

# Sharing Common Ground

## Science is Big Part of Ag in the Classroom Message



*By Alex Binkley*

Johanne Ross comes to her job as executive director of the Agriculture in the Classroom program in Manitoba (AITC-M) with good credentials. Her P.Ag. shows she knows the subject, and as the mother of three boys, she understands youngsters. She has always felt it was important to introduce kids “to where their food comes from and why they should really care about that.” She got involved with the program eight years ago. The Nutrients for Life Foundation is working with Agriculture in the Classroom on its educational initiatives.

### **Q: Is Agriculture in the Classroom a national program?**

**A:** There are Agriculture in the Classroom organizations right across the country. We don't have a national umbrella organization because each province runs their programs differently. But we do work together a lot. We hold a conference call with each other once a month and we get together face to face once a year. We share lots of resources and work together across the country.

### **Q: Who supports Ag in the Classroom?**

**A:** In Manitoba, we have unbelievable support from across the agriculture industry. The membership listing on our website ([www.aipc.mb.ca](http://www.aipc.mb.ca)) shows who AITC-M's financial supporters are but they also help us run our programs. We supply teaching tools to schools for all grade levels for teachers to use in the classroom. But we also have a whole outreach component, kind of what I like to call “experiential” learning, where we put students and teachers right up close and personal with agriculture. To do that, we need support from our membership in terms of volunteers and speakers.

### **Q: So your program is very dependent on the participation of volunteers?**

**A:** Frankly, we just couldn't run our organization without them. The industry as a whole is realizing that we have to look after agriculture education and awareness if we want to see a strong



future for the industry. They've really bought into supporting us. We are one of the only organizations in the industry that's telling the good news story about agriculture. It's our responsibility to be talking about the industry's exciting and dynamic opportunities.

**Q: How widespread is the program in Manitoba?**

**A:** There are about 1,000 schools in Manitoba and during the last 10 years, about 70 per cent of them have used one of our resources or attended one of our programs. Most of our current material is aimed at kindergarten to Grade 8 because it's easy to work with the curriculum. During the next three years, we plan to focus on our high schools. For example, a lot of high schools offer career placement programs but the guidance counselors may not understand the opportunities in our sector because of a lack of information. We want to provide them with contacts to help place students. Students who have had a weeklong placement in an agriculturally based job are blown away with the opportunities that are available within the industry.

**A: What about public awareness about agriculture?**

**A:** Young people have lost their connection with agriculture. They understand farmers produce food but they don't really think about what happens after the farm gate. There's a big black hole between there and the grocery store. They don't think about all the steps in between, how lucky we are to have such abundant, affordable food and why they should care where it comes from, or why they should support local and Canadian products. We want to inspire young people to think of agriculture as a career but also to know where their food comes

from, to read labels and to think more about the industry as a whole so we'll have informed consumers in the future who will support agriculture. We have to look at ways we can connect with young people and what they're enjoying. Right now it's all about technology. We have to be on YouTube and Facebook; we have to be really savvy.

One of the most rewarding aspects of my job is seeing the dawning on kids' faces when they realize how cool, amazing or scientific something is and how it affects them as a person. They're also thankful when they see what farmers have to do to produce food as well as non-food products.

**Q: How does the Nutrients for Life Foundation fit in with your program?**

**A:** I'm really excited that Nutrients for Life has started here in Canada because I've used the U.S. website and it has a tremendous amount of excellent science-based resources. I'm especially pleased they are trying to adapt some of the U.S. materials to each of the provinces. It's a huge task but once it's adapted to the Manitoba curriculum, we will make very good use of it. We've always said to our supporters and members that AITC-M is a vehicle into the schools. The Nutrients for Life resources are dead-on in terms of the content and we need more resource material on the nutrient side of things in growing crops to reply to some of the negative reports about nutrients. It's important to growing food and it will only become more important as our population grows. I'm excited about the materials that Nutrients for Life is putting together and I know we'll be able to work closely with them. ♦



## Nutrients for Life Connects with Teachers



The Nutrients for Life Foundation Canada connected with more than 6,000 teachers across Canada at provincial science teacher conferences.

In October and November 2008, Nutrients for Life set up booths at science teacher conferences in Saskatchewan, Alberta, Ontario and Manitoba. The purpose was to raise awareness of the Foundation's activities and showcase its educational material to school teachers.

On display was the educational material, *Nourishing the Planet in the 21st Century*, tailored to provincial standards. Brochures and giveaways were made available and teachers were encouraged to fill out ballots to win a \$200 classroom grant.

The Foundation received positive feedback from teachers and great interest in the new plant and soil science educational material.

Nutrients for Life provided a sponsorship of \$1,000 for the Choose the Future – Education for Sustainable Development Conference, led by the Manitoba Education for Sustainable Development Working Group. This conference was co-ordinated through the Science Teachers Association of Manitoba and was partnered with Manitoba Education Citizenship and Youth. Nutrients for Life Board member Al Raine with Richardson International presented at the conference and helped to raise awareness of the Foundation.

Nutrients for Life Board members Dr. Tom Jensen, IPNI and John Heard, Manitoba Agriculture Department, attended the Alberta Teachers Association Conference, Nov. 13 to 15. John also attended the Manitoba 'Choose the Future, Education for Sustainable Development Conference' on November 28 on behalf of Nutrients for Life.

Teachers can now download copies of the educational materials from the website [www.nutrientsforlife.ca](http://www.nutrientsforlife.ca)

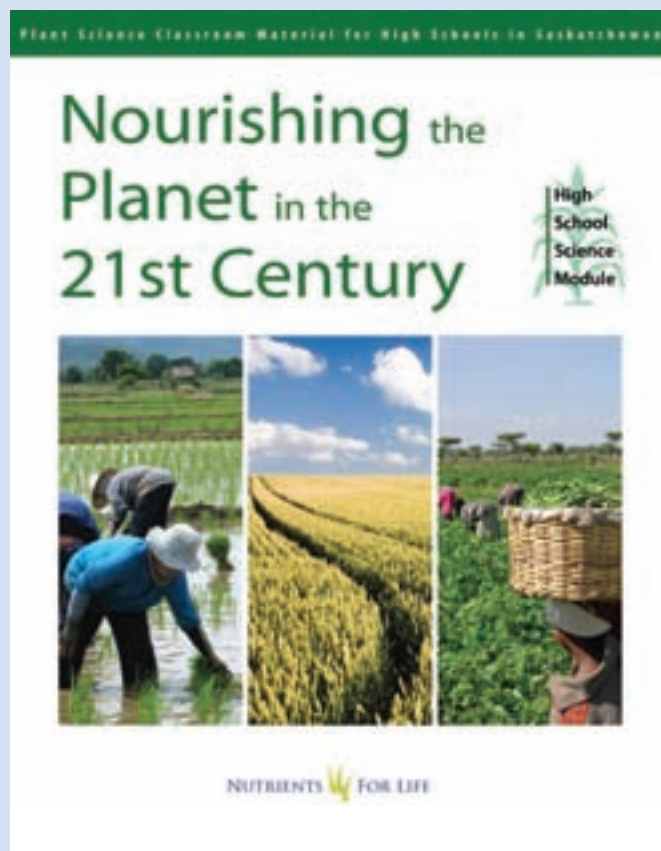
Nutrients for Life is a valuable new resource for agri-retailers and their farmer customers, who want to educate their communities about the importance of their products.

We encourage agri-retailers to help spread the word to middle school and high school teachers in their communities. We need

to raise awareness about how the responsible use of plant nutrients improves the health of our soil, the plants that grow in it, and ultimately the foods we eat.

Nutrients for Life informs the public of the role of plant nutrients in both the production of nutritious, abundant food and preservation of healthy green spaces through the development of educational resources and an outreach campaign to Canadians across the country.

For more information, please visit our website at [www.nutrientsforlife.ca](http://www.nutrientsforlife.ca) or contact the Foundation's Executive Director, Carla Ventin at [info@nutrientsforlife.ca](mailto:info@nutrientsforlife.ca) ♦

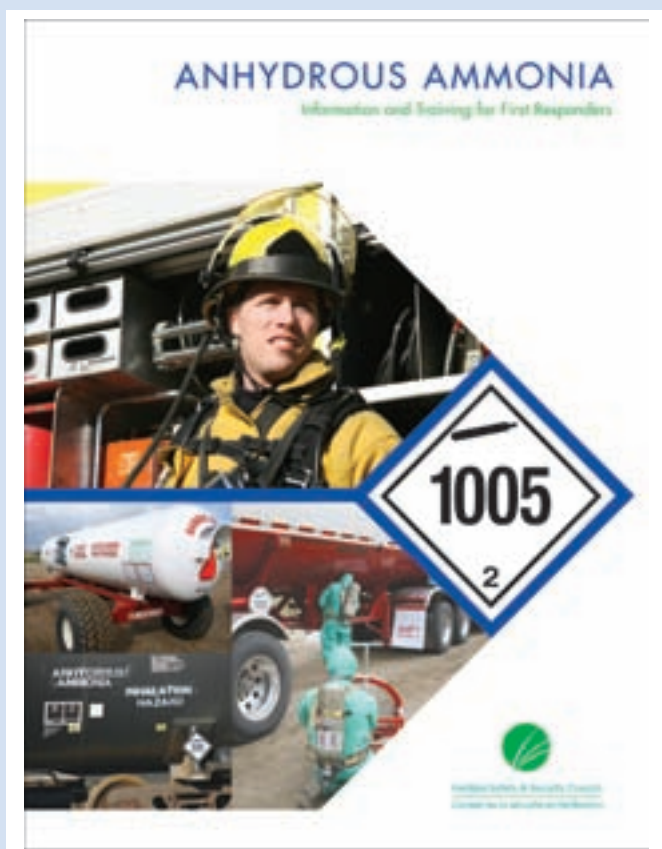


## New Anhydrous Ammonia Training and Awareness Campaign for First Responders and the Agri-Retail Community

A training and awareness campaign directed at Canada's first responders, including fire, police, and emergency personnel, has been created by the Fertilizer Safety and Security Council (FSSC) to support the reclassification of the well-known fertilizer anhydrous ammonia.

The awareness program was developed in consultation with first responder partners including the Canadian Association of Fire Chiefs, Transport Canada and the agri-retail community. The new program – consisting of a training DVD and printed materials – will be distributed to some 3000 first responders across Canada early this year.

“Our priority is public safety and the preparedness of first responders if they encounter an incident involving anhydrous ammonia in their community,” said Dave Finlayson, executive director of FSSC. “The training and awareness campaign is one of the ways we inform front-line responders about the importance of recognizing anhydrous ammonia and the action required to protect themselves and the community in the event of a spill. We appreciate the support of our first responder partners in developing this program and in communicating this important message.”



Anhydrous ammonia is widely used in urban and rural communities across Canada in agricultural and industrial applications.

Due to its hazardous properties, anhydrous ammonia is regulated under the Transportation of Dangerous Goods Regulations as a Class 2.3 Toxic Gas, Subsidiary Class 8, Corrosive, with the internationally recognized UN # 1005. Trucks, rail cars, and nurse wagons transporting anhydrous ammonia are now required to display a new placard featuring a black cylinder on white background, and the UN1005 product number, as well as the words “Anhydrous Ammonia, Inhalation Hazard.” These safety marks enable first responders to immediately identify the product so they can protect themselves and the public in the event of a spill.

The FSSC supports the education of farmers, first responders, retailers/distributors and carriers on proper handling of ammonia products. To learn more about the Fertilizer Safety & Security Council, visit the website at [www.fssc.ca](http://www.fssc.ca) or contact Dave Finlayson, executive director of the FSSC at 613-230-2600. ♦



The black and white placard, now widely used by the agriculture industry, identifies the product as anhydrous ammonia with the UN1005 product identification number, alerting first responders to the presence of a toxic gas with corrosive properties. This placard is unique to anhydrous ammonia. The words "Anhydrous Ammonia, Inhalation Hazard" must also be marked on transportation equipment when this placard is used.

## Ammonia Code Audits and Continuous Improvement



Agri-retailers have always held safety and security at the top of their priority list when handling anhydrous ammonia. Now, agri-retailers can gain valuable feedback and assistance in ensuring their facilities meet industry standards for safety and security by conducting facility audits under the Fertilizer Safety & Security Council's Ammonia Code of Practice. Retailer audits are also an important way for the FSSC to gain feedback on the Ammonia Code of Practice, the auditing process and protocols, and auditor training requirements. Voluntary audits done in 2008 led to some valuable recommendations for improvement within the Ammonia Code of Practice and the audit process.

The Ammonia Code of Practice is the first industry-led program of this magnitude for the safe and secure handling of anhydrous ammonia. It was initiated by the FSSC and was developed by fertilizer manufacturers, distributors, and agri-retailers. First responders, government representatives, and allied industries also helped in the drafting process. While existing regulations, safety programs and training have greatly reduced the incidence of accidents involving anhydrous ammonia, implementation of the code will further reduce this risk and provide the industry with credibility in the eyes of regulators and the general public.

Retailers have until Dec. 31, 2010 to successfully complete the first mandatory audits under the Ammonia Code of Practice. Now is the time to get a head start and gain the peace of mind that your facility is as safe as possible. To book your audit today, please contact one of the FSSC's certified auditors. A list of auditors can be found on the FSSC website at [www.fssc.ca](http://www.fssc.ca) ♦



## Managing Fertilizer Economics

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### Introduction

The most common question expressed at crop production meetings this past summer and fall was, How much can I cut back on fertilizer and not decrease my crop yields? There is no simple answer to this question. The correct answer is, It depends. It is important to understand what plant nutrient applications will most affect the yield of a specific crop, on a specific field.

Fertilizer prices have increased dramatically over the past four years. For example, nitrogen (N) has gone from around \$0.40/lb of N in 2005 to as high as \$0.90/lb N in 2008, the same comparisons for phosphorous (P) and potassium (K) are

respectively \$0.30/lb P<sub>2</sub>O<sub>5</sub> to \$1.00/lb P<sub>2</sub>O<sub>5</sub>, and \$0.15/lb K<sub>2</sub>O to \$0.59/lb K<sub>2</sub>O. Just cutting back on fertilizer applications, however, may end up decreasing yield to the point where lower net incomes result.

### Advising Farm Customers When Asked How Much Can They Cutback on Fertilizer

It is useful to ask some questions of customers to gain a better understanding of what information is really wanted. Such questions are:

- What do you mean when you say you will cut back on fertilizer?
- Have you considered each field separately and how a broad, general “cutback” in fertilizer rates on all fields will affect yield on specific fields?

Depending on what a farm customer wants to do here are some useful ways to suggest they manage their fertilizer applications:

*“I won’t reduce my N rates much as this will adversely affect my yields right away. I’ll just fine tune my rates of N.”*

In this instance it is useful to suggest fertilizer N rate decisions be based on soil test results, or apply based on crop uptake and removal. The key is to add sufficient N to obtain a crop that yields well, while maximizing returns to the fertilizer investment. This means add enough but not too much.



## Sharing Common Ground

*“For P, K, S and micronutrients, I will apply two-thirds to one-half as much P, and skip the K, S, and micros.”*

It is important to point out this approach might be valid if used in the short-term (one to two years) on a field where there has been a consistent program of applying more than what the crops require as a minimum, and the background availability of P, K, S and other secondary and micronutrients is sufficient. Lower yields and decreased net returns, however, may result if used on a field where there has not been building up of these nutrients and soil test results show marginal to deficient availability.

### Specific Examples and Challenges with Reduced Phosphorous Rate Strategies

A grower will apply P at rates one-third to one-half of the normal rates.

It costs less per acre, but even though crop yields may not decrease in the short-term (i.e. one to two years), there is an effectual mining of the more easily available P out of the soil, and over a few years or more lower crop yields and net incomes will result.

A grower can get a good deal on rock phosphate and will apply P at the regular rate. For example: \$500/tonne for rock phosphate compared to \$1,150/tonne for mono-ammonium phosphate (11-52-0), both farm delivered prices.

Rock phosphate does contain P, but it is in a form that is less soluble and available to crops than the soluble forms of processed phosphate fertilizers such as granular 11-52-0, or liquid 10-34-0 (See Table 1). These more soluble fertilizer products are produced by acidulation (treating ground rock phosphate with sulfuric acid) and filtering to produce phosphoric acid and then this acid is reacted with anhydrous ammonia to produce granular ammonium phosphate, or liquid ammonium poly-phosphate respectively.

Rock phosphate applications can work quite well on very acidic soils (<pH 5.0) because the natural soil acidity reacts with the rock phosphate to produce phosphoric acid, but the rock phosphate needs to be ground finely and subsequently granulated to be used as a granular fertilizer. Unfortunately on high pH soils (>7.0) the natural acidulation process doesn't happen and additions of rock phosphate are often less effective.

### Efficiency of P Fertilizers

The use of P fertilizer in the year of application by target crops has been measured using isotope <sup>32</sup>P-labelled fertilizer. Usually the amount used is 25 per cent or lower (Syers, et al. 2008, page 28). This is called calculating fertilizer use by the “direct method” and is calculated as the amount of labelled P taken up into the crop as a percentage of labelled P fertilizer applied.

The P not used in the first year, however, is residual in the soil and contributes to a pool of labile P that can be used over a period of years (a decade or more) by subsequent crops. This means that the efficiency of applied P is much greater over time. For example, a conclusion by Syers, et al. (2008, page 54) is that on many soils, added P is not irreversibly fixed in forms that are unavailable to plants. Consequently, the efficiency of use of P added in fertilizers is often high (up to 90 per cent) when considered over an adequate time scale and when evaluated using the balance method. The “balance method” defines P use as the total P in the crop divided by the P applied, expressed as a percentage.

### Ideal P Management

It has been suggested that an efficient management strategy for P fertilizer is to build up available P levels in a soil to a so-called “Critical Value”, then to add P fertilizer to replace P removed with the harvested portion of a crop (Syers, et al. 2008, page 54). It is further suggested that the soil be sampled at least every four to five years and tested to monitor the level of plant available P, if the test value is lower than the critical value, then P rates should be increased. If the test

Product	P2O5 Content (% solubility)	Soluble P2O5 Content	Cost \$/tonne	Cost \$/lb P2O5 Total	Cost \$/lb P2O5 soluble
Rock Phosphate	26.6% (21.9%)	5.8%	\$500	\$0.85	\$3.90
11-52-0	52% (91.0%)	47.3%	\$1150	\$1.00	\$1.10

**Table 1. Comparison of the Solubility and Cost of Rock Phosphate and Mono-Ammonium Phosphate (11-52-0)**

value is greater than the critical value, the P rates could be decreased. Under the soil, climate and crop conditions of the United Kingdom the current recommendation is to maintain soils at a level of 15-25 mg kg<sup>-1</sup> (approximately 30 to 50 lb P<sub>2</sub>O<sub>5</sub>/acre) of Olsen soil test P.

### Conclusions

The lower the amount of available soil nutrient in a field, there is less opportunity to cut back and save money, as crop yield will decrease along with a decrease in revenues greater than the amount saved by using less fertilizer.

Help farm customers understand each field they manage may have different background levels of available plant nutrients and that a broad cutback on fertilizer rates on all fields, in response to an increase in fertilizer prices may result in lower net incomes.

Even though the apparent efficiency of P fertilizer may appear low (e.g. 25 per cent or less) in the year of application using the direct method of measurement, the reality is using the

balance method over longer periods of time (e.g. 10 years or more), the efficiency of use can be as high as 90 per cent.

Ideal P fertilizer management is to add P fertilizer to a soil, specific critical response level and then maintain this level by replacing P removals in harvested portions of crops with equal amounts of P fertilizer. ♦

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### Reference

Syers, J.K., Johnston, A.E., and Curtin, D. 2008. *Efficiency of soil and fertilizer phosphorous use, reconciling changing concepts of soil phosphorous behavior with agronomic information*. FAO, Rome.



# Fertilizer Outlook Forum

Thursday, February 12, 2009

1:00 p.m. – 5:00 p.m., Delta Regina Hotel

The Canadian Fertilizer Institute will be holding its first Fertilizer Outlook Forum on February 12, 2009 in partnership with the Canadian Association of Agri-Retailers Annual Convention.

The program will include presentations on global fertilizer outlook, the Canadian market, hedging options to manage risk, farmers' perspectives and update on the Ammonia Code of Practice. The aim: to better equip you to make more informed decisions about your business.

Plan to attend CFI's Outlook Forum this February!



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