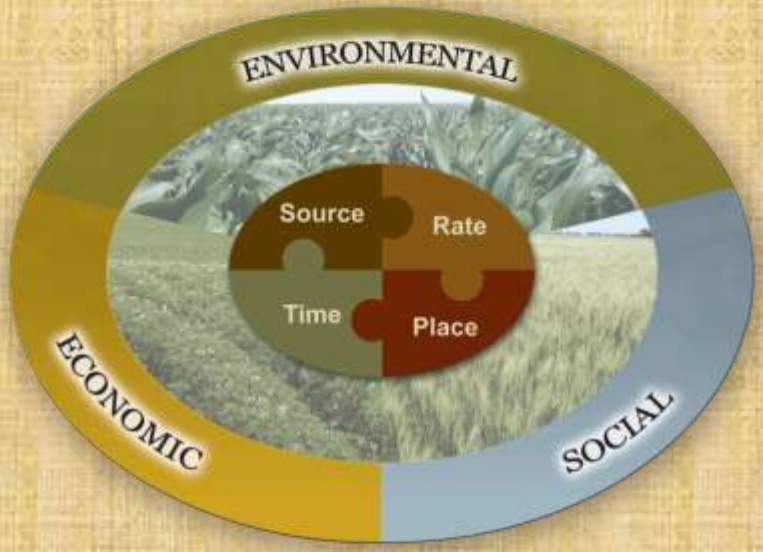
PA 4Rs Alliance

The nation is facing expanding and conflicting environmental, land use, and food production priorities.

Producers are searching for ways to optimize inputs and maximize profits.



Right **source**

Right **rate**

Right **time**

Right **place**

PA 4Rs Alliance

An initiative of
PennAg Industries Association

- Research
- Education / Outreach
- Data Collection & Quality
- Communication

PennAg Industries Association
Serving Agribusiness Since 1878

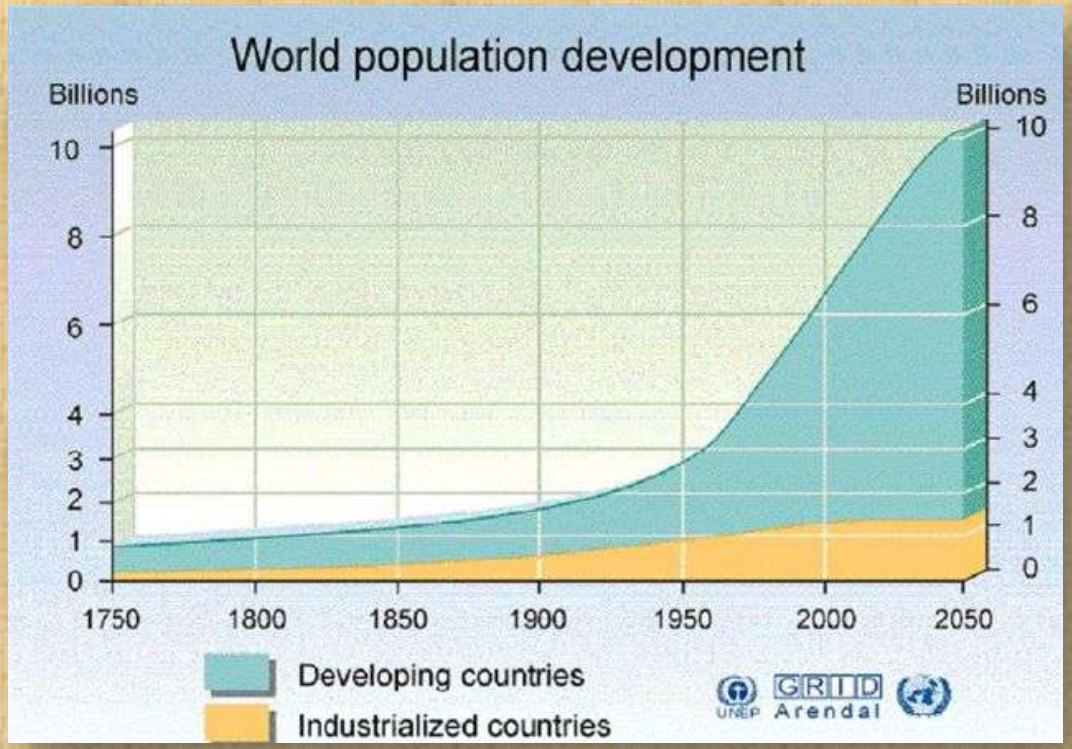
4 nutrient stewardship

PA 4Rs Alliance

Food for thought…

World population is estimated to reach 9.1 billion by 2050.

To sustain this level of growth, we will need to produce as much food in the **next 40 years** as we have in the **past 500 years**.



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↑World population
↑Demand for food and fiber
↑Demand for clean water
↑Demand for productive farmland
↑Demand for skilled farmers
↑Regulatory pressure, **and**

PA 4Rs Alliance

National Water Quality Challenges

Major and minor watersheds with water quality impairment

- **Agriculture is a major contributor** of nutrients and sediments to local water.

Nutrient restrictions have been imposed by regulators in some areas (e.g., nutrient load limits)

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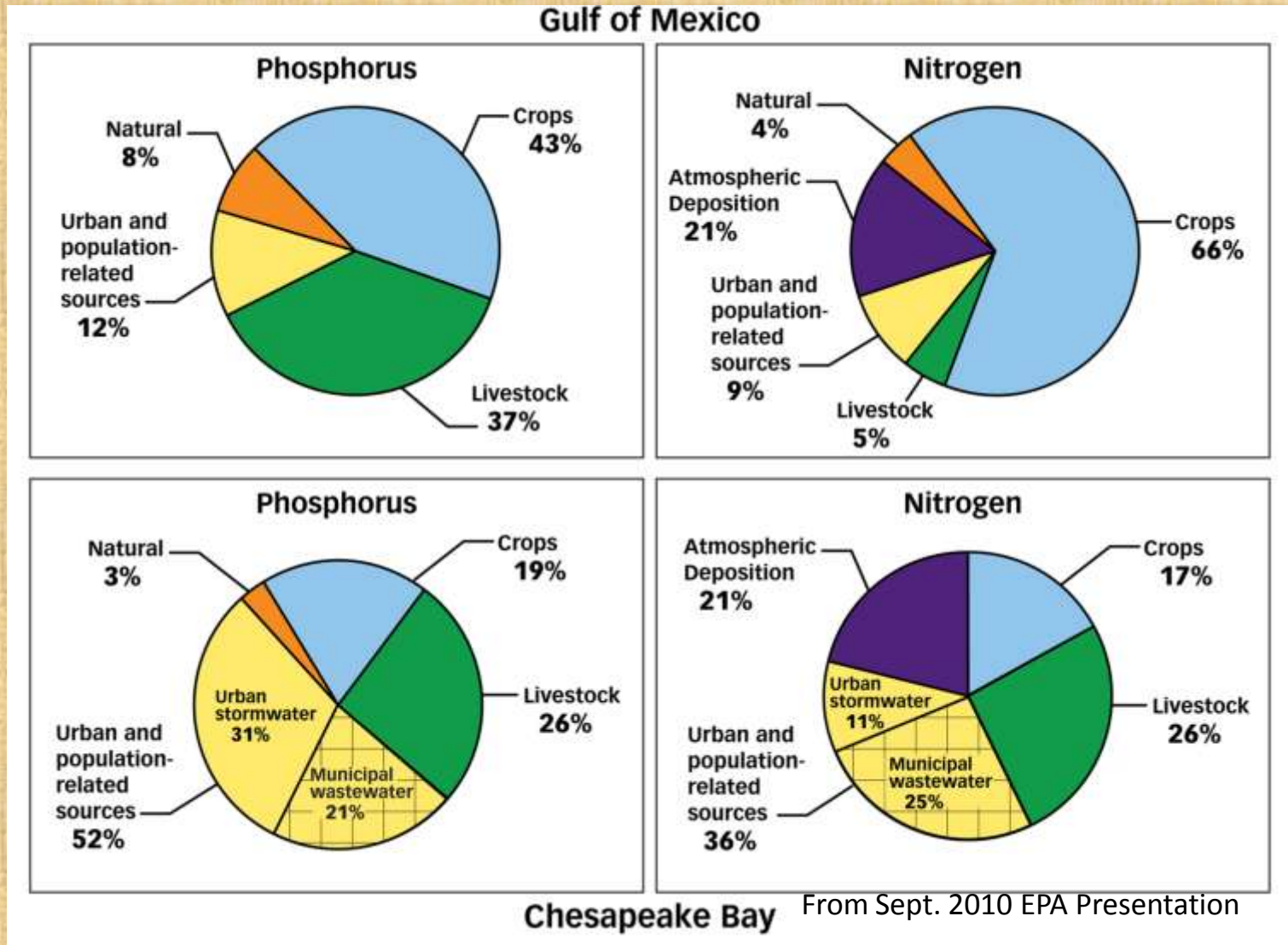
Row Crop N & P Contributions to the Gulf of Mexico & the Chesapeake Bay



From Sept. 2010 EPA Presentation

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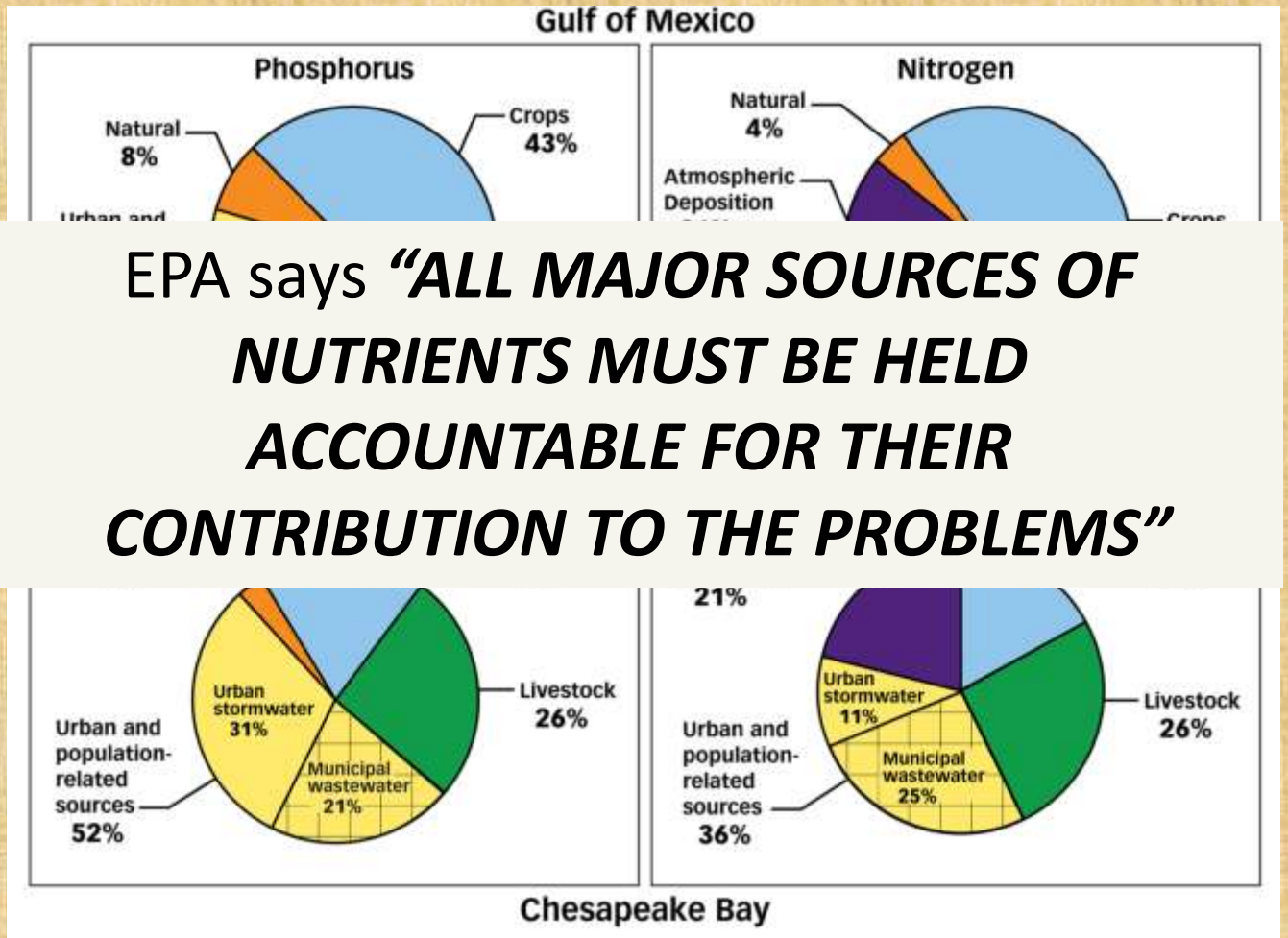
What EPA Has Been Saying…….



EPA says ***"ALL MAJOR SOURCES OF NUTRIENTS MUST BE HELD ACCOUNTABLE FOR THEIR CONTRIBUTION TO THE PROBLEMS"***

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Increased Scrutiny of Land and Resource Management

- Negative headlines effecting public opinion
- EPA aggressively pursuing rulemaking affecting agriculture – more CAFO-type regulations
- Environmental organizations litigating to force regulatory action

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U.S. Department of Agriculture

Increase complete and consistent use of nutrient management

- **53-80% of the cultivated cropland require additional nutrient management**

- 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

Upper Mississippi River Basin & Chesapeake Bay CEAP report:

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Suites of practices to reduce soil erosion and manage nutrients are required to simultaneously address soil erosion and nutrient loss

Avoid losses by controlling runoff, erosion, leaching, and volatility.

Avoid nutrient applications when the risk for nutrient loss is high

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4R Nutrient Management in NRCS conservation plans

Right **source**

Right **rate**

Right **time**

Right **place**

With 4Rs as its base,

NRCS offers confidential voluntary technical and financial assistance to producers for planning and implementing on-farm nutrient management plans

USDA United States Department of Agriculture
Natural Resources Conservation Service

Home | About NRCS | Newsroom | Careers

You are here: **Home** / **Land Use** / **Cropland** / Nutrient & Pest Management

Nutrient & Pest Management

Nutrient Management Definition

Nutrient Management is defined as the management of the 4R's of Nutrient Management:

- **Right amount** (rate)
- **Right source**
- **Right placement** (method of application)
- **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.

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**

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.**

A GLOBAL INDUSTRY
ENVIRONMENTAL STEWARDSHIP
4R Nutrient Stewardship
Fertilizer Re
Manag
Manag
Precisi
Hypoxi
Fertiliz
FERTIL
NUTRIE

4R Nutrient Stewardship

The fertilizer industry endorses a best management practice concept known as 4R nutrient stewardship. The 4R philosophy is an innovative and science-based approach that enhances environmental protection, expands production, increases farmer

In This Section

Fertilizer Regulations

TFI supports site-specific best management practices framed around the 4R nutrient stewardship system.

A “one size fits all” approach, as is being advocated in some policy circles, will not achieve the common goals of productive, sustainable and economically rewarding farming that protects the environment.

The Latest From:
TFI VOICE
The Blog of The Fertilizer Institute

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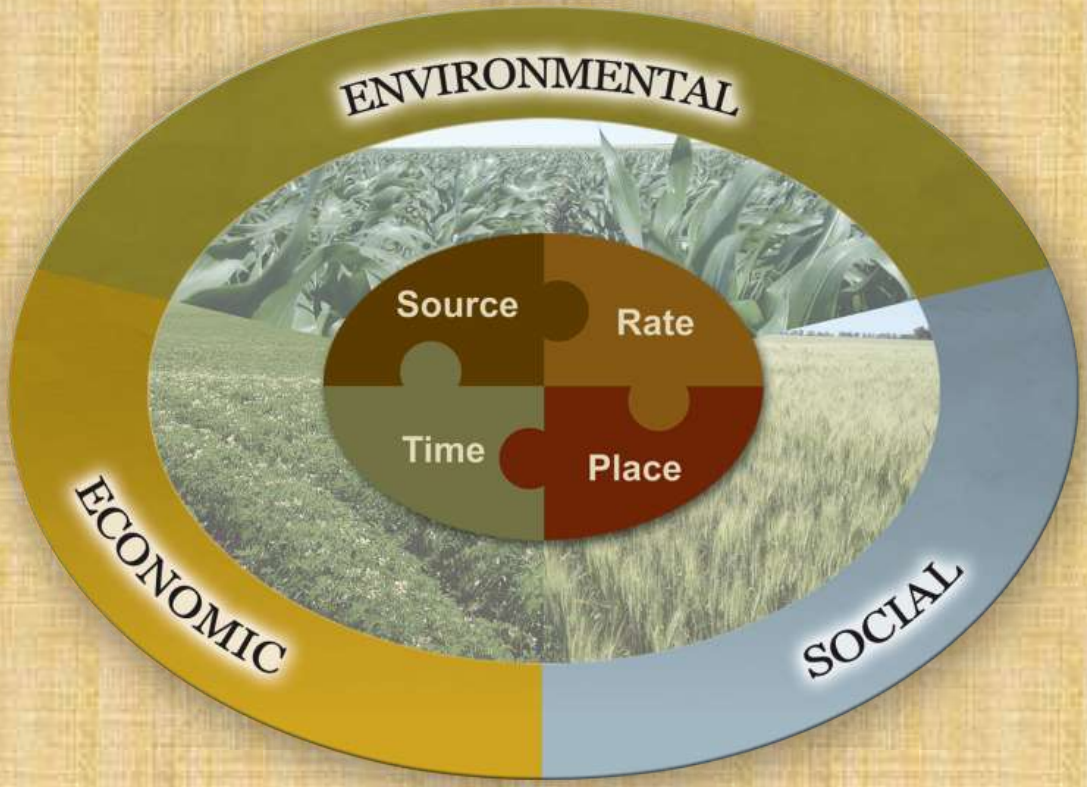
4R Nutrient Stewardship National Voluntary Campaign

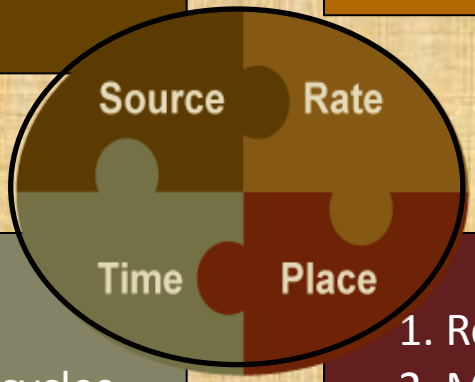
Improve agricultural production while contributing to social well being and minimizing environmental impacts (benefits water and air quality)



Universal scientific principles of 4R management systems

1. Supply plants available nutrients
2. Match nutrient source-soil
3. Nutrient-soil interactions
4. Blending compatibility

1. Soil and manure testing
2. Legume & manure history credit
3. in-season PSNT / chlorophyll
4. Predict fertilizer use efficiency



1. Apply near crop uptake
2. Understand of soil nutrient cycles
3. Application timing & weather
4. Practical farming consideration

1. Recognize root-soil dynamics
2. Manage variability in fields/farm
3. Fit needs of tillage system
4. Limit potential off-field transport

PA 4R Alliance

CHARTER

- Increase adoption of sustainable crop nutrient stewardship systems by PA farmers. These systems will:
  - Increase farm profitability
  - Enhance environmental conservation

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LEADING TODAY'S AGRICULTURE

PA 4Rs Alliance

PA 4R Alliance will:

- **Identify the best crop nutrient management techniques** current research has to offer and collaborate with crop nutrient researchers doing current research

- **Effectively provide best management information to farmers** and their service providers

- **Cooperate and collaborate with other service providers**, such as conservation, extension, and farmer groups who help farmers implement improved 4R nutrient stewardship cropping systems

PA 4Rs Research & Education

EXAMPLES

- Manure nutrient conservation & technologies
- In-season field-specific NUE strategies
- Soil Health for Resilience, Plant Stress & Environment

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Manure nutrient Injection technologies

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In-season field-specific NUE strategies

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Soil Health - Resilience, Plant Stress & Environment

Increases infiltration and water storage providing drought protection

Keeps nutrients and chemicals in field for crop and Reduces runoff and stream contamination

Increases soil organic matter & crop nutrient cycle efficiency

Each 1% organic matter =

- 10,000 lbs of C
- 1,000 lbs of N
- 100 lbs of P
- 100 lbs of S
- Holds 0.3" - 1" of water

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Principles of Healthy Soil Systems

1. Disturb soil as little as possible
2. Keep soil covered as much as possible
3. Grow a diversity of plant species
4. Living roots in the soil all year round

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4R Nutrient Stewardship + Healthy Soil Systems

Solutions for farmers to

- increase productivity,
- lower costs of production,
- improve environmental stewardship

PA 4Rs Alliance

PA 4R Alliance is looking for

- On-farm demonstration sites
- Field day locations
- Local and state partnership associations
- Network with farmer groups

Contact

Jennifer Reed-Harry, PennAg Industries

717-651-5920 or jrharry@pennag.com

Mark Goodson, NRCS