

Value of Manure as a Fertilizer



Ray Massey
Economist

When 4 quarters \neq \$1



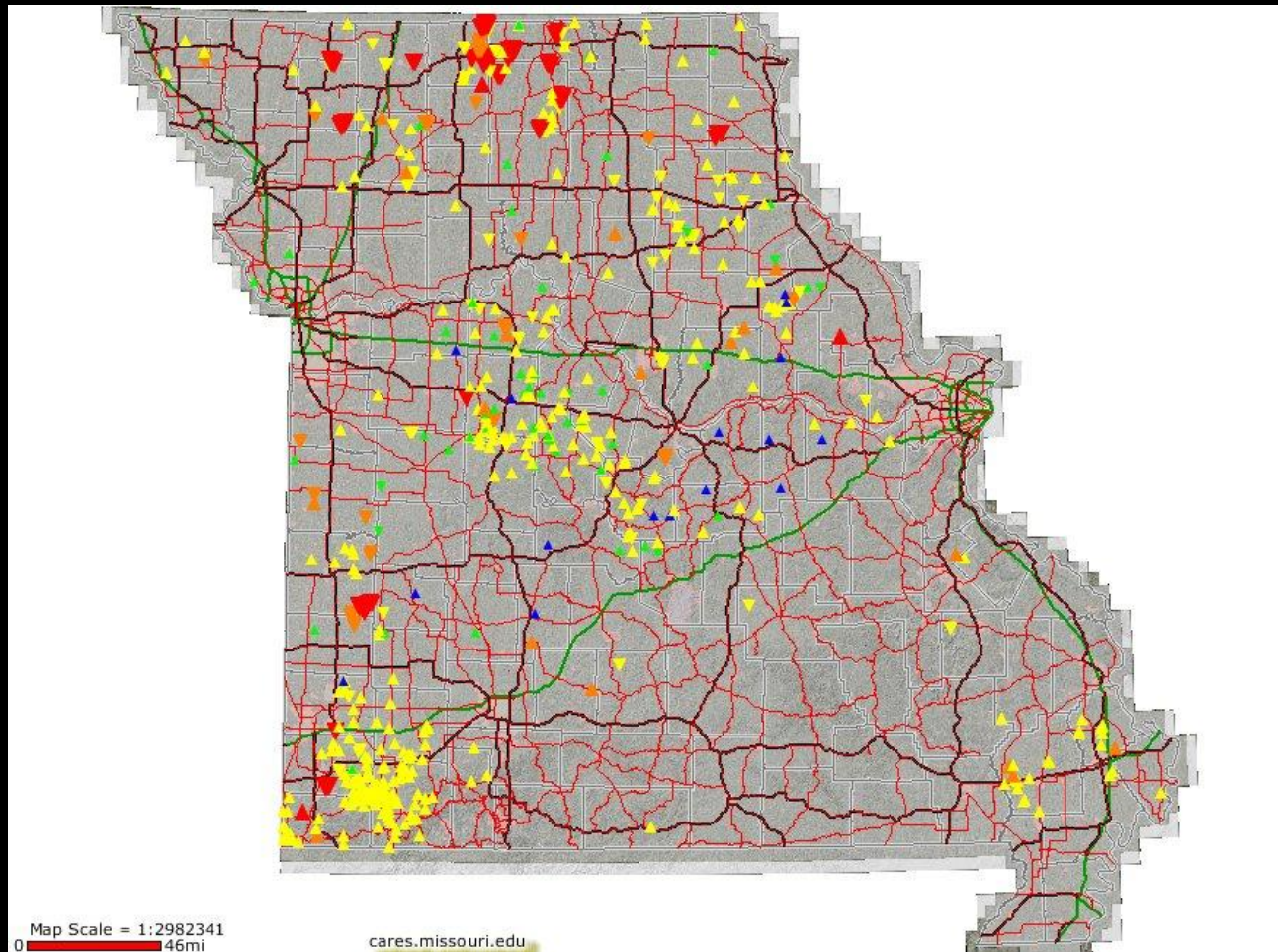
**Value of Manure is NOT the sum
of its individual nutrient values**

Not all nutrients are created equal



- N, P and K from manure does not have the same value as N, P and K from commercial fertilizer

Supply and Demand Still Rules



Manure Value

- Determinants:
 - Supply of manure supplied benefits
 - Demand for manure supplied benefits
- Characteristics that affect yield are valued.

Manure Characteristics that Affect Yield

- Manure Nutrient Content
- Individual crop needs
- Cropping System
- Soil Fertility and Productivity
- Nutrient Limit Rule
- Application Method (Nutrient Availability)

Form Affects Value



Not all Carbon is Equally Priced

Not all NaCl is equally priced



– Table salt: 2.1¢ per ounce

• Popcorn Salt: 2.6¢ per ounce



– Canning Salt: 5.6¢ per ounce

Not all N is Equally Priced

Nitrogen Source	Price (\$/lb N)
Ammonium Nitrate	\$.56
Anhydrous Ammonia	\$.37
Urea	\$.50

Manure Value (\$/1000 gallons)

Nutrient	Pounds per 1000 gallons	Dollars per pound	Dollars per 1000 gallons
Available Nitrogen	40	\$0.50	\$20.00
P₂O₅	42	\$0.59	\$24.78
K₂O	30	\$0.40	\$12.00
Total Value (\$/1000 gallons)			\$56.78

Farmers Fertilizer Acres!

Nutrient	Pounds per 1000 gallons	Dollars per pound	Dollars per 1000 gallons
Available Nitrogen	40	\$0.50	\$20.00
P₂O₅	42	\$0.59	\$24.78
K₂O	30	\$0.40	\$12.00
Total Value			\$56.78
Application Rate (1000 gallons/acre)			4
Value per acre			\$227.12

Nutrient Concentration impact on Manure Value

- The *limiting nutrient* is completely valued.
- Any excess nutrients are partially valued.

Corn: N Limit, Surface Applied

Nutrient	Applied	Needed	Cost	Value/acre
	----- Pounds -----		\$/lb.	
Available Nitrogen	144	144	\$0.50	\$72.00
P ₂ O ₅	214	58	\$0.59	\$34.22
K ₂ O	153	43	\$0.40	\$17.20
Total Value				\$123.42
Application Rate (1000 gallons/acre)				5.1
Value per 1000 gallons				\$24.20
Value per 500,000 gallons				\$12,100
Acres Fertilized				98

Corn: N Limit, Injected

Nutrient	Applied	Needed	Cost	Value/acre
	----- Pounds -----		\$/lb.	
Available Nitrogen	144	144	\$0.50	\$72.00
P ₂ O ₅	151	58	\$0.59	\$34.22
K ₂ O	108	43	\$0.40	\$17.20
Total Value				\$123.42
Application Rate (1000 gallons/acre)				3.6
Value per 1000 gallons				\$34.28
Value per 500,000 gallons				\$17,142
Acres Fertilized				139

Corn: P Limit, Injected

Nutrient	Applied	Needed	Cost \$/lb.	Value/acre
	----- Pounds -----			
Available Nitrogen	56	144	\$0.50	\$28.00
P ₂ O ₅	58	58	\$0.59	\$34.22
K ₂ O	42	43	\$0.40	\$16.80
Total Value				\$79.02
Application Rate (1000 gallons/acre)				1.4
Value per 1000 gallons				\$56.44
Value per 500,000 gallons				\$28,221
Acres Fertilized				357

Corn-Soybean: N Limit, Injected

Nutrient	Applied	Needed	Cost	Value/acre
	----- Pounds -----		\$/lb.	
Available Nitrogen	145	145	\$0.50	\$72.50
P ₂ O ₅	155	102	\$0.59	\$60.18
K ₂ O	111	111	\$0.40	\$44.40
Total Value				\$177.08
Application Rate (1000 gallons/acre)				3.7
Value per 1000 gallons				\$47.86
Value per 500,000 gallons				\$23,930
Acres Fertilized				135

Applied to corn

Impact of Nutrient Limit, Crop and Application Method

Crop	Limit	Application Method	\$/acre	Acres	Total Value
Corn	N	Surface	\$123.42	98	\$12,100
Corn	N	Inject	\$123.42	139	\$17,142
Corn	P	Inject	\$79.02	357	\$28,221
Corn-SB	N	Inject	\$177.08	135	\$23,930

Take Home Message

- Manure Value is affected by
 - Nutrient Content
 - Cropping System
 - Nutrient Limit
 - Application Method
- Manure Price is determined by
SUPPLY AND DEMAND

Manure Value Spreadsheet

[agebb.missouri.edu/commag/crops/
massey/downloads/index.htm](http://agebb.missouri.edu/commag/crops/massey/downloads/index.htm)

Value of Manure as a Fertilizer



Ray Massey
Economist