Innovation:
Integrating Wholesale, Retail and Technology

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Key Messages

Productivity
Need to produce more food

- Food production needs to increase by 35% in order to feed the world in 2030
- Land, water and energy resources are limited
- Yield improvements are critical

Efficiency
... with less

- Lets not debate application rates
- Best management practices are more important than you think
- New products will play an increasing role

Technology
... using innovation

- Precision Agriculture / Big Data hold promise
- Yield improvements, business value, sustainability

About Agrium

A Leading Producer of NPK Products: 9 MMT Capacity

The Largest Global Ag Retailer: Approximately 1,250 Facilities

The 3rd Largest Nitrogen Producer Globally

A Major Global Fertilizer Distributor: Over 3 MMT Annual NPK Volumes

A Leading Retailer with Seed and Crop Protection Product Sales of Over $4.5-billion

A World Leader in Innovative Controlled-Release Fertilizers

Messages

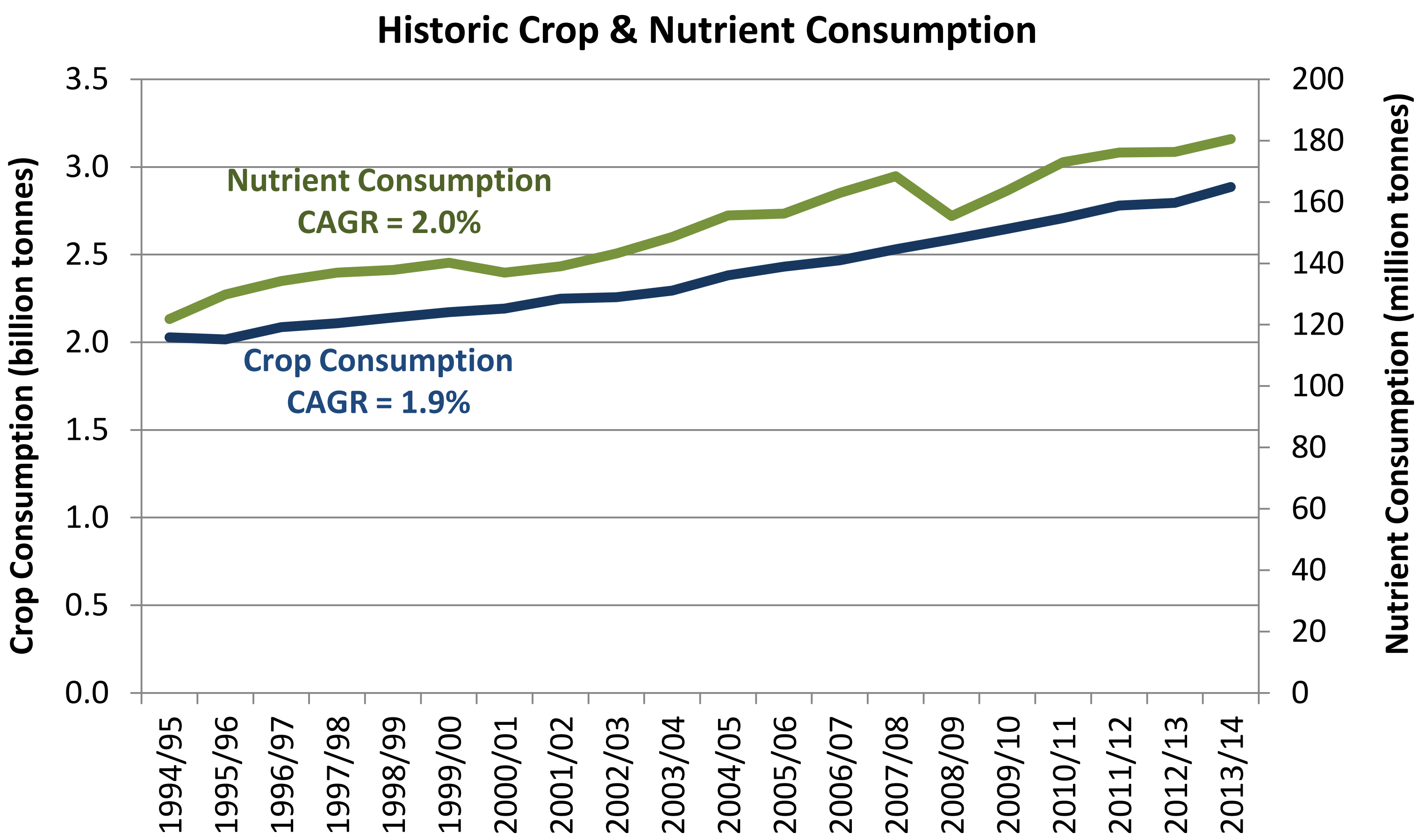
Productivity

Efficiency

Technology

Growing Food Consumption

- Increased fertilizer consumption required to feed increased crop consumption



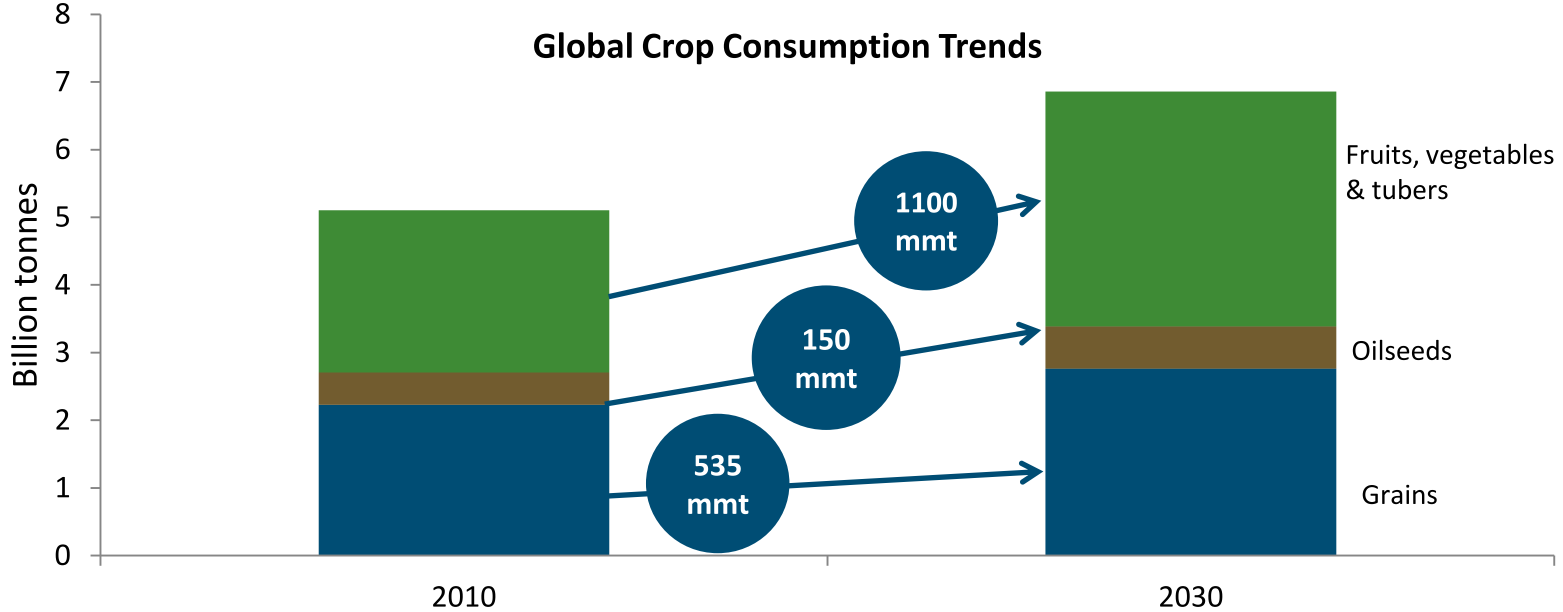
Source: USDA, FAOSTAT, IFA, Agrium

Growing Demand for Crops & Crop Inputs

By 2030 the world will need an additional 1.8B tonnes of crops

To reach this target, growers globally will need to increase expenditures:

- Additional nutrient expenditure of ~$40 billion required[1]
- Additional seed/crop protection expenditure of ~$30 billion required[2]



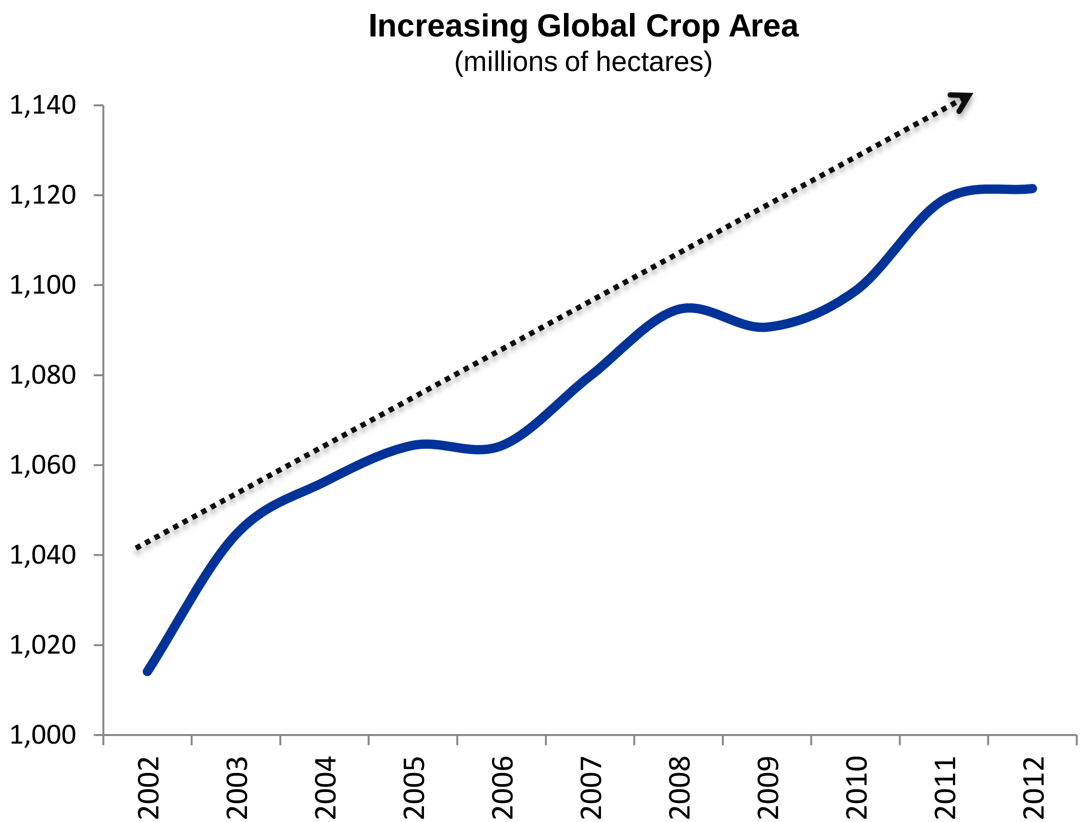
Source: FAOSTAT, USDA, Integer, Phillips MacDougall, IFA, Green Markets, Agrium

[1] Based on per unit application rates from IFA, 2012 U.S. benchmark crop nutrient prices and applied to 2030 crop production.

[2] Based on per unit expenditures in 2012 from Phillips MacDougall data applied to 2030 crop production.

Crop Stocks Tight Despite Increases in Global Crop Area

- Demand for crops has been on a steady upward trend for decades, it grows by on average 90 million tonnes per year. Meeting this steady growth in demand is a challenge.



Source: USDA, FAOSTAT, Agrium

10 Year Global Acreage Change by Geography

- Some of the largest area increases have occurred where future area growth potential is low (China, India)
- Future growth potential in Brazil, Argentina, and Africa

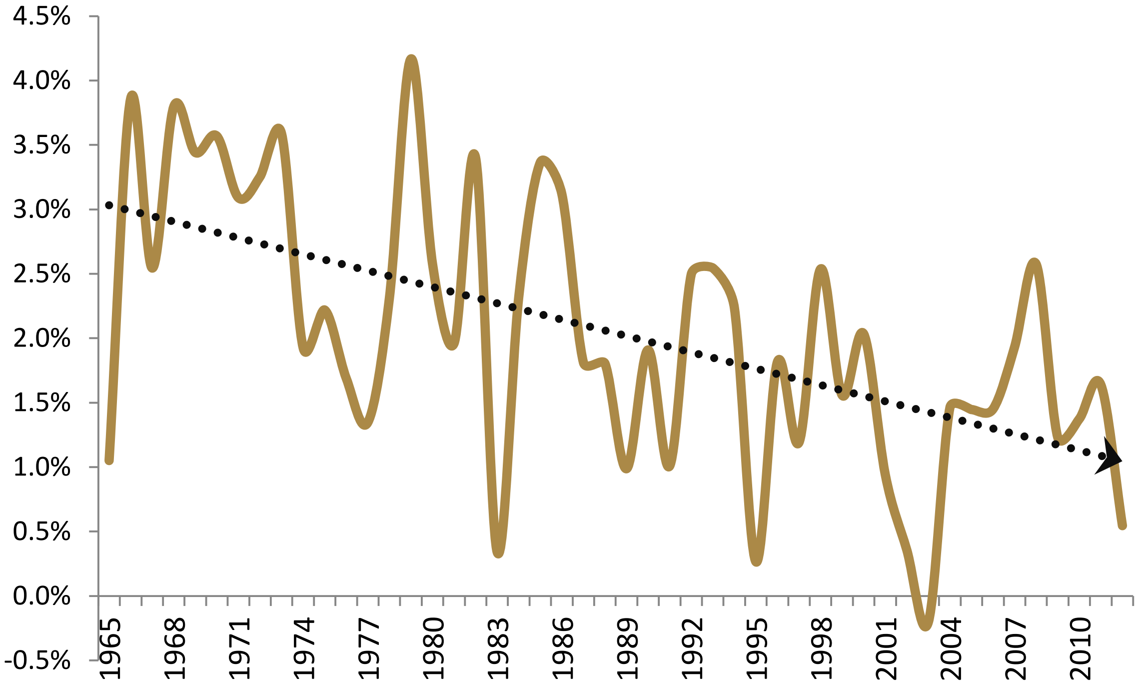
Country/Region	Change (mm ha)
Africa	19
China	19
India	19
Brazil	12
United States	7
Argentina	7
Ukraine	6
Canada	5
Other	13
World Total	107

Source: USDA, FAOSTAT, Agrium

Declining Growth in Global Crop Yields

- Global crop area has a limited ability to grow, so future demand growth must be met by improvements in yield

Slowing Rate of Growth in Global Crop Yields
(five year average yield growth of corn, wheat and soybeans)



Source: USDA, FAOSTAT, Agrium

Required Area / Yield Growth Scenarios

- The majority of the 90 million tonnes per year of crop consumption growth must be met by increased yields

Area Growth (mm ha)	Yield Growth (kg/ha)	Yield Growth (%)
0	1,450	30%
50	**1,170**	**25%**
100	**920**	**19%**
150	**690**	**14%**
200	480	10%
250	280	6%
300	100	2%
330	0	0%

Source: FAOSTAT, USDA, Agrium

Productivity Summary (Message 1)

- Long term Ag fundamentals support the challenge of feeding the world
  - Demand for crops will continue to grow
  - Arable land and water scarcity are real constraints
  - Yield improvements are critical
  - Yield improvements need to be sustainable

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Messages

Productivity

Efficiency

Technology

Intensive Agriculture Critical

If the world's

1.5 billion

hectares of farm land were farmed organically, there would only be enough food for

2.4 billion

people, about

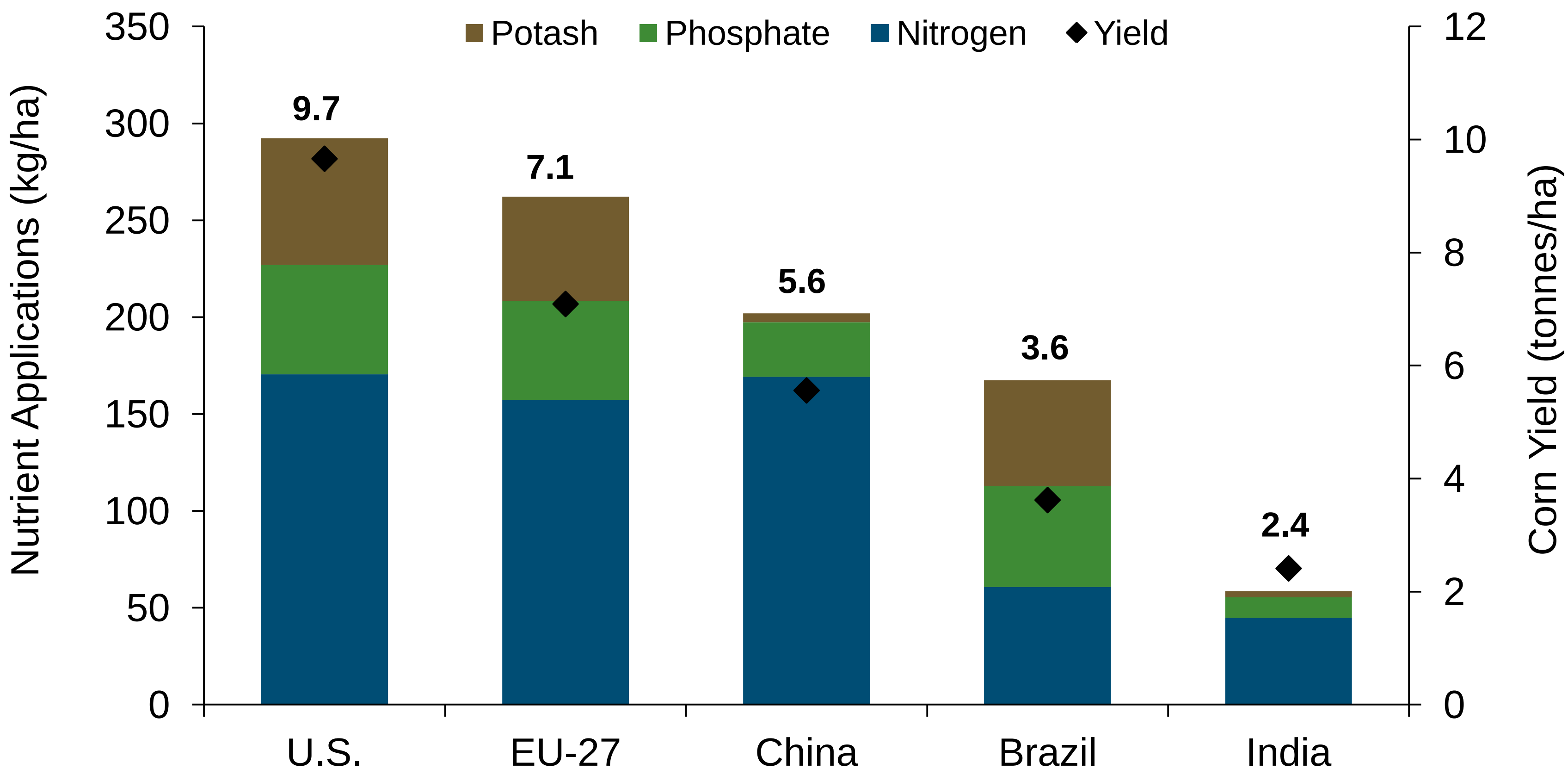
1 in 3

of those in the world today.

Source: IPNI

Efficiency Improvements are Important

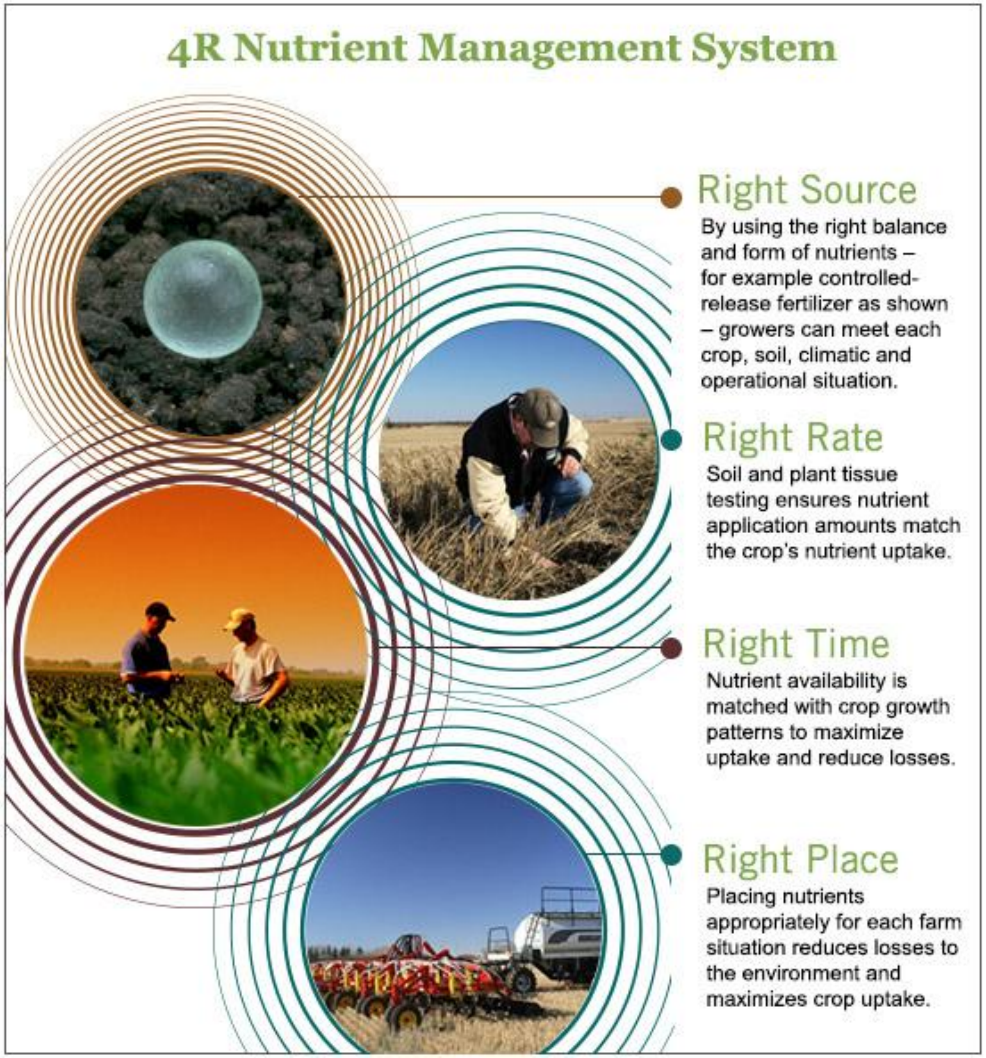
- Balanced and adequate nutrient applications are important for crop yields



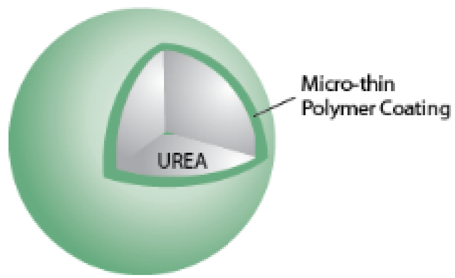
Source: USDA, IFA, Agrium

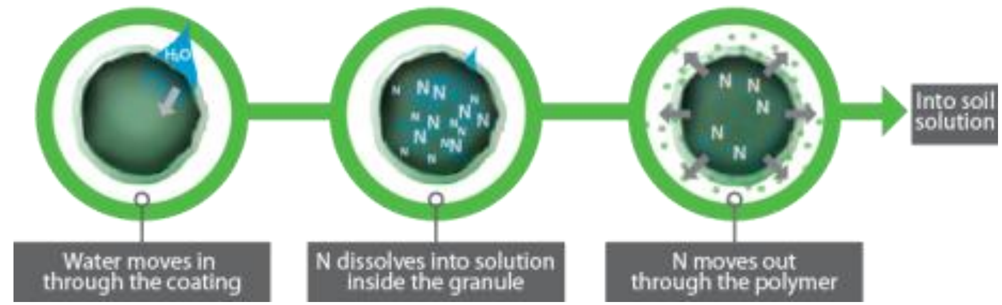
4R Nutrient Stewardship System

- Science Based and Measurement Driven
- All 4 Required to:
  - Improve Economics
  - Increase Social Benefits
  - Reduce Environmental Impacts, Protect Habitat and Enhance Soil
- Innovation Constantly Improving Performance



ESN: How it Works





ESN is a polymer coated, controlled-release nitrogen (N) product. The unique polymer coating helps protect against all forms of N loss, including volatilization, denitrification, and leaching. The benefits to farmers include:

Economic
- Increased Yields
- Improved Crop Quality
- Environmental Incentives

Environmental
- Increased Crop Uptake
- Reduced Losses
- Increased Efficiency

Social
- Application Flexibility
- Convenient / Ease of Use

Sustainable return for the grower

Efficiency Summary (Message 2)

- It's not just about more fertilizer
  - 4R Nutrient Stewardship System will improve overall efficiencies
  - Product development should play a more important role

Messages

Productivity

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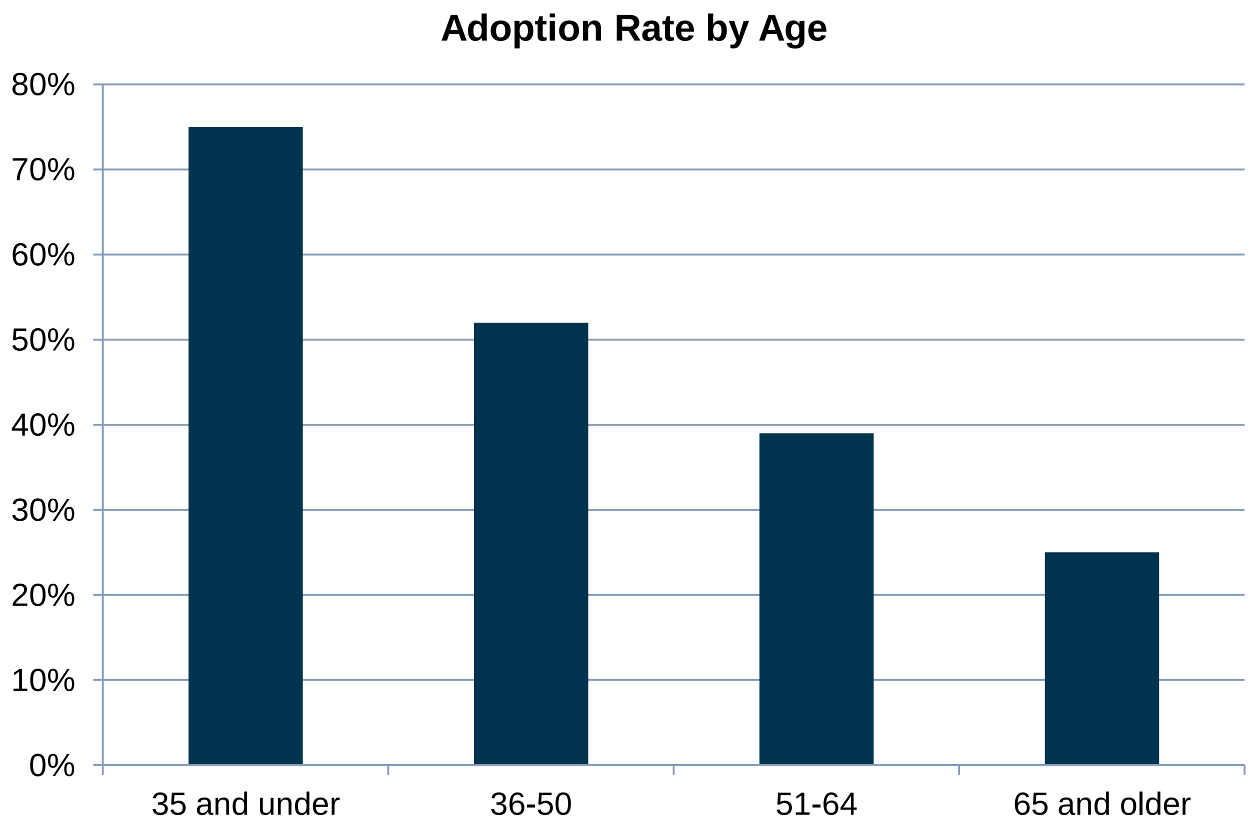
Technology

Farm Demographics

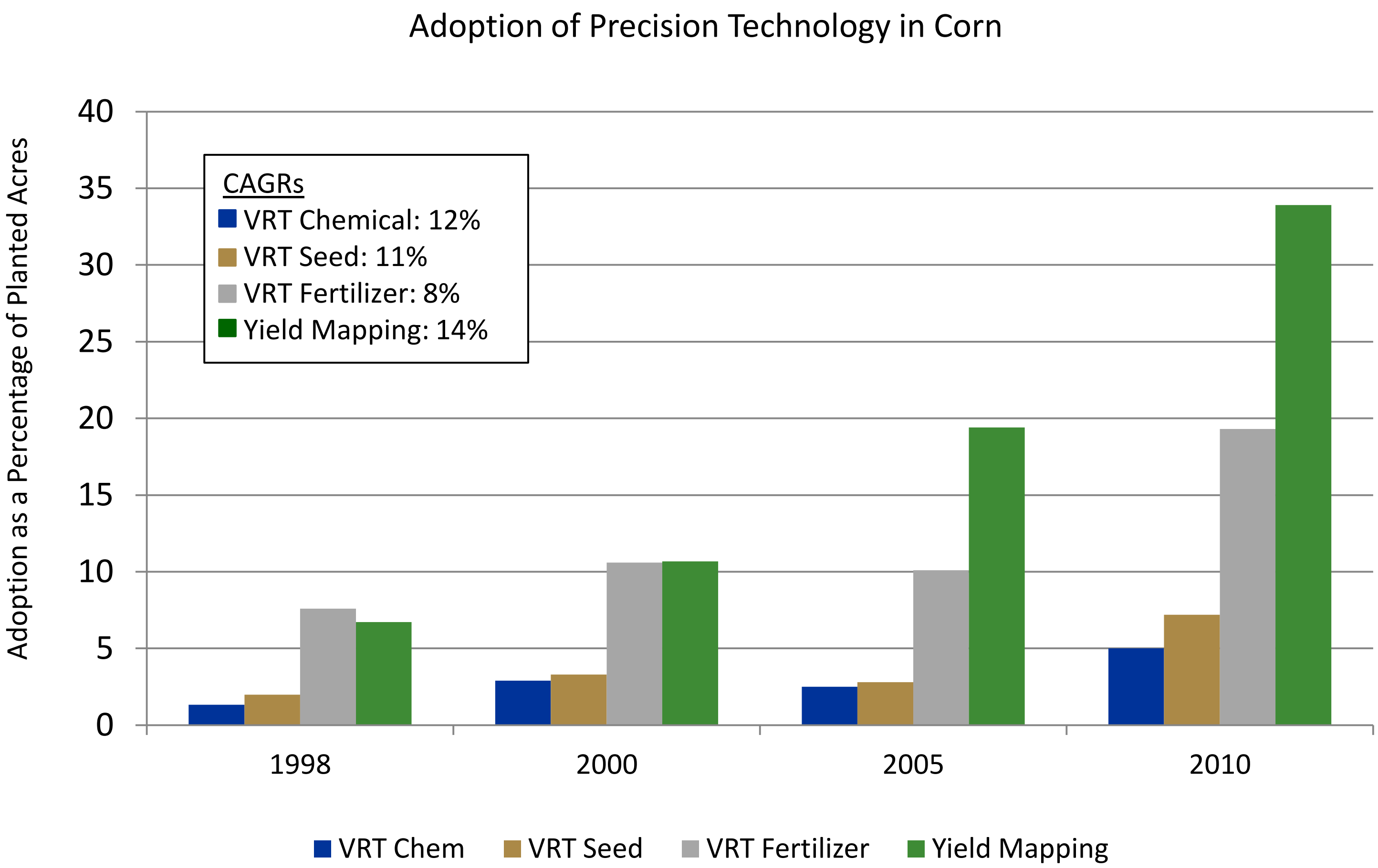
- Younger farm demographics favor uptake in precision adoption



Source: Ohio State University AEDE

Precision Technology

- Adoption of Precision Technology has increased rapidly
- Expect this trend to continue into the future



Source: USDA

Down the Value Chain – Unlocking Yields With Technology

What Grower Wants

- Increase size of operations
- Enhance efficiency
- Maximize yields
- Technology support and advice from the Retailer

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NutriScription HD Value Added Services

Precision soil sampling

Yield monitoring/mapping

VR seed planting (plant population)

VR fertility and VR application services

Field scouting (disease and pest)

Tissue sampling

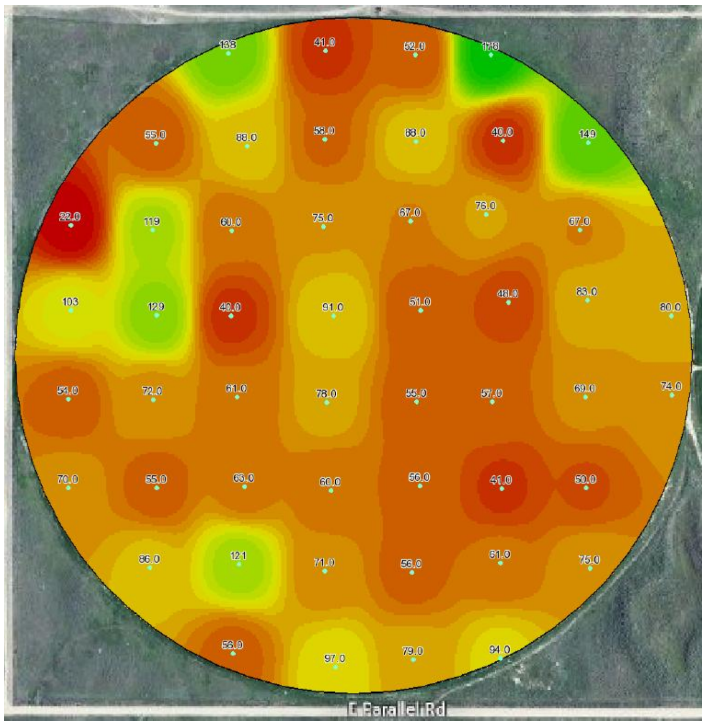
Crop input record keeping

Field trial analysis

Ability to provide services throughout the growing cycle

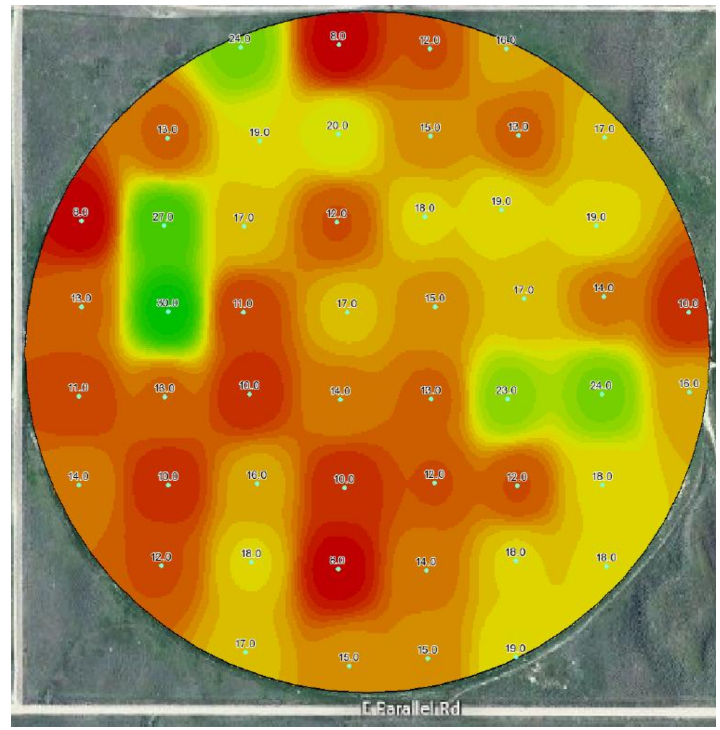
Soil Sampling Results

Phosphate (ppm)



- Very low levels: 0-65 ppm
- Low levels: 65-100 ppm
- Sufficient levels: >100 ppm

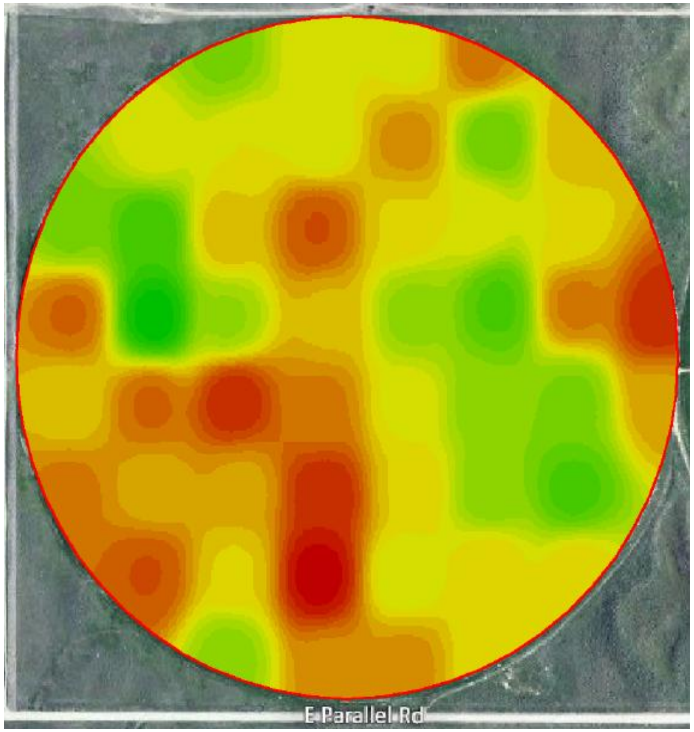
Nitrogen (ppm)



- Very low levels: 0-15 ppm
- Low levels: 15-23 ppm
- Sufficient levels: >23 ppm

Fertilizer Application Recommendation

UAN-32% Fertilizer Application



- Application rate: 35-36 gallon/acre
- Application rate: 32-35 gallon/acre
- Application rate: 30-32 gallon/acre

Without VR Fertility	
Area	120 acres
Yield	210 bu/acre
Revenue @ $5.00/bu	$1,050/acre

With VR Fertility	
Area	120 acres
Yield	220 bu/acre
Revenue @ $5.00/bu	$1,100/acre

Value Proposition	
Yield difference	+10 bu/acre
Adjusted revenue difference	+$50/acre

Value proposition resulting from application only – no change in the total amount of fertilizer used.

Crop-Year: Corn-2012

In Season – Field Scouting Report

The in – season services we provide are essential for making sure our pre-planting Rx (fertility, variety, planting rates) are maximized.

Crop Production Services

Field Scouting Report

Grower
Farm
Field
Crop CORN, GRAIN

Scout
Start Date 2013-06-13
End Date 2013-06-13

Diseases

None

Insects & Mites

None

Weeds

W1	Bindweed, Field (Spots)	06/13
W2	Bindweed, Field (Spots)	06/13
W3	Johnsongrass (Light)	06/13
W4	Bindweed, Field (Heavy)	06/13
W5	Bindweed, Field (Spots)	06/13
W6	Bindweed, Field (Heavy)	06/13

Field Notes

N1	dying, crisp	06/13
N2	dying, burnt leaves	06/13
N3	dying, crisp	06/13
N4	bind weed heavy, but has been aprayed and dying	06/13
N5	bind weed crispy	06/13
N6	all in all field looks clean. Weeds that were up are now brown, crispy or dead	06/13
N7	bindweed half crispy half alive continue to watch	06/13

Crop Conditions

Growth Stage V5 06/13
Plant Condition

Stand Count	Estimated Yield
None	None
AVG	AVG

Irrigation

Irrigation Type Center Pivot 06/13
Pivot Position South
On/Off On
Soil Moisture

1'	2'	3'
65%	50%	45%

Notes

In Season – Tissue Sampling Report

- 8 million acres sampled in 2012
- Our tissue sampling program is highly successful in recognizing nutritional deficiencies and recommending corrective actions before yields are significantly impacted

Tissue: Corn - Midwest Labs - Tassel

Grower Name

Field Name

Crop **Corn**

Sample Date **7/3/2012**

Test Date **7/6/2012**

Field Rep

Sample ID

Subfield

		Very Low	Low	Optimum	High	Excessive	
Total N	2.82						MAX. N-Pact at 1 gal/A
Total P	0.24						Black Label ZN 1 gal/A
Total K	2.08						Optimum
Macronutrients		***Very Low***	***Low***	***Optimum***	***High***	***Excessive***	
Ca	0.69						Optimum
Mg	0.38						High
Na	0.00						Optimum
S	0.19						Optimum
Micronutrients		***Very Low***	***Low***	***Optimum***	***High***	***Excessive***	
Zn-ppm	19.00						BOMNZN 10 oz/ac
Mn-ppm	60.00						Optimum
Fe-ppm	192.00						High
Cu-ppm	9.00						Optimum
B-ppm	10.00						BOMNZN 10 oz/A
Petioles		***Very Low***	***Low***	***Optimum***	***High***	***Excessive***	

Very Low	Comments:
Low	
Optimum	
High	
Very High	

Analytical data provided by Midwest Labs. Recommendations provided in this report are proprietary in nature whereby nutrient thresholds used as a reference may or may not match Midwest Labs ranges for this particular crop and growth stage.

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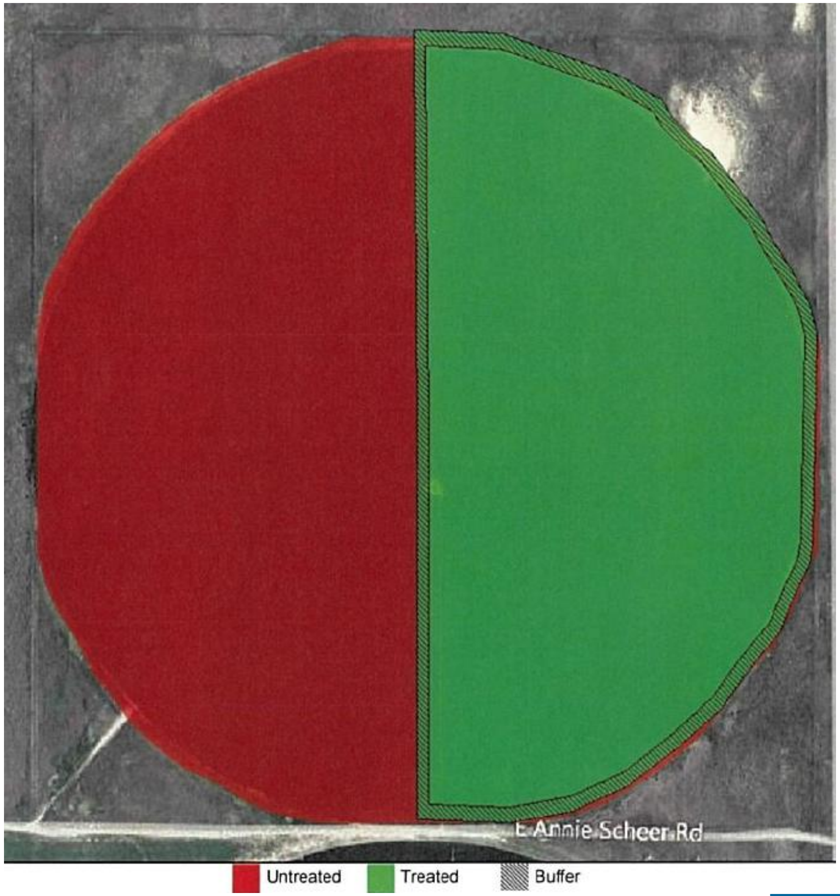
Field Trial Analysis



Inside Trial Area – treated	
Area	59 acres
Yield	225 bu/acre
Income @ $5.00/bu	$1,125/acre
Product cost	$15/acre
Adjusted income	$1,110/acre

Outside Trial Area – untreated	
Area	67 acres
Yield	210 bu/acre
Income @ $5.00/bu	$1050/acre
Product cost	-
Adjusted income	$1050/acre

Crop-Year: Corn-2010

Field Trial: Fungicide

Harvested Area: 126 acres

Value Proposition	
Yield difference	15 bu/acre
Adjusted income difference	$60/acre

Technology Summary (Message 3)

- Technology and Innovation – Keys to unlocking yield
  - Precision Ag and Big Data becoming mainstream
  - Yield improvements have solid returns

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