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Part IX.

Conversion Factors Needed for Common Fertilizer Calculations

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The world is a big place, and farmers, industry, government, and others likely use different units of measure, oxidation states, and measurements when calculating and reporting nutrient use for farming systems. The following table outlines some of the most common conversions needed for nutrient management. For instance, to convert K to K_2O, you would multiply your K number by 1.2051. So a fertilizer being reported as 49.8% K is also commonly reported as 49.8% × 1.2051 = 60% K_2O. Therefore, you are equally correct to report muriate of potash (KCl) fertilizer as 49.8% K or 60% K_2O as long as you have the correct unit represented. However, note that fertilizer law generally states that oxidation states should be reported for certain nutrients (e.g., K_2O must be used on Virginia fertilizer labels).

Table 1. Common fertilizer conversions needed for nutrient management calculations

Column 1: Conversion	Multiply by	Column 2: Multiplication vValue
Nutrient sources		
P to P_2O_5	Multiply P by	2.2910
P_2O_5 to P	Multiply P_2O_5 by	0.4365
K to K_2O	Multiply K by	1.2051
K_2O to K	Multiply K_2O by	0.8301
KCl to K	Multiple KCl by	0.5244
KCl to Cl	Multiply KCl by	0.4756
K_2SO_4 to K	Multiply K_2SO_4 by	0.4487
Mg to MgO	Multiply Mg by	1.6578
MgO to Mg	Multiply MgO by	0.6032
$MgCO_3$ to MgO	Multiply $MgCO_3$ by	0.4782
MgO to $MgCO_3$	Multiply MgO by	2.0913
$MgSO_4$ to Mg	Multiply $MgSO_4$ by	0.2020
$MgCO_3$ to $CaCO_3$	Multiply $MgCO_3$ by	1.1867
CaO to Ca	Multiply CaO by	0.7147
Ca to CaO	Multiply Ca by	1.3992
$CaCO_3$ to $MgCO_3$	Multiply $CaCO_3$ by	0.8426
$CaCO_3$ to CaO	Multiply $CaCO_3$ by	0.5603
K_2SO_4 to S	Multiply K_2SO_4 by	0.1840
Column 1: Conversion	**Multiply by**	**Column 2: Multiplication vValue**
$CaSO_4$ to Ca	Multiply $CaSO_4$ by	0.2938
$CaSO_4$ to S	Multiply $CaSO_4$ by	0.2350
SO_4 to S	Multiply SO_4 by	0.3339

Table 1. Common fertilizer conversions needed for nutrient management calculations (cont.)		
S to SO_4	Multiply S by	2.9963
NaCl to Cl	Multiply NaCl by	0.6066
N to NH_3	Multiply N by	1.2158
N to KNO_3	Multiply N by	7.2162
NH_3 to N	Multiply NH_3 by	0.8225
N to $(NH_4)_2SO_4$	Multiply N by	4.7160
$(NH_4)_2SO_4$ to N	Multiply $(NH_4)_2SO_4$ by	0.2120
$(NH_4)_2SO_4$ to S	Multiply $(NH_4)_2SO_4$ by	0.2427
N to NH_4NO_3	Multiply N by	2.8571
NH_4NO_3 to N	Multiply NH_4NO_3 by	0.3500
Concentration		
Parts per million (ppm) to pounds per acre (lb/acre)	Multiply ppm by	2.0
Pounds per acre (lb/acre) to parts per million (ppm)	Multiply lb/acre by	0.5
Percentage to gram per kilogram	Multiply percent by	10
Gram per kilogram to percentage	Multiply gram per kilogram by	0.1
Length		
Mile to kilometer	Multiply mile by	1.609
Kilometer to mile	Multiply kilometer by	0.621
Foot to meter	Multiply foot by	0.304
Meter to foot	Multiply meter by	3.28
Column 1: Conversion	**Multiply by**	**Column 2: Multiplication vValue**
Area		
Acre to hectare	Multiply acre by	0.405
Hectare to acre	Multiply hectare by	2.47
Square foot to square meter	Multiply square foot by	0.0929
Square meter to square foot	Multiply square meter by	10.76
Volume		
Gallon to liter	Multiply gallon by	3.78

Table 1. Common fertilizer conversions needed for nutrient management calculations (cont.)		
Liter to gallon	Multiply liter by	0.265
Quart to liter	Multiply quart by	0.946
Liter to quart	Multiply liter by	1.057
Mass		
Pound to gram	Multiply pound by	454
Gram to pound	Multiply gram by	0.00220
Pound to kilogram	Multiply pound by	0.454
Kilogram to pound	Multiply kilogram by	2.205
U.S. ton to tonne	Multiply U.S. ton by	0.907
Tonne to U.S. ton	Multiply tonne by	1.102
Yield and rate		
Pound per acre to kilogram per hectare	Multiply pound per acre by	1.12
Kilogram per hectare to pound per acre	Multiply kilogram per hectare to	0.893
Bushel per acre (bu/acre) for 60-pound bushel to kilogram per hectare	Multiply bu/acre by	67.19
Column 1: Conversion	**Multiply by**	**Column 2: Multiplication vValue**
Bushel per acre (bu/acre) for 56-pound bushel to kilogram per hectare	Multiply bu/acre by	62.71
Bushel per acre (bu/acre) for 48-pound bushel to kilogram per hectare	Multiply bu/acre by	53.75
Gallon per acre to liter per hectare	Multiply gallon per acre by	9.35
Liter per hectare to gallon per acre	Multiply liter per hectare by	0.107
Temperature		
Fahrenheit (˚F) to Celsius (˚C)	Multiply Fahrenheit by	5/9 × (˚F − 32)
Celsius (˚C) to Fahrenheit (˚F)	Multiply Celsius by	(9/5 × ˚C) + 32