during negotiations. Early in 2017, our association created a trade committee focused on highlighting to the Canadian government the necessity of consultations with the fertilizer industry on trade. The formation of this committee is a major step forward in protecting the fertilizer industry's interests in growth and to ensuring farmers around the world continue to receive the fertilizer they need to feed the growing population.

There is no doubt the work Fertilizer Canada has done in the past has elevated the fertilizer industry to a position of leadership. I look forward to the year ahead as our association continues to have a positive impact on our national and global landscapes.

Kathy Jordison
Yara Canada Inc.
Chair of the Board of Directors
2017-18

Gaining Recognition, Building Momentum

Message from the President

Those of us who are familiar with the fertilizer industry understand the significant outward influence it has on a wide network of sectors. Our industry is well known as the foundation of agriculture, but we also play an integral role in trade, transportation, economics and environmental conservation.

Over the last 12 months, the Canadian fertilizer industry has gained increased recognition for our wide-spread influence as all levels of government and other important stakeholders begin to understand the importance the sector brings to the social, economic and environmental fabrics of Canada and the world.

- In February of 2017, the **Government of Canada's Advisory Council on Economic Growth** released its *Unleashing the Potential of Key Sectors* report and identified Canada's agriculture sector as one with the ability to boost the national economy to a leadership position globally. In order to meet this new mandate, Canadian growers will rely on the support of the fertilizer industry to provide and replenish essential nutrients for plant growth.
- The **Canadian Federation of Agriculture** (CFA) passed a unanimous resolution in 2017 in support of 4R Nutrient Stewardship as a best practice to boost crop productivity and reduce negative environmental impacts. This recognition from CFA, an association that represents growers in every province, is a major step forward in Fertilizer Canada's goal to achieve sustainability in agriculture.

- As the mission to conserve environmental resources continues, 4R Nutrient Stewardship has been formally recognized by the **International Joint Commission** as a best practice solution for managing nutrients around Lake Erie and the other Great Lakes to avoid phosphorus losses to water. The International Joint Commission is leading the cooperation of Canada and the United States as they formulate strategies to protect and conserve their shared waters on the international border.
- As provinces discussed a Canada-wide approach to standardizing environmental farm plans in 2016, the **National Environmental Farm Plan Summit** recognized 4R Nutrient Stewardship as a universally applicable method for nutrient management that can be integrated into a national system.
- In 2016, Fertilizer Canada signed a Memorandum of Cooperation (MOC) with the **Saskatchewan Ministry of Agriculture** to fund 4R Nutrient Stewardship demonstration projects in the province. This recognition of 4R Nutrient Stewardship by the provincial government furthers both organizations' goals of conserving natural resources like soil while boosting crop production for local farmers.
- Fertilizer Canada was recognized this year as one of the **Hill Times' Top 100 Lobbyists** for our integral role in shaping legislation around subjects like product regulation, transportation and trade. With hundreds of interactions with all levels of government each year, Fertilizer Canada provides important input on issues that help shape our country.

Each of these recognitions is another milestone marker for Fertilizer Canada as we work to increase industry profile and build awareness of the importance of the fertilizer sector.

With this increased recognition from government and other stakeholders, more groups are expressing interest in forming relationships with the Canadian fertilizer industry. Fertilizer Canada has responded by creating two new membership categories to expand this opportunity to new stakeholders:

- **Associate Members**. Fertilizer Canada has re-evaluated its Associate Member category to open access for groups who are directly involved in the fertilizer industry but do not make or sell fertilizers, such as agronomic service providers or those that manufacture or distribute micronutrients, supplements, inoculants and other products.
- **Partnership Program**. This newly formed category creates opportunities for other stakeholders who are not directly involved, but have an interest in interacting with the fertilizer industry in Canada. This category is open to those who deal with logistics, infrastructure and transportation as it relates to the industry.

These new membership opportunities will allow us to work more closely with a wider variety of stakeholders who have a vested interest in the success of the industry and its goals.

It is clear that the fertilizer industry is growing stronger each year as it gains recognition as a major contributor to positive growth for Canada and the rest of the world. I look forward to the year ahead as our industry continues to build momentum.

Garth Whyte
President & CEO

"Over the last 12 months, the Canadian fertilizer industry has gained increased recognition for our wide-spread influence as all levels of government and other important stakeholders begin to understand the importance the sector brings to the social, economic and environmental fabrics of Canada and the world."

Garth Whyte
President & CEO, Fertilizer Canada

Advancement Across Canada

AUDIENCE REACHED
THROUGH
MEDIA RELEASES:
OVER
552 MILLION

PROVINCES
WITH
MOUs:
5

VISITORS TO
FERTILIZER CANADA'S
WEBSITE
104,000

CANADIANS REACHED
ON
SOCIAL MEDIA:
OVER
690,000

13
NEWS
RELEASES
DISTRIBUTED

OVER
1,020
CANADIANS TRAINED
THROUGH
ELEARNING
IN 2016

Nutrient Stewardship

4 MILLION

ACRES COUNTED
UNDER
4R NUTRIENT
STEWARDSHIP

32
4R DEMONSTRATION FARMS
ACROSS CANADA

PEI 4R DEMONSTRATION FARM
INCREASED PROFIT:
$80-$200
PER ACRE

9 LEADING SCIENTISTS
WHO HAVE REACHED OVER
10,000
INFLUENCERS ON 4R NUTRIENT STEWARDSHIP RESEARCH

LEVERAGE TOTALS FOR
4R NUTRIENT STEWARDSHIP RESEARCH:
FERTILIZER INDUSTRY
$1.6 MILLION
GENERATED OVER
$4 MILLION

1,960
GROWERS, CCAS & OTHER STAKEHOLDERS
EDUCATED
ON 4R NUTRIENT STEWARDSHIP

89 ONTARIO **CCAs**
CERTIFIED IN
4R NUTRIENT MANAGEMENT SPECIALITY

1,000
CONTINUING EDUCATION
UNITS EARNED BY CCAs

80%
OF GROWERS IN CANADA AWARE OF **4R NUTRIENT STEWARDSHIP**

Safety & Security

980
FIRST RESPONDERS
TRAINED THROUGH
ELEARNING

COMPLIANT SITES

WITH AMMONIUM NITRATE CODE OF PRACTICE:
25+

WITH ANHYDROUS AMMONIA CODE OF PRACTICE:
385

Business Environment

INTERACTIONS WITH GOVERNMENT OFFICIALS
118 PROVINCIAL
156 FEDERAL

GLOBAL PERFORMANCE FOR ENERGY EFFICIENCY & GHG EMISSIONS
TOP 25%

NERP
REDUCES
GHG EMISSIONS
BY 25%

CANADIAN EXPORTS
80%
OF FERTILIZER PRODUCED IS EXPORTED TO MORE THAN **70 COUNTRIES** AROUND THE WORLD

ACCOUNTS FOR
12%
OF GLOBAL FERTILIZER SUPPLY

Business Environment

A large part of Fertilizer Canada's role as a representative of manufacturers, wholesalers and retail distributors of fertilizer products involves working with decision-makers across federal, provincial and municipal jurisdictions to ensure positive growth for the industry. Fertilizer Canada's Vision 2020 action plan identifies the need to communicate with all levels of government on the industry's initiatives related to reducing greenhouse gas emissions, to maintain the industry's freedom to operate without needless regulations and to focus on safe and efficient transportation services.

Advancing Climate-Smart Agriculture

As Canada continues to develop a national framework to grow the economy while reducing greenhouse gas emissions, Fertilizer Canada is working to ensure the fertilizer industry is at the forefront of climate-smart agriculture practices that align with the country's priorities.

While extensive government and third-party benchmarking studies have already concluded that Canadian fertilizer manufacturers perform in the top quartile globally for energy efficiency and greenhouse gas emissions, Fertilizer Canada is focused on reducing emissions on-farm by encouraging the widespread adoption of our Nitrous Oxide Emission Reduction Protocol (NERP).

Using the principles of 4R Nutrient Stewardship, NERP can help growers better manage crop nutrition, maximize yields, minimize losses of nitrogen fertilizer and reduce greenhouse gas emissions by up to 25 per cent.

With over one million acres already operating under the protocol in Alberta, where it was developed, NERP is quickly turning Canada into a leader in climate-smart agriculture. As a universal practice, NERP is also advancing globally in regions such as Iowa, Illinois, California and Australia. NERP is also the candidate protocol being adopted for use in Ontario and Quebec's cap and trade system

In 2016, Fertilizer Canada attended COP22 – the United Nations Climate Change Conference – where we highlighted NERP as a best practice for climate-smart agriculture and nutrient management that can help governments achieve greenhouse gas emission reductions from agriculture sources.

Building Stronger Trade Opportunities

With the election of a new United States federal government in 2016, trade negotiations have been at the forefront of political discussions. Creating universally beneficial agreements is a focus for Fertilizer Canada.

"I am aware of the strong co-operation that has taken place between Fertilizer Canada, its members and the Department [of Environment and Climate Change] on the topic of greenhouse gas reductions, and I look forward to continuing this collaboration."

The Honourable Catherine McKenna, P.C., M.P
Minister of Environment and Climate Change

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Canadian nitrogen-based fertilizer production facilities implement the best technology and practices currently available and use the cleanest fuel source available – natural gas.

The Canadian fertilizer industry exports 80 per cent of the fertilizer produced within its borders to more than 70 countries around the world, accounting for 12 per cent of global fertilizer supply. Additionally, Canada is the largest exporter of potash and elemental sulphur with more than 15 million metric tonnes entering foreign markets each year. This fertilizer plays a critical role in ensuring farmers around the world have sustainably fertile soil in which to grow the crops needed to feed the rapidly expanding population.

To ensure the Canadian government understands the importance of trade to the fertilizer industry and to food production on a global scale, Fertilizer Canada has created a trade committee focused on highlighting the necessity of consultations with the fertilizer industry on trade negotiations.

Paving the Way for an Efficient Transportation System

Canadian farmers are part of a global group of growers who need to increase crop production by 70 per cent over the next 30 years in order to keep up with demands of the expanding population. Delivering the fertilizers these farmers need to feed the world in a safe and efficient manner is critical.

Fertilizer is the third highest volume commodity shipped by Canadian railways, and the industry is heavily reliant on rail to move products to domestic markets and also to enable the export of more than two-thirds of its fertilizer to the United States and offshore markets.

Fertilizer Canada is constantly working to advocate for transportation systems that are beneficial to our members and their customers both in Canada and abroad. Each year, Fertilizer Canada co-hosts the North American Fertilizer Transportation Forum (NAFTF) with The Fertilizer Institute to further the improvement of transportation systems in Canada and the United States.

Product Regulation

Fertilizers and supplements are primary determinants of crop yields and soil health, and producers depend on timely and safe access to these products. To help facilitate this, Fertilizer Canada works in joint partnership with the Canadian Food Inspection Agency (CFIA) through the Canadian Fertilizer Products Forum (CFPF), a consultative body to strengthen coordination, increase transparency and improve stakeholder engagement in the regulatory process.

Since its establishment in 2006, CFPF working groups have engaged with CFIA to recommend improvements to modernize Fertilizer Regulations, and develop recommendations to resolve issue-specific regulatory challenges faced by the industry. As an example, this year the Cannabis working group was formed to review the implications of the Cannabis Act and associated regulations on the fertilizers and supplements products sector.

Milestones

- Fertilizer Canada facilitated hundreds of interactions with decision makers at all levels of government in 2016 and 2017, including dozens each during the annual Parliamentary and Legislative Forums. These meetings opened lines of communication between industry stakeholders and government officials and created opportunities to build discussion around topical issues.
- What's good for agriculture is good for the fertilizer industry. With Canada's agri-food sector highlighted for support in the 2017 Federal Budget, Fertilizer Canada has continued to advocate for action in creating opportunities for the advancement of both sectors.
- Fertilizer Canada continued to develop stronger relationships with government decision-makers in Alberta, Saskatchewan, Ontario and Manitoba.

Safety and Security

Safety and security in the manufacturing, handling, storage, transportation and application of fertilizer products is central to the operations of the industry. Guided by the Vision 2020 action plan, Fertilizer Canada is invested in constantly working to ensure standards are developed, met and updated on an ongoing basis to certify the Canadian fertilizer industry maintains its position as a world leader in safety.

3,600+

people trained online in fertilizer safety and security

980+

first responders trained on how to respond to an anhydrous ammonia incident

Improving Safety through Codes of Practice

The Canadian fertilizer industry is a world leader in safety and security. Developed to create standardized procedures, our *Agricultural Ammonium Nitrate Code of Practice* and our *Anhydrous Ammonia Code of Practice* continue to be the gold standard for the industry. These Codes of Practice are mandatory for members of Fertilizer Canada.

Through the implementation of these codes, Canadian fertilizer sites have demonstrated a stringent commitment to furthering safety and security. All anhydrous ammonia and ammonium nitrate sites managed by Fertilizer Canada members reach mandatory code compliance requirements by meeting or exceeding safety standards. In fact, 100 per cent of the 385 anhydrous ammonia sites in Canada are certified under the *Anhydrous Ammonia Code of Practice* verified by a third-party audit.

These high levels of compliance can be attributed to the successful implementation of educational resources through Fertilizer Canada's eLearning platform. Fertilizer Canada has developed several eLearning courses to ensure the safe and secure handling and use of fertilizer products throughout the supply chain – from manufacturing to storage to application.

In addition to existing courses on ammonium nitrate and anhydrous ammonia, Fertilizer Canada launched a new eLearning course in early 2017 in partnership with the Canadian Association of Agri-Retailers (CAAR) called *Anhydrous Ammonia Safety and the Farmer*. For farmers who utilize anhydrous ammonia on their farm, this course offers education to ensure this product is handled and transported safely.

To maintain and further Canada's position of leadership in safety and security, Fertilizer Canada is always working to respond to industry concerns and update our codes of practice to deliver the highest standard of information. In 2016, both the *Agricultural Ammonium Nitrate Code of Practice* and the *Ammonia Code of Practice* published minor amendments to clarify language and ensure standardized interpretation throughout the industry.

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One hundred per cent of 385 ammonium nitrate sites in Canada are compliant with Fertilizer Canada's Code of Practice.

Training Canada's First Responders

In addition to promoting safety for manufacturers, retailers and users of fertilizer products, Fertilizer Canada is also a world leader in the training and education of first responders.

Over 980 first responders across Canada have already completed training using Fertilizer Canada's eLearning course *Anhydrous Ammonia Awareness for First Responders*. This course educates emergency crews on safely responding to an incident involving anhydrous ammonia.

Fertilizer Canada is invested in continuing to grow this area of our safety and security outreach. In 2016, our association formalized a strategic partnership with the Quebec National Fire Academy to expand fertilizer safety training courses to a broader network of first responders. Following this partnership, Fertilizer Canada has seen training of first responders in all 10 Canadian provinces.

On the Road to Safer Transport

Farmers rely on fertilizer to supplement the soil's natural nutrients, which are necessary for optimizing crop production. During peak agriculture seasons in the spring and fall, fertilizer is in high demand and transport from agri-retailers to farms increases.

Fertilizer Canada is committed to ensuring this transport is done in a safe and efficient manner, both during peak seasons and year round. To date, over 1,400 individuals have completed our *Driver Fatigue for Commercial Vehicle Drivers* eLearning course, which offers an avenue for truck drivers who transport fertilizer products to earn an exemption under the *Commercial Vehicle Drivers Hours of Service Regulation*. This exemption allows extra-provincial drivers to operate safely under a more flexible work schedule as an alternative to the accumulation of on-duty hours – and allowing more farmers to receive the fertilizer critical to their operations when it's needed.

In 2016, Fertilizer Canada worked successfully with Transport Canada to extend our previous three-year permit period to five years, creating easier access to the exemption and streamlining the process.

Milestones

- As a proactive approach to the anticipated review of the *Explosives Regulations* (formerly the *Restricted Components Regulations*) by the federal government, Fertilizer Canada is developing a Calcium Ammonium Nitrate (CAN) Security Code of Practice, which will place audited security requirements on Canadian sites where it is sold or stored.

"Fertilizer Canada is committed to promoting agriculture safety during Canadian Agricultural Safety Week and year round. Our eLearning courses provide the tools necessary to ensure industry professionals have the knowledge to use fertilizer products effectively and safely."

Garth Whyte
President & CEO, Fertilizer Canada

Nutrient Stewardship

Smarter, more efficient fertilizer management practices will help growers meet the rising demand for food while minimizing pressure on the environment and meeting societal expectations for sustainable food sourcing.

Canada's fertilizer industry is determined to get sustainability right — by supporting Canada's sustainable development goals, generating science-based information on innovative fertilizer management practices, providing a unified voice for our members and promoting the adoption and implementation of 4R Nutrient Stewardship across the country.

In early 2017, Fertilizer Canada published its first 4R Nutrient Stewardship Sustainability Report, a document that highlights the association's journey to date and path forward for creating truly sustainable agriculture in Canada. To further highlight the fertilizer industry's commitment toward balanced environmental stewardship, Fertilizer Canada has set a goal of securing a total of 20 million 4R acres across Canada, or 25 per cent of national crop production, by 2020.

How 4R Nutrient Stewardship Works

4R Nutrient Stewardship is a science-based approach to fertilizer application that applies best management practices (BMPs) to optimize plant nutrient availability so growers can sustainably increase yields and profitability on their farms. By implementing 4R Nutrient Stewardship, growers are better able to balance the environmental, economic and social goals of crop production.

Getting to 20 Million Acres

Through Fertilizer Canada's national 4R Designation program, we're building the capacity of our industry partners to rapidly implement 4R Nutrient Stewardship, develop sustainable nutrient management plans and demonstrate that Canadian growers are moving to the forefront of BMPs in commercial fertilizer use.

By encouraging farmers and agri-retailers to adopt 4R Nutrient Stewardship as a way of managing nutrients and counting their acres towards our goal, Canada already has four million acres under the program.

Through in-person and online training, this voluntary program gives industry stakeholders the skills they need to show growers the commitment being made by the Canadian agricultural industry to the economy, the environment and their communities. In addition to providing training, the 4R Designation program measures and recognizes the accomplishments of agri-retailers, accredited professionals and farmers in areas such as the implementation of 4R Nutrient Stewardship and BMP performance outcomes.

Fertilizer Canada also offers a full suite of 4R Nutrient Stewardship eLearning courses that agriculture and agri-food professionals, farmers, agri-retailers, agronomists and crop advisors can use to learn how to adopt and promote sustainable nutrient management practices. Many courses provide professional credits, helping students pursue careers within the fertilizer industry.

Building a Research Network

The 4R Research Network is composed of 10 leading Canadian researchers and the International Plant Nutrition Institute who together are qualifying the science behind 4R Nutrient Stewardship principles in a way which will be profitable for farmers, meet society's need for increased food production, and improve the environmental performance of farming practices.

The research, funded in part by Agriculture and Agri-Food Canada, covers many areas of environmental focus including reducing greenhouse gas and ammonia emissions, losses of phosphorus to surface waters, and nitrate leaching in groundwater. Through extensive research from field trials and other projects in Alberta, Saskatchewan, Manitoba, Quebec, Ontario, Nova Scotia and Prince Edward Island, these projects are expected to identify up to four new BMPs for phosphorous fertilizer and 10 new BMPs for nitrogen fertilizer.

Growing Sustainability for the Industry

In order to fill a current information gap in public data regarding commercial fertilizer management, Fertilizer Canada is working with the Canadian Field Print Initiative, Pulse Canada and other industry partners to execute the annual Fertilizer Use Survey.

Conducted between 2014 and 2018, the survey gathers data on fertilizer management practices and current knowledge of 4R Nutrient Stewardship from producers across the country. The survey also captures baseline data about major grain, oilseed and pulse crops in Canada. This information is essential for developing sustainability metrics and sound 4R Nutrient Stewardship strategies.

The Fertilizer Use Survey is helping us understand the current state of fertilizer management in Canadian crop production. With a better understanding of how growers use and make decisions about fertilizer applications, we have a clearer picture of the economic and environmental impacts of sustainable agricultural practices, leading to better-informed strategic and policy decisions in the future.

The Findings

1. Over three years, the survey has captured data on fertilizer use from **3,292 growers nationwide** detailing fertilizer use practices on **8.3 million acres** of cropland.
2. **Canadian growers are managing nutrients responsibly**. Growers who are more familiar with 4R Nutrient Stewardship are more likely to adopt BMPs to optimize the source, rate, time and place of fertilizer applications.
3. **Sixty-one per cent of growers surveyed reported familiarity with 4R Nutrient Stewardship**. Grower familiarity with 4R Nutrient Stewardship increased by over 30 per cent from 2014 to 2016.
4. **Canadian Agri-Retailers play an integral role in grower implementation of 4R Nutrient Stewardship to achieve productivity goals for safe and nutritious food**. In 2016, 57 per cent of growers surveyed listed agri-retailers are their primary resource for 4R Nutrient Stewardship.
5. An estimated **2.5 million acres** have been grown with awareness of 4R Nutrient Stewardship in 2016.

"Hard-working farmers could not grow and provide quality agriculture products without the right tools. Fertilizer Canada and its member companies do an excellent job of providing them with the right expertise and fertilizer. Over the next 30 years, the world will need to increase food production by 70 per cent. I look forward to working with farmers and Fertilizer Canada to ensure Canada seizes this exporting opportunity."

Francis Drouin, M.P.
Glengarry–Prescott–Russell, Ontario, House of Commons (May 18, 2016)

4R Nutrient Stewardship Across Canada

Fertilizer agri-retailers and growers are adopting the top international standard for on-farm nutrient application across the country. Fertilizer Canada works in close collaboration with federal and provincial government departments as well as key stakeholders such as watershed groups, conservation authorities and farm groups to research new fertilizer management practices and extend the 4R Nutrient Stewardship framework to more Canadian growers.

Alberta

The province of Alberta continues to work on implementing climate-smart agriculture practices and reducing greenhouse gas emissions from fertilizer use in crop production through the Nitrous Oxide Emission Reduction Protocol (NERP). More than one million acres of farmland in Alberta operate under 4R Nutrient Stewardship, utilizing the principles of the program to develop climate-smart agriculture practices and track and estimate emission reductions.

In 2016, the inaugural National Environmental Farm Plan Summit met to discuss an effort to form a Canada-wide approach to environmental farm plans (EFPs) from the current provincial approach. During this summit, the participating parties agreed 4R Nutrient Stewardship could become integrated as a sustainable approach to nutrient management.

To get this initiative in motion, Fertilizer Canada signed a Memorandum of Understanding (MOU) with the Agricultural Research Extension Council of Alberta to integrate 4R Nutrient Stewardship into Alberta's EFP. This pilot program will set the stage for national implementation of 4R Nutrient Stewardship with some provinces such as Saskatchewan already incorporating 4R language in the province's EFP workbook.

Saskatchewan

Saskatchewan is a leader in encouraging farmers to use nutrient management plans in crop production. In 2016, Saskatchewan's Ministry of Agriculture signed a Memorandum of Cooperation (MOC) with Fertilizer Canada, recognizing both parties' shared commitment to protecting and conserving the province's soils, improving nutrient management and supporting sustainable agriculture.

Under this MOC, both Fertilizer Canada and the Saskatchewan Ministry of Agriculture contributed funding ($24,000 and $100,000, respectively) to implement 4R demonstration projects at eight Agri-Applied Research Management (Agri-ARM) sites in the province.

Manitoba

4R Nutrient Stewardship continues to take hold in Manitoba through an MOU between Fertilizer Canada and the Government of Manitoba, in partnership with the Keystone Agricultural Producers, Lake Friendly Initiative and the Canadian Association of Agri-Retailers.

More than 40 individuals from Manitoba completed a full day of 4R Nutrient Stewardship training, including 26 Certified Crop Advisors (CCAs) who each submitted a 4R attestation towards becoming Designated in 4R Nutrient Stewardship.

Field tours and 4R demonstration farms also continue to operate in Manitoba, bringing more than 65 individuals to trial sites to witness demonstrations of 4R Nutrient Stewardship on crops.

"Consistently it seems that we are getting better results out of the practices the 4Rs have brought… When you take it home and you can see the results, that's when you start to believe."

Morgan Smallman
Potato Farmer, Prince Edward Island

Ontario

Through an MOC with the Ontario Ministry of Agriculture, Food and Rural Affairs and the Ontario Agri Business Association (OABA) the province has embraced 4R Nutrient Stewardship as an important tool to meet its agricultural and environmental goals.

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.

Under this partnership, the Ontario 4R Retail Certification pilot program is being launched. This program encourages the voluntary certification of Ontario's agri-retailers and CCAs based on auditable criteria such as their training practices, how they monitor the adoption and implementation of 4R Nutrient Stewardship, and their nutrient recommendations and applications. If fully established, this program will greatly improve the industry's capacity to document the crop acres managed under 4R Nutrient Stewardship, providing a benchmark for sustainable crop production across the province — while also encouraging education and innovation in nutrient stewardship that would deliver long-term positive impacts on the water bodies associated with Ontario's agricultural production areas.

As part of Ontario's overarching commitment to sustainable agriculture, Fertilizer Canada collaborated with the Ontario Certified Crop Advisor Board to develop and launch the 4R Nutrient Management Specialty Certification for CCAs in that province. Designed for those who work in nutrient management planning, this certification ensures they can receive formal training on how to acquire reliable resources and advice to assist in making on-farm decisions about 4R Nutrient Stewardship. To date, 89 Ontario CCAs are accredited with the specialty.

New Brunswick

The province of New Brunswick continues to expand the reach of 4R Nutrient Stewardship. In the second year of 4R demonstration farms, five sites were coordinated by the New Brunswick Soil & Crop Improvement Association. These on-farm trials continue discussions with producers on 4R Nutrient Stewardship recommendations to implement in their operations.

Three 4R Nutrient Stewardship trials in the province focused on nitrogen fertility in grain and corn and evaluated various nitrogen sources at the right rate, time and place to increase nutrient uptake and reduce nutrient losses. The fourth site investigated whether increased sulphur with top-dress nitrogen strip trials could increase yields and provide an economic advantage in soybean crop. Site five demonstrated increased marketable yields and a return on investment on potato crops, with a trial assessing potash application and organic potassium release from green manure.

Prince Edward Island

To help potato farmers in Prince Edward Island (PEI) achieve greater economic and environmental sustainability, Fertilizer Canada is working alongside the Government of PEI, the PEI Federation of Agriculture, the PEI Potato Board and the Kensington North Watersheds Association to establish a series of 4R demonstration farms — a total of 10 in 2016 — where growers' standard practices are compared directly to 4R Nutrient Stewardship.

Though there were variations from farm to farm, three years of results from the demonstration farms in PEI have shown that implementing the 4R Nutrient Stewardship BMPs can lead to increased economic value.

THE AVERAGE CROP VALUE OF THE HARVEST FROM THE 4R DEMONSTRATION FARMS INCREASED BY $80 TO $200 PER ACRE COMPARED TO THE STANDARD PRACTICE PLOTS DUE TO BETTER TUBER YIELD AND QUALITY.

Additionally, a local benchmarking survey was conducted in order to get a picture of current nutrient management practices on the Island and how they align with the 4R principles Of the 20 per cent of PEI's potato growers surveyed, 92 per cent met the basic level of 4R Nutrient Stewardship, 55 per cent are practicing an intermediate level of 4Rs, and 17 per cent are advanced in their nutrient stewardship practices.

Building Proactive Solutions to Climate Change

The fertilizer industry is well positioned to face the sustainability challenges of today and tomorrow. Our sustainability principles are strongly aligned with the Government of Canada's Federal Sustainable Development Strategy and parallel the United Nation's Sustainable Development Goals. Through its vast network of manufacturers and agri-retailers, the industry is working to ensure Canadian growers can implement internationally recognized climate-smart agriculture practices and adopt new technologies that will help them achieve their environmental objectives without compromising food security.

INvested

Fertilizer Canada is working with stakeholders to develop the 4R Solution to help smallholder farmers sustainably increase yields and profitability on their farms.

The Solution uses on-farm demonstrations and is scaled through shared-value partnerships which brings government, non-government organizations (NGOs) and the private sector together to expand extension capacity, while the fertilizer industry, researchers and smallholders develop regionally specific 4R Nutrient Management recommendations using Nutrient Expert®. The end result is increased yields and profits that smallholder farmers can use to expand their farming operations and increase access to education, health care and a more stable and nutritious food supply.

Greener World

Fertilizer use is the foundation of commercial agriculture, but it can also be the foundation property owners use to grow healthy and vibrant green spaces for their communities.

Our Greener World campaign promotes the safe and effective use of nitrogen (N), phosphorus (P) and potassium (K) fertilizers in urban settings – such as on residential lawns – using 4R Nutrient Stewardship. By educating the public on choosing the right source of urban fertilizer and applying it at the right rate, time and place, we can grow a greener world one lawn at a time.

Our trademarked characters, dog-and-owner team Turf and Buddy, help us to spread the message of using fertilizer products effectively in urban settings to grow thicker, greener grass, which can aid in lowering air temperatures, filtering groundwater, managing dust and soil erosion and providing people and pets with safe places to play. Turf and Buddy are also champions of using fertilizer products properly to reduce unwanted nutrient losses to air and water resources. Videos and graphic resources on our website (greenerworld.ca) make it simple for property owners to get the information they need.

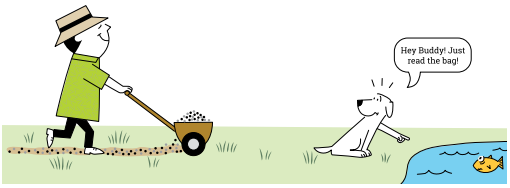
Our Use It, Share It, Store It campaign also encourages urban fertilizer users to correctly manage surplus fertilizer to reduce the negative impacts of improper disposal.

44,000+

Social Media Impressions @GreenerWorldCA

818,000

reached through an Ontario radio campaign



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