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Useful Nutrient Management Planning Data

Nutrient management plans should be based on accurate information. Ideally, manure generation and content should be determined on individual farms. Nutrients removed by harvesting crops also vary from farm to farm. The data provided here suggests general guidelines based on current research and can be used in preliminary planning.

Table 1. Weights of crops (per bushel).

Crop	lb/bu	Crop	lb/bu
Corn	56	Rye	56
Sorghum	56	Sudangrass	40
Soybeans	60	Potatoes	60
Wheat	60	Sweet potatoes	55
Barley	48	Sunflowers	25
Oats	32		

Length Conversion Factors

1 inch = 2.54 centimeters
1 yard = 0.915 meters
1 mile = 5,280 feet = 1,610.7 meters = 1.61 kilometers
1 meter = 100 centimeters = 1,000 millimeters = 0.001 kilometers
1 chain = 66 feet = 100 links = 20.1 meters = 4 rods

Weight Conversion Factors

1 pound = 454 grams = 0.454 kilograms = 16 ounces
1 ton (short) = 2,000 pounds
1 ton (long) = 2,240 pounds

Speed Conversions

1 mile per hour = 1.467 feet per second
= 88 feet per minute
= 26.8 meters per hour

Other Conversions

1 pound per acre = 1.12 kilograms per hectare
1 pound per gallon = 0.119 kilograms per liter
parts per million (ppm)
= micrograms per gram
= milligrams per liter
1 gallon per acre = 9.35 liters per hectare

Table 2. Common fertilizer analysis.

Fertilizer	Analysis	Chemical Formula
N		
Anhydrous ammonia	82-0-0	NH_3
Ammonium nitrate	34-0-0	NH_4NO_3
Urea	46-0-0	$(NH_2)_2CO$
UAN solution (urea ammonium nitrate)	28 to 32-0-0	$NH_4NO_3 + (NH_2)_2CO$ in water
Aqua ammonia	20-0-0	NH_3 in water
Ammonium sulfate	21-0-0-24(S)	$(NH_4)_2SO_4$
P		
Triple superphosphate (TSP)	0-44 to 46-0	$Ca(H_2PO_4)_2$
Diammonium phosphate (DAP)	18-46-0	$(NH_4)_2HPO_4$
Monoammonium phoshate (MAP)	11-48-0	$NH_4H_2PO_4$
Ammonium polyphosphate liquid (APP)	10-34-0	$NH_4H_2PO_4 + (NH_4)_3HP_2O_7$
Ammonium polyshosphate dry (APP)	15-62-0	Same as liquid
K		
Potassium chloride (muriate of potash)	0-0-60	KCl
Potassium sulfate	0-0-50-18(S)	K_2SO_4
Potassium-magnesium sulfate (sul-fo-mag)	0-0-22-22(S)-11(Mg)	$K_2SO_4 \cdot 2MgSO_4$
Potassium nitrate	13-0-44	KNO_3

Soil Testing Conversions

Plow layer (6–7 inches) = parts per million times 2 = pounds per acre
Top 12 inches = parts per million times 4 = pounds per acre

Table 3. Manure generation and nutrient content.

Animal	Average Weight of Animal *(lb)*	Manure Production *(lb/d/1,000#)*	Nutrient Content *(cf/d/1,000#)*		
			N	P_2O_5	K_2O
Dairy cow	1,200	80.00	0.45	0.16	0.31
Feeder swine	135	63.40	0.42	0.36	0.26
Gestation sow	375	27.20	0.19	0.14	0.14
Lactation sow w/ pigs	475	60.00	0.47	0.34	0.36
Nursery pig	20	106.00	0.60	0.57	0.42
Pullet litter	3	10.10	0.16	0.20	0.18
Breeder litter	8	13.40	0.21	0.27	0.23
Broiler litter	2	17.80	0.52	0.43	0.33

Table 4. Nutrient management data.

	N	P_2O_5	P	K_20	K
Corn, 100 bushels grain	90	44	19	27	22
1 ton dry stover	22	8	4	32	26
Silage, ton	10	3.1	1	7	6
Cotton, bale	32	14	6	19	16
Rice, 150 bushels	86	45	20	24	20
Bahiagrass, ton	43	12	5	35	29
Hybrid bermudagrass	50	12	5	43	36
Sweet potatoes, 100 bushels	24	13	6	56	46
Tall fescue	27	12	5	54	45
Soybeans, 40 bushels	152	34	15	52	43
Grain sorghum, 80 bushels	53	31	14	22	18
Wheat, 50 bushels	65	30	13	17	14
Peanuts, 6 tons	420	66	29	102	85
Dalligrass (5.8 tons/acre)	209	70	30	293	244
Annual ryegrass (4.5 tons/acre)	270	72	32	225	187

For more information, see MSU Extension Publication 2647 Nutrient Management Guidelines for Agronomic Crops Grown in Mississippi.

Fertilizer Conversion Factors

$P_2O_5 \times 0.44 = P$
$P \times 2.29 = P_2O_5$
$K_2O \times 0.83 = K$
$K \times 1.20 = K_2O$
1 gallon of water = 8.328 pounds
1 gallon of UAN (28%N) = 10.6 pounds

Area Conversion Factors

1 acre = 43,560 feet^2 = 0.405 hectare
1 hectare = 10,000 meters^2
1 yard^2 = 0.836 meters^2
1 chain^2 = 0.10 acre = 16 rods^2
1 mile^2 = 640 acres

Volume Conversion Factors

1 bushel (level) = 1.244 feet^3 = 8 gallons (dry) = 9.31 gallons (liquid) = 35.24 liters

1 liter = 1,000 milliliters or centimeters^3
1 gallon (liquid) = 3.78 liters = 128 fluid ounces = 4 quarts = 8 pints
1 acre-foot = 43,560 feet^3 = 1,613 yards^3 = 325,851 gallons
1 cup = 236.6 centimeters^3 = 0.236 liters = 8 ounces = 16 tablespoons

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