

MANURE information

ESTIMATED AVAILABLE NUTRIENT CONTENT *

1st Year [2nd Year]

Manure units:

Solid (lb/ton); Liquid (lb/1000 gal)

	time to incorporation	N				
		> 3 days	1 hr-3 days	< 1 hr	P ₂ O ₅	K ₂ O
Dairy	Solid, >20% DM	2 [1]	3 [1]	3 [1]	3	6
	Solid, 11-20% DM	2 [1]	2 [1]	3 [1]	3	5
	Liquid, 4-11% DM	7 [2]	10 [2]	12 [2]	6	17
	Liquid, <4% DM	4 [1]	6 [1]	7 [1]	3	11
Beef	Solid	3 [1]	4 [1]	5 [1]	6	10
	Liquid	5 [2]	6 [2]	8 [2]	6	12
Swine	Solid	7 [2]	9 [2]	12 [2]	10	8
	Liquid, finish, indoor pit	17 [4]	22 [4]	28 [4]	14	22
	Liquid, finish, outdoor pit	7 [2]	9 [2]	12 [2]	6	8
Poultry	Liquid, farrow-nursery, indoor pit	8 [2]	10 [2]	14 [2]	6	10
	Solid, chicken	24 [5]	27 [5]	29 [5]	35	26
Horse	Solid, turkey	26 [5]	28 [5]	31 [5]	35	25
	Liquid	6 [1]	7 [1]	7 [1]	6	7
Horse	Solid	2 [1]	3 [1]	4 [1]	5	6

* Because manure nutrient content can vary greatly, manure analysis is encouraged.

MANURE OUTPUT

(volume as excreted)

Animal & weight	lb/day	ton/year	gal/day	1000 gal/year
Dairy 1400 lb	148	27	17.7	6.5
Beef 1100 lb	80	15	9.5	3.5
Swine 150 lb	9.5	1.7	1.2	0.44
Chicken (broiler) 2 lb	0.18	0.033	0.02	0.007
Horse 1000 lb	50	9.1	6.0	2.2

HOW TO DETERMINE MANURE APPLICATION RATE

Step 1: Figure load size:

Weigh spreader in tons for solid or semi-solid manure
Use 90% tank capacity in gallons for liquid manure

Step 2: Determine field acreage:

$$\frac{\text{field length (ft)} \times \text{field width (ft)}}{43,560 \text{ ft}^2/\text{a}} = \text{acres}$$

Step 3: Calculate manure application rate:

$$\frac{[(\# \text{ of loads}) \times (\text{load size})]}{\text{field acreage}} = \text{tons or gallons / acre}$$

Nutrient Management Fast Facts is a summary of University of Wisconsin recommendations. For more information, see the UWEX publication A2809 Nutrient Application Guidelines for Field, Vegetable and Fruit Crops in Wisconsin.

Indicates information pertains to Wisconsin only.

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FERTILIZER ANALYSIS & CONVERSIONS

	N	P ₂ O ₅	K ₂ O	other
Nitrogen				
Ammonium nitrate	34	0	0	
Ammonium sulfate (AMS)	21	0	0	24(S)
Ammonium thiosulfate (ATS)	12	0	0	26(S)
Anhydrous ammonia	82	0	0	
Aqueous ammonia	20	0	0	
Calcium nitrate (CN)	15	0	0	17(Ca)
Urea	46	0	0	
28% Urea ammonium nitrate (UAN)	28	0	0	
32% UAN	32	0	0	
Phosphorus				
Ammonium polyphosphate (dry)	15	62	0	
Ammonium polyphosphate (liquid)	10	34	0	
Diammonium phosphate (DAP)	18	46	0	
Monoammonium phosphate (MAP)	11	52	0	
Triple superphosphate (TSP)	0	46	0	
Potassium				
Potassium chloride (muriate of potash)	0	0	60-62	
Potassium-magnesium sulfate	0	0	22	22(S), 11(Mg)
Potassium nitrate	13	0	44	
Potassium sulfate	0	0	50	18(S)

Liquid weights: 1 gallon water weighs 8.3 lbs
 1 gallon UAN (28%) weighs 10.6 lbs
 1 gallon 10-34-0 weighs 11.6 lbs
 1 gallon 9-18-9 weighs 11.1 lbs

To get column 3, multiply column 1 by column 2

acre (a)	43,560	square feet (ft ²)
acre (a)	0.405	hectare (ha)
square mile (mi ²)	640	acres (a)
cubic yard (yd ³)	27	cubic feet (ft ³)
cubic feet (ft ³)	7.48	gallons (gal)
bushel (bu)	1.244	cubic feet (ft ³)
bushel (bu)	8	gallons - dry
bushel (bu)	9.31	gallons - liquid
ounces (oz)	29.6	milliliters (ml)
gallon (gal)	3.78	liters (l)
gallon (gal)	128	fluid ounces (fl oz)
gallon (gal)	4	quart (qt)
acre-foot	43,560	cubic feet (ft ³)
acre-foot	325,851	gallons (gal)
chain (ch)	66	feet (ft)
chain (ch)	4	rods (r)
rods (r)	16.5	feet (ft)
mile (mi)	5,280	feet (ft)
ton (t)	2,000	pounds (lb)
gallons/acre (gal/a)	9.354	liters/hectare (l/ha)
miles/hour (mph)	88	feet/minute (ft/min)
pounds/acre (lb/a)	1.12	kilograms/hectare (kg/ha)
P ₂ O ₅ (lb)	0.44	P (lb)
K ₂ O (lb)	0.83	K (lb)
ppm-plow layer (6 in)	2	lb/acre (lb/a)
ppm-top soil (12 in)	4	lb/acre (lb/a)

To get column 1, divide column 3 by column 2

PLANTING & HARVEST INFORMATION

DETERMINING PLANT POPULATIONS

Row Width	20"	28"	30"	32"	36"	38"	40"
Row Length*	26'1"	18'8"	17'5"	16'4"	14'6"	13'9"	13'1"

* required to equal 1/1000 acre
Calculation: (# of plants in row length) x 1000 = plants/acre

NUTRIENTS REMOVED BY CROP AT HARVEST

	P ₂ O ₅	K ₂ O
	lb per yield unit	
Alfalfa* / Red clover, per ton (dry matter)	13	60
Barley , Grain, per bu (1 bu = 48 lb @ 14.5% moisture)	0.40	0.35
Straw, per ton (dry matter)	10	32
Corn , Grain per bu (1 bu = 56 lb @ 15.5% moisture)	0.38	0.29
Silage, per ton (65% moisture)	3.6	8.3
Sweet, per ton (fresh)	3.3	6.0
Stover, per ton (dry matter)	4.6	32
Small grain silage , per ton (dry matter)	11	44
Oats , Grain, per bu/a (1 bu = 32 lb @ 14% moisture)	0.29	0.19
Straw, per ton (dry matter)	9.4	47
Potatoes , per cwt (fresh)	0.12	0.50
Rye , Grain, per bu/a (1 bu = 56 lb @ 14% moisture)	0.41	0.31
Straw, per ton (dry matter)	3.7	21
Sorghum , Grain, per bu (1bu = 56 lb @ 14% moisture)	0.40	0.40
Sorghum-sudan , Forage, per ton (65% moisture)	15	60
Soybean ,* Grain, per bu (1 bu = 60 lb @ 13% moisture)	0.80	1.4
Straw, per ton (dry matter)	5.4	19
Wheat , Grain, per bu (1 bu = 60 lb @ 13.5% moisture)	0.50	0.35
Straw, per ton (dry matter)	6.0	28

*Nitrogen removal by alfalfa is 60 lb N/ton and by soybeans is 4 lb N/bu.

CONVERTING lbs HARVESTED TO bu with % moisture content corrections

Shelled Corn														
[lbs harvested x (1 - % moisture in corn)] ÷ 47.32 = bu @ 15.5% moisture														
Ear Corn lbs harvested ÷ number from chart below = bu @ 15.5% moisture														
moisture %	15	15.5	16	17	18	19	20	21	22	23	24	25	26	27
equation #	68.1	68.2	69.2	70.4	71.6	72.8	74.1	75.4	76.6	78.0	79.4	80.7	82	83.4
Soybean lbs harvested x (1 - % foreign matter) = adjusted lbs [adjusted lbs x (1 - % moisture)] / 52.2 = bu @ 13% moisture														
Wheat lbs harvested x (1 - % foreign matter) = adjusted lbs [adjusted lbs x (1 - % moisture)] / 51.9 = bu @ 13.5% moisture														

CALCULATING ACRES HARVESTED

$$\text{acres harvested} = \frac{[\text{row length (ft)} \times \text{row width (ft)} \times \# \text{ of rows harvested}]}{43,560 \text{ ft}^2/\text{acre}}$$

Example with shelled corn harvested by combine:

- Step 1:** 12,580 lbs corn harvested @ 21.35% moisture
 12,580 lbs x (1 - .2135) ÷ 47.32 = 209 bu of corn @ 15.5% moisture
- Step 2:** Four-row harvester: 16 rows, each 30 inch (2.5 ft) row is 1210 feet long
 (1210 ft x 2.5 ft x 16 rows) ÷ 43,560 ft²/acre = 1.10 acres
- Step 3:** 209 bu of corn ÷ 1.10 acres = 190 bu/acre

SOIL pH liming recommendations

- Lime should be applied and incorporated at least 6 to 12 months prior to planting an acid sensitive crop such as alfalfa.
- Lime recommendations are made using the target pH for the most acid sensitive crop in a 4-year rotation.
- Application rates for lime should never exceed 12 ton/acre (8 ton/acre for potato). The minimum application rate is 1 ton/acre on sandy soils with <1% OM; all other soils 2 ton/acre.
- No additional lime should be applied until the most recent application has had 2-3 years to equilibrate with the soil.

Crop	Target pH
Alfalfa	6.8
Red Clover, Soybean	6.3
Pastures, Corn (silage or grain), Wheat	6.0