



Replacing commercial sidedress nitrogen with liquid livestock manure on emerged corn using a modified manure tanker



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4 R's

- Right nutrient
- Right place
- Right time
- Right amount

This applies to manure nutrients as well!



Field day surveys of manure application timing in western Ohio

• January - March	3%
• April – June	19%
• July – September	29%
• October – December	49%

Over a billion gallons of swine manure and 2.5 billion gallons of dairy manure/wastewater annually

Manure application windows dictated by growing crops
Wheat acreage continues to decline
Fall application season starts when silage harvest begins

We need to make more days available for manure application and apply more manure to growing crops

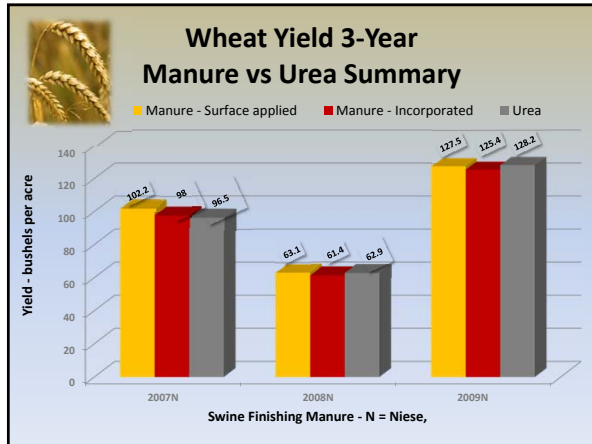


Manure Nutrient Analysis
(lbs/1000 gallons)

Nutrient	Swine Finisher	Dairy Pond
Manure TN	43	18
Manure NH ³	37	8
Manure ON	6	10
Manure Avail N	40	12
Manure P ² O ⁵	16	15
Manure K ² O	22	31
Calcium	7.3	5.9
Magnesium	2.7	0.03
Sodium	4.4	0.01
Sulfur	3.4	0.01
Boron	0.03	0.001
Iron	0.8	0.91
Manganese	0.06	0.04
Calcium	5.5	5.9

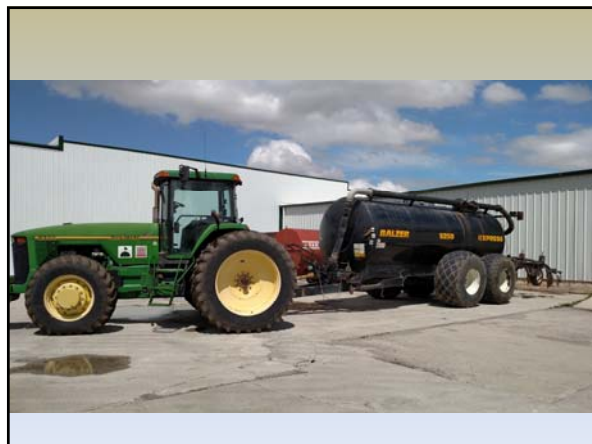
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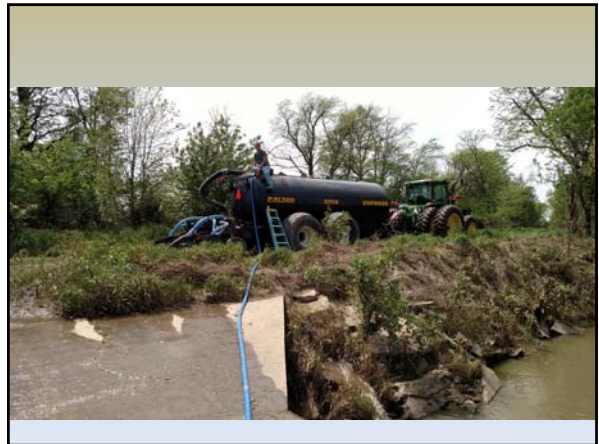
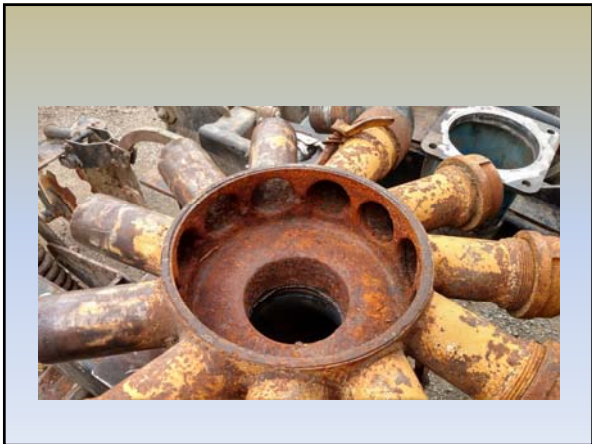


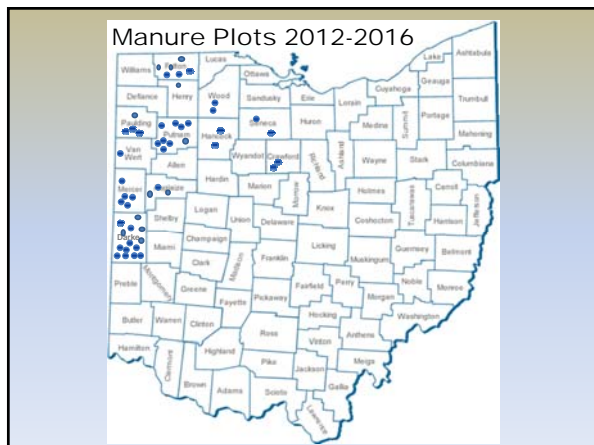
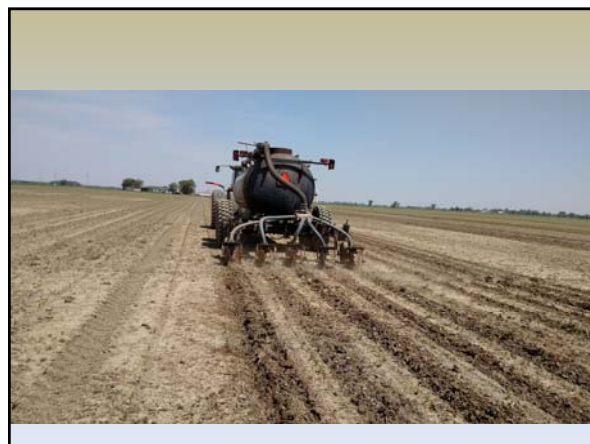
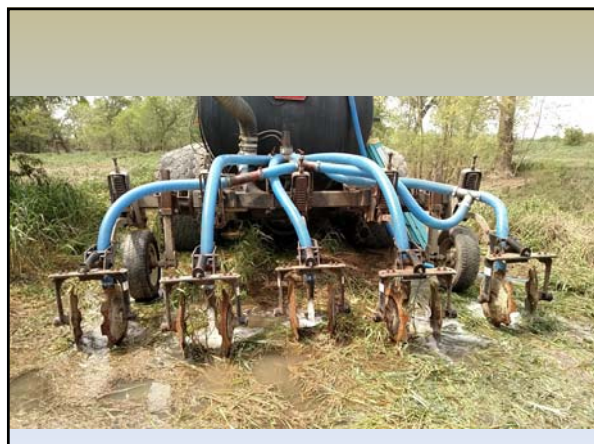


2012-2016 OARDC Manure Sidedress Yields; bushels per acre

TREATMENT	2012	2013	2014	2015	2016	5-Year Average
PRE-EMERGENT TREATMENTS						
Incorporated 28% UAN	111.5	184.6	145.1	130.8	140.9	142.6
Incorporated swine manure	128.6	191.8	146.5	161.9	162.0	158.2
Surface-applied swine manure	109.5	175.7	137.2	110.3	125.5	131.6
Incorporated dairy manure +28% UAN	132.0	185.4	166.1	146.3	163.7	158.7
Surface-applied dairy manure +28%UAN	97.0	166.0	141.9	106.4	122.1	126.7
POST-EMERGENT TREATMENTS						
Incorporated 28% UAN	116.0	181.9	140.9	140.1	145.1	144.8
Incorporated swine manure	138.4	196.7	139.9	158.5	183.7	163.4
Surface-applied swine manure	116.4	188.0	115.6	114.6	153.1	137.5
Incorporated dairy manure +28%UAN	138.8	192.0	156.9	167.5	167.7	164.6
Surface-applied dairy manure +28%UAN	101.6	181.5	125.3	111.6	156.1	135.2
Zero nitrogen check	62.6	82.0	67.0	40.2	48.7	60.1







2016 Swine manure side-dress plots

Cooperator	Manure	28%UAN
Campbell	151.4	147.6
Leffel	146.6	143.1
Nofziger	203.8	215.8
Heitbrink	147.1	146.9
Knapke	183.8	183.2

2016 Liquid Beef Manure Sidedress Plot Yields (bu/acre)

Farmer	Manure	Commercial Fertilizer
Nofziger	214.0	215.8
Sinn	136.7	147.2 (AA)
Rufenacht	191.5	194.7
Hoffman	220.4	218.5

Manure applied with tanker and Dietrich toolbar. Each site had four replications. Commercial fertilizer source was 28%UAN.

2016 Liquid Dairy Manure Sidedress Plot Yields (bu/acre)

Farmer	Manure	Commercial Fertilizer
Meyerhoffer	146.7	148.0
Schmitmeyer	221.5	224.4
Sinn	146.4	152.0 (AA)

Manure applied with tanker and Dietrich toolbar. Each site had four replications. Commercial fertilizer source was 28%UAN.

Adding 28% UAN to Manure



Nutrient balance of manure sidedress

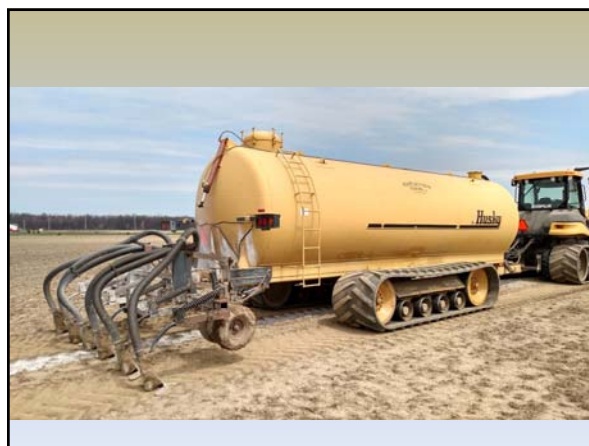
Crop		P2O5	K2O
Corn	200 bu		
	(.37) (.27)	74 lbs	54 lbs
Soybeans	60 bu		
	(.80) (1.4)	48 lbs	84 lbs
Removal		122 lbs	138 lbs
6,500 gal manure		117 lbs	143 lbs
Net nutrient gain		-5 lbs	+6 lbs

Almost perfect N, P & K balance for a corn-soybean rotation



Why sidedress with a manure tanker?

- Smaller fields (& organic fields)
- More forgiving soils (compaction not an issue)
- Corn can be taller
- Efficiency improved if manure delivered to edge of field
- Application rate limited by volume of tanker
- Sloping fields can be a problem





Ohio State University Extension

Nutrient Stewardship YouTube site:

- <https://www.youtube.com/channel/UC7jUsQNGM8fCHjbZUdT9pKw>
- Facebook: Ohio State Extension Environmental and Manure Management
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