



Plant Nutrition
Canada

Lake Futures Steering Committee
Presentation Series
17 March 2021





Tom Bruulsema,
Plant Nutrition Canada

Responsible Plant Nutrition & Water Quality

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Plant
Nutrition
Canada

Research Resources Presentations About Contact

Supporting Science

Plant Nutrition Canada provides science support for the fertilizer industry's efforts to advance nutrient stewardship. We apply, interpret and extend science for sustainable plant nutrition.

<https://plantnutrition.ca>




Apply Science

We lead, shape and mold concepts and intended implementation pathways for nutrient stewardship



Interpret Science

We explain implications, strengths and limitations of new scientific reports on issues relevant to nutrient stewardship



Extend Science

We educate and inform practitioners on science-based principles underlying agronomic practices relevant to nutrient stewardship

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History

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Plant Nutrition Canada

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IPNI CANADA

Publications Research News Topics

BetterCrops with plant food

A PUBLICATION OF THE INTERNATIONAL PLANT NUTRITION INSTITUTE (IPNI) 2019 NUMBER 1

Behold... Phosphorus!

01 Apr 2019
Final Issue of Better Crops with Plant Food

As 2019 marks the 350th anniversary of Hennig Brandt's discovery of phosphorus (P), it is a time to reflect back on the number of significant scientific advancements that have followed.

[Read More](#)

Publications

- Better Crops
- Plant Nutrition Today
- Issue Review Series
- Fact Sheets

Research

- Image Database
- Research with Impact Series
- Nutrient Uptake & Removal
- Toolbox & Software

News & Information

- About IPNI
- Photo Contest
- Scholar Award
- More ...

Note

The agronomic programs of IPNI ceased operations on April 1, 2019. This website will remain online until the end of

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THE FERTILIZER INSTITUTE <https://store.tfi.org> Home Catalog

4R and Plant Nutrient Educational Resources

The Fertilizer Institute is now your source for select educational resources previously published by the International Plant Nutrition Institute

Preparing for the 2019 International Certified Crop Adviser Exam (IPNI)

Soil Fertility Manual

Preparing for the 4R Nutrient Management Specialist Exam (Certified Crop Adviser)

4R PLANT NUTRITION

Soil Management Practices for Fertilizer and Low Fertilization

Digital Download - Crop Nutrient Deficiency Image

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Linkages

- Plant Nutrition Canada supports the Nutrient Stewardship programs of Fertilizer Canada, The Fertilizer Institute in the USA and the International Fertilizer Association.

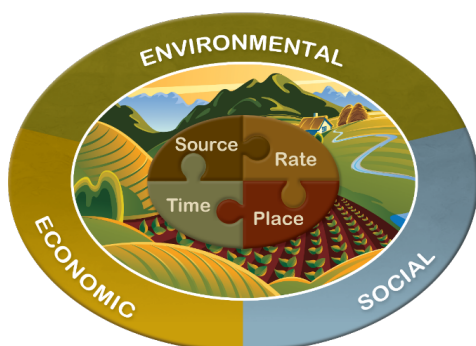


- Its partners include African Plant Nutrition Institute, Scientific Panel on Responsible Plant Nutrition, 4R Solution Project and 4R Research Fund.



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4R Nutrient Stewardship - Impacts



 nutrient
stewardship

1. Farmland productivity
2. Soil health
3. Nutrient use efficiency
4. **Water quality**
5. **Air quality**
6. **Greenhouse gases**
7. **Biodiversity**
8. **Macroeconomic value**
9. **Food security**

On-farm

P


N

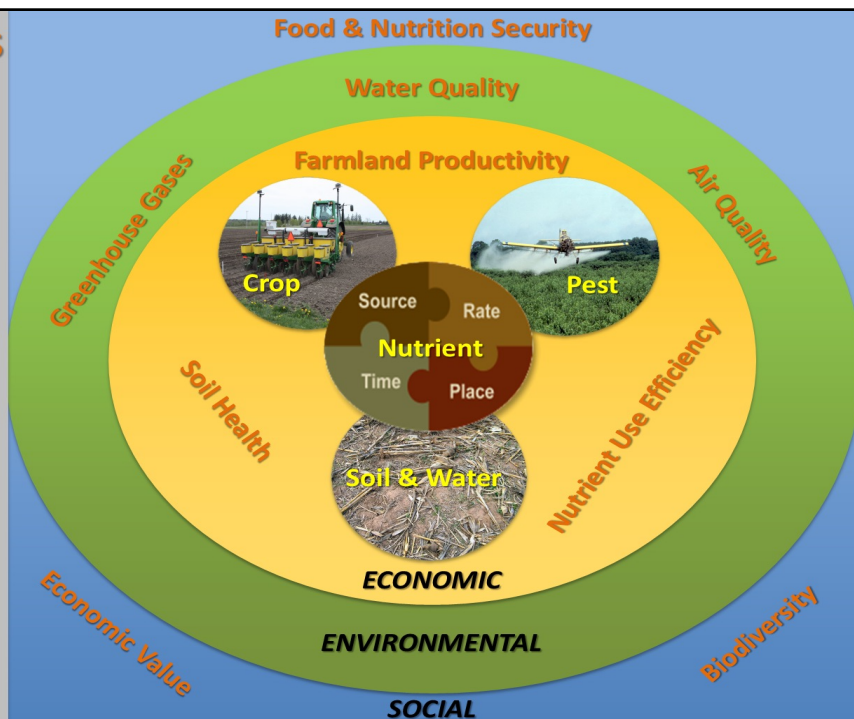
External

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OUTCOMES

of
 nutrient
stewardship
are
influenced
by
**crop and pest
management,**
and
by
**soil and water
conservation
practices**
in the context
of changing
**weather and
climate.**




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Food and Agriculture
Organization of the
United Nations

The international
Code of Conduct
for the **sustainable use**
and **management**
of **fertilizers**




itps
INTERNATIONAL
TECHNICAL PANEL OF EXPERTS



GLOBAL SOIL
PARTNERSHIP

Principles of 4R Nutrient Stewardship are embedded in the FAO Code of Conduct, and in other Codes of Practice.




RESPONSIBLE GRAIN
CANADIAN FARM STANDARDS

FARMERS | INDUSTRY STAKEHOLDERS | BUYERS | CONSUMERS | CODE CONTENTS | ABOUT US | CONTACT

Canadian Grain Farmers Code of Practice

Responsible Grain is a national, voluntary Code of Practice that will allow Canadian grain farmers to demonstrate their care and commitment to the environment.



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Canada**

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**SCIENTIFIC PANEL
ON RESPONSIBLE PLANT NUTRITION**



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 Bruno GERARD CIMMYT - Centro Internacional de Mejoramiento de Maiz y Trigo Director Sustainable Intensification Program	 Kaushik MAJUMDAR African Plant Nutrition Institute (APNI) Director General	 Mike MCLAUGHLIN University of Adelaide Professor	 Fusuo ZHANG China Agricultural University Dean of the School of Agriculture Green Development	 Xin ZHANG University of Maryland Center for Environmental Science (UMCES) Assistant Professor	



ifa
INTERNATIONAL
FERTILIZER ASSOCIATION

<https://www.sprpn.org>

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A NEW PARADIGM FOR PLANT NUTRITION

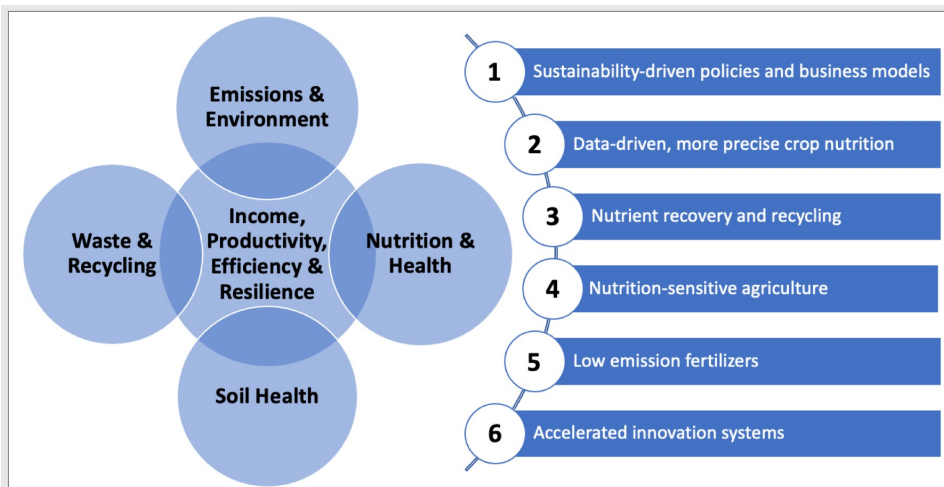


Figure 1. The five interconnected aims of responsible plant nutrition, and six key actions to take.

By 2040: “Through **responsible consumption**, **increased recycling**, and **better management practices** nutrient waste along the food system has been halved. Nitrogen and **phosphorus surpluses** in hotspots have been reduced to **safe levels** which **minimize eutrophication** and other environmental harm.” (outcome #3 of 9)



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4R Solution



FERTILIZER CANADA



Co-operative Development
Foundation of Canada
since 1947



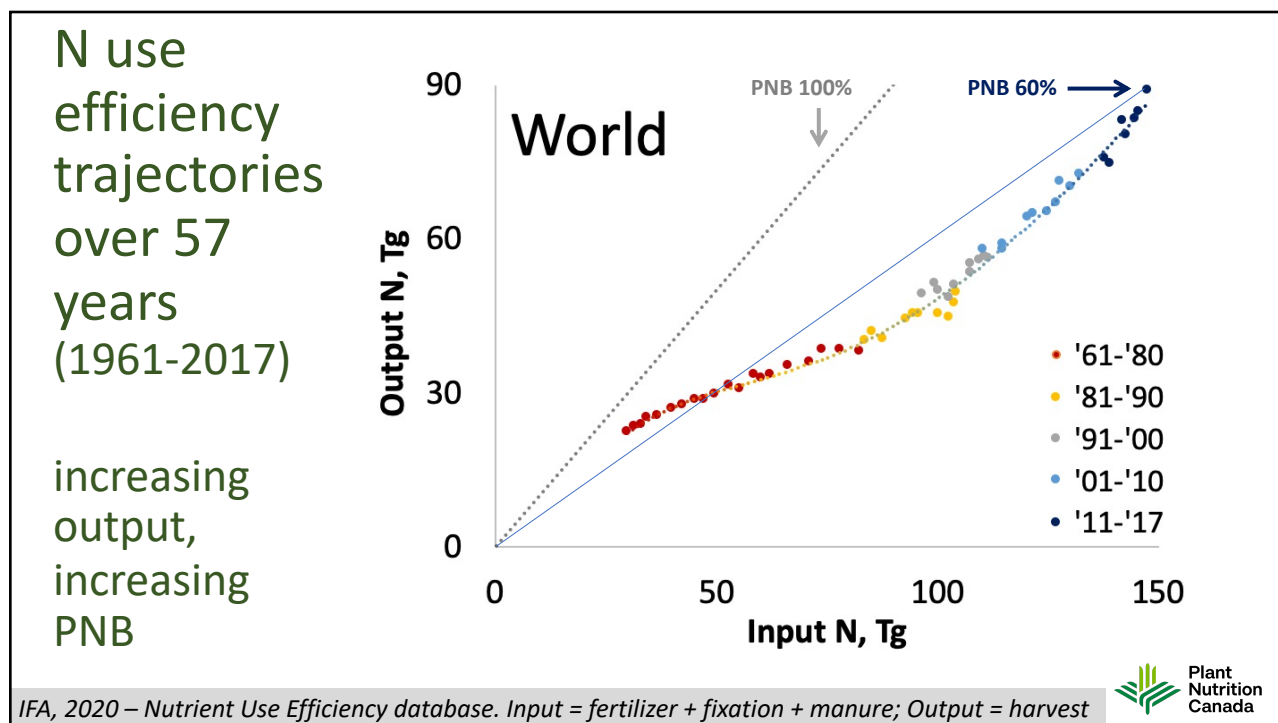
Global Affairs
Canada

Affaires mondiales
Canada

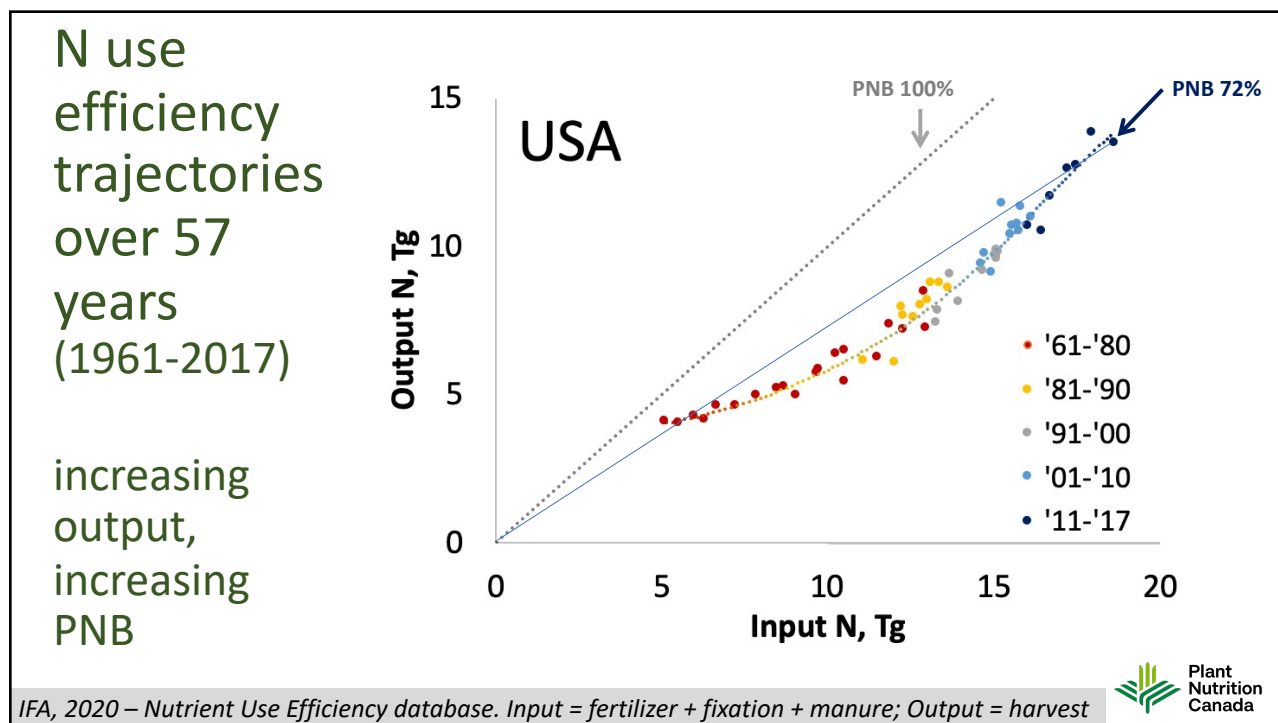
The Context and Relevance for 4Rs in Ghana and Ethiopia

Dr. Shamie Zingore | **Director for Research**
 Dr. Samuel Njoroge | **4R Solution Project Scientist**
AFRICAN PLANT NUTRITION INSTITUTE

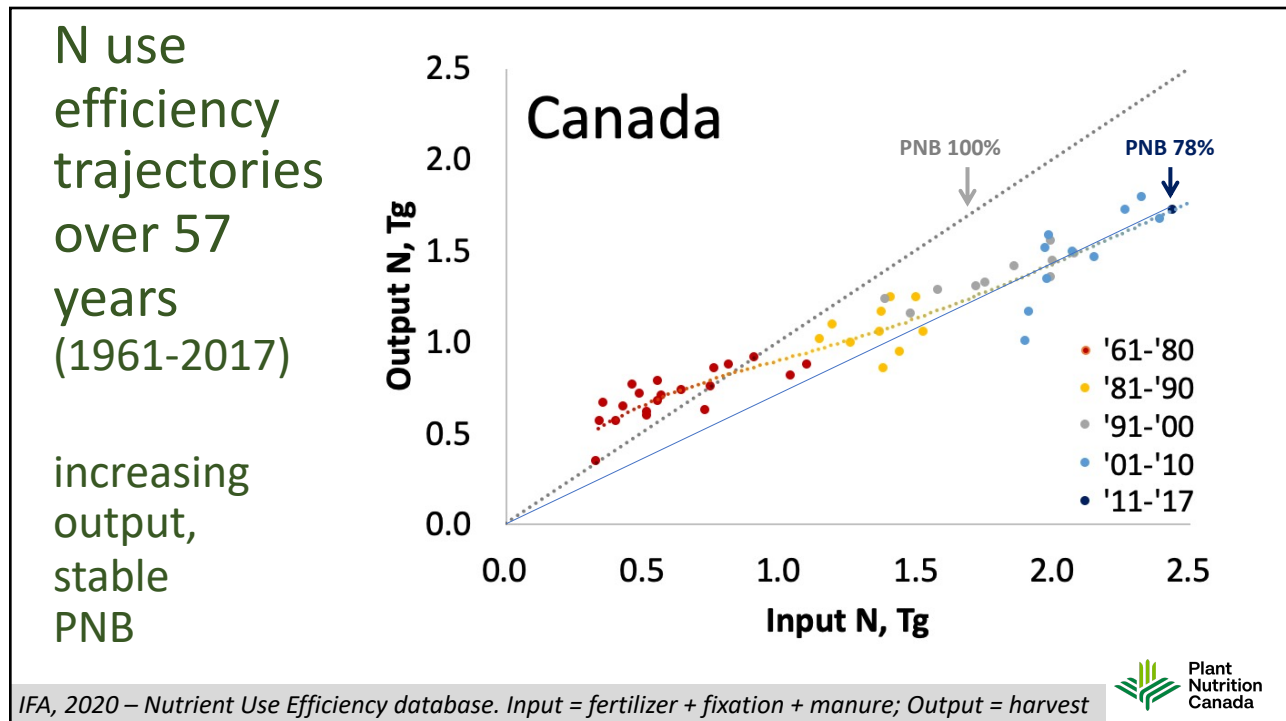
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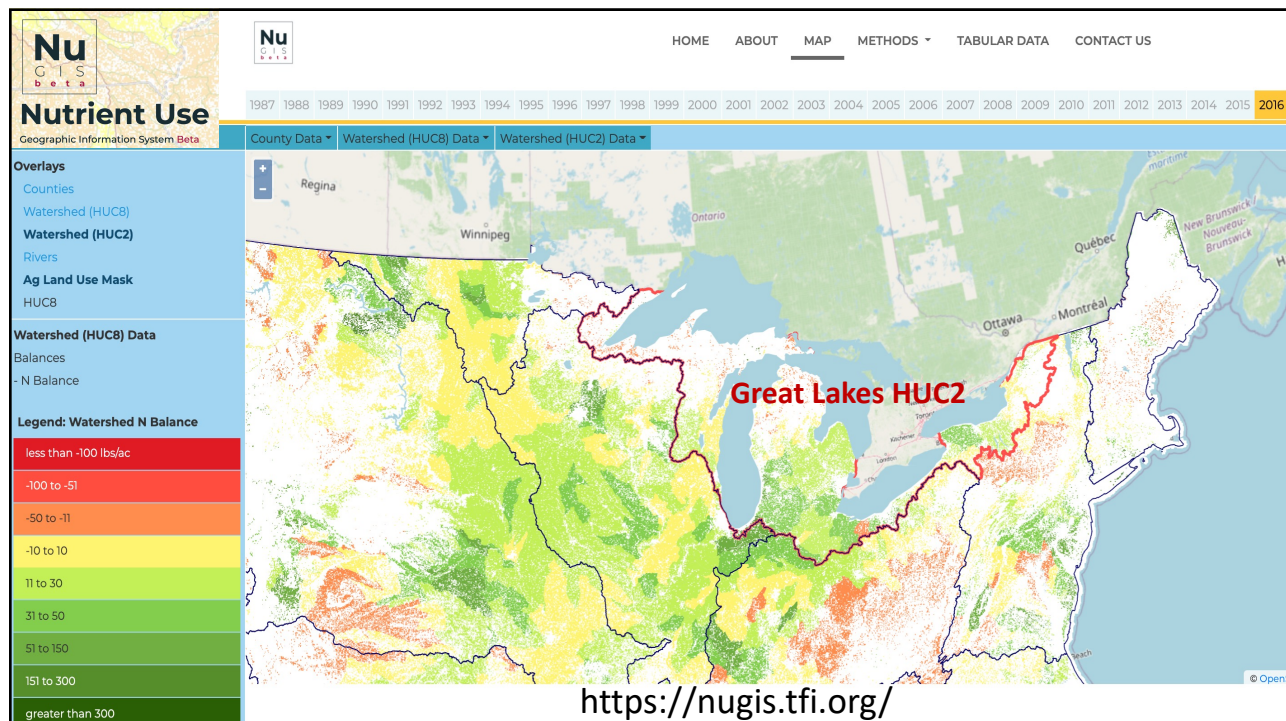
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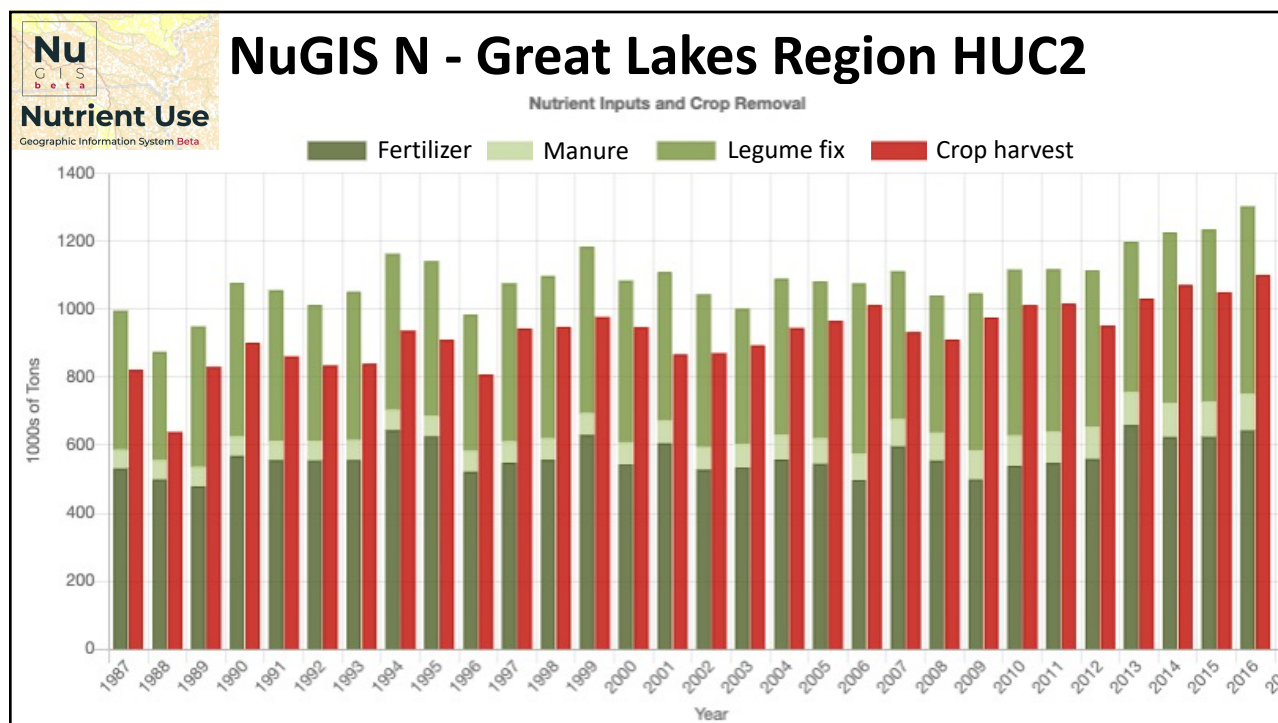
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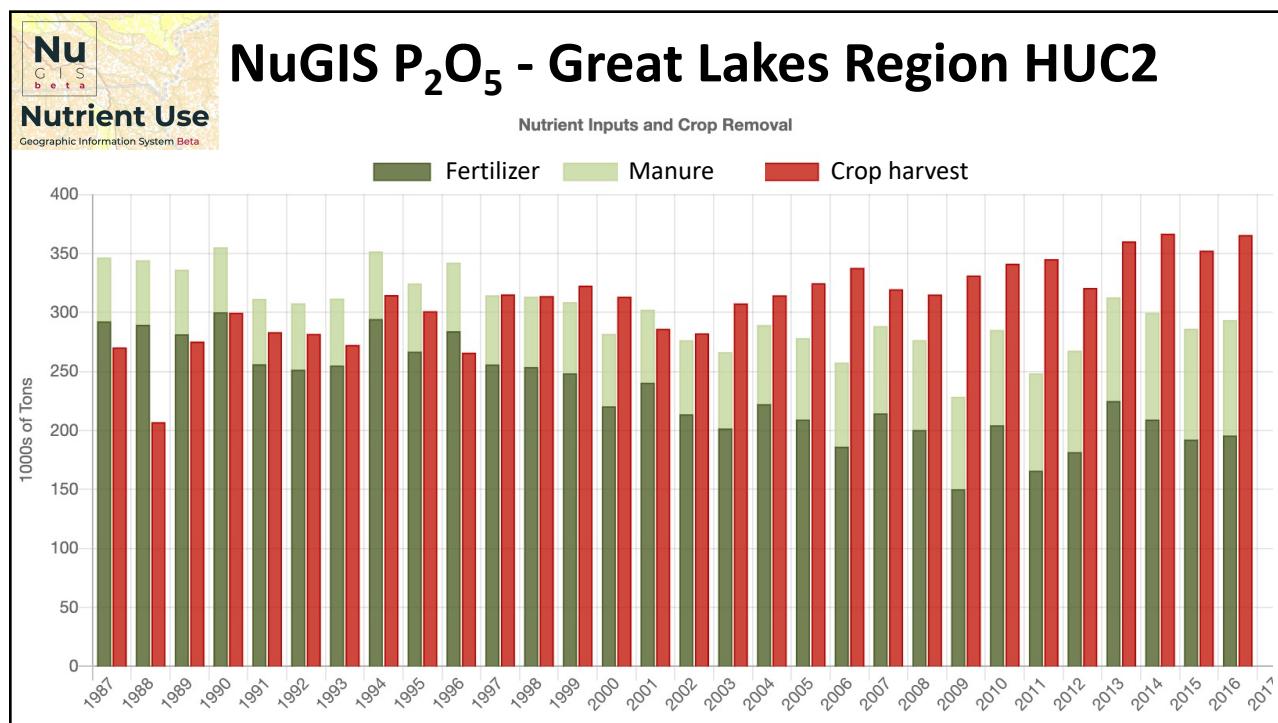
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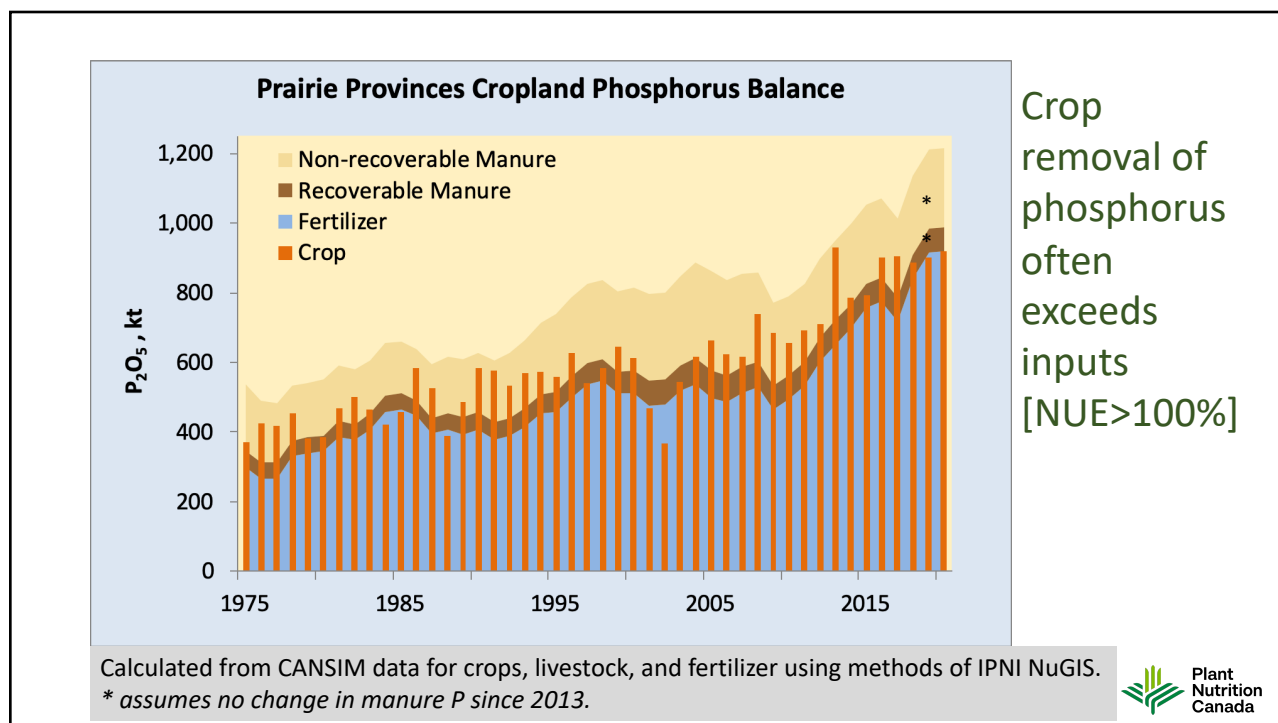
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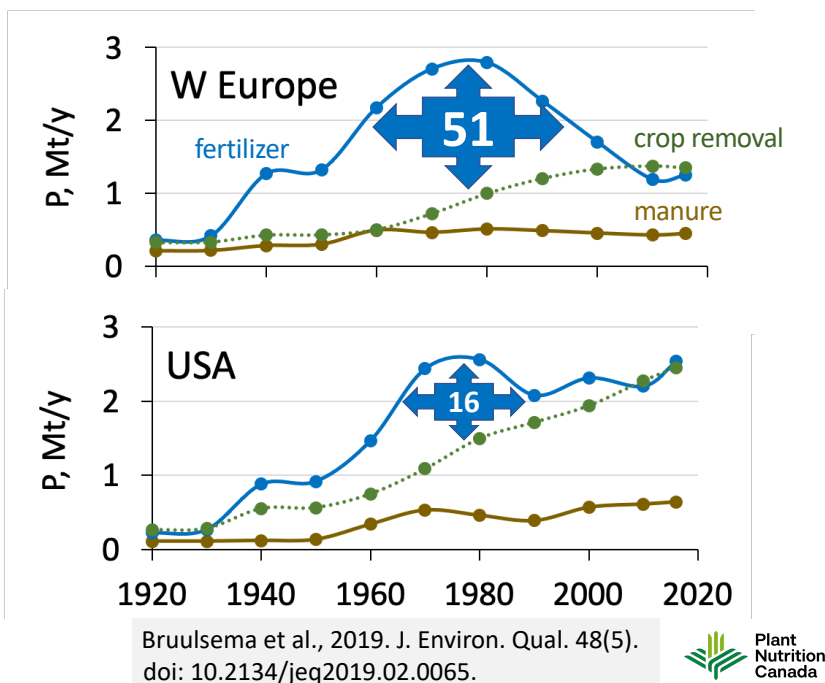
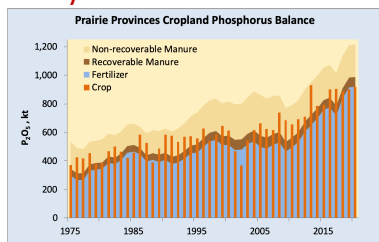


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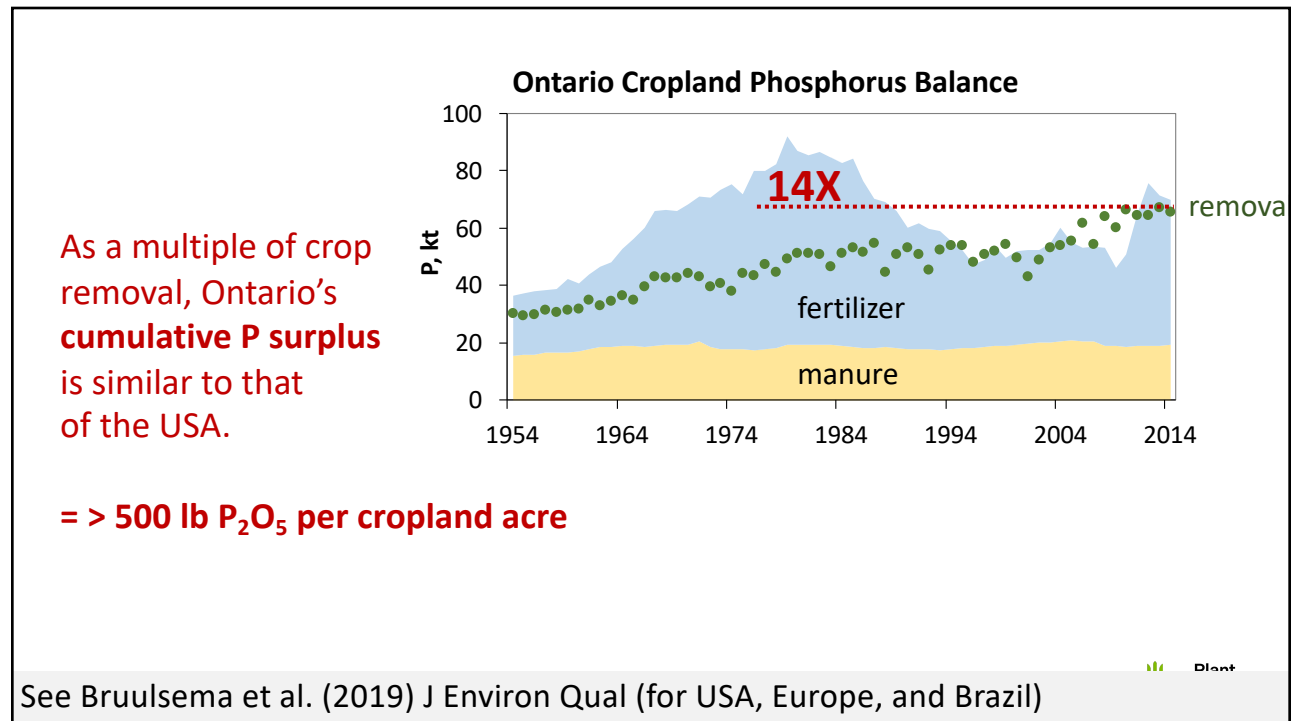
Crop P balances 1920-2016

The **cumulative P surplus** amounts to **51 years** crop removal in Western Europe, and **16 years** in the USA.

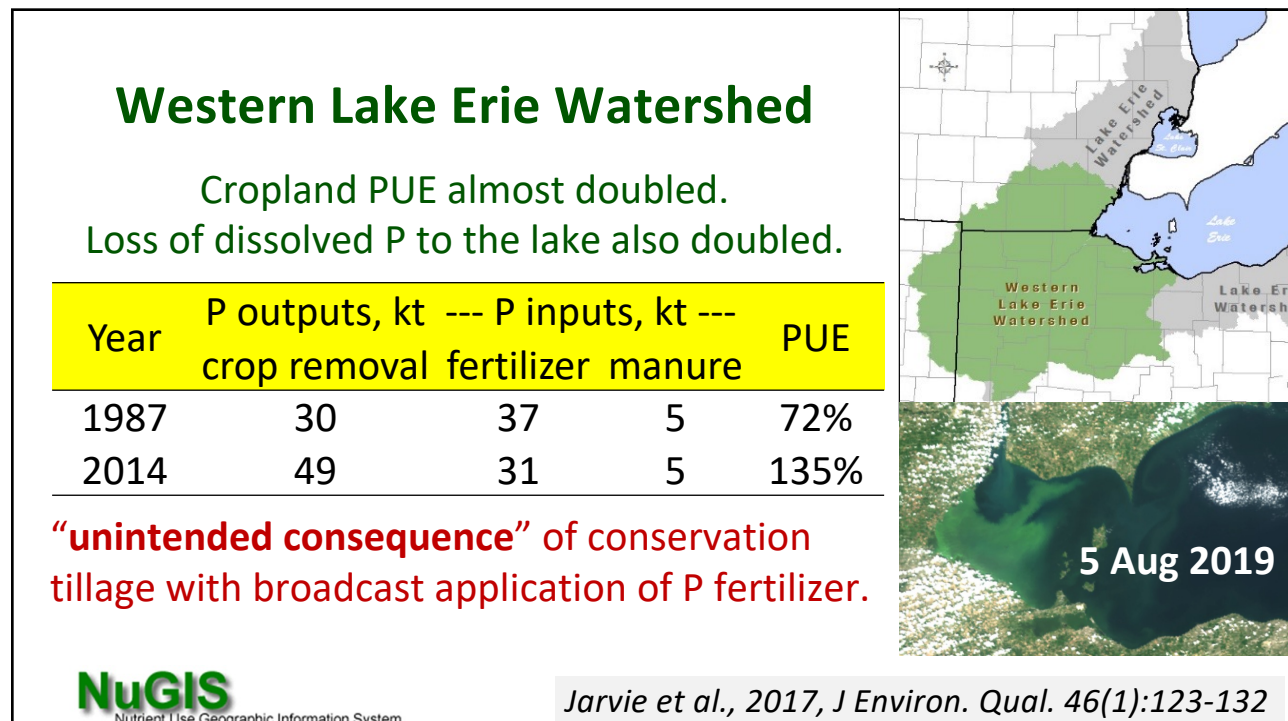
The Canadian prairies differ. Likely a **cumulative P deficit**.



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sts soil test summary

HOME ABOUT CHARTS MAPS TABLES MY ACCOUNT

LOCATIONS

OPTIONS

Year(s)	Element
<input checked="" type="checkbox"/> 2001	<input checked="" type="checkbox"/> Phosphorus
<input checked="" type="checkbox"/> 2005	<input type="checkbox"/> Potassium
<input checked="" type="checkbox"/> 2010	<input type="checkbox"/> Magnesium
<input checked="" type="checkbox"/> 2015	<input type="checkbox"/> Sulfur
<input checked="" type="checkbox"/> 2020	<input type="checkbox"/> Zinc
	<input type="checkbox"/> Chloride
	<input type="checkbox"/> Soil Organic Matter
	<input type="checkbox"/> pH

CANCEL OK

Soil Test Levels in North America

Create an account to customize your search.

LOG OUT

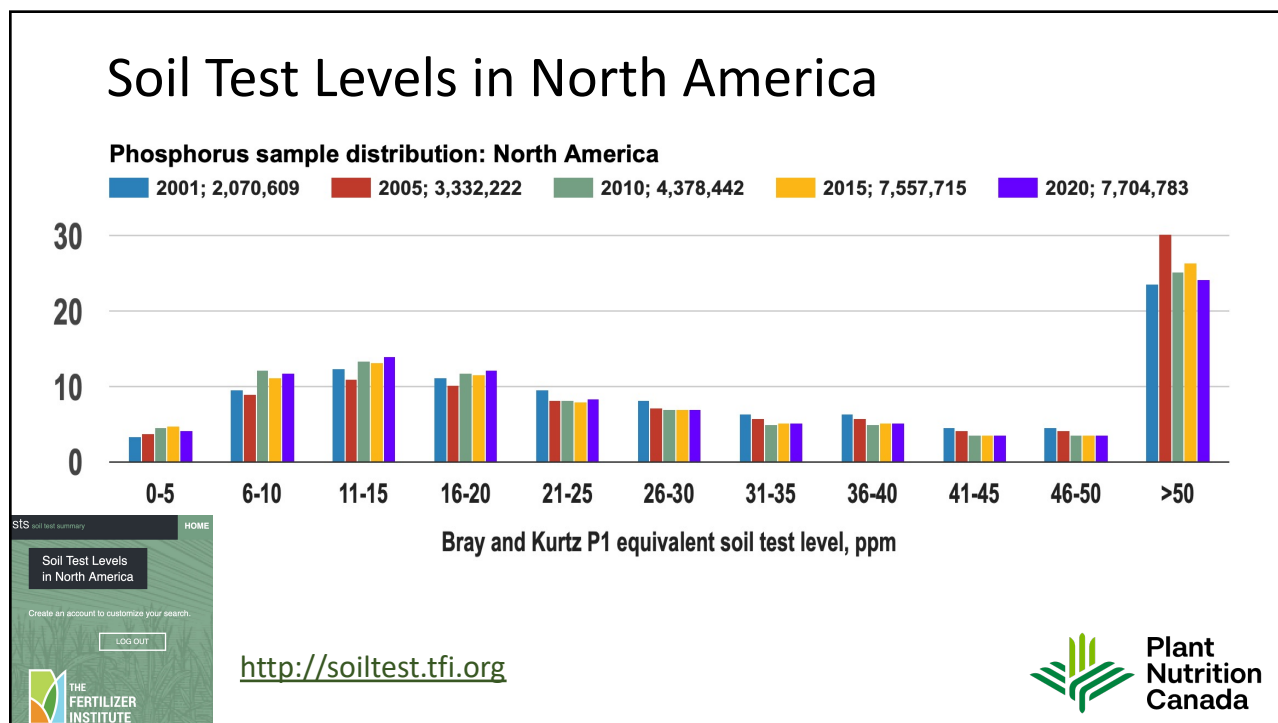
THE FERTILIZER INSTITUTE

<http://soiltest.tfi.org>

Plant Nutrition Canada

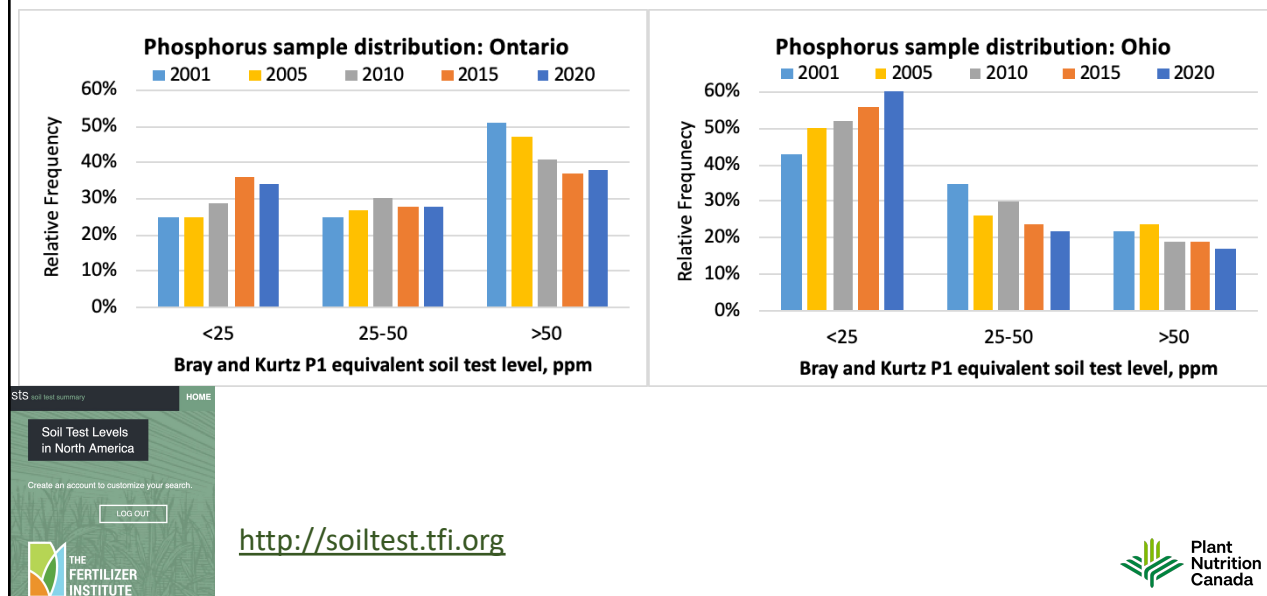
Soil Test Summary by state & province

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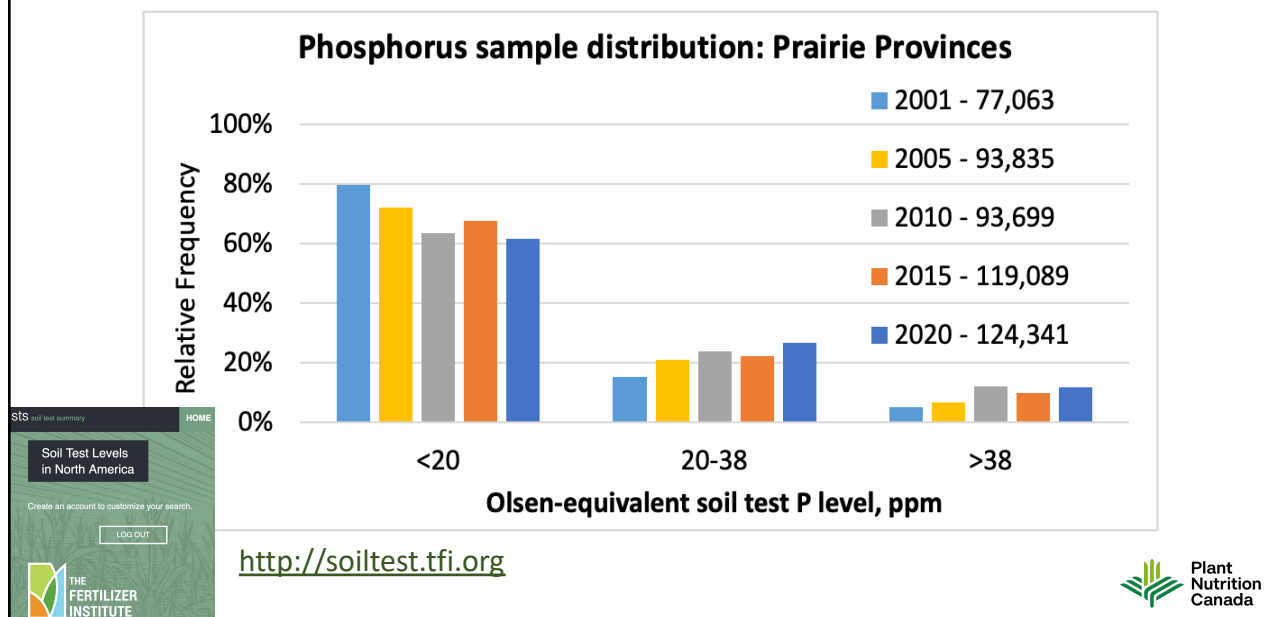
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Ontario and Ohio 2001-2020 – drawdown of legacy P




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Soils of the Canadian Prairies: much lower in P



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Stratus
AG RESEARCH
Real Story. Better Decisions.

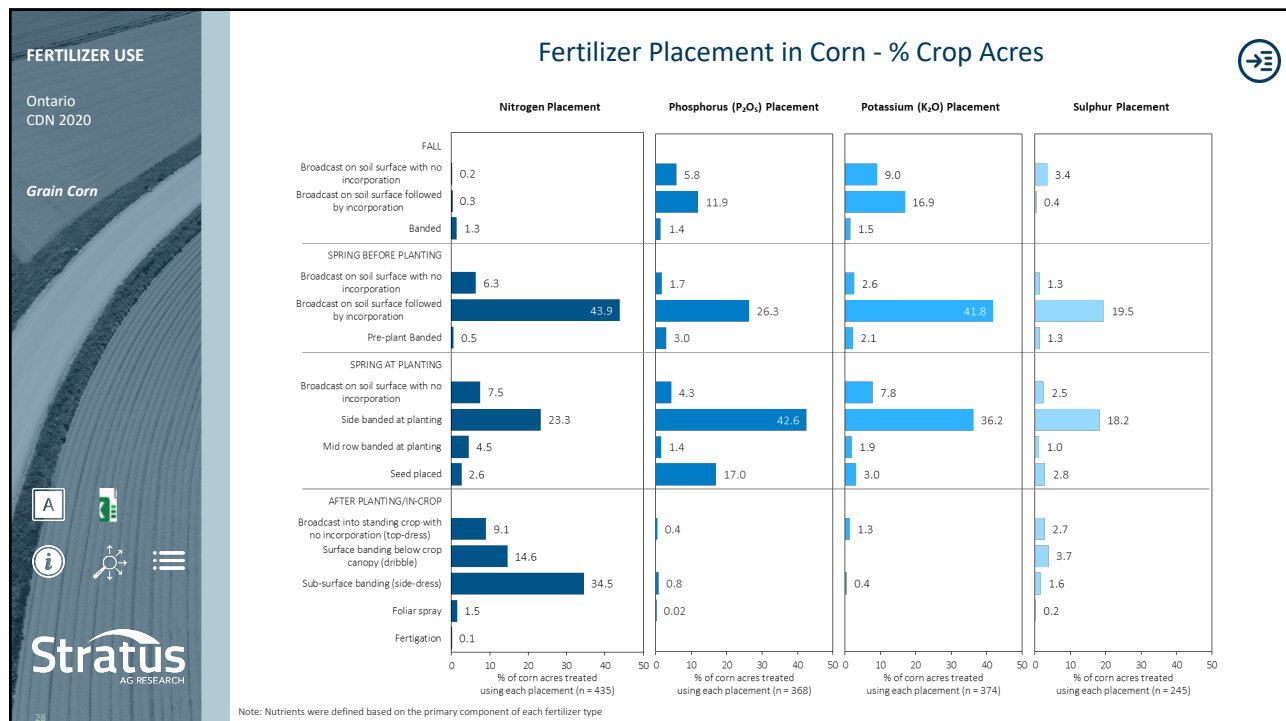
FERTILIZER USE
Ontario
CDN 2020

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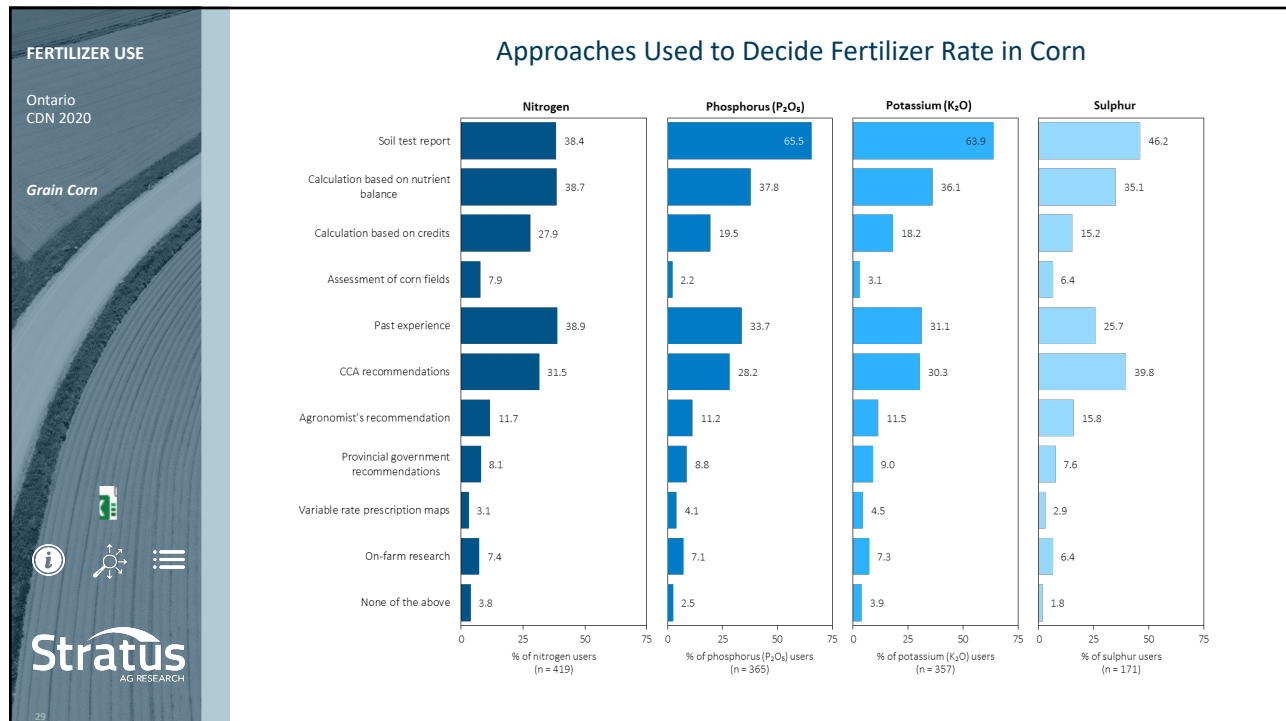
Fertilizer Canada 4R Fertilizer Use Survey

- 2016-2020
- Key crops in Ontario and Western Canada
- Source x rate x time x place
- N, P, K & S
- Canadian prairies: 95% of fertilizer P is applied subsurface

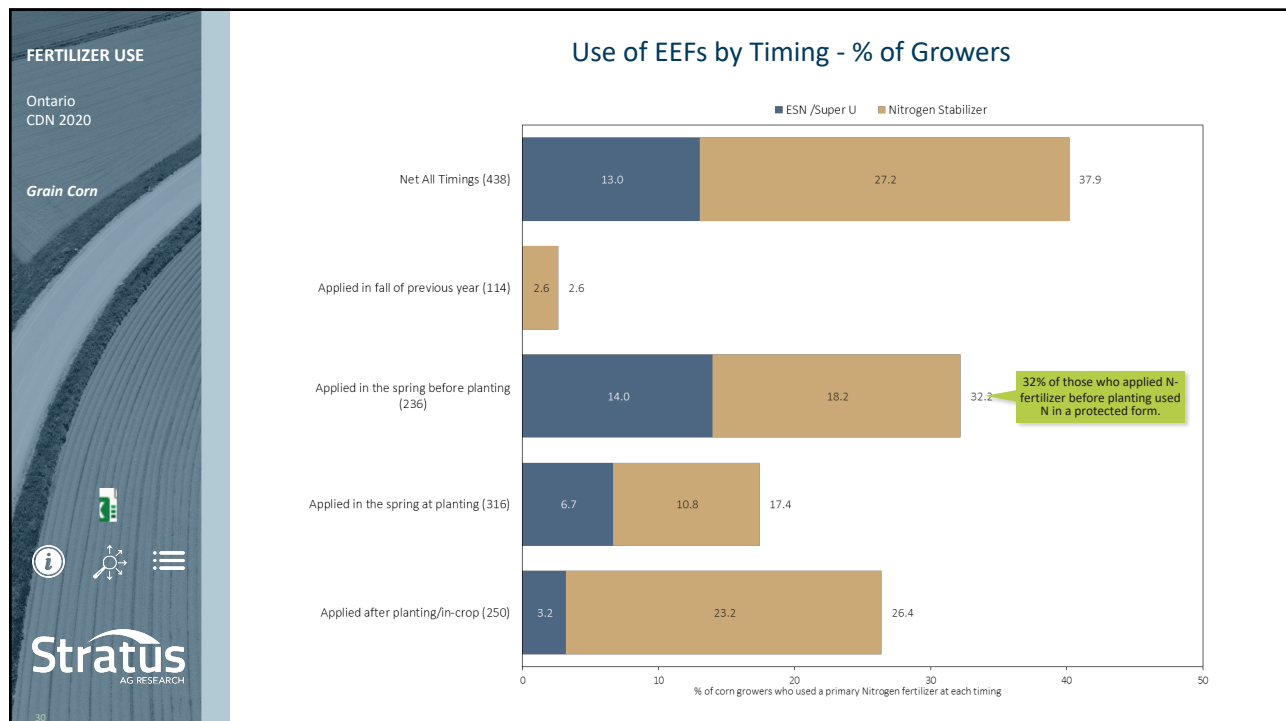
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Made possible through funding by:



The 4R Certification standards were created by the 4R Ontario Steering Committee in close collaboration with the Nutrient Stewardship Council, the Ohio Agri-Business Association and The Fertilizer Institute in the U.S. to ensure alignment between cross-border efforts to implement 4R Nutrient Stewardship and minimize nutrient losses under the 4R Certification Program. The standards are reflective of the best available science, technology and regulatory requirements for Ontario conditions.

Members of the 4R Ontario Steering Committee represent a diversity of stakeholders including Fertilizer Canada; the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA); the Ontario Agri-Business Association (OABA); the Grain Farmers of Ontario; the Ontario Federation of Agriculture; the Christian Farmers Federation of Ontario; Conservation Ontario; The Nature Conservancy – Ohio; the Ministry of the Environment and Climate Change; the International Plant Nutrition Institute; the Ontario Certified Crop Advisor Board; and Ontario agri-retailers.



4R Nutrient Stewardship Certification

Right Source © Right Rate, Right Time, Right Place®

4rcertified.ca
4rcertification@fertilizercanada.ca
(613) 230-2600

FERTILIZER CANADA

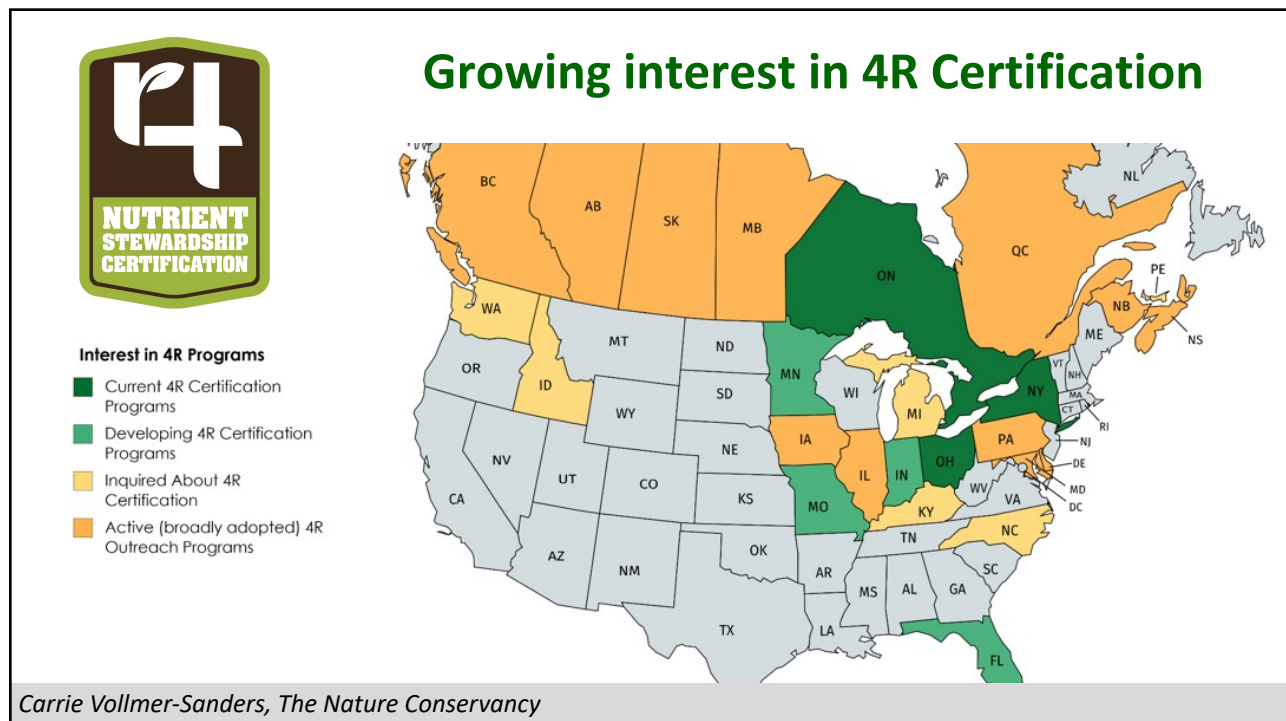
Program administered by Fertilizer Canada on behalf of the 4R Ontario Steering Committee

4R Nutrient Stewardship Certification Program in Ontario

Voluntary program for Ontario agri-retailers and nutrient service providers implementing 4R Nutrient Stewardship

Collaboration – “We All Play a Role”

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Support for research underscores industry commitment to linking 4R practice to outcomes



Initiated 2013.

Delivering ~\$1M per year.

2019: \$2.7M for new projects in AZ, AR, CA, UT, VA.

2020: new projects for Canada

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Summary

- The fertilizer industry seeks to advance nutrient stewardship through support for its institutions:
 - Plant Nutrition Canada, Fertilizer Canada, TFI
 - FAR, 4R Research Fund, 4R Solution
 - IFA & the Scientific Panel on Responsible Plant Nutrition
- Soil test, nutrient balance and 4R practice survey data can help inform policy on changes to management – 4R and beyond – effective in reducing nutrient loads to water.
- Collaboration invited in the continuing evolution of 4R!

