CANADIAN FERTILIZER INSTITUTE
INSTITUT CANADIEN DES ENGRAIS

Nutrient Stewardship in North America

Voluntary Initiatives for a Sustainable Industry

Presented by: Roger Larson, President, CFI
IFA Workshop on Fertilizer Best Management Practices (BMPs)
Brussels, Belgium ~ March 8, 2007

Agenda

- North American BMP Framework
- United States Situation
- Canadian Situation
- Case study: Lake Winnipeg
- Economic Models
- Future Directions

CANADIAN FERTILIZER INSTITUTE
INSTITUT CANADIEN DES ENGRAIS

Becoming a Sustainable Industry

SUSTAINABILITY GOALS

Environmental

- Sustain or improve soil quality
- Maintain nutrient levels within natural ecosystems
- Preserve wildlife habitat

Social

- Produce nutritious, abundant and affordable food
- Support programs for strong and caring communities
- Help meat global food needs
- Provide ongoing employment opportunities in agriculture and related industries

Economic

- Produce revenue to sustain farm operations
- Preserve quality of life
- Make the most of dollars spent on fertilizer

CANADIAN FERTILIZER INSTITUTE
INSTITUT CANADIEN DES ENGRAIS

Fertilizer's Image - 1900

FEED THE LAND AND IT WILL FEED YOU.

BUY

L. L. CROCKER'S

BUFFALO HONEST FERTILIZERS,

Ammoniated Bone Super-Phosphates,

AND

PURE GROUND BONES.

L. L. Crocker's Buffalo Fertilizer and Chemical Works, Buffalo, N. Y.

COMPLIMENTS OF

H. A. TROMMER,

DEALER IN

AGRICULTURAL IMPLEMENTS

FERTILIZERS, &c.

OFFICE ON RAILROAD STREET.

HANOVER, PENNA.

CANADIAN FERTILIZER INSTITUTE
INSTITUT CANADIEN DES ENGRAIS

Fertilizer's Image - 2006

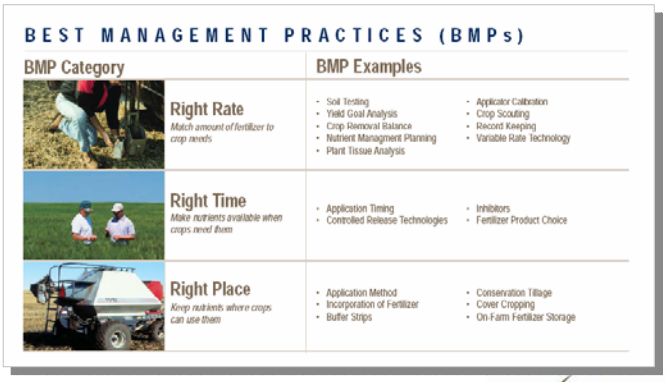
What is "Best" for nutrient management?

- A flexible, site-specific approach
- Based on science and industry expertise
- Voluntary initiatives accommodate both these objectives

CANADIAN FERTILIZER INSTITUTE
INSTITUT CANADIEN DES ENGRAIS

Voluntary BMP Framework

The Right Products at the…



CANADIAN FERTILIZER INSTITUTE
INSTITUT CANADIEN DES ENGRAIS

United States Situation

CANADIAN FERTILIZER INSTITUTE
INSTITUT CANADIEN DES ENGRAIS

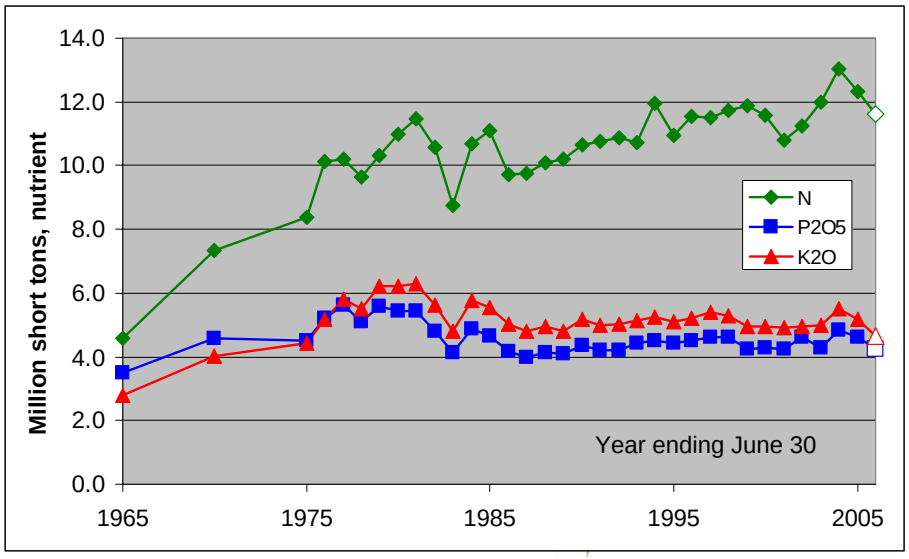
Nutrient Use Task Force

- Collaborative effort
  - The Fertilizer Institute (TFI)
  - International Plant Nutrition Institute (IPNI)
  - Foundation for Agronomic Research (FAR)

Mission Statement

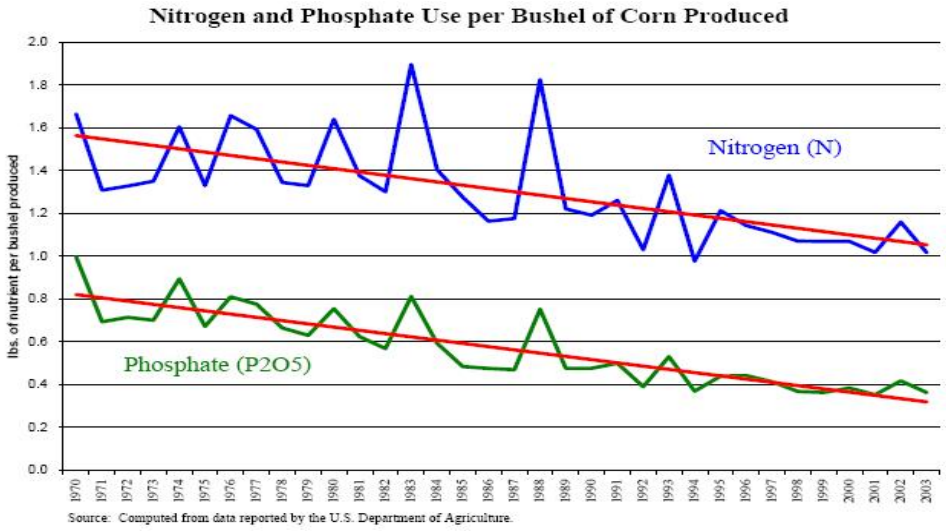
- To assist in developing and implementing strategy… to promote the appropriate and efficient use of fertilizer
  - Fertilizer industry seeks optimum plant nutrition for an abundant, economical, safe, nutritious food and fibre supply
  - At the same time, we seek to encourage farmers and their advisers to responsibly protect and improve air and water quality

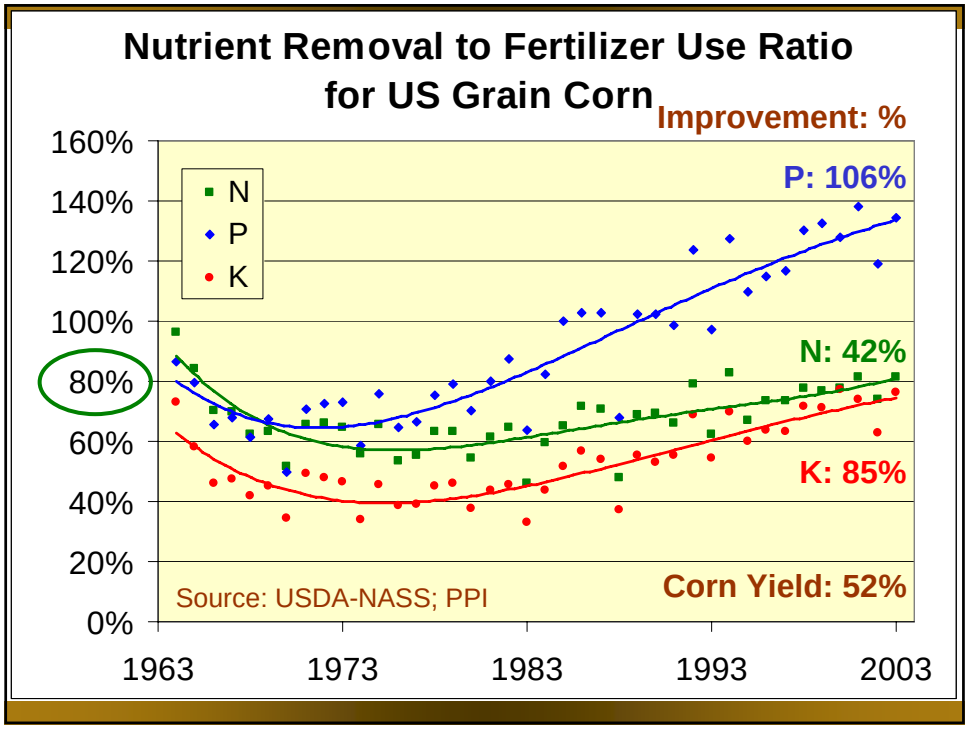
U.S. Fertilizer Consumption



*Preliminary estimates from Vroomen (10/20/06), TFI

Nutrient Use Efficiency Improving

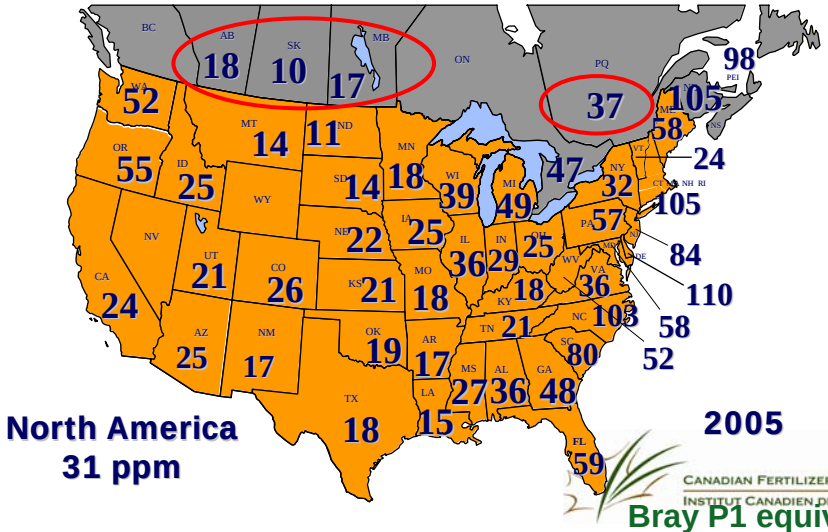




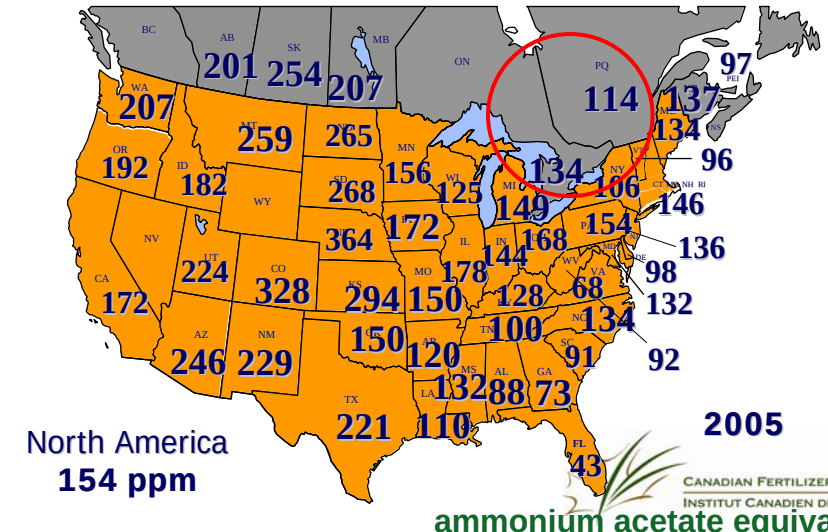
Canadian Situation

CANADIAN FERTILIZER INSTITUTE
INSTITUT CANADIEN DES ENGRAIS

Median soil test P levels



Median soil test K levels



Ratio of crop removal to nutrients applied

	Removal to use ratio (%)[1]		% land in P deficit
	N	P	
Prairies	101	107	79
Eastern Prov.	80	69	32
U.S.A.	75	95	71

1/ Removal to use ratio = $\frac{\text{crop removal}}{\text{(fertilizer + recoverable manure + legume fixation)}}$

Data sources: PPI, 2002; for crop years 1998-2000
CFI, 2004; for crop years 1991-2001

Canadian Fertilizer Institute
Institut Canadien des Engrais

The Manitoba Challenge: Lake Winnipeg

Canadian Fertilizer Institute
Institut Canadien des Engrais

The Manitoba Challenge: Lake Winnipeg

- 10th largest freshwater lake on Earth
- 2nd largest watershed in Canada
- 1M km^2, 5M people

CANADIAN FERTILIZER INSTITUTE
INSTITUT CANADIEN DES ENGRAIS

The Manitoba Challenge: Lake Winnipeg

CANADIAN FERTILIZER INSTITUTE
INSTITUT CANADIEN DES ENGRAIS

Manitoba Nutrient Regulations

- The provincial government originally proposed hard caps on Nitrogen and Phosphorus application rates, but backed down in the face of opposition from farmers and the fertilizer industry
- Instead, softer limits on residual soil N and P were established
- Farmers can escape the regulations if they submit nutrient management plans
- Now agriculture has to deliver results

Manitoba MOU

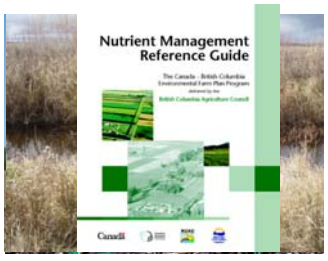
- CFI is proposing Memorandum of Understanding with the Manitoba government
  - Founded on Right Rate, Right Time, Right Place™ principles
  - CFI will provide training for farmers through Certified Crop Advisers and science from IPNI
  - Manitoba will share the cost

CANADIAN FERTILIZER INSTITUTE
INSTITUT CANADIEN DES ENGRAIS

An Economic Evaluation of BMPs for Crop Nutrients in Canadian Agriculture

Purpose

- To estimate farm profitability before and after participation in crop nutrient BMPs.
  - With and without financial assistance
- BMPs evaluated:
  - Soil testing
  - Variable rate fertilization
  - Minimum tillage
  - No-tillage
  - Nutrient management planning
  - Buffer strips



CANADIAN FERTILIZER INSTITUTE
INSTITUT CANADIEN DES ENGRAIS

Survey of Canadian Producers

- 1,000 producers surveyed across Canada
- Producers are familiar with BMPs:
  - 97% of producers use at least one BMP
  - 50% of producers use multiple BMPs
- High level of importance on managing their farm to protect the environment.
  - 98% of survey respondents
- Low uptake of financial assistance programs
  - Only 1-7% of producers using financial assistance

CANADIAN FERTILIZER INSTITUTE
INSTITUT CANADIEN DES ENGRAIS

Survey of Canadian Producers

- Key reasons to adopt BMPs:
  - Increased yields
  - More efficient use of fertilizer and manure
  - Concern about soil quality/erosion
  - Fuel, labour and monetary savings
- Barriers to adoption:
  - Cost
  - Lack of equipment
  - Believing that BMPs are unnecessary

CANADIAN FERTILIZER INSTITUTE
INSTITUT CANADIEN DES ENGRAIS

Farm Profitability Models

- Developed representative farm models for western, central and eastern Canadian farms.
  - Based on 2006 provincial cost of production budgets
- Survey results used to determine impact of BMP on yields and operating costs
  - Determined % change in net income due to the adoption of the BMP based on producer perceptions
- Estimated results with and without financial assistance

CANADIAN FERTILIZER INSTITUTE
INSTITUT CANADIEN DES ENGRAIS

Farm Profitability Models - Results
(% change in net income due to BMP)

	Soil Testing	VRF	Min-Till	No-Till	NMP	Buffers
Alberta - Black Soils		53			78	-10
Alberta - Brown Soils	19		34		33	
Sask - Black Soils	24	25			38	
Sask - Brown Soils	15		17		30	
Manitoba	12	-7	12	12	20	-1
Ontario	59	-9	23	23	42	-3
Quebec	1	-6	12	8	13	-2
Prince Edward Island						-1

VRF – Variable Rate Fertilization
NMP – Nutrient Management Planning
Note: Table shows models without financial assistance

CANADIAN FERTILIZER INSTITUTE
INSTITUT CANADIEN DES ENGRAIS

Key Results

- Profitable BMPs included:
  - Soil testing
  - Nutrient management planning
  - Minimum tillage
  - No-tillage

- These BMPs increased yields which offset any increase in operating costs, enhancing farm profitability.

Canadian Fertilizer Institute
Institut Canadien des Engrais

Key Results

- Unprofitable BMPs included:
  - Variable Rate Fertilization
    - Equipment costs outweighed benefits of the BMPs.
    - Exception: Alberta and Saskatchewan
  - Buffer strips
    - High costs of establishment and lost crop production.

Canadian Fertilizer Institute
Institut Canadien des Engrais

Summary and Conclusions

- Research provides farmers with knowledge of how adopting BMPs affects their financial bottom line.
- Research demonstrates that some BMPs can improve farm profitability.

CANADIAN FERTILIZER INSTITUTE
INSTITUT CANADIEN DES ENGRAIS

Summary and Conclusions

- To manage environmental risk using BMPs, barriers to adoption need to be addressed.
- How?
  - Written material on adopting BMPs
  - More accurate information on economic and environmental impacts of BMPs on the farm
  - Workshops/seminars
  - Agricultural extension assistance
  - More financial assistance

CANADIAN FERTILIZER INSTITUTE
INSTITUT CANADIEN DES ENGRAIS

CANADIAN FERTILIZER INSTITUTE
INSTITUT CANADIEN DES ENGRAIS

Future Directions

Future Directions

- Major Opportunity
  - U.S. Farm Bill is being drafted
  - Canada is developing its new five-year, federal provincial plan: Agricultural Policy Framework II

CANADIAN FERTILIZER INSTITUTE
INSTITUT CANADIEN DES ENGRAIS

3Rs/4Rs

- TFI and CFI are working to get government recognition for nutrient BMPs system – the Right Product at the Right Rate, Right Time, Right Place™
- Next Step: International recognition

Critical Elements

- Science-based
- Extension is needed
- Partnerships with farmers is essential
- Voluntary is key

Science-based

IPNI INTERNATIONAL PLANT NUTRITION INSTITUTE

- Better Crops, Better Environment...through Science
- BMP definition, improvement and impact measurement

CANADIAN FERTILIZER INSTITUTE
INSTITUT CANADIEN DES ENGRAIS

Extension: Certified Crop Advisers

- American Society of Agronomy's Certified Crop Adviser Program (CCA)
- The largest certification program in agriculture
- Over 14,000 certified throughout the USA and Canada

CANADIAN FERTILIZER INSTITUTE
INSTITUT CANADIEN DES ENGRAIS

Partnerships with farmers

Crop Nutrients Council

Conseil des Nutriments Culturaux

Canadian Fertilizer Institute
Institut Canadien des Engrais

CNC Mission

- "To promote science-based Beneficial Management Practices for crop nutrients that enhance both the ***economic*** and ***environmental*** sustainability of agriculture"
- It's all about balance

Canadian Fertilizer Institute
Institut Canadien des Engrais

Voluntary Nutrient Management Plans

- Focus has been on manure management
- Fertilizer is next
- Avoid regulation that imposes quantitative limits instead of supporting nutrient balance
- Protect fertilizer's reputation
- **RIGHT PRODUCT/S @ Right Rate, Right Time, Right Place™**
  - This is the foundation

CANADIAN FERTILIZER INSTITUTE
INSTITUT CANADIEN DES ENGRAIS

Communication of BMPs

- **Right Rate, Right Time, Right Place™**
- **Right Products, Right Rate, Right Time, Right Place™**
- **RIGHT PRODUCT @ Right Rate, Right Time, Right Place™**

CANADIAN FERTILIZER INSTITUTE
INSTITUT CANADIEN DES ENGRAIS