

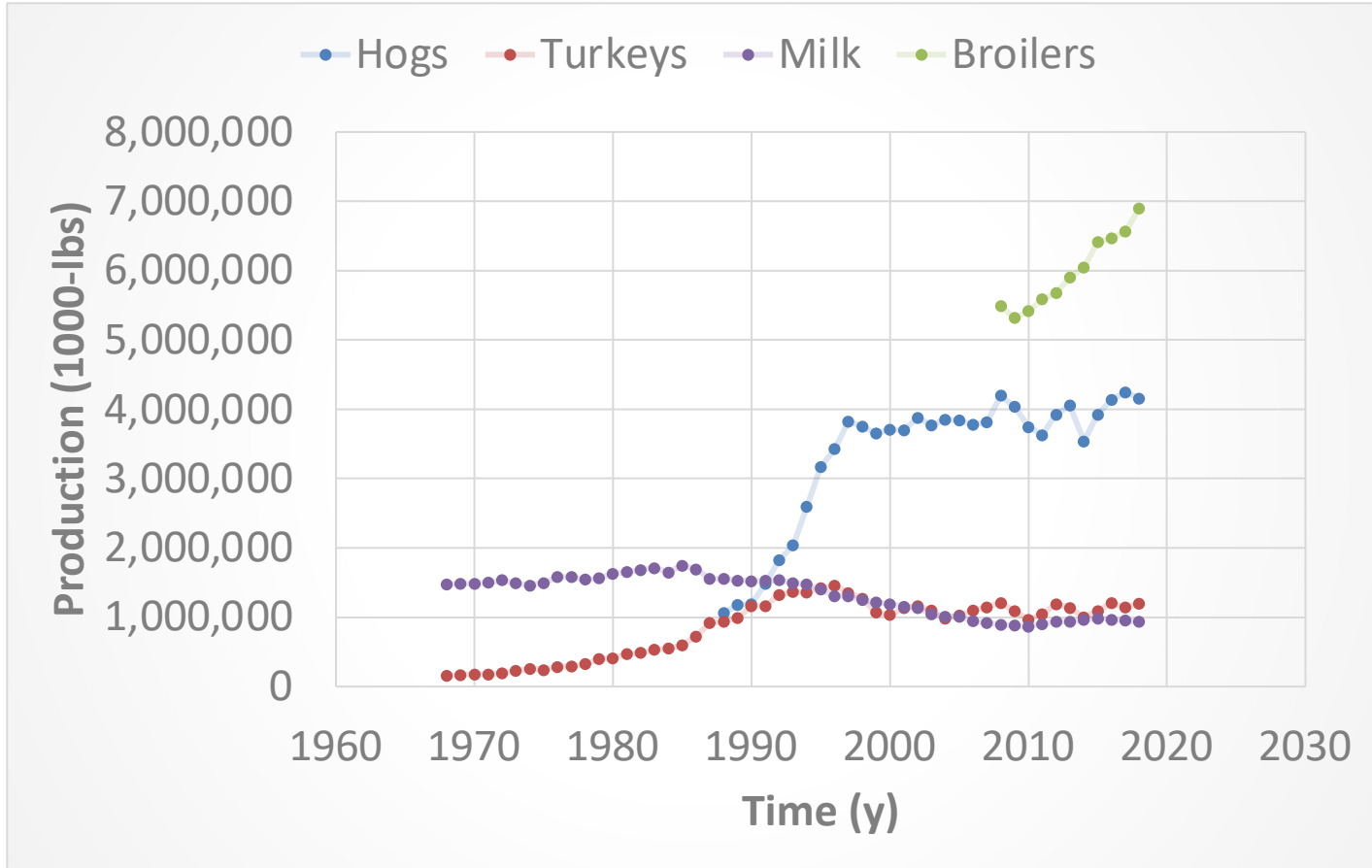
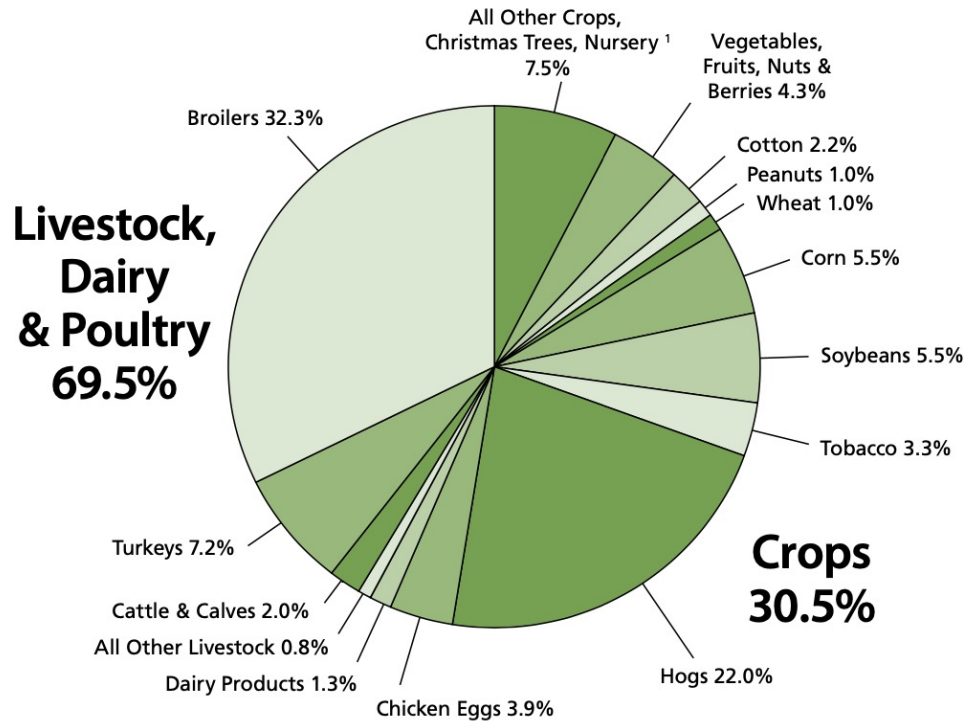
Adding Manure to Your Fertility Program

Steph Kulesza

Nutrient Management and Animal Waste

Animal Ag Trends in North Carolina

SOURCE OF FARM CASH RECEIPTS, NORTH CAROLINA, 2021
\$13,283,473,000



Common Manure Sources and Characteristics

- Poultry Litter
 - Dry
 - Whole house vs cake
 - Broiler vs turkey vs layer
 - Most widely marketed and transported



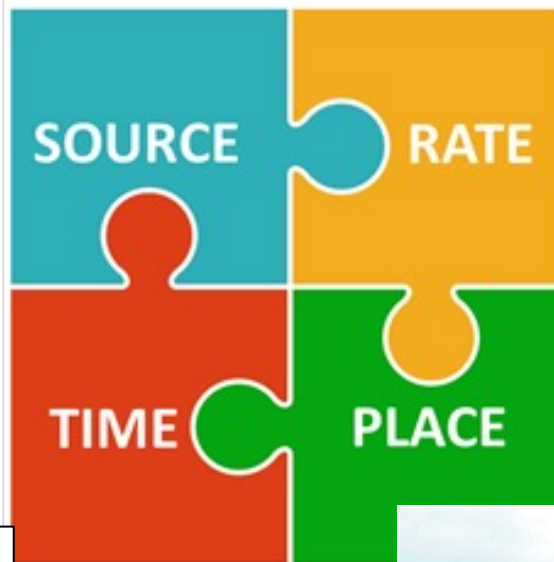
Common Manure Sources and Characteristics

- Dairy Manure
 - Wet
 - Slurry
 - More fiber
 - Typically used on acreage to grow feed
 - Lots of variation on farms



NCDARS Agronomic Division Phone: (919) 733-2655 Website: www.ncagr.gov/agronomi/ Report No. FY21-W000027																																																																																																																	
Predictive Waste Report	Client: Stephanie Kulesza NCSU 101 Derieux Place Raleigh, NC 27695 Rowan County																																																																																																																
Advisor:																																																																																																																	
Sampled: 06/29/2020 Received: 07/01/2020 Completed: 07/03/2020	PALS #: 405145 PALS #:																																																																																																																
Farm: Not Provided																																																																																																																	
Sample Information	Nutrient Measurements are given in units of parts per million (ppm), unless otherwise specified.																																																																																																																
ID: Sa1sb Code: HLB Description: Poultry Broiler House Grower Comments: Not Provided	<table border="1"> <tr> <th>Nitrogen (N)</th> <th>P</th> <th>K</th> <th>Ca</th> <th>Mg</th> <th>S</th> <th>Fe</th> <th>Mn</th> <th>Zn</th> <th>Cu</th> <th>B</th> <th>Mo</th> <th>C</th> <th>Al</th> <th>Na</th> <th>Cl</th> </tr> <tr> <td>Total N: 39900</td> <td>16400</td> <td>38700</td> <td>33400</td> <td>9330</td> <td>14600</td> <td>1750</td> <td>837</td> <td>631</td> <td>437</td> <td>67.1</td> <td>-</td> <td>-</td> <td>1420</td> <td>9390</td> <td>-</td> </tr> <tr> <td>Inorganic:</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>NH4-N</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>NO3-N</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td>SS (10⁻³ Si/cm)</td> <td>EC (mSi/cm)</td> <td>pH (Unitless)</td> <td>BD (lb/yd³)</td> <td>CCE (%)</td> <td>ALE (tons)</td> <td>C:N (Unitless)</td> <td>DM (%)</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>68.9</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>	Nitrogen (N)	P	K	Ca	Mg	S	Fe	Mn	Zn	Cu	B	Mo	C	Al	Na	Cl	Total N: 39900	16400	38700	33400	9330	14600	1750	837	631	437	67.1	-	-	1420	9390	-	Inorganic:																NH4-N																NO3-N																	SS (10 ⁻³ Si/cm)	EC (mSi/cm)	pH (Unitless)	BD (lb/yd ³)	CCE (%)	ALE (tons)	C:N (Unitless)	DM (%)									-	-	-	-	-	-	-	68.9							
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4R Nutrient Stewardship



Management Practices



SUBCHAPTER 02H .0101

15A NCAC 02H .0101 PURPOSE

The rules in this Subchapter shall govern application for and use of, and the siting of, systems that do not discharge to surface waters of the state:

- (1) sewer systems;
- (2) disposal systems;
- (3) treatment works;
- (4) residual and residue disposal/utilization systems;
- (5) animal waste management systems;
- (6) treatment of contaminated soils; and
- (7) stormwater management systems pursuant to 15A NCAC 02H .1000.

History Note: Authority G.S. 143-215.1; 143-215.3(a)(1); Eff. September 1, 2006; Readopted Eff. September 1, 2018.

Yr	Commodity	Unit	1-Sep	31-Mar	Yr
10	Sorghum (Grain)	CWT	15-Mar	31-Aug	0.75
11	Soybeans (Double Cropped)	Bushels	1-Apr	15-Sep	0.8
12	Soybeans (Full Season)	Bushels	1-Apr	15-Sep	0.8
13	Soybeans (Double Cropped - Monocult)	Bushels	1-Apr	15-Sep	0.8

NC STATE EXTENSION

Realistic Yield Expectations for North Carolina Soils

The North Carolina Realistic Yield Database is the product of an extensive data gathering and review process conducted by NC State University, the Natural Resource Conservation Service, the North Carolina Department of Agriculture and Consumer Services, and the North Carolina Division of Soil and Water Conservation.

In 1999, county-by-county above-normal yield data and maize yields for various of in their county. The responses represent then compared with intensively reviewed soil scientists and crops and climatic reviewing the data, made.

1. Realistic Yield is average of the 4 could be achieved top 20% of soil.
2. For soils that are slightly different or absent from the most common.

Certification Training for Operators of Animal Waste Management Systems

Nutrient Management Plan For Animal Waste Utilization 12-09-2016

This plan has been prepared by:

Sycamore Farm
Mary G Farmer
123 Sycamore Farm Lane
Aposton, NC 23456
1234567890

This plan has been developed by:

Eve H. Honeyscott
N.C. Cooperative Extension
Lenoir County Center
1791 Hwy 11253
Kinston, NC 28504
252-527-2191
Developer: *[Signature]*

Type of Plan: Nitrogen Only with Manure Only

Owner/Manager/Producer Agreement

I (we) understand and agree to the specifications and the operation and maintenance procedures established in this nutrient management plan which includes an animal waste utilization plan for the farm named above. I have read and understand the Required Specifications concerning animal waste management that are included with this plan.

Signature (owner) _____ Date _____
Signature (manager or producer) _____ Date _____

This plan meets the minimum standards and specifications of the U.S. Department of Agriculture - Natural Resources Conservation Service or the standard of practices adopted by the Soil and Water Conservation Commission.

Plan Approved By: *[Signature]* 12-9-16
Technical Specialist Signature Date



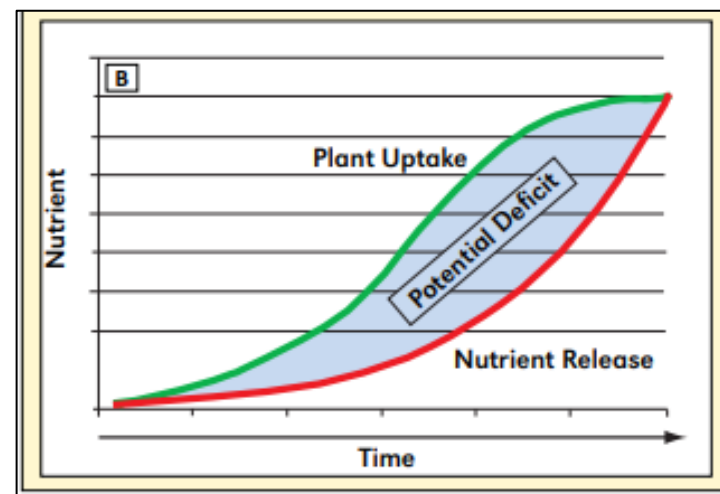
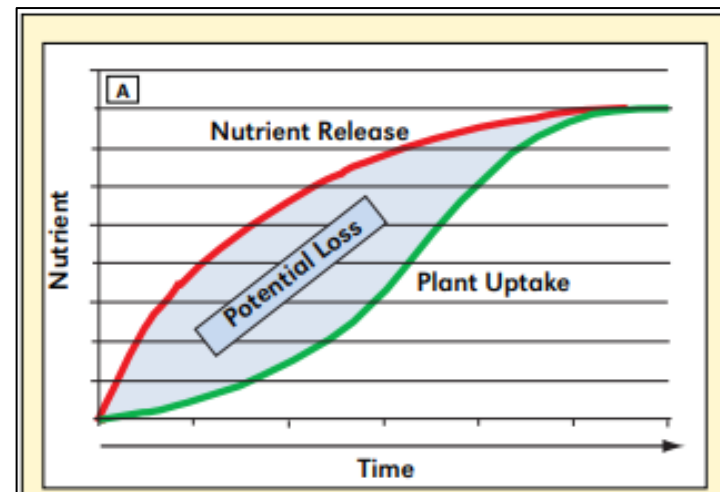
What affects nutrient content?

- Species
 - Feed
 - Manure production
 - Manure handling
- Management
 - Caked versus whole house
 - Windrowing
 - Bedding material
 - Frequency of cleanouts

Manure Type	Nutrient	Minimum	Maximum	Median
<i>Broiler house litter (lb/ton)</i>	Nitrogen	2.0	106	52
	Phosphate (P ₂ O ₅)	2.5	127	44
	Potash (K ₂ O)	0.6	114	57
<i>Turkey house litter (lb/ton)</i>	Nitrogen	1.9	105	39
	Phosphate (P ₂ O ₅)	0.3	108	50
	Potash (K ₂ O)	0.1	93	35
<i>Swine lagoon effluent (lb/1,000 gal)</i>	Nitrogen	0.0	11.0	2.6
	Phosphate (P ₂ O ₅)	0.001	276	0.7
	Potash (K ₂ O)	0.004	117	5.5
<i>Dairy liquid slurry (lb/1,000 gal)</i>	Nitrogen	0.2	116	16.7
	Phosphate (P ₂ O ₅)	0.1	154	9.1
	Potash (K ₂ O)	0.1	204	15.4

How much N is available?

- Unfortunately, it depends
 - Temperatures
 - Application method
 - Rainfall
 - Soil type
 - Timing of application
- Estimate
 - 50% if surface applied
 - 60% if incorporated



(Mikkelsen and Hartz. *Better Crops*, 92:16-19, 2008)

What is it worth?

Nutrient	Broiler Litter	Turkey Litter	Swine Sludge	Dairy Manure
	lb/ton	lb/ton	lb/1000 gal	lb/1000 gal
Available Nitrogen	26	19.5	10.25	6.7
Phosphorus (P ₂ O ₅)	44	50	32	9.1
Potassium (K ₂ O)	57	35	7.5	15.4
Sulfur	12.8	6.2	4.0	0.85
Manganese	0.81	0.92	0.26	0.06
Zinc	0.74	0.88	1.34	0.07
Copper	0.56	0.63	0.33	0.02

What is it worth?

Nutrient	Broiler Litter	Turkey Litter	Swine Sludge	Dairy Manure	Price
	lb/ton	lb/ton	lb/1000 gal	lb/1000 gal	\$/lb
Available Nitrogen	26	19.5	10.25	6.7	0.84
Phosphorus (P₂O₅)	44	50	32	9.1	0.50
Potassium (K ₂ O)	57	35	7.5	15.4	0.48
Sulfur	12.8	6.2	4.0	0.85	0.28
Manganese	0.81	0.92	0.26	0.06	1.40
Zinc	0.74	0.88	1.34	0.07	1.68
Copper	0.56	0.63	0.33	0.02	7.12
Total Value (\$/ton or 1000 gal):	49.10	33.10	12.17	12.99	

Rules around Manure Use

- Must be applied at agronomic rates
 - Current soil test report
 - Current waste analysis
 - To an actively growing crop, within 30 days of breaking dormancy, or within 30 days of planting
- Must be covered if stockpiled for more than 15 days
- Setbacks
 - 100' from well
 - 25' vegetative buffer from water body
- No application during precipitation or to flooded, saturated, or snow covered ground

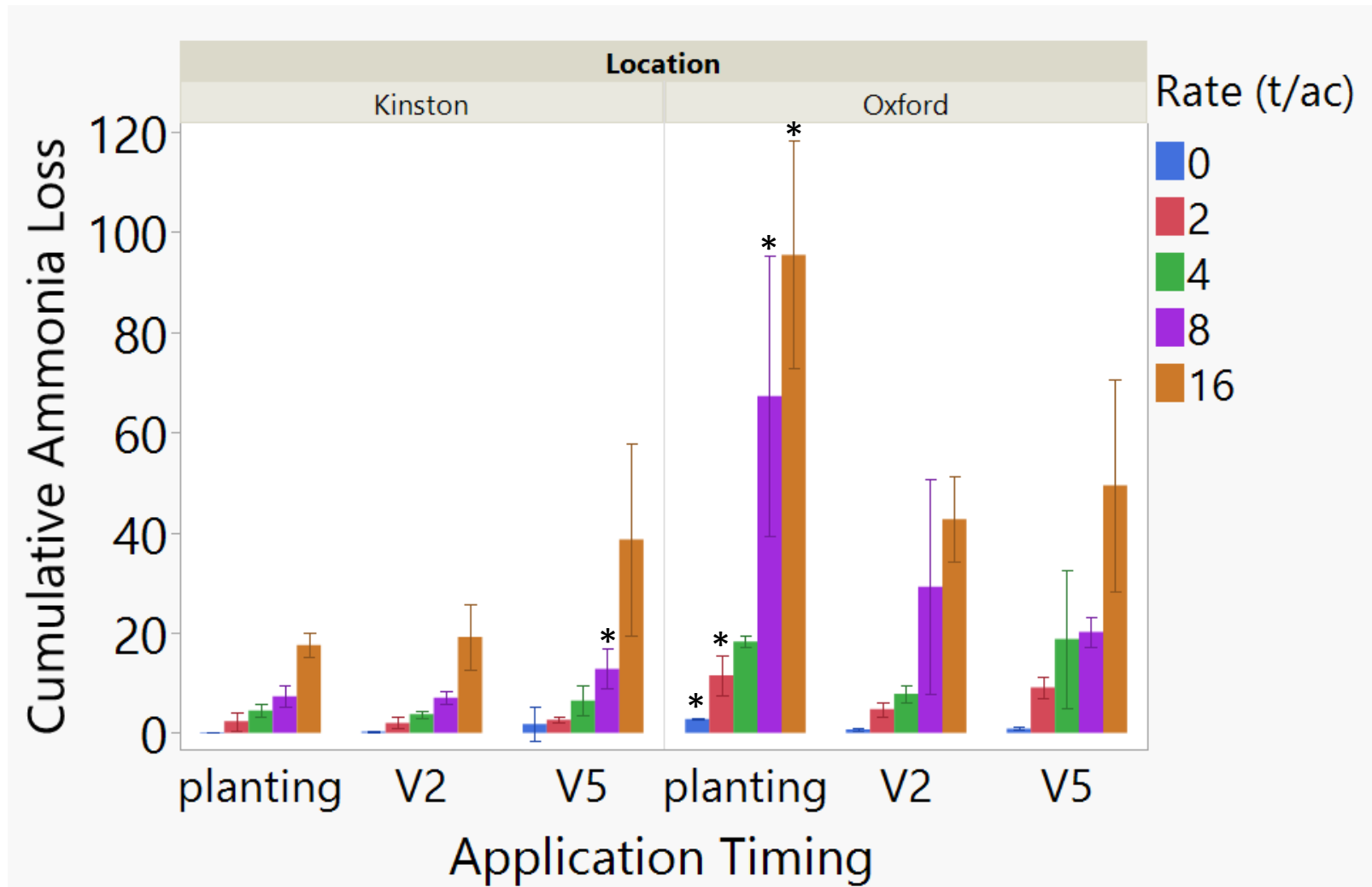
Other things to consider

- Current soil test report
 - Anything of concern?
- Cropping systems
 - Growing peanuts, cotton, sweet potato?
- Manure analysis
 - Anything of concern?
- Hauler/spreader schedules
 - Can someone spread when you need it?
 - Who is the manure hauler?

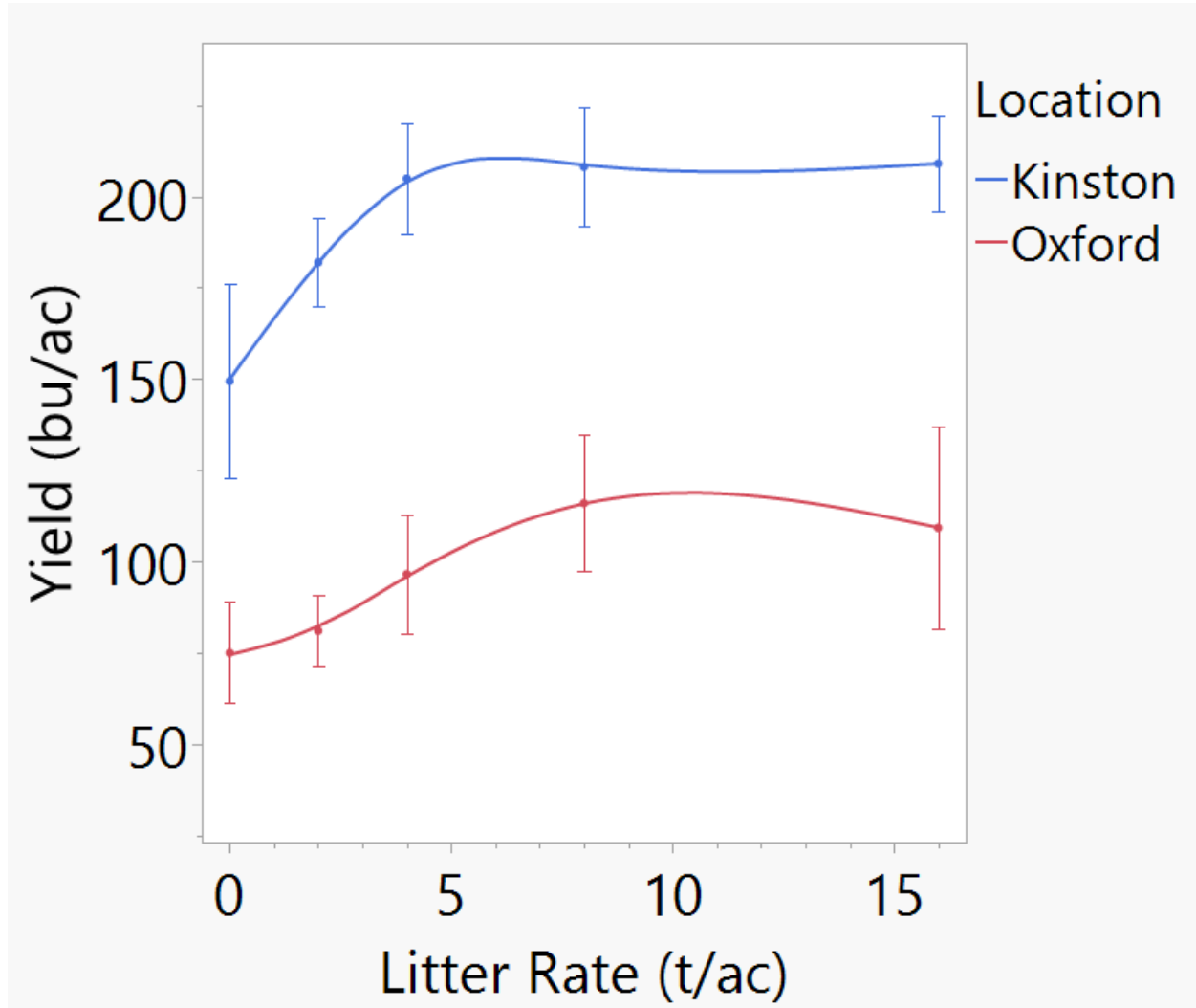
Topdressing Poultry Litter on Corn and Wheat

- Why?
 - Wet weather
 - Hauler schedule
 - Manure availability

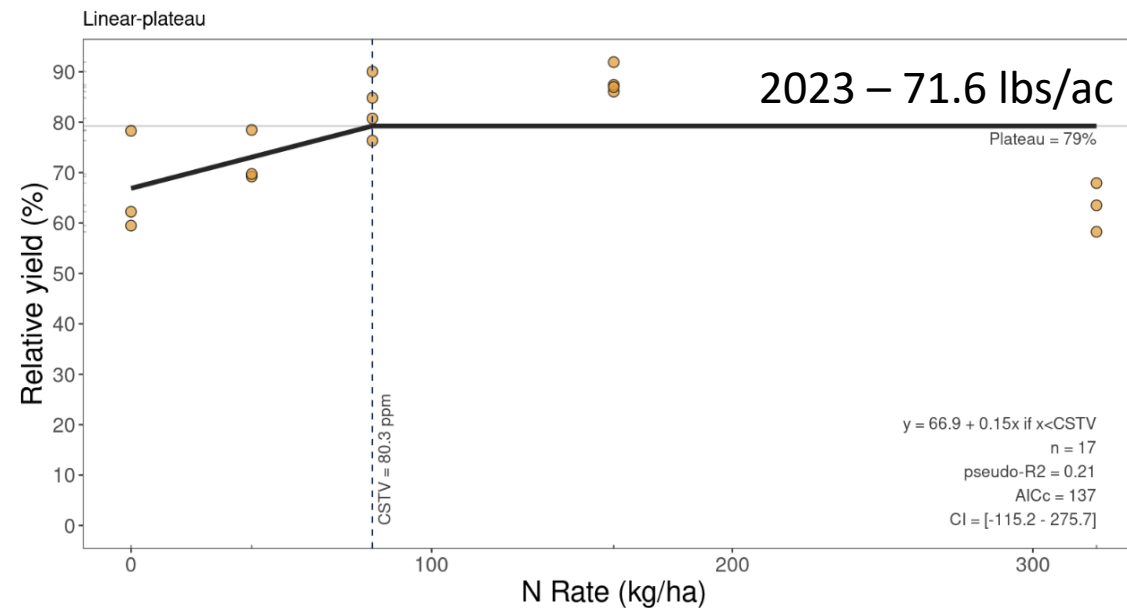
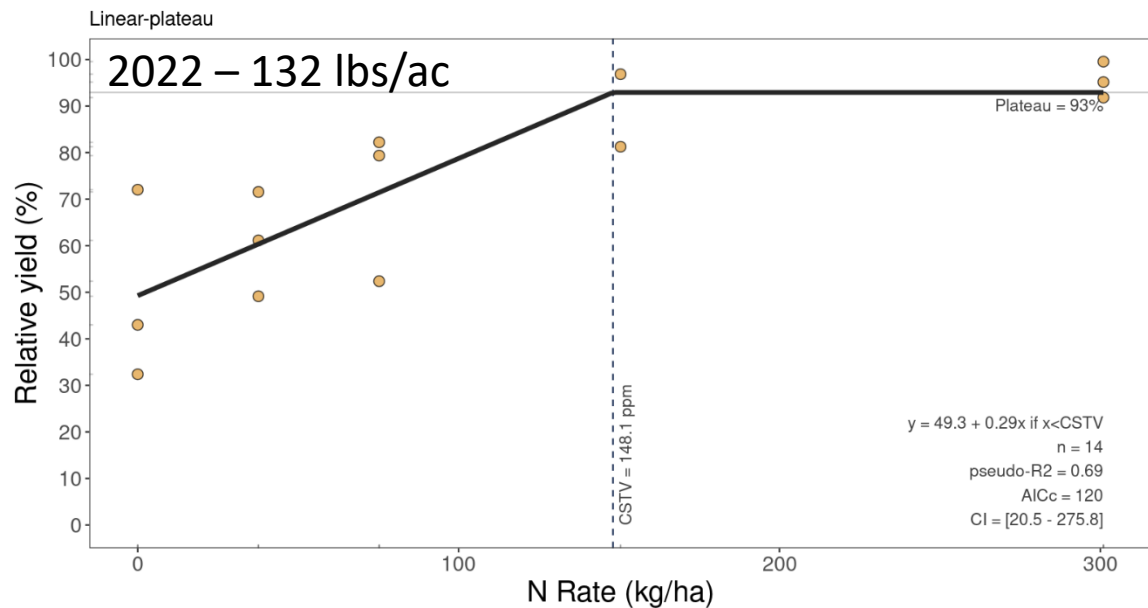
Initial Data – Ammonia Loss in Corn



Initial Data - Yield



Topdressing Poultry Litter on Wheat - Yield



Yields Plateaued around 2-4 tons/ac topdress

Comments? Suggestions?

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