

UF-IFAS BMP Research

“Past, Present, & Future”

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Next Generation BMPs IST, Apopka, FL
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The Past

Past

- Ridge citrus BMPs
- Everglades Agricultural Area
- Nutrient management
 - Vegetables (North, central, and south production zones)
 - Citrus (Ridge and flatwoods)
 - Nursery (In-ground and container)
 - Turfgrass (Sports turf and lawns)
- Irrigation
 - Drip
 - Microsprinkler

Ridge Citrus BMPs – A chronology

The Problem

- Late 1980s – Nitrates found in Lake, Polk, and Highlands county drinking water.
- Citrus production is implicated.

State Agency Response

- 1994 – Fla. Legislature passes Nitrogen BMP bill.
- FDACS adopts “Nitrogen Best Management Practices for Florida Ridge Citrus” by rule.
- Growers get presumption of compliance with water quality standards for implementing BMPs.

Ridge Citrus BMPs – A chronology

UF-IFAS Research and Extension Response

- Questions to answer: “Where does the nitrogen go?” and “How do we best manage it?”
- Most effective BMPs:
 - Right fertilizer rate.
 - Split applications.
 - Improve irrigation.
 - Use slow-release fertilizer.
- Maintaining production and reducing groundwater nitrate are compatible.
- 2008: BMPs integrated into UF-IFAS recommendations.

Ridge Citrus BMPs – A chronology

Outcomes

- About 90% of Florida citrus growers have signed a notice of intent to implement BMPs.
- Average N fertilizer rates have decreased about 20% since the 1980s.

BMPs in the EAA: A success story

- Total P concentration in WY2004 was 69 ppb compared to 173 ppb base line period (1978-1988)
- Total P load reduction = 64% compared to base line period
- BMPs in the EAA have been proven to be very successful with an average P load reduction of 50% since 1995

The Present

Present

- On-farm trials
 - N fertilization of tomato in South Florida
 - N fertilization of potato in the TCAA
 - Fate of N-P-K in mulched beds with high water table
 - Water/nutrient BMPs for strawberry
 - Fertilization/irrigation of corn in north Florida
- Technology
 - Controlled release fertilizers
 - Irrigation control by soil moisture sensors
 - Precision and variable-rate fertilizer application
- Social
 - Understanding BMP decisions

On-farm trial:
N Fertilization of tomato in
south Florida

South Florida Vegetable Nitrogen BMP Trials 2004-2009



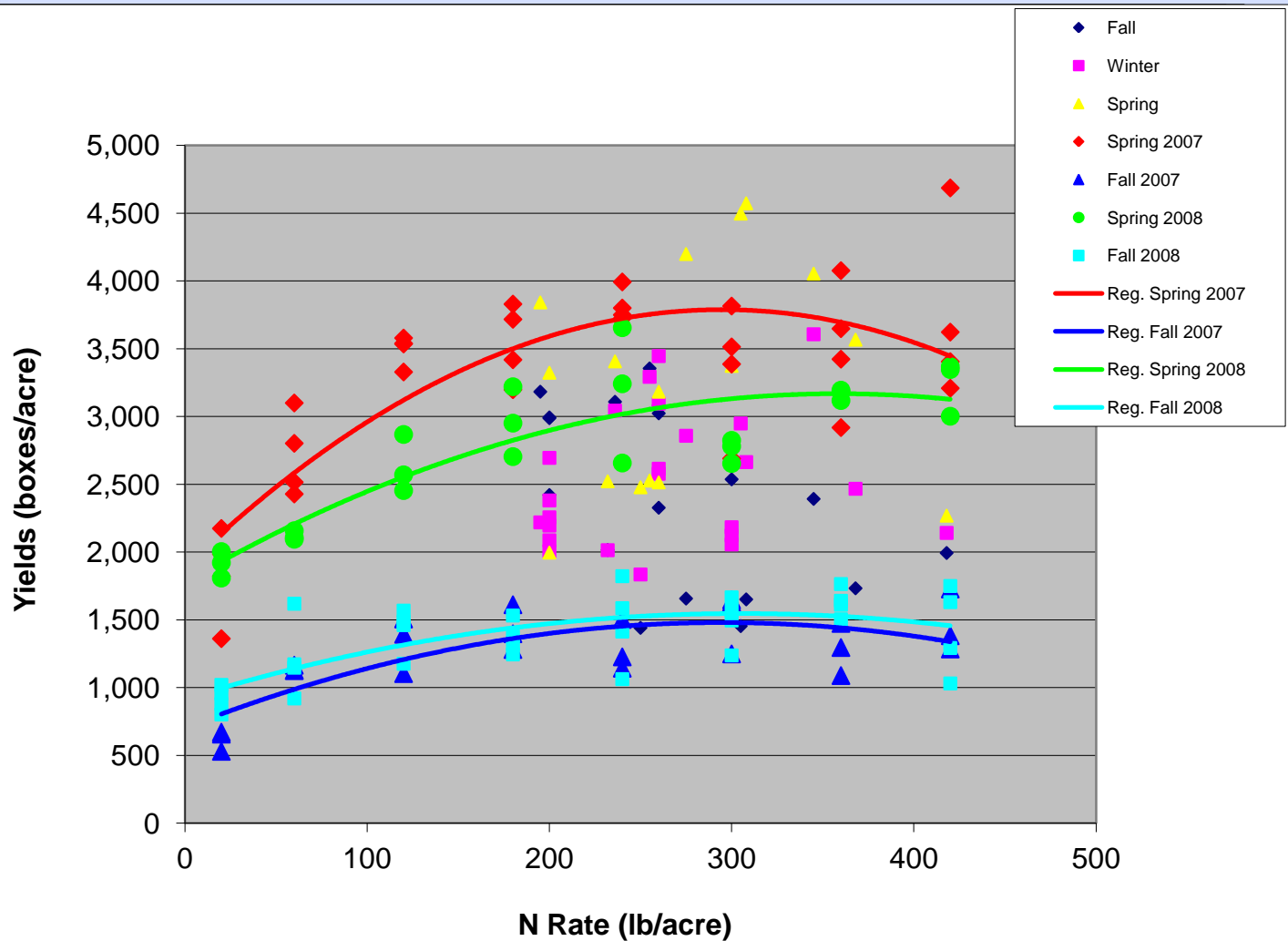
Monica Ozores-Hampton, Eric Simonne, Eugene McAvoy, Steven Sargent, D.C. McClure, Tom Wilkes, Phil Stansly, Sanjay Shukla, Pam Roberts, Fritz Roka, Kelly Morgan, Tom Obreza, and Crystal Snodgrass





Total Marketable Yields

32 Trials (2004-07)



On-farm evaluation: Water/nutrient BMPs for strawberry

Strawberry growers using BMPs effectively minimize N losses. Less than 5% of applied N was collected below the root zone in monitored fields.



On-farm demonstration: Variable rate fertilizer application in citrus groves

Variable rate citrus fertilization

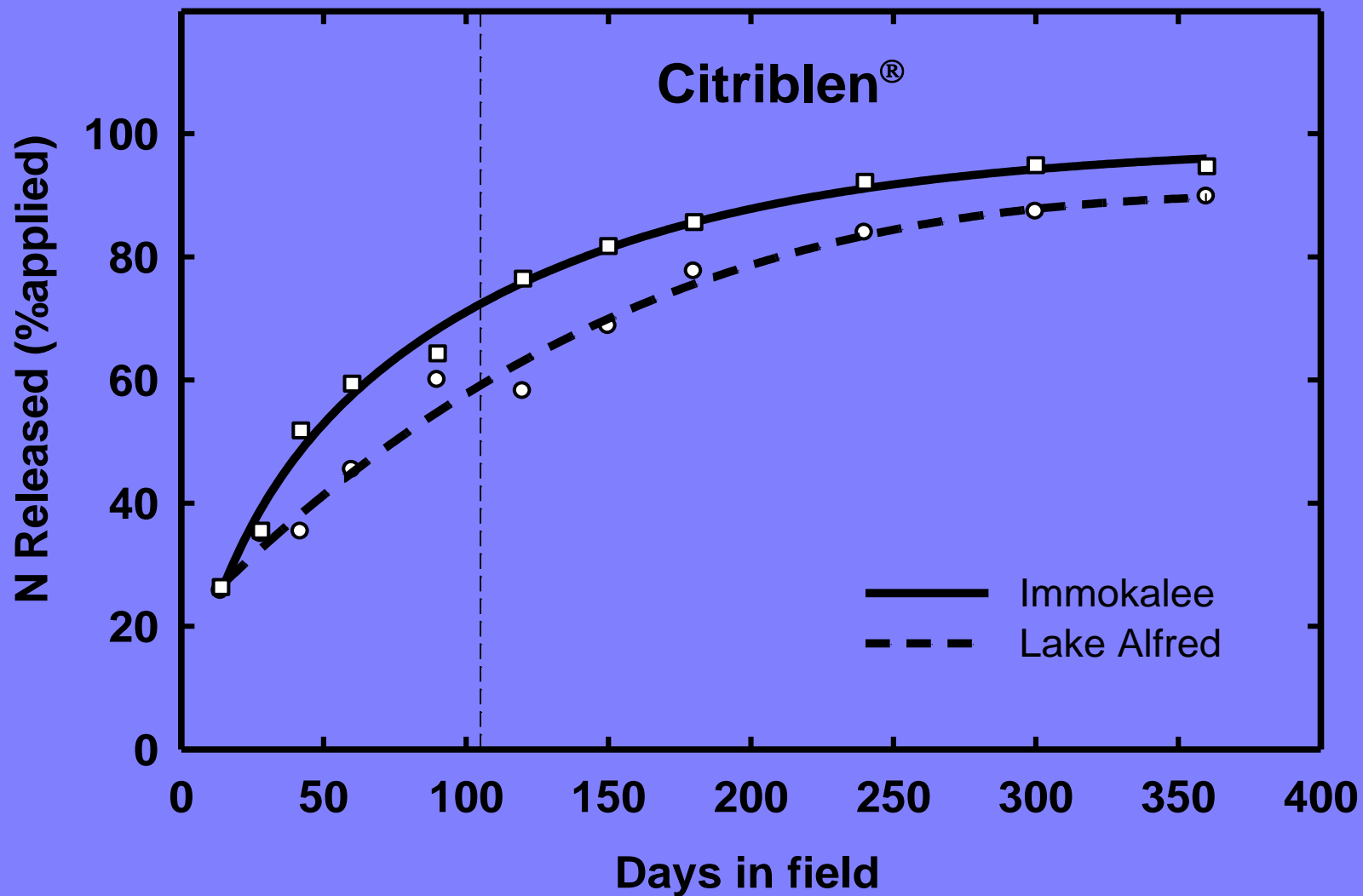
- 222 acre test citrus grove.
- Side-by-side conventional vs. variable-rate application.
- Conventional: 48 tons/appl.
- VRT: 37 tons/appl.
- 23% savings in applied fertilizer
= One 20-ton fertilizer load
saved every 150 acres
fertilized.



Technology example: Controlled release fertilizer for citrus groves

Nitrogen release rate field study





Technology example: Drainage lysimeters

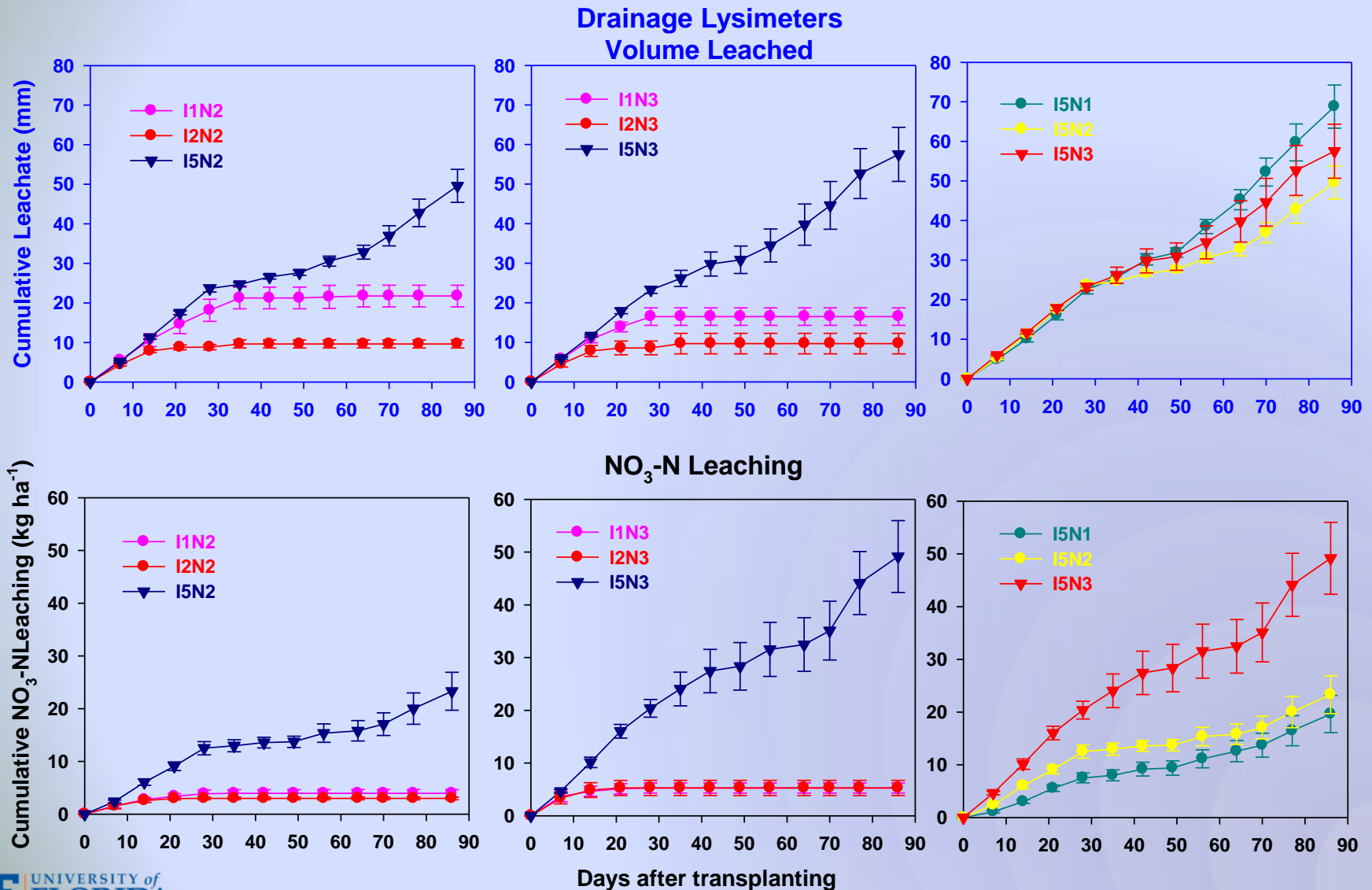
Drainage lysimeter leachate removal system



Drainage lysimeter pumping



Tomato (Spring 06) Water and Nitrate leaching

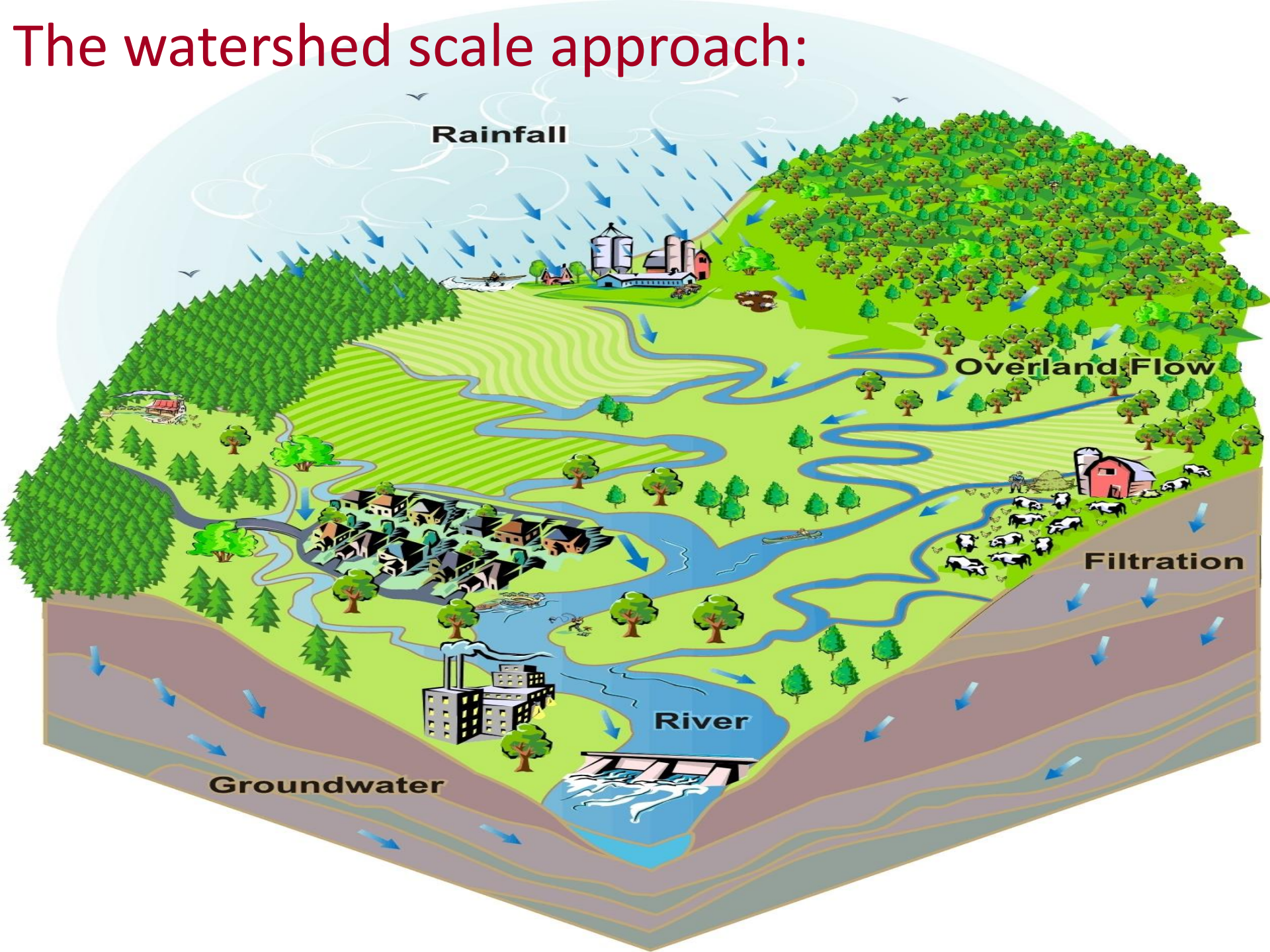


The Future

Future Research

- “Next generation” BMPs
- Watershed scale approach

The watershed scale approach:





Future Research

- Historically research has not integrated production & environmental quality
- “Next generation” BMPs
- Watershed scale approach
- “Systems”
 - Agricultural production
 - Environmental quality
 - Integrated research teams
- Continue and enhance technology
- Predictions, climate forecasts, etc.

Next Generation BMPs Today

- Soil pH management
- Qualitative/quantitative root zone pH management
- Irrigation technology
- Fertilization technology
- Bio-surfactants & efficient water/fert. use
- Biochar & efficient water/fert. Use
- Organic-compliant fertilizers
- Composted dairy manure for potting media