

Embracing 4R Opportunities

4Rs OF NUTRIENT STEWARDSHIP

Economically, Environmentally & Socially
Sustainable Crop Nutrition



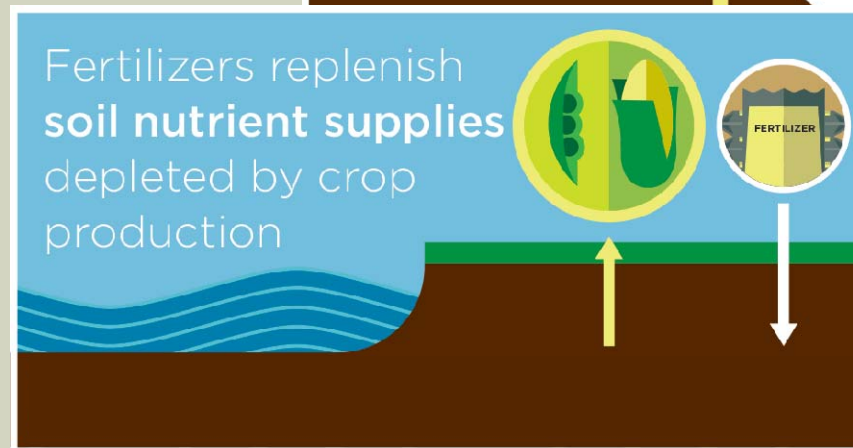
The 4Rs promote best management practices (BMPs)
to achieve cropping system goals while minimizing field
nutrient loss and maximizing crop uptake.

What do you think of when
you hear the word
FERTILIZER?

Word Association with Fertilizer



- 50% of food production is the result of fertilizer use
- To meet growing population needs we need to double food production by 2050
 - **34 Growing Seasons**
- 77% of increased food production will be the result of increased yields, while only 9% is due to increased cultivation

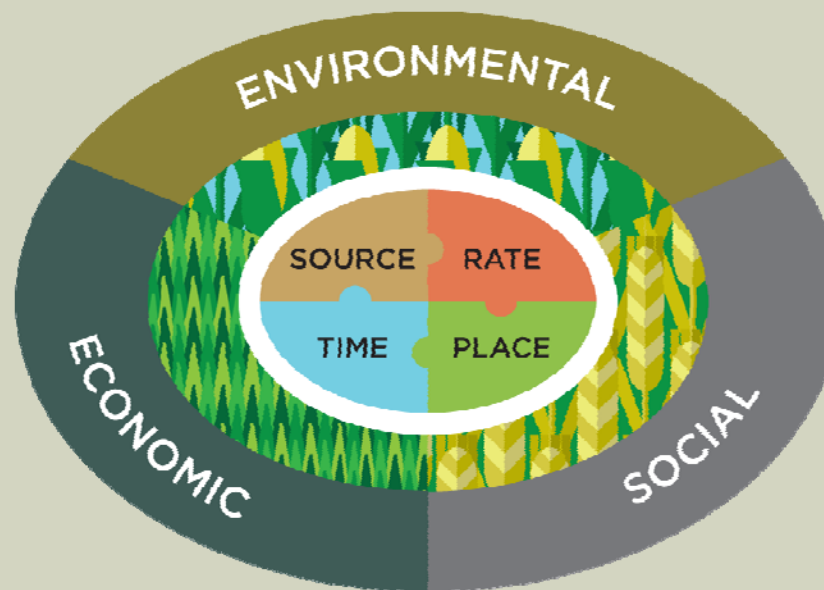


***“Efficiency is doing things right;
effectiveness is doing the right things.”***

- Peter Drucker

4R Nutrient Stewardship

- Improve agricultural production while contributing to social well being and minimizing environmental impacts (benefits water and air quality)
- 4R represents the use of fertilizer Best Management Practices to ensure:
 - the right source
 - at the right rate
 - at the right time
 - in the right place



Challenge We Face

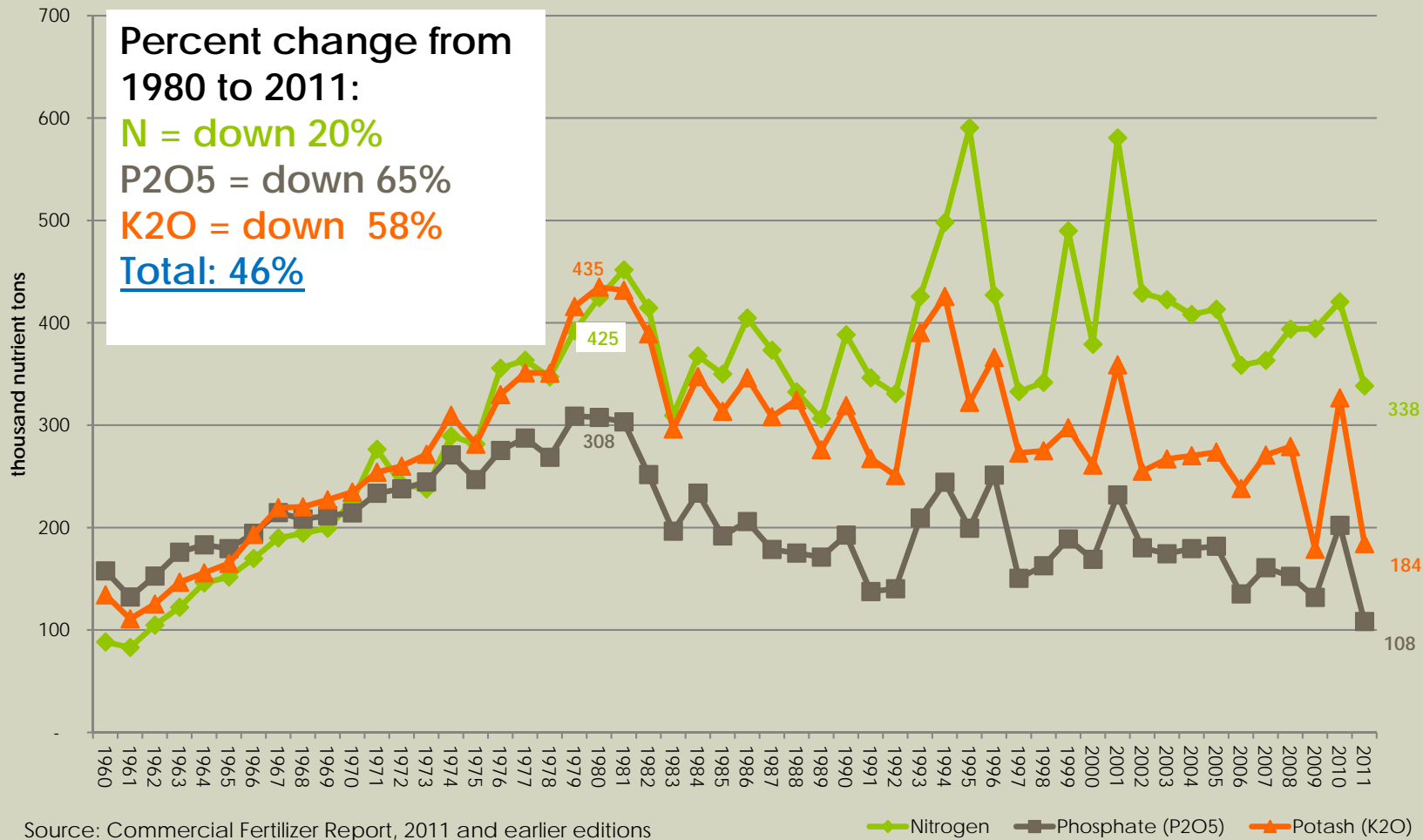
- Negative Headlines
- Public sector, including government agencies and NGOs don't understand retailer services and industry efforts
- Weather Extremes
- Need a unified message and positive visibility across the agricultural landscape



Reality



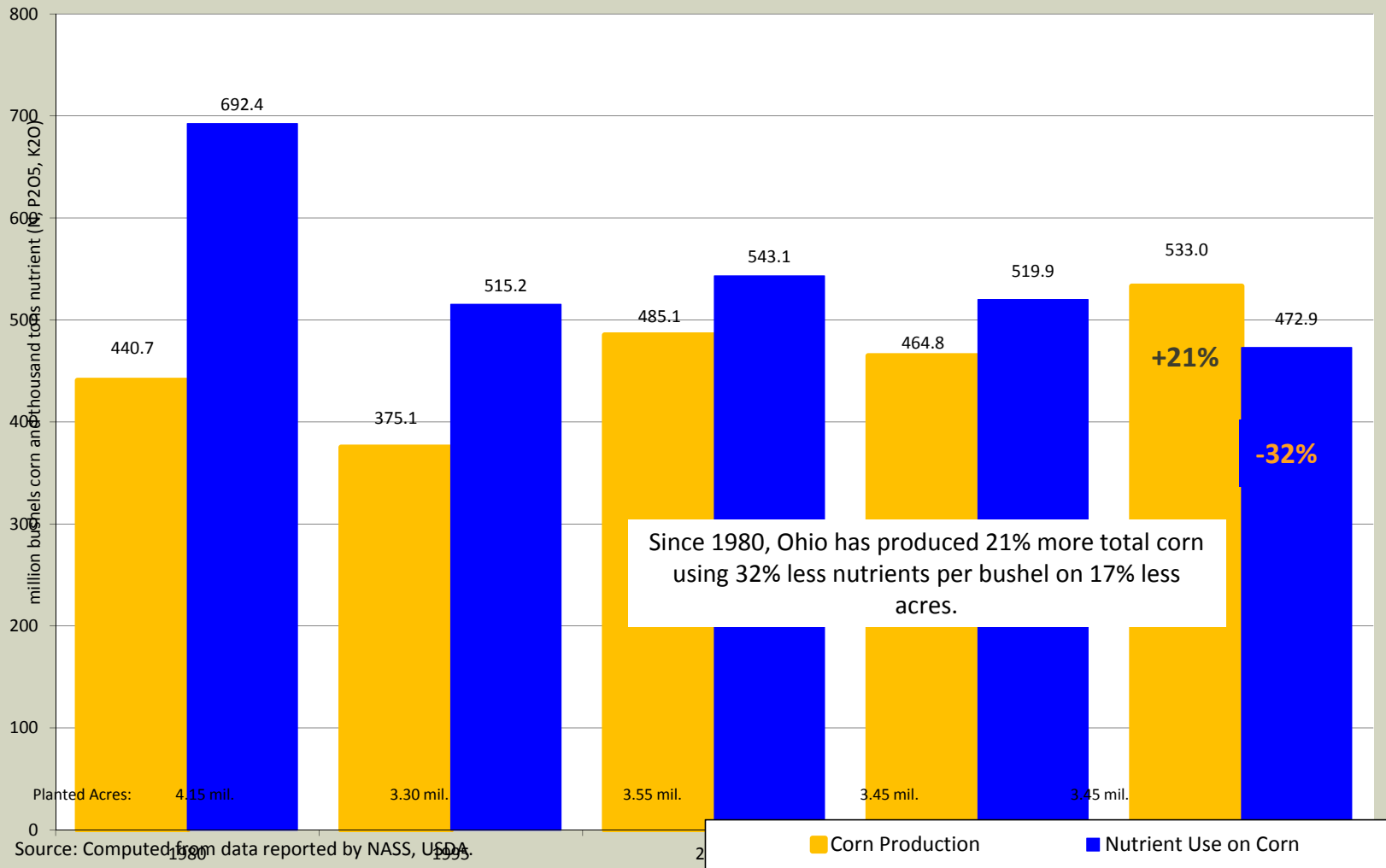
Ohio – Total Fertilizer Nutrient Consumption



Source: Commercial Fertilizer Report, 2011 and earlier editions

—◆— Nitrogen —■— Phosphate (P2O5) —▲— Potash (K2O)

Ohio Corn Production and Nutrient Use on Corn



Opportunities We Have

- Ability to achieve **positive visibility across the agricultural landscape**
- Ability to engage with stakeholders and influence state efforts

EMBRACE OUR PARTNERSHIP
OPPORTUNITIES



4R NMP Specialty Program for CCAs

- Designed for CCAs with a heavy focus on Nutrient Management Plans
- Aligns with USDA-NRCS and state nutrient management standards
- Open to all CCAs
- Currently available in:
 - Illinois, Indiana, Iowa, Michigan, Minnesota, Wisconsin
 - Plans for Nationwide Expansion
- 70 took first exam on August 7th



4R NMP Specialty Program Cont.

- Wonderful Opportunity for Collaboration with TFI & Our Members

How the Program is being Supported

- Letter of Support
 - 11 Membership Supporters
 - Publicity/Public Engagement Opportunity
- 4R Strategic Plan
- TFI's State of the Industry Report
 - Show where the industry currently is on a variety of issues..
 - Production, Safety, Transportation, and a variety of other topics
 - Hope to include as a future reporting metric

In Addition...

- Use of Online Training Modules by TFI Members
- Work Very Well with Current 4R Learning Modules
- Adds Value To Other Partnerships
 - 4R Advocates
 - State Associations

The screenshot displays a website for '4R Educational Modules: Site Specific Nutrient Management'. At the top, there are navigation tabs: 'WHAT ARE THE 4RS', 'IMPLEMENT THE 4RS', '4R TRAINING', and '4R NEWS'. Below these is a breadcrumb trail: 'Home > 4R Training > 4R Educational Modules Site Specific Nutrient Management'. The main content area is titled '4R EDUCATIONAL MODULES: SITE SPECIFIC NUTRIENT MANAGEMENT'. It includes a paragraph about the partnership between TFI, USDA/NRCS, IPNI, and Iowa State University. Below this is an 'INTRODUCTION TO THE 4RS AND THE EDUCATIONAL MODULES' section, followed by an 'OVERVIEW OF SOIL FERTILITY, PLANT NUTRITION, AND NUTRITION MANAGEMENT' section, and then sections for 'NITROGEN' and 'PHOSPHORUS'. Each of these latter sections has a 'START MODULE' button. A sidebar on the left contains the '4R TRAINING' header, 'TRAINING MODULES', 'PARTNERS' (listing Iowa State University, The Fertilizer Institute, IPNI, and NRCS), and logos for each partner.

Nutrient Stewardship Across the Nation



4R STATE EFFORTS

Several states are helping lead the way for nutrient stewardship by developing governing methods such as certification programs, codes of practice and sustainability programs. State by state, 4R BMPs are gaining ground in local communities through demonstration and outreach efforts.



4R ADVOCATE

Each year the Nutrient Stewardship 4R Advocate program recognizes outstanding agriculture retailers and farmers dedicated to sustainable crop nutrition. These advocates travel the country educating local communities about the 4R principles as well as promoting the benefits of sustainable farming to the general public.



4R EDUCATION

Industry partners have come together to help producers learn more about sustainable farming. These partners have developed webinars, learning modules and online interactive training to provide essential information about the basic components of soil fertility and nutrient BMPs as they pertain to implementation of the 4Rs.

4R NUTRIENT STEWARDSHIP CERTIFICATION PROGRAM

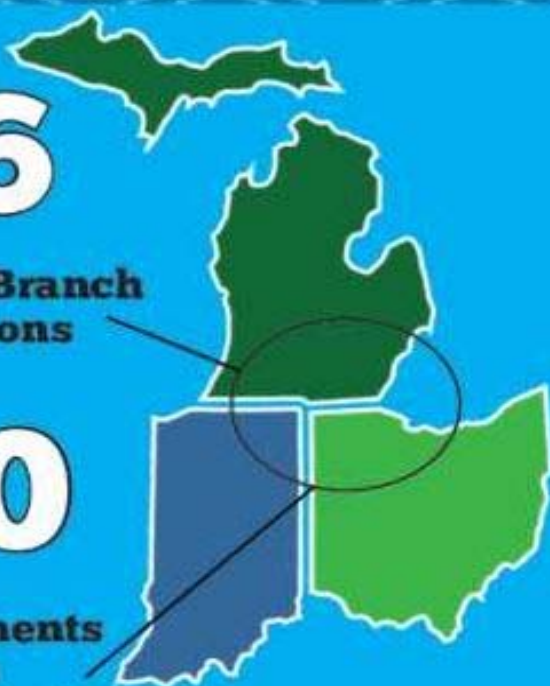
Western Lake Erie Basin - Ohio, Michigan, and Indiana

16

Certified Branch Locations

50

Commitments From Other Branches



Acres serviced or applied in WLEB 636,000

Acres outside WLEB serviced or applied 477,000

Total 1,113,000

Number of Clients Serviced in WLEB 1,580

Clients Serviced Outside WLEB 1,460

Total 3,040



Voluntary Program for Agricultural Retailers & Service Providers Implementing the 4Rs

Other State Efforts

- Illinois Fertilizer and Chemical Association
 - 4R Code of Practice for retailers
 - 4R included in state NLR strategy
- Chesapeake Bay 4R Alliance
- PA 4R Alliance – Identify best practices, effective outreach to growers, and collaborative efforts with other service providers
- Florida Chemical Fertilizer Association
 - Help bring 4R message to state agencies
 - Working to include 4R messaging in state BMP guides and non-point source efforts
- TFI inventorying state efforts and developing case studies for others to utilize



4R Advocates

Grower: John Werries

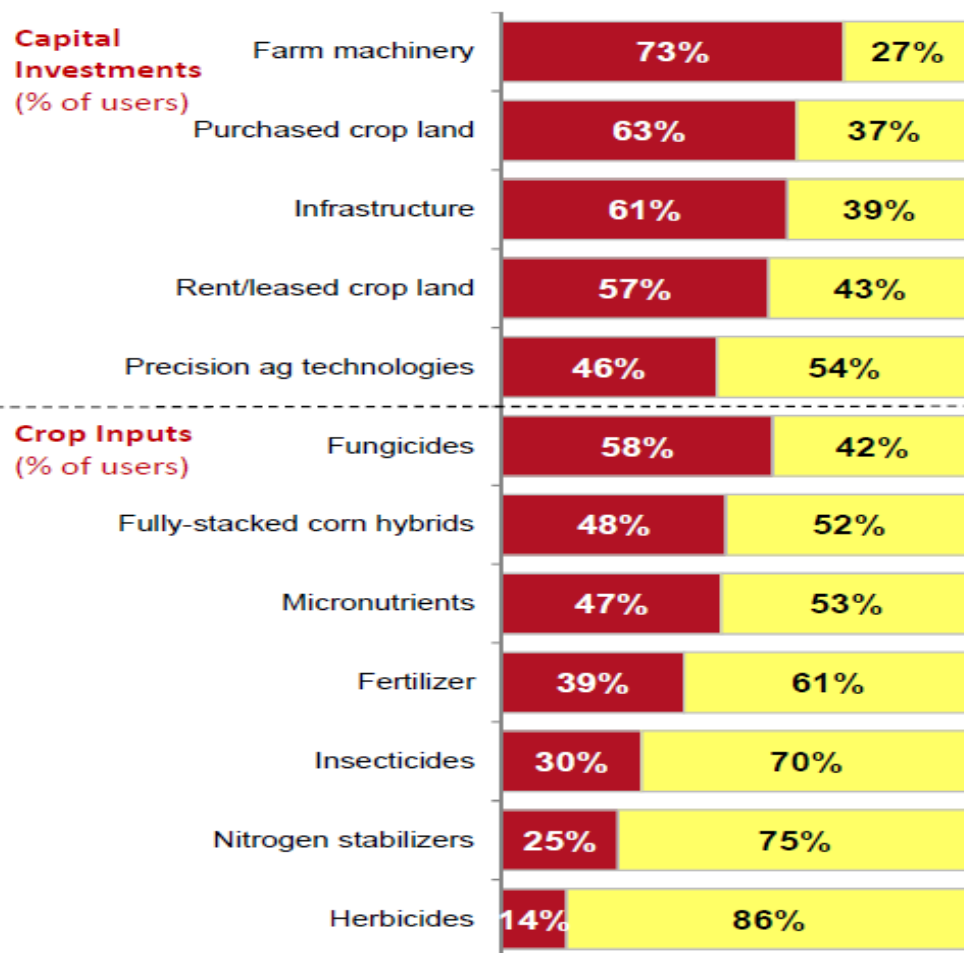
Retailer: Verne “Tinker” Bader

- 3800 Corn & Soybean farm in Chapin, Ill.
- Goal: Continually evaluate practices to strive for improved yields, reduced soil erosion, sequestering of nutrients, and improved soil health
- Yield and Nitrogen Use Efficiency:
 - Average corn yield
 - 2006-2012: 193 bu/ac
 - 2013: 234 bu/ac
 - NUE based on inputs/yield
 - 2006 – 2012: 1.2 – 1.3 lb N/bu
 - 2013: 0.96 lb N/bu



Expected Farm Expenditure Cuts When Corn Reaches Trigger Point

- A fall 2013 survey of 500 Mid-west corn growers conducted by Dow AgroSciences indicates where growers will make significant changes to farm expenditures when the price of corn reaches their “trigger point”
 - Growers were asked to identify the specific corn price at which they would make significant cuts to their farm expenditures
- Capital investments will see the greatest reduction in growers expenditures
 - **However**, capital purchases are not always made on an annual basis.
- Significant cutbacks in crop input expenditures threaten some categories more than others.
 - Fungicides, fully-stacked corn hybrids, micronutrients and fertilizer are most likely to see greater pricing scrutiny.
- Herbicides, nitrogen stabilizers and insecticides will see the least pullback activity overall.



■ Significant Cut in Investment ■ No Change

Source:
2013 Dow AgroSciences third party research
Base:
Cap. Invest: All respondents (N=501)
Crop Input: Users (N=246-501)



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The 4Rs Are EXPANDING...

U.S. Department of Agriculture

Upper Mississippi River Basin & Chesapeake Bay CEAP report:

- Increase complete and consistent use of nutrient management (proper rate, form, timing, and method of application)
 - 53-80% of the cultivated cropland require additional nutrient management to reduce the loss of N or P from fields
- Nutrient losses are acceptable when practices for soil erosion are paired with management of rate, form, timing, and placement of nutrient application to maximize nutrient availability for crop growth while minimizing environmental losses
 - Suites of practices to reduce soil erosion and manage nutrients are required to simultaneously address soil erosion and nutrient loss



NRCS Embraces 4Rs in 590 Std.

- NRCS incorporated 4Rs in the revised 590 Nutrient Mgmt. conservation practice standard
- 590 Std. an important NRCS tool
- Used to help farmers apply nutrients more efficiently
- With 590 as base, NRCS will offer voluntary technical and financial assistance to producers for planning and implementing on-farm nutrient management plans



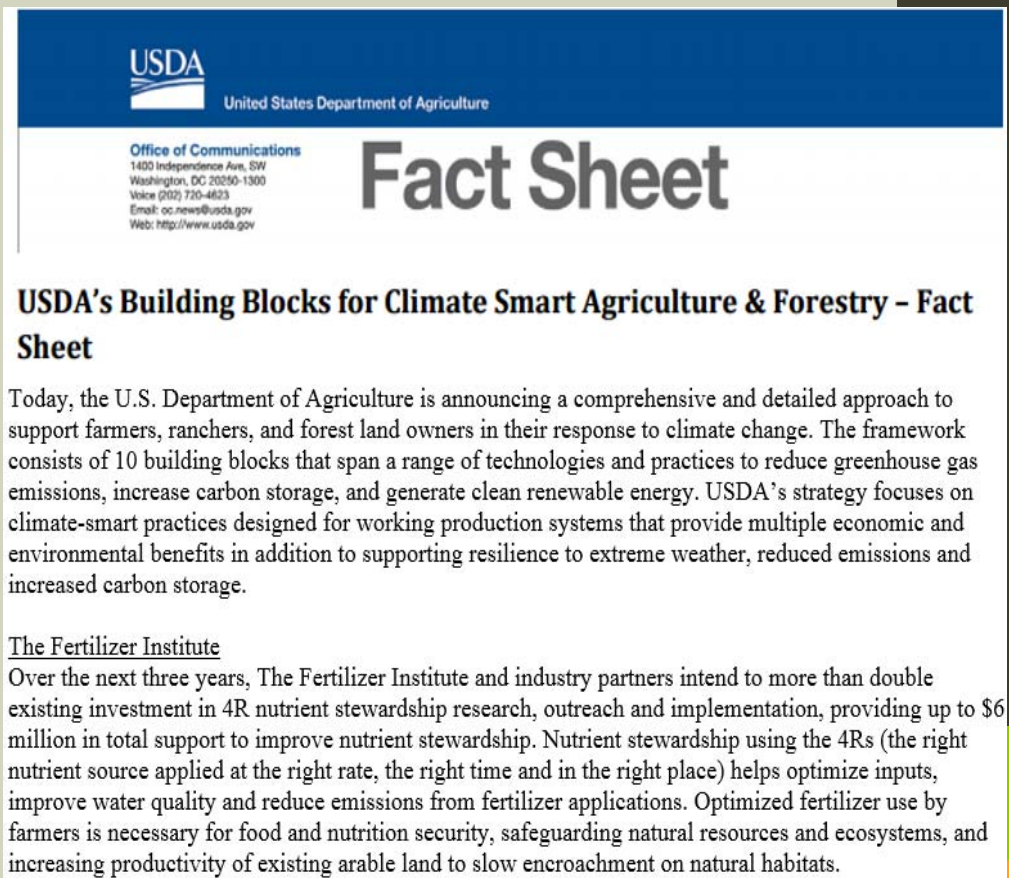
The screenshot shows the NRCS website page for Nutrient & Pest Management. The header includes the USDA logo and the text "United States Department of Agriculture" and "Natural Resources Conservation Service". The navigation menu includes "Home", "About NRCS", "Newsroom", and "Careers". The breadcrumb trail reads "You are here: Home / Land Use / Cropland / Nutrient & Pest Management". The main heading is "Nutrient & Pest Management". Below this is the "Nutrient Management Definition" section, which states: "Nutrient Management is defined as the management of the 4R's of Nutrient Management:". The 4R's are listed as: "Right amount (rate)", "Right source", "Right placement (method of application)", and "Right timing of commercial fertilizers, manure, soil amendments, and organic by-products to agricultural landscapes as a source of plant nutrients while protecting local air, soil and water quality." To the right of the text is an aerial photograph of a farm with a winding road and green fields. Below the definition is a paragraph: "The corner stone for Nutrient Management is the Natural Resources Conservation Service (NRCS) 590 Nutrient Management Conservation Practice Standard. Contact John Davis via phone at 202-720-2308, or email j.russell.davis@wdc.usda.gov". At the bottom, it says: "In addition to the 590 Nutrient Management Standard, NRCS provides further guidance on the application of nutrient management via the National Nutrient Management Policy and National Instruction."

NRCS 590 Nutrient Mgmt. Std.

- From 590 “Nutrients must be applied with the right placement, in the right amount, at the right time, and from the right source to minimize nutrient losses to surface and groundwater.
- NRCS Chief White – “If we can get those four R's right, we will have gone a tremendous way towards:
 - maximizing the efficiency of fertilizer
 - helping protect the environment
 - saving producers money

USDA Climate-Smart Ag Fact Sheet

- www.usda.gov/documents/climate-smart-fact-sheet.pdf
- **Nitrogen Stewardship:** Focus on the right timing, type, placement and quantity of nutrients to reduce nitrous oxide emissions and provide cost savings through efficient application.



The image shows the cover page of a USDA Fact Sheet. At the top, there is a blue header with the USDA logo and the text "United States Department of Agriculture". Below the header, on the left, is the "Office of Communications" contact information: "1400 Independence Ave, SW Washington, DC 20250-1300 Voice (202) 720-4823 Email: oc.news@usda.gov Web: http://www.usda.gov". To the right of this is the title "Fact Sheet" in a large, bold, sans-serif font. Below the title is the subtitle "USDA's Building Blocks for Climate Smart Agriculture & Forestry - Fact Sheet". The main body of text describes the announcement of a comprehensive approach to support farmers and ranchers in response to climate change, mentioning 10 building blocks for reducing greenhouse gas emissions and increasing carbon storage. At the bottom, there is a section titled "The Fertilizer Institute" which discusses a plan to double investment in 4R nutrient stewardship research and implementation, aiming to improve nutrient use and reduce emissions.

USDA
United States Department of Agriculture

Office of Communications
1400 Independence Ave, SW
Washington, DC 20250-1300
Voice (202) 720-4823
Email: oc.news@usda.gov
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Fact Sheet

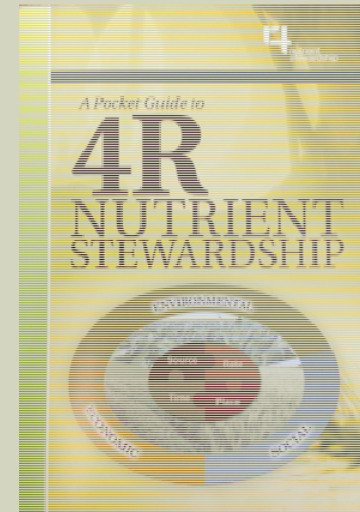
USDA's Building Blocks for Climate Smart Agriculture & Forestry - Fact Sheet

Today, the U.S. Department of Agriculture is announcing a comprehensive and detailed approach to support farmers, ranchers, and forest land owners in their response to climate change. The framework consists of 10 building blocks that span a range of technologies and practices to reduce greenhouse gas emissions, increase carbon storage, and generate clean renewable energy. USDA's strategy focuses on climate-smart practices designed for working production systems that provide multiple economic and environmental benefits in addition to supporting resilience to extreme weather, reduced emissions and increased carbon storage.

The Fertilizer Institute
Over the next three years, The Fertilizer Institute and industry partners intend to more than double existing investment in 4R nutrient stewardship research, outreach and implementation, providing up to \$6 million in total support to improve nutrient stewardship. Nutrient stewardship using the 4Rs (the right nutrient source applied at the right rate, the right time and in the right place) helps optimize inputs, improve water quality and reduce emissions from fertilizer applications. Optimized fertilizer use by farmers is necessary for food and nutrition security, safeguarding natural resources and ecosystems, and increasing productivity of existing arable land to slow encroachment on natural habitats.

Outreach and Resources

- Become a 4R Partner:
www.partners.nutrientstewardship.com
-  1fertilizer
-  @4Rnutrients
- 4R Quarterly Newsletter: sign-up at
www.nutrientstewardship.org
- 4R Pocket Guide



Discussion.....

- How do we show/promote level of 4R adoption?
- How can the role of fertilizer industry continue to evolve?
- What is the best way to expand the 4R NMP nationally?
- Can effectiveness/adoption data be aggregated locally or by watershed to help tell the story?

How Will You Get Involved?

Thank You

