

Nutrient Management Program in Oklahoma

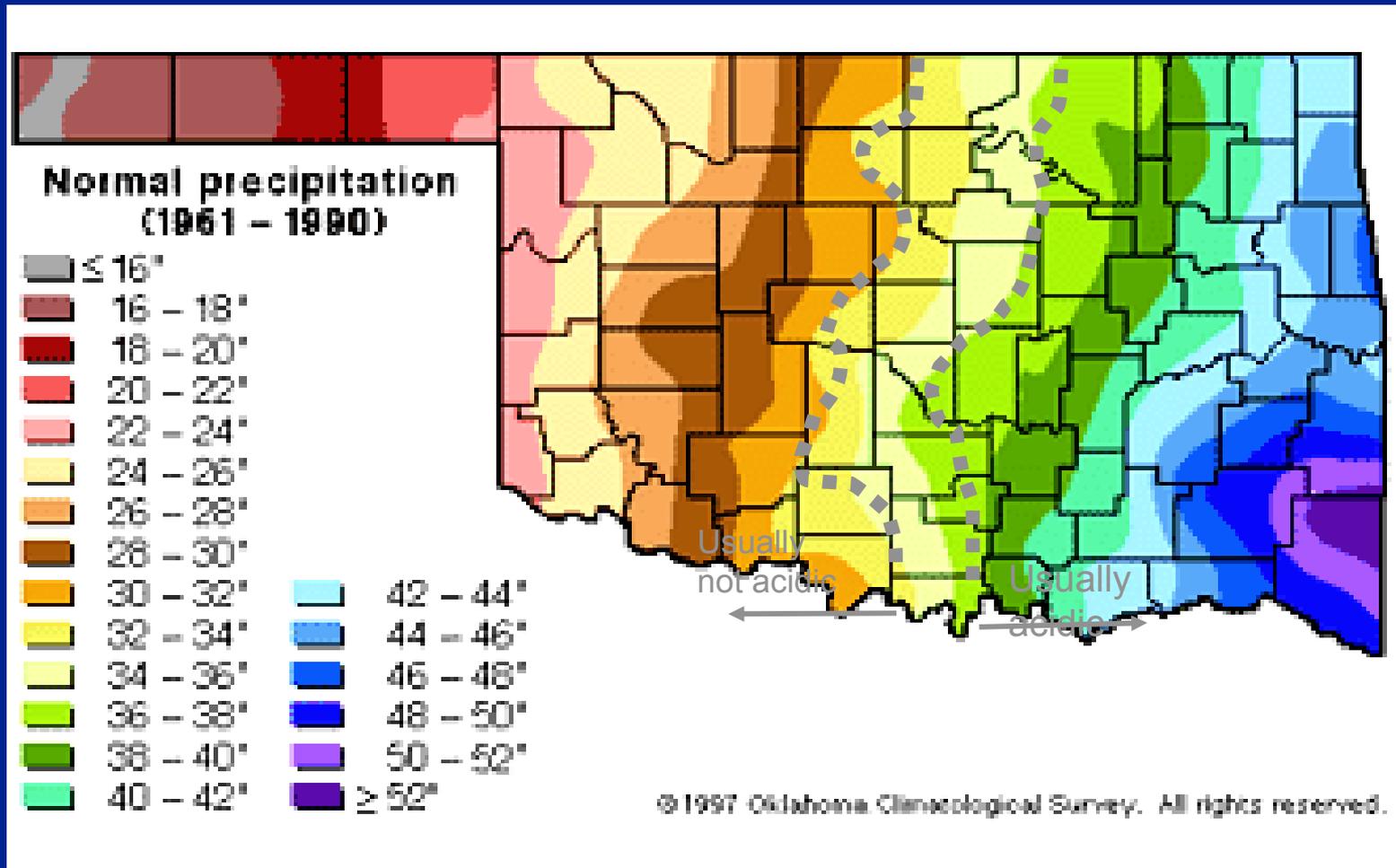
Hailin Zhang and Dan Storm

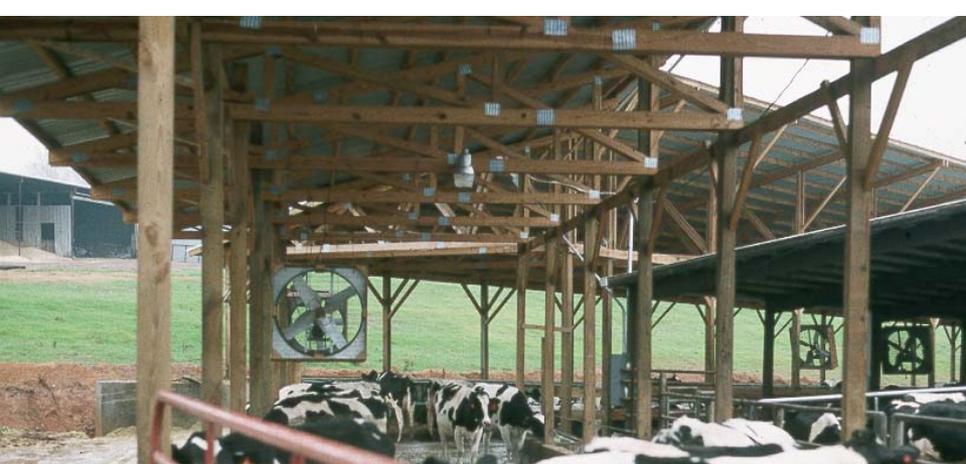
Oklahoma State University

Harold Springer, ODAFF

Larry Poindexter, OK NRCS

The Diversified Oklahoma

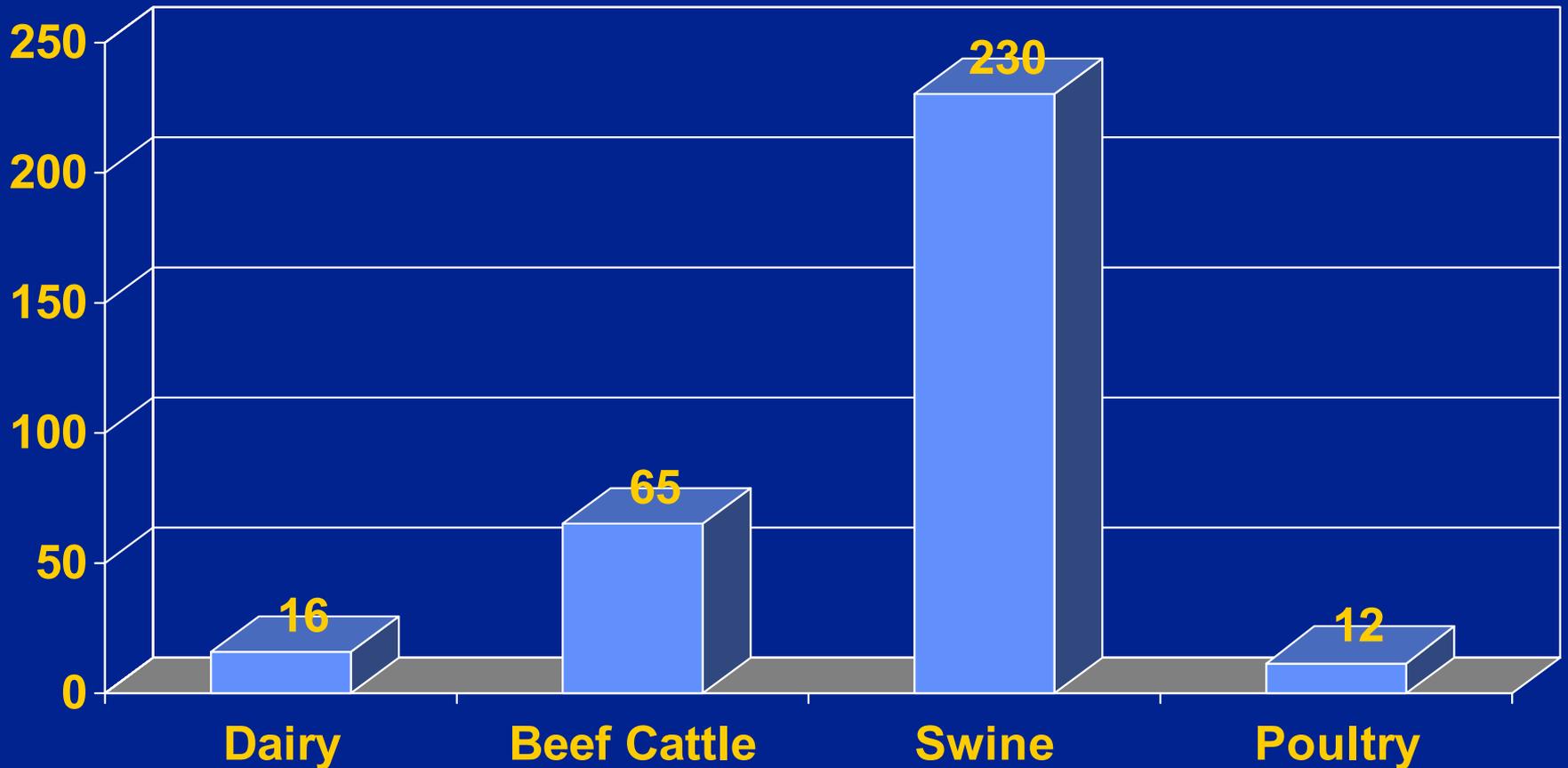


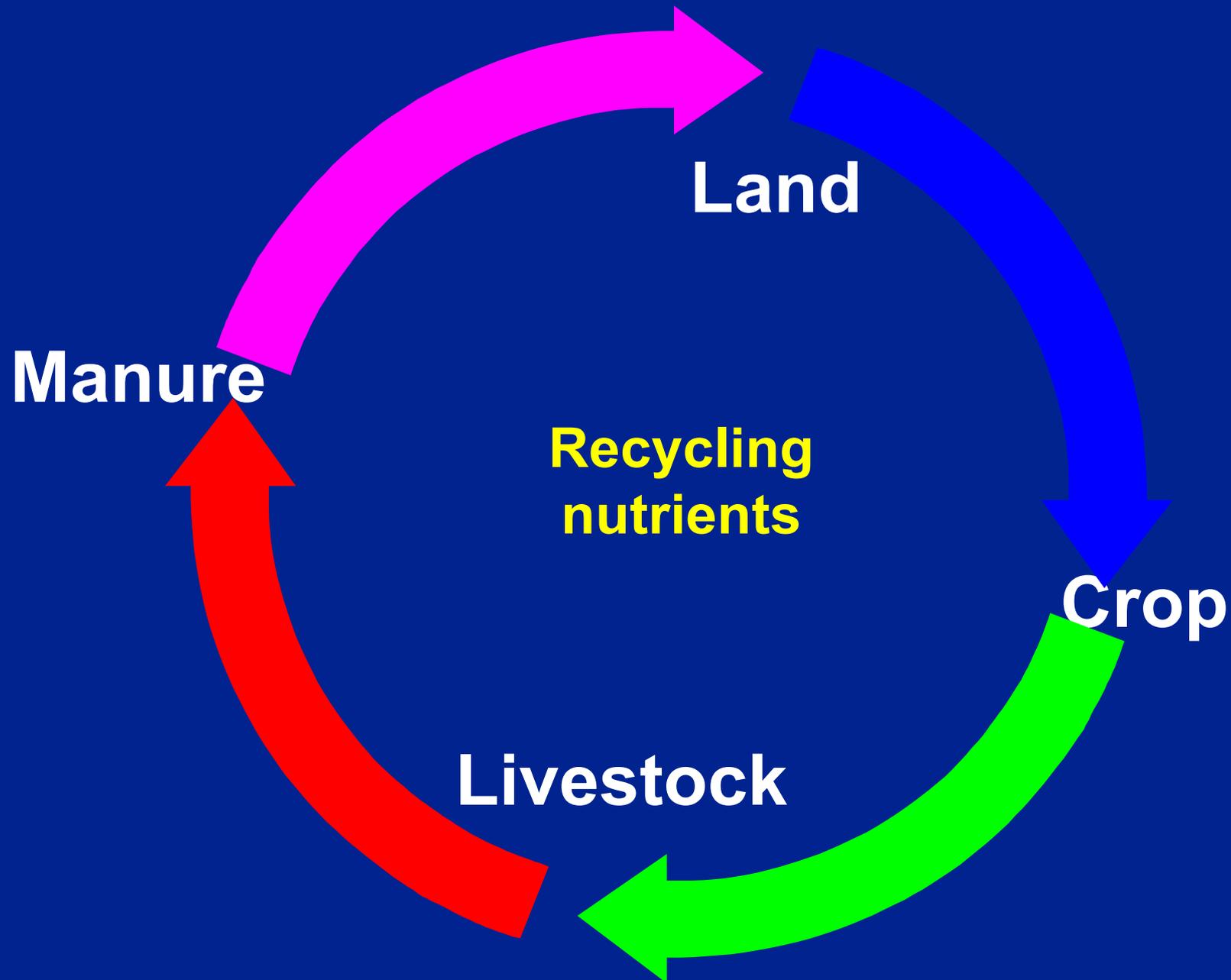


Major Commodities in Oklahoma

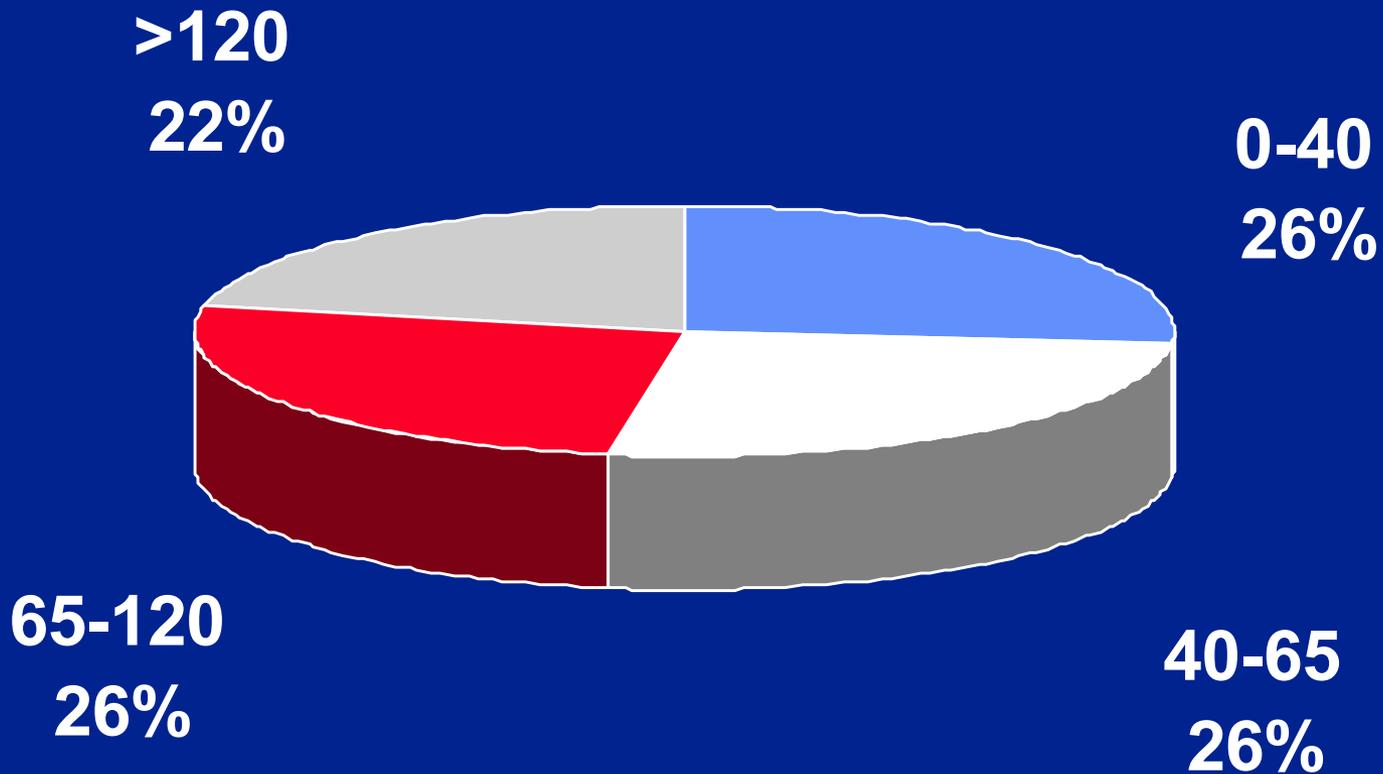
Category	2003 Rank	National Rank	Total # (Million)	\$ Value (Million)
Cattle & Calves	1	4	5.4	1,485
Poultry & Eggs	2	11	58	410
All Hay	3	11		347
Winter Wheat	4	3		343
Hogs & Pigs	5	8	2.4	333
Milk Production	6	29		175

CAFO Facilities in Oklahoma



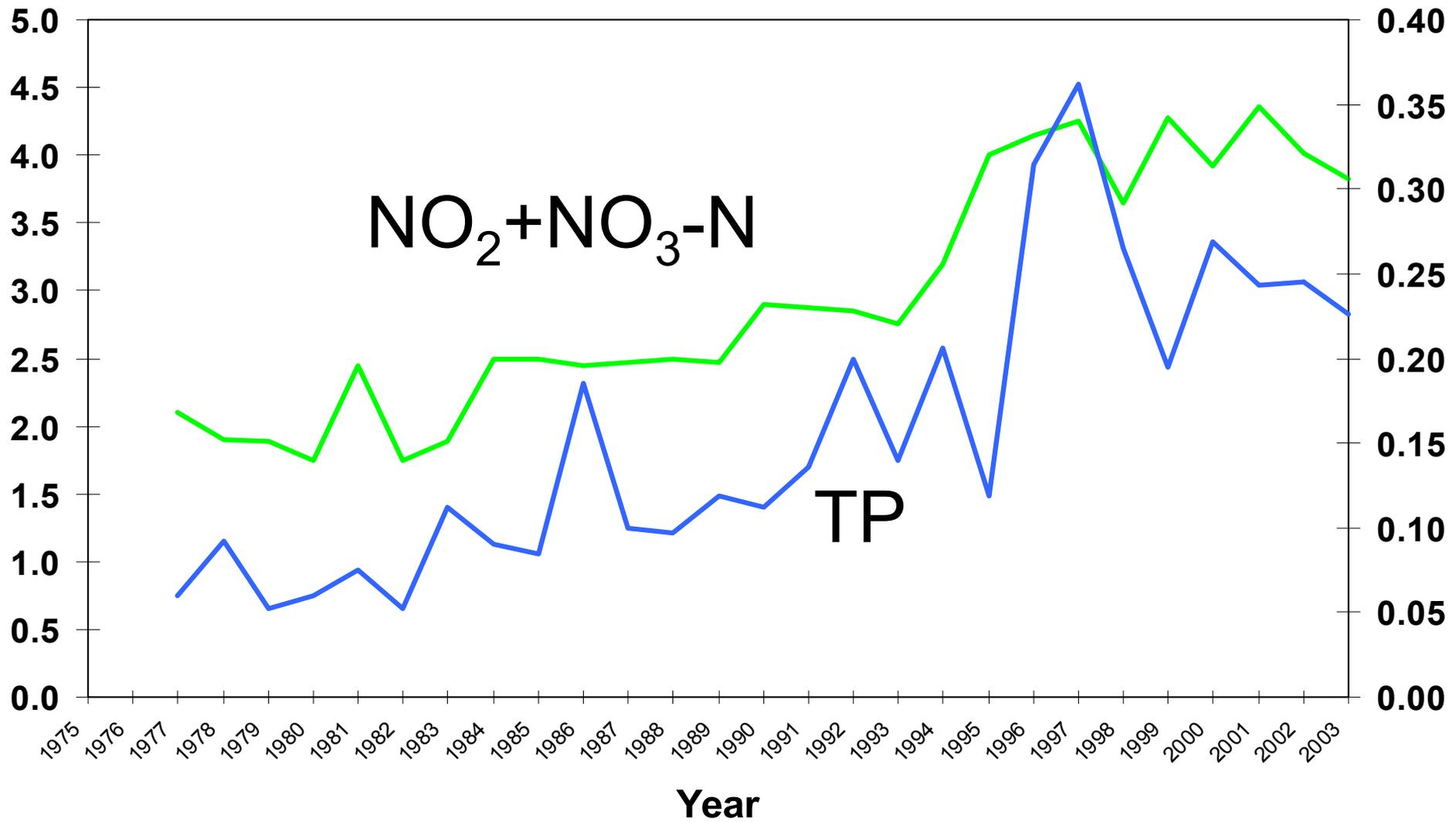


Soil Test P Distribution in OK Farm Land (Mehlich 3 Extraction)



Over 800 poultry houses in the Eucha/Spavinaw Watershed





Mean Annual Nutrient Concentrations of Spavinaw Creek

What have we done to help better manage the valuable resources?

- **Regulation**
- **Education**
- **Research**
- **Teaching**

Regulations On Animal Waste Management

- **Poultry operations are required to be registered with ODAFF and take 9 + 3 hours education**
- **Large swine operations to be licensed and trained (9 + 3 hours)**
- **Other CAFOs comply USEPA regulations**

Rule Implementation and Enforcement

- **ODAFF Water Quality Division**
- **Poultry, Swine, and CAFO inspectors**
- **Monitoring wells around liquid manure facilities**
- **Water and soil samples**
- **License issuing, closure permits**

OK Phosphorus Risk Assessment Ratings for Non-Nutrient Limited Watershed

Rating	Soil Test P Index	0 – 8% Slope	8 to 15% Slope	0 to 15% Slope
		Soil > 20” Deep	Soil > 20” Deep	Soil 10” to 20” Deep
Low	0 – 65	Full Rate	Full Rate Split	Half Rate
Moderate	66 – 250	Full Rate	Half Rate	Half Rate
High	251 – 400	Half Rate	Half Rate	Half Rate
Very High	> 400	Plant Rem.	Plant Removal	Plant Removal
Severe		No Appl.	No Appl.	No Appl.

OK Phosphorus Risk Assessment Ratings for Nutrient Limited Watershed

Rating	Soil Test P Index	0 – 8% Slope Soil > 20”	8 to 15% Slope Soil > 20”	0 to 15% Slope Soil 10” to 20”
Low	0 – 65	Full Rate	Full Rate Split Appl.	Half Rate
Moderate	66 – 120	Full Rate	Half Rate	Half Rate
High	121 – 300	Half Rate	Half Rate	Half Rate
Severe	> 300	No Appl.	No Appl.	No Appl.

Pasture Phosphorus Management (PPM) Calculator

A Future Oklahoma P Index?

- Developed for Eucha/Spavinaw basin
- Quantitative
- Physically based
- Monthly and Annual P Loss
- Requires P Limit to be specified

Pasture Phosphorus Management Calculator - Lake Eucha/Spavinaw Basin Version 1.01

Field Owner: Dale Dribble
 Plan Developer: Rusty Shackelford
 Field Description: south 40
 Date MM/DD/YYYY: 10/25/2004
 Field Area (Acres): 40

Dominant Soil: CAPTINA
 Forage Type: Mixed
 STP (lb/acre): 275
 Min Dry Forage (lb/acre): 500
 Forage Yield Goal (t/acre): 8
 Average Field Slope (%): 3.0
 Field Slope Length (ft): 100

Field Center (UTM Coord.): 15678432 E
 UTM 83: 12355343 N
 Buffer Strip Width (ft):
 Alum Treated Litter:
 Distance to Stream (ft):
 Slope to Stream (%):

P Allocation lb/acre/year: 0

Month	Hay	Stocking Rate (AU/acre)			Litter (lb/acre)		Commercial (lb/acre)	
		Ref.	N	P205	N	P205		
January	<input type="checkbox"/>	All .5						
February	<input type="checkbox"/>	.5						
March	<input type="checkbox"/>	.5	300	100				
April	<input type="checkbox"/>	.5						
May	<input type="checkbox"/>	.5						
June	<input type="checkbox"/>	.5						
July	<input type="checkbox"/>	.5						
August	<input type="checkbox"/>	.5						
September	<input type="checkbox"/>	.5			80	0		
October	<input type="checkbox"/>	.5						
November	<input type="checkbox"/>	.5						
December	<input type="checkbox"/>	.5						

PPM Calculator

Status and Warnings

Load Complete

Load Save
 Calculator About PPM
 Fertilizer Calculator
 Help **RUN**

Animal Waste Management Extension

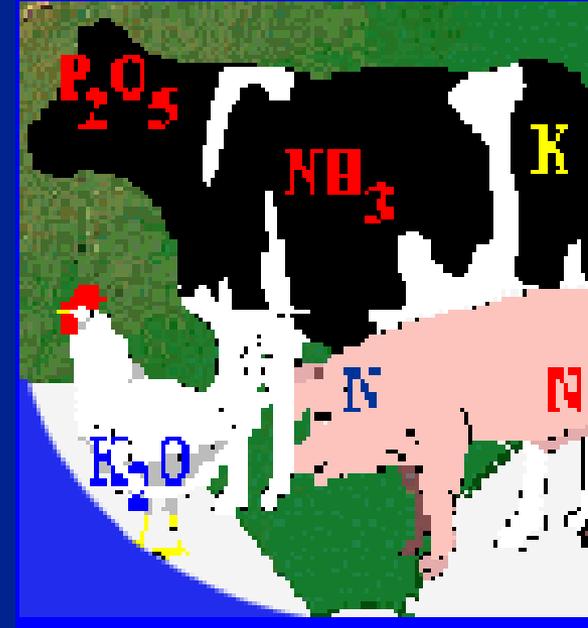
- Prepared and implemented the required educational needs for all sectors
- Certified (comprehensive) nutrient management planners
- Launched a website and developed numerous extension publications



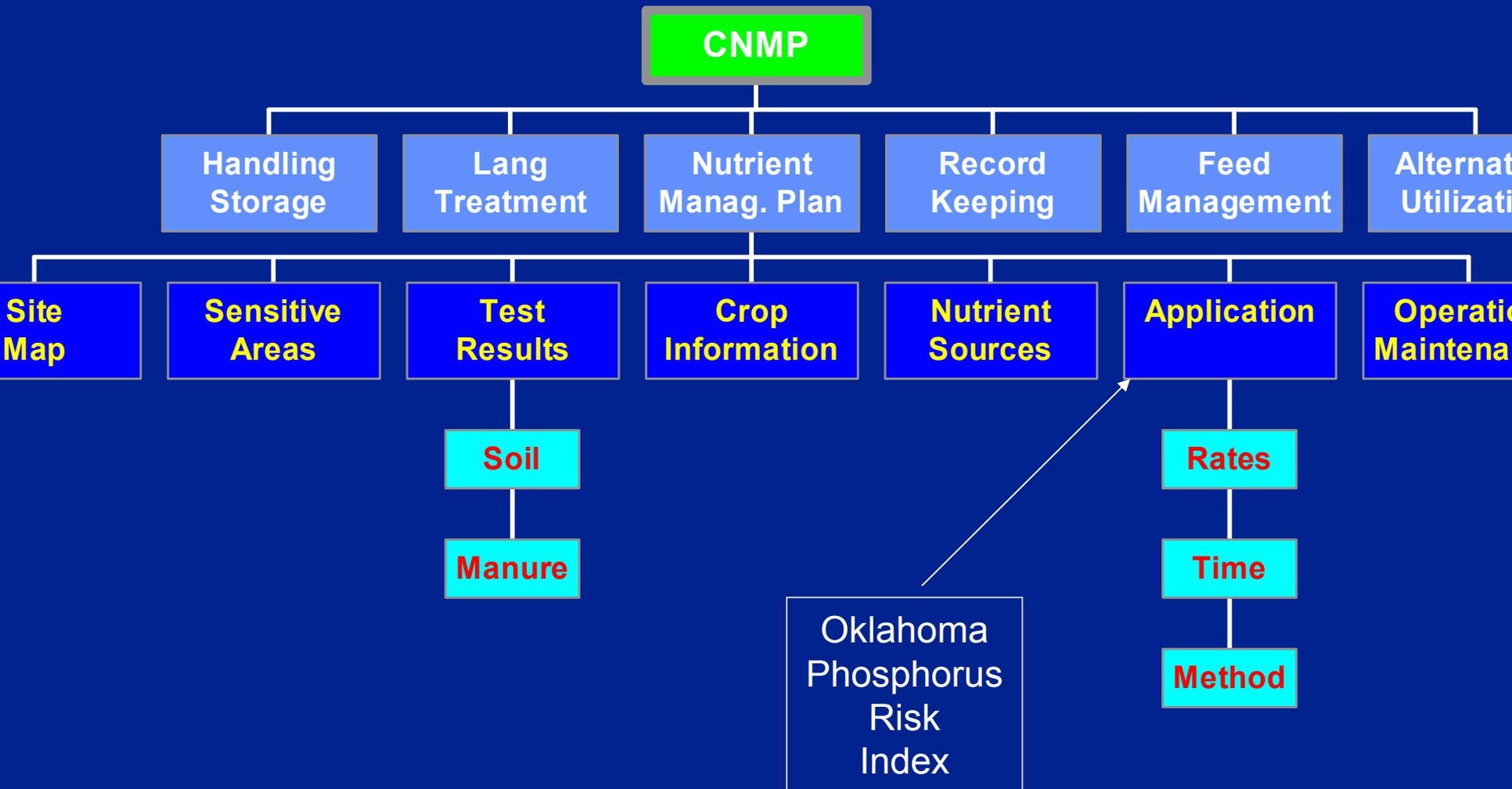
Animal Waste Management

Education

- Certified over 200 manure management planners
- Over 350 swine waste operators, 9-hr initial, 3-hr annual
- Over 1,200 poultry waste operators, 9-hr initial, 3-hr annual
- Commercial manure applicators certification



Comprehensive Nutrient Management Plan



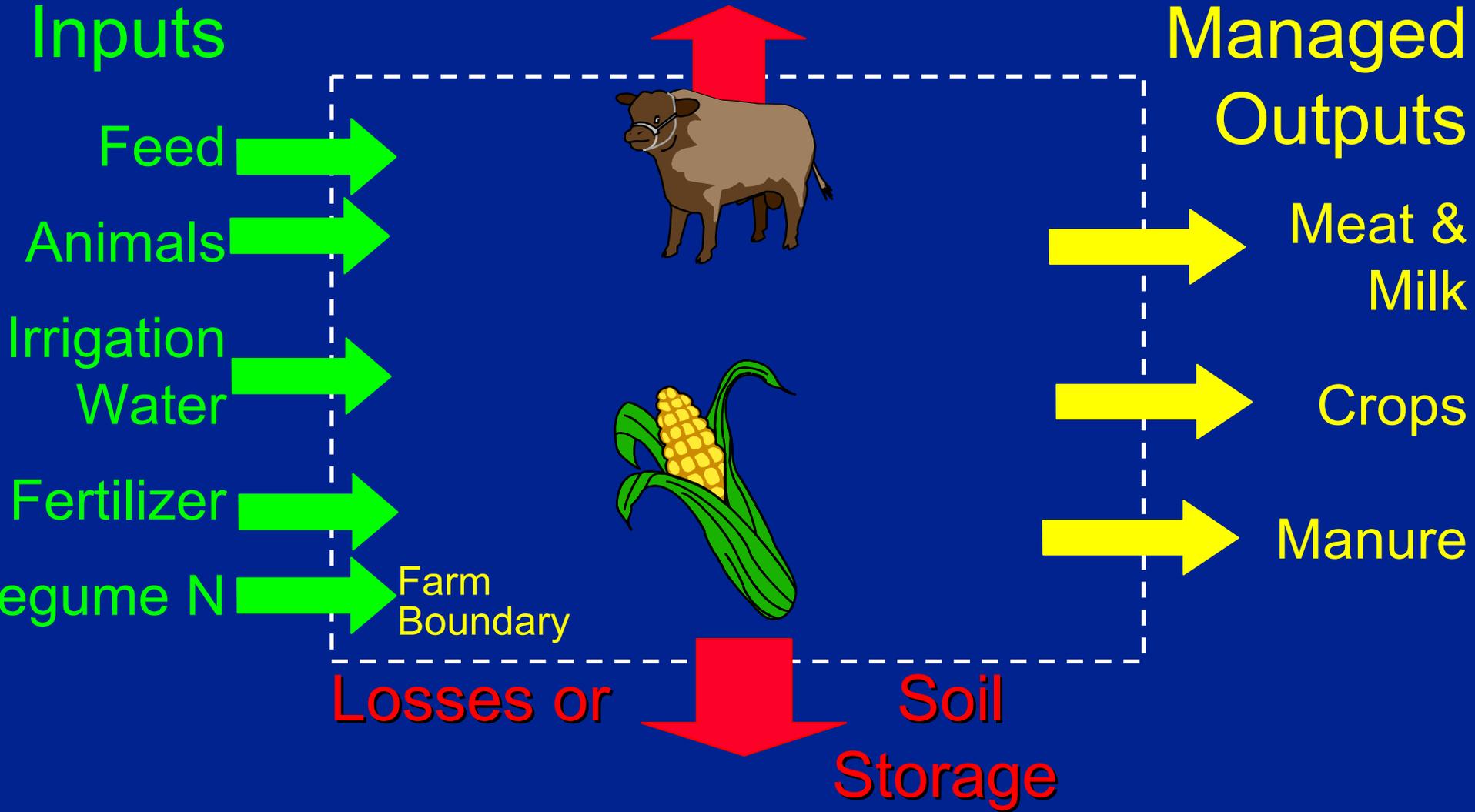
Alternative Use

- Poultry Litter Marketing

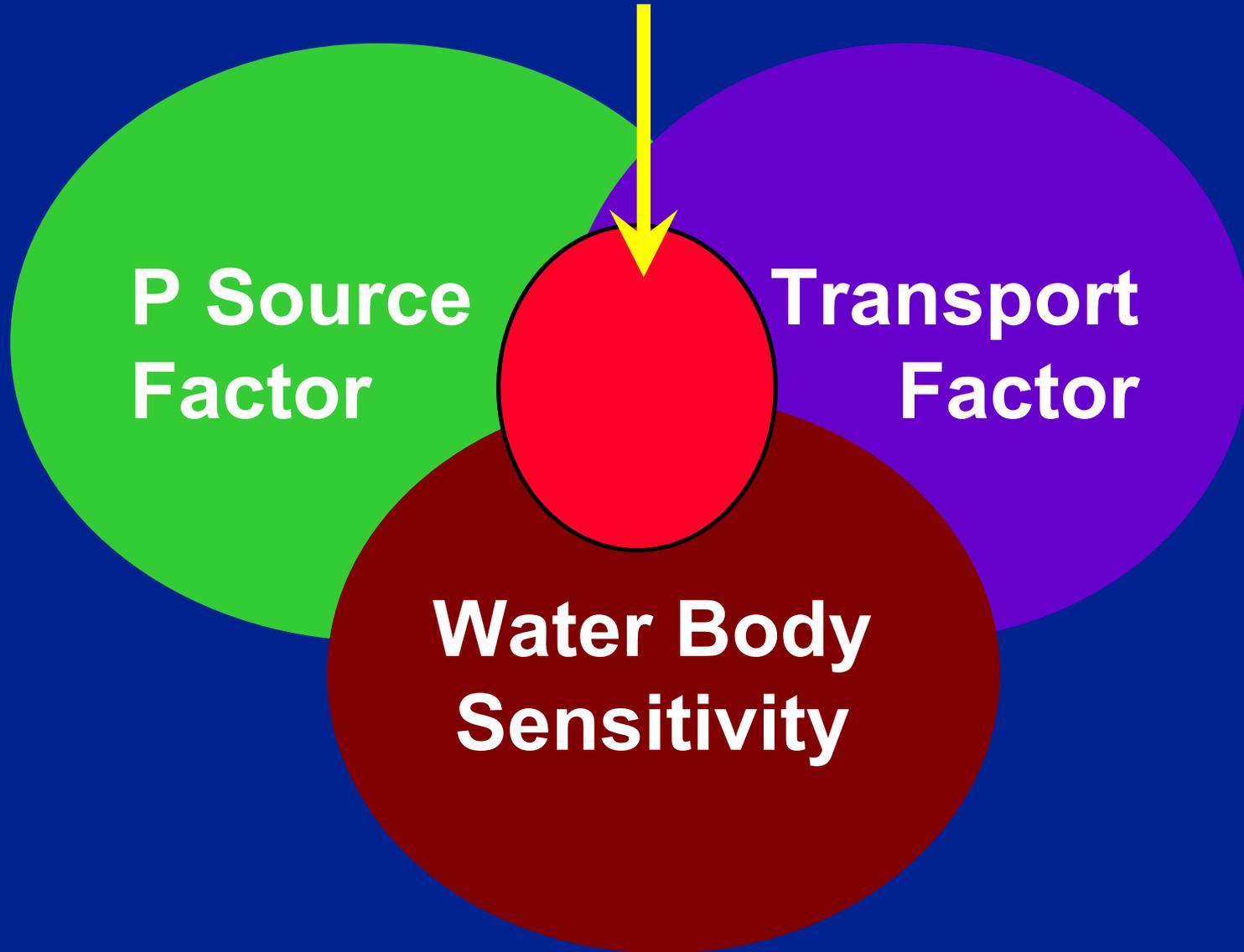
Animal Waste Related Research

- **Nutrient management**
- **Water quality**
- **Feed management**
- **Air quality**
- **Economics**
- **Marketing and alternative use**

Nutrient Balance



P Risk Factors



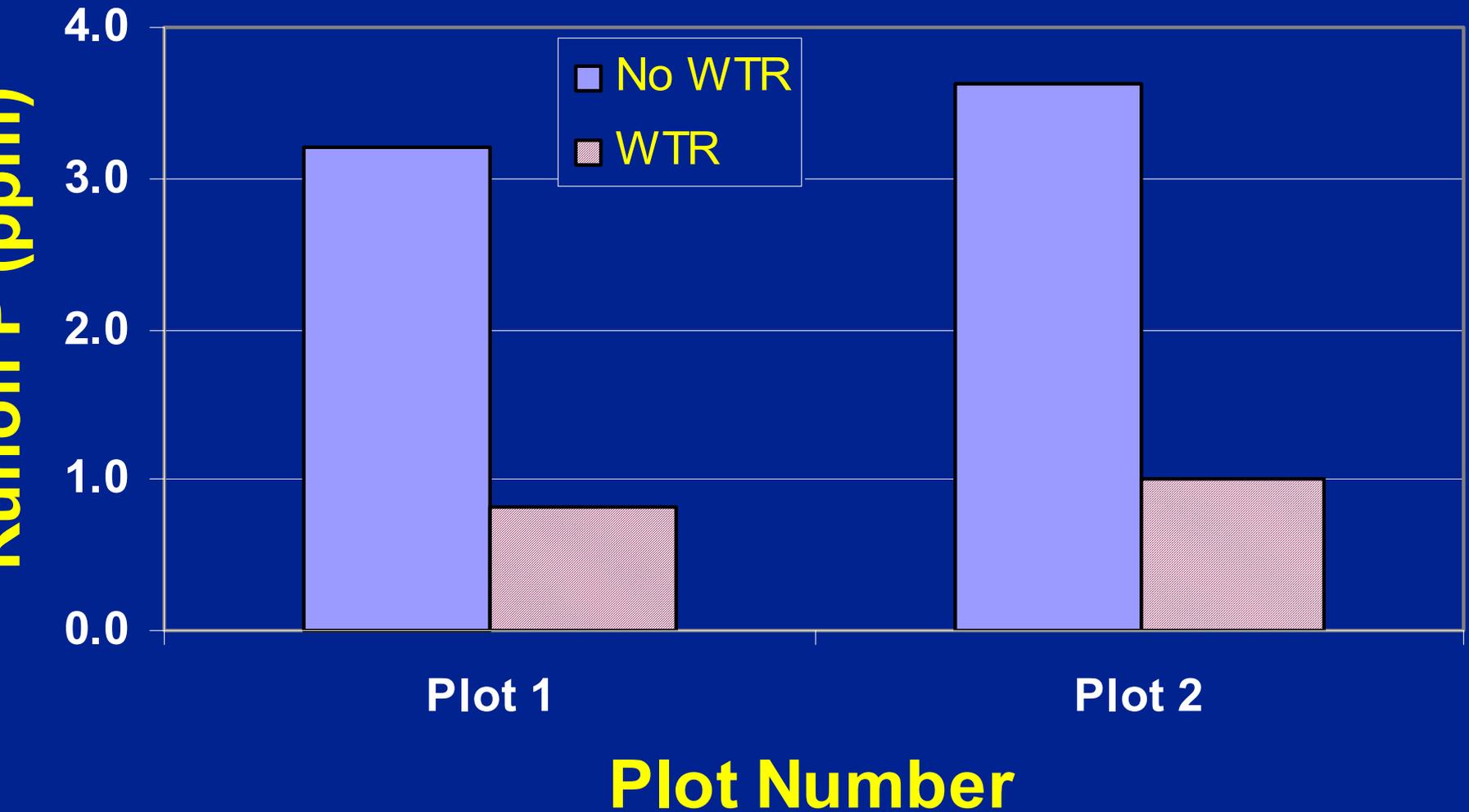
**P Source
Factor**

**Transport
Factor**

**Water Body
Sensitivity**



Effect of WTR on Runoff P



Web Resources for Animal Waste Management in Oklahoma

- <http://www.animalwaste.okstate.edu>
- <http://www.soiltesting.okstate.edu>
- <http://www.agen.okstate.edu/waterquality/>
- <http://www.oda.state.ok.us/water-home.htm>