

**PESTICIDE CALIBRATION FORMULAS AND INFORMATION**  
Bert McCarty

<b>Acres covered/hour:</b>	= MPH x Swath (ft) x 0.1212	or	$\frac{\text{MPH} \times \text{Swath (ft)}}{8.25}$
<b>Gallons Per Acre (GPA):</b>	= $\frac{\text{GPM} \times 495}{\text{MPH} \times \text{Swath (ft)}}$	or	$\frac{\text{GPM per nozzle} \times 495}{\text{MPH} \times \text{nozzle spacing (ft)}}$
	= $\frac{\text{GPM per nozzle} \times 5940}{\text{MPH} \times \text{nozzle spacing (inches)}}$	or	$\frac{\text{GPM per nozzle} \times 5940}{\text{MPH} \times \text{width of nozzle spray (inches)}}$
	= $\frac{\text{fl.oz collected per nozzle in 100 ft} \times 40.8375}{\text{nozzle spacing (inches)}}$	or	$\frac{\text{fl.oz. collected per nozzle} \times 4084}{\text{ft. traveled} \times \text{nozzle spacing (inches)}}$
	= $\frac{\text{gallons collected per nozzle} \times \text{no. nozzles} \times 43560}{\text{ft. traveled} \times \text{Swath (ft)}}$	or	$\frac{\text{gallons per 1000 sq.ft.}}{0.023}$
<b>Gallons per 1000 sq.ft.</b>	= 0.023 x GPA		
<b>Ounces per 1000 sq.ft.</b>	= 2.94 x GPA		
<b>Gallons Per Minute (GPM):</b>	= $\frac{\text{GPA} \times \text{MPH} \times \text{Swath (ft)}}{495}$	or	$\frac{\text{fl.oz per minute}}{128}$
	= $\frac{\text{GPA} \times \text{MPH} \times \text{nozzle spacing (inches)} \times \text{no. nozzles}}{5940}$		
<b>GPM/Nozzle:</b>	= $\frac{\text{GPA} \times \text{MPH} \times \text{nozzle spacing (inches)}}{5940}$	or	$\frac{\text{GPA} \times \text{MPH} \times \text{nozzle spacing (ft)}}{495}$
	= $\frac{\text{Test jar fl.oz} \times 0.46875}{\text{seconds to fill test jar}}$	or	$\frac{7.5}{\text{seconds to fill 1 pint (16 fl.oz.)}}$
	= $\frac{15}{\text{seconds to fill 1 quart (32 fl.oz.)}}$		
<b>Minutes/Acre:</b>	= $\frac{495}{\text{MPH} \times \text{Swath (ft)}}$	<b>Acres covered per tank:</b>	= $\frac{\text{Gallons per tank}}{\text{GPA}}$
<b>Minutes/load:</b>	= $\frac{\text{gallons/load} \times 495}{\text{MPH} \times \text{GPA} \times \text{Swath (ft)}}$	<b>Material needed per tank</b>	= $\frac{\text{rate/A} \times \text{gallons/tank}}{\text{GPA}}$
<b>Travel Speed (Miles Per Hour, MPH)</b>	= $\frac{\text{Distance traveled (ft)} \times 0.68}{\text{time (seconds) to travel distance}}$		

**Flow Rate** (as influenced by pressure):

$$\frac{GPA_1}{GPA_2} = \frac{\sqrt{PSI_1}}{\sqrt{PSI_2}} \quad \text{or} \quad GPA_2 = GPA_1 \times \sqrt{\frac{PSI_2}{PSI_1}} \quad \text{or} \quad PSI_2 = PSI_1 \times \left(\frac{GPA_2}{GPA_1}\right)^2$$

For any change in travel speed (mph), calculate the resulting GPA<sub>2</sub> by:

$$GPA_2 = \frac{GPA_1 \times MPH_1}{MPH_2} \quad \text{or} \quad \frac{GPA_1}{GPA_2} = \frac{MPH_2}{MPH_1} \quad \text{or} \quad MPH_2 = \frac{GPA_1 \times MPH_1}{GPA_2}$$

**Fluid Application**

<b>lbs/acre nutrient applied</b>	= 0.226464 x element concentration (ppm) x acre inches of solution applied		
<b>PPM</b>	= $\frac{1,000,000 \times \text{lbs ai used}}{\text{gal/tank} \times 8.34}$	or	$\frac{\text{wt. of material to be used (lbs)} \times 1,000,000}{\text{wt. of tank mixture (lbs)}}$
	= $\frac{1,000,000 \times \text{oz commercial material used} \times \% \text{ ai (decimal)}}{\text{gal/tank} \times 8.34 \times 16}$	or	$\frac{1,000,000 \times \text{fl.oz. used} \times \text{lb ai/gal}}{\text{gal/tank} \times 8.34 \times 128}$
<b>lbs nutrients applied/acre</b>	= ppm of the element in the water x acre-inches water applied x 0.226464		
<b>lb ai to use per tank</b>	= $\frac{\text{PPM desired} \times \text{gal/tank} \times 8.34}{1,000,000}$	or	$\frac{\text{ppm desired} \times \text{gal/tank} \times 8.34}{1,000,000 \times \% \text{ ai}}$
<b>lb commercial material to use per tank</b>	= $\frac{\text{PPM desired} \times \text{gal/tank} \times 8.34}{1,000,000 \times \% \text{ ai (decimal)}}$	or	$\frac{\% \text{ desired} \times \text{gal/tank} \times 8.34}{\% \text{ ai (decimal)}}$
<b>fl. oz. to use per tank</b>	= $\frac{\text{PPM desired} \times \text{gal/tank} \times 8.34 \times 128}{1,000,000 \times \text{ai per gal}}$		

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$$\text{gal commercial material to use per tank} = \frac{\text{ai (decimal)} \times 8.34 \times \text{gal/tank}}{\text{ai per gal} \times 100}$$


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$$\% \text{ ai in a spray mix} = \frac{\text{lbs. commercial material used} \times \% \text{ ai (decimal)}}{\text{gal/tank} \times 8.34}$$


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$$\text{gal commercial material for total treated acres} = \frac{\text{PPM desired} \times \text{GPA} \times \text{acres} \times 8.34}{1,000,000 \times \text{lb ai/gal}}$$


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**Active Ingredients (ai)**

$$\text{lbs commercial material/acre} = \frac{\text{lbs ai to be applied per acre}}{\% \text{ ai of material}} \quad \text{gal commercial material/tank} = \frac{\text{gallons/tank} \times \text{lb ai to be applied per acre}}{\text{gallons/acre} \times \text{lbs ai per gallon}}$$


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$$\text{gal commercial material/acre} = \frac{\text{lbs ai to be applied per acre}}{\text{lbs ai per gallon}}$$


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**Time (seconds) required to cover a specific distance to obtain a desired speed (MPH).**

Desired MPH	Feet per minute	Time Required (Seconds) to Travel a Distance of		
		100 ft.	200 ft.	300 ft.
2.0	176	34	68	102
2.5	220	27	54	81
3.0	264	23	45	68
3.5	308	20	39	58
4.0	352	17	43	51
4.5	395	15	30	45
5.0	440	14	27	41
6.0	528	--	23	34
7.0	616	--	19	29
8.0	704	--	17	26
9.0	792	--	15	23

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**Metric Prefix Definitions (basic metric unit = 1)**

tera	=	10 <sup>12</sup>	deci	=	10 <sup>-1</sup>	<b>Example (weight):</b> 1kg = 10 <sup>3</sup> g = 10 <sup>6</sup> mg = 10 <sup>9</sup> µg = 10 <sup>12</sup> ng 1g = 10 <sup>-3</sup> kg = 10 <sup>3</sup> mg = 10 <sup>6</sup> µg = 10 <sup>9</sup> ng 1mg = 10 <sup>-9</sup> kg = 10 <sup>-3</sup> g = 10 <sup>3</sup> µg = 10 <sup>6</sup> ng 1µg = 10 <sup>-9</sup> kg = 10 <sup>-6</sup> g = 10 <sup>-3</sup> mg = 10 <sup>3</sup> ng 1ng = 10 <sup>-12</sup> kg = 10 <sup>-9</sup> g = 10 <sup>-6</sup> mg = 10 <sup>-3</sup> µg	<b>Example (volume):</b> 1L = 10 <sup>3</sup> mL = 10 <sup>6</sup> µL 1mL = 10 <sup>-3</sup> L = 10 <sup>-6</sup> µL 1µL = 10 <sup>-6</sup> L = 10 <sup>-3</sup> mL
giga	=	10 <sup>9</sup>	centi	=	10 <sup>-2</sup>		
mega	=	10 <sup>6</sup>	milli	=	10 <sup>-3</sup>		
kilo	=	10 <sup>3</sup>	micro	=	10 <sup>-6</sup>		
hecto	=	10 <sup>2</sup>	nano	=	10 <sup>-9</sup>		
deca	=	10 <sup>1</sup>	pico	=	10 <sup>-12</sup>		

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**Approximate Rates of Application Equivalents**

<u>Weights</u>		<u>Liquid</u>		
1 oz/ft <sup>2</sup>	= 2722.5 lbs/A	1 oz/1000 ft <sup>2</sup>	= 43.56 oz/A	= 1.4 qt/A
1 oz/yd <sup>2</sup>	= 302.5 lbs/A	1 pt/1000 ft <sup>2</sup>	= 5.4 gal/A	
1 oz/100 ft <sup>2</sup>	= 27.2 lbs/A	100 gal/A	= 2.3 gal/1000 ft <sup>2</sup>	= 1 qt/100 ft <sup>2</sup>
1 oz/1000 ft <sup>2</sup>	= 43.46 oz/A			
1 lb/A	= 1 oz/2733 ft <sup>2</sup>			
100 lb/A	= 2.5 lb/1000 ft <sup>2</sup>			
1 yd <sup>3</sup> sand	= 1.3 to 1.5 tons			
1 bushel	= 1¼ ft <sup>3</sup>			
				= 0.046 yd <sup>3</sup>

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**Helpful Calculations and Formulas:**

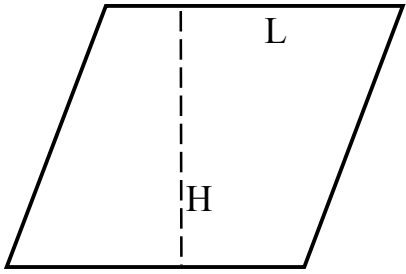
<b>Rectangle, square or parallelogram:</b>	<b>area</b>	=	length (L) x width (W)	
<b>Trapezoid:</b>	<b>area</b>	=	[a + (b x h)] ) 2	
<b>Circle:</b>	<b>area</b>	=	radius (r) <sup>2</sup> x 3.1416 (B)	= diameter (d) <sup>2</sup> x 0.7854
	<b>radius</b>	=	d ) 2	
	<b>diameter</b>	=	r x 2	
	<b>circumference</b>	=	B x d	
<b>Sphere:</b>	<b>volume</b>	=	r <sup>3</sup> x 4.1888	= d <sup>3</sup> x 0.5236
<b>Triangle:</b>	<b>area</b>	=	(W x H) ) 2	
<b>Cylinder:</b>	<b>volume</b>	=	r <sup>2</sup> x 3.1416 x L	

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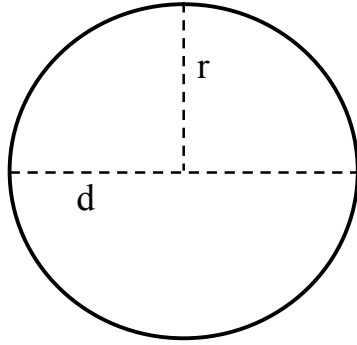
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**Finding Tank Capacity (gallons):**

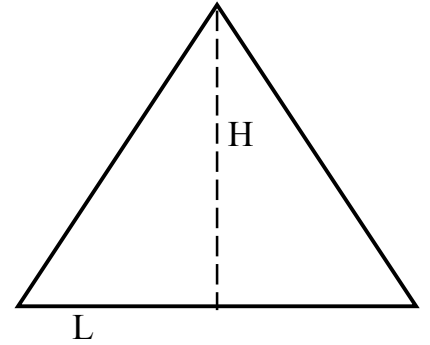
<b>Cylindrical tanks:</b>	<b>(inches)</b>	=	$L \times d^2 \times 0.0034$
	<b>(feet)</b>	=	$L \times d^2 \times 5.875$
<b>Rectangle tanks:</b>	<b>(inches)</b>	=	$L \times W \times \text{height} \times 0.004329$
	<b>(feet)</b>	=	$L \times W \times \text{height} \times 7.48$
<b>Elliptical tanks:</b>	<b>(inches)</b>	=	$L \times \text{short diameter (sd)} \times \text{long diameter (ld)} \times 0.0034$
	<b>(feet)</b>	=	$L \times \text{sd} \times \text{ld} \times 5.875$



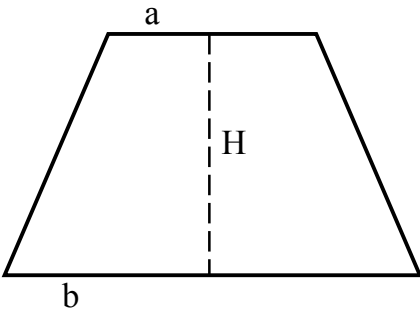
Parallelogram



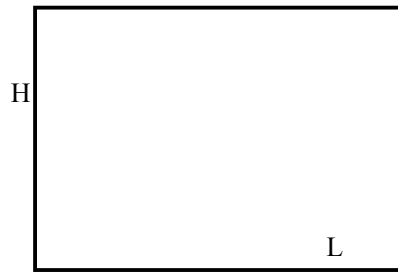
Circle



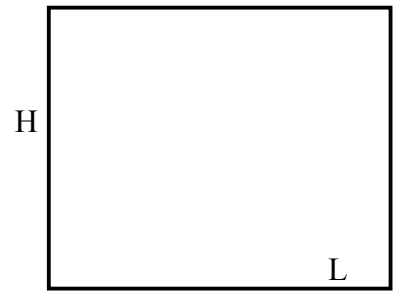
Triangle



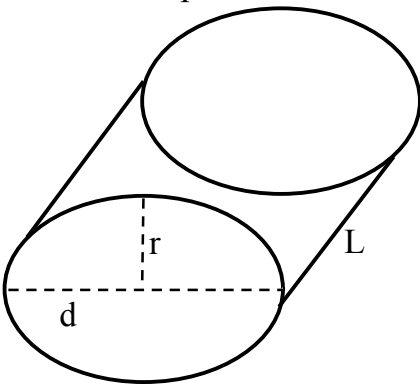
Trapezoid



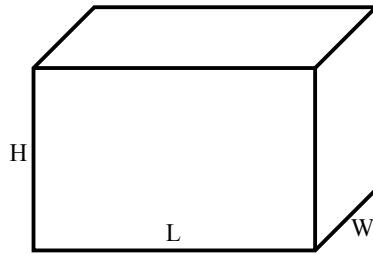
Rectangle



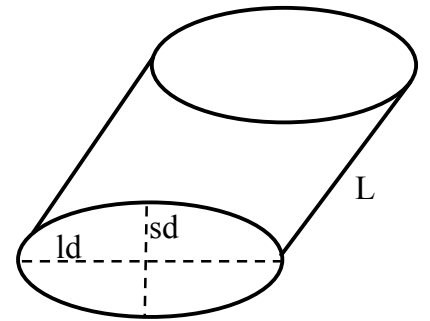
Square



Cylindrical Tank



Rectangular Tank



Elliptical Tank

## Metric System Conversion Factors

### Area Equivalents

1 acre = 43,560 ft<sup>2</sup> = 4840 yd<sup>2</sup> = 0.4047 hectares = 160 rods<sup>2</sup> = 4047 m<sup>2</sup> = 0.0016 sq. mile

1 hectare (ha) = 10,000 m<sup>2</sup> = 100 are = 2.471 acres = 107,639 ft<sup>2</sup>

1 cubic foot (ft<sup>3</sup>) = 1728 in<sup>3</sup> = 0.037 yd<sup>3</sup> = 0.02832 m<sup>3</sup> = 28,320 cm<sup>3</sup>

1 square foot (ft<sup>2</sup>) = 144 in<sup>2</sup> = 929.03 cm<sup>2</sup> = 0.09290 m<sup>2</sup>

1 acre-inch = 102.8 m<sup>3</sup> = 27,154 gal = 3630 ft<sup>3</sup>

1 cubic yard (yd<sup>3</sup>) = 27 ft<sup>3</sup> = 0.765 m<sup>3</sup>

1 square yard (yd<sup>2</sup>) = 9 ft<sup>2</sup> = 0.836 m<sup>2</sup>

### Liquid Equivalents

1 ft<sup>3</sup> of water = 7.5 gal = 62.4 lbs. = 28.3 liters

1 liter (l) = 2.113 pts. = 1000 ml = 1.057 qts. = 33.8 fl.oz. = 0.26 gal

1 US gallon = 4 qt. = 8 pt. = 16 cups = 128 fl.oz. = 8.337 lbs of water = 3.785 L = 3785 ml = 231 in<sup>3</sup> = 256 tbsp. = 0.1337 ft<sup>3</sup>

1 quart = 0.9463 liters = 2 pt. = 32 fl. oz. = 4 cups = 64 tablespoons (tbsp.) = 57.75 in<sup>3</sup> = 0.25 gal = 946.4 ml

1 pint = 16 fl. oz. = 2 cups = 473.2 ml = 32 level tablespoons = 0.125 gal = 0.5 qt

1 tablespoon = 14.8 ml = 3 teaspoons (tsp.) = 0.5 fl.oz.

1 US fluid ounce = 29.57 ml = 2 tablespoons = 6 tsp. = 0.03125 qt

1 acre-inch of water = 27,154 gal = 3630 ft<sup>3</sup>

1 cup = 8 fl. oz. = ½ pt. = 16 tablespoons = 236.6 ml

1 milliliter (ml) = 1 cm<sup>3</sup> = 0.034 fl.oz. = 0.002 pts

1 teaspoon = 4.93 ml = 0.1667 fl. oz. = 80 drops

### Temperature Equivalents

degrees Centigrade = (EF-32) x 5/9

degrees Fahrenheit = (EC x 9/5) + 32

### Pressure Equivalents

1 lb per square inch (PSI) = 6.9 kilopascal (kPa)

1 PSI = 2.31 feet head of water

1 atm = 760 mmHg = 1.013 x 10<sup>5</sup> Pa = 1.013 bar = 14.70 psi

1 mmHg = 133.32 Pa = 0.133 kPa = 133,333 mPa

1 Pa = 10<sup>-3</sup> kPa = 10<sup>-6</sup> mPa

1 mPa = 10<sup>3</sup> kPa = 10<sup>6</sup> Pa

1 kPa = 0.001 MPa = 10 cm H<sub>2</sub>O = 10 mbar = 0.01 bar = 0.0099 atm. = 0.145 psi

### Length Equivalents

centimeter (cm) = 0.3937 inch = 0.01 m = 0.03281 ft.

meter (m) = 3.28 feet = 39.4 inches = 100 cm = 1.094 yds = 1000 mm

kilometer = 0.621 statute mile = 1000 meters = 100,000 cm = 3281 ft = 39,370 in.

inch = 2.54 cm = 25.4 mm = 0.0254 m = 0.08333 ft.

foot = 0.3048 meters = 30.48 cm = 12 inches

yard = 0.9144 meters = 3 feet = 36 inches = 91.44 cm

statute mile = 1760 yards = 5280 feet = 1.61 kilometers = 1609 meters

### Mixture Ratios

1 mg/g = 1000 ppm

1 fl.oz./gal = 7490 ppm

1 fl.oz./100 gal = 75 ppm

1 qt/100 gal = 2 tablespoons/1.0 gal

1 pt/100 gal = 1 teaspoons/1 gal

### Flow

1 gpm = 0.134 ft<sup>3</sup>/minute

1 ft<sup>3</sup>/min. (cfm) = 449 gal/hr. (gph) = 7.481 gal/min

### Weight Equivalents

1 ton (US) = 2000 lb = 0.907 metric tons = 907.2 kg

1 metric ton = 10<sup>6</sup> g = 1000 kg = 2205 lb

1 lb = 16 oz = 453.6 grams (g) = 0.4536 kg

1 oz (weight) = 28.35 g = 0.0625 lb

1 gram = 1000 mg = 0.0353 oz = 0.001 kg = 0.002205 lb

milligrams (mg) = 0.001 grams

1 kilogram (kg) = 1000 grams = 35.3 oz = 2.205 lbs

microgram (:g) = 10<sup>-6</sup> grams = 0.001 mg

nanogram (ng) = 10<sup>-9</sup> grams = 0.001 micrograms (:g)

picogram = 10<sup>-12</sup> grams

1 ppm = 0.0001% = 1 mg/kg = 1 mg/L = 1 :g/g = 1:l/l = 1µg/mL = 0.379 g in 100 gal water = 8.34 x 10<sup>-6</sup> lb/gal = 0.013 fl oz in 100 gal

10 ppm = 0.001% = 10 mg/L

100 ppm = 0.01% = 100 mg/L

1000 ppm = 1mg/g = 0.1% = 1000 mg/L

1 ppb = 1 :g/kg = 1 :g/L = 1 ng/mL = 1 ng/1,000,000,000      1 ppt = 1 picogram/g  
1 % = 10,000 ppm = 10g/L = 1g/100ml = 10g/kg = 1.33 oz by weight/gal water = 8.34 lbs/100 gal water

**Approximate Weight of Dry Soil**

Type	g/cm <sup>3</sup>	lbs/ft <sup>3</sup>	lbs/acre (6 inches deep)
sand	1.6	100 (or 2700 lbs/yd <sup>3</sup> )	2,143,000
loam	1.3 to 1.55	80-95	1,714,000
clay or silt	1.0 to 1.30	65-80	1,286,000
muck	0.65	40	860,000
peat	0.325	20	430,000

Sand weights (tons): = yd<sup>3</sup> x 1.3  
 Gravel weights (tons): = ft<sup>3</sup> x 110  
 -0.5- to 1-inch diameter gravel = 2700 lbs/ton  
 -0.25- to 0.375-inch diameter gravel = 3000 lbs/ton

**Conversions for determining turfgrass irrigation needs**

1 acre-inch = 27,154 gal = 43,560 cu.in. = 3,630 cu.ft.  
 1 inch/1000 sq.ft. = 620 gal = 83 cu.ft.  
 1 gallon = 0.134 cu.ft. = 8.34 lbs  
 1 million gallon = 3.07 acre-feet  
 7½ gallons = 1 cu.ft. = 231 cu.in.  
 1 acre-foot = 325,851 gal = 43,560 cu.ft.  
 1 pound of water = 0.1199 gal  
 Precipitation rate (in/hr) =  $\frac{\text{gpm} \times 96.3}{\text{area (ft}^2\text{)}}$   
 Rainfall (inches) =  $\frac{0.5 \times \text{volume collected (ml)}}{[\text{diameter (cm) of opening}]^2}$

**Energy**

1 calorie (cal) = 4.184 Joule (J)  
 Joule (J) = 1 kg m<sup>2</sup> s<sup>-2</sup>  
 1 kcal = 4.184 kJ

**Metric Conversion Factors**

<b>To Convert</b>	<b>Multiply by</b>	<b>To Obtain</b>
Acres (a)	0.4047	Hectare (ha)
Acres	43,560	Sq. feet (ft <sup>2</sup> )
Acres	0.00405	Sq. kilometer (km <sup>2</sup> )
Acres	4047	Sq. meter (m <sup>2</sup> )
Acres	4840	Sq. yards (yd <sup>2</sup> )
Acre-foot	325,851	Sq. feet (ft <sup>2</sup> )
Acre-foot	43560	Cu. Feet (ft <sup>3</sup> )
Acre-foot	1233.5	m <sup>3</sup>
Acre-inch	102.8	m <sup>3</sup>
Bar	14.5	lb/in <sup>2</sup>
Bar	1019.7	g/cm <sup>3</sup>
Bar	29.53	inches Hg @ 0°C
Bar	75	cm Hg @ 0°C
Bar	0.001	J/kg
Bar	100	kPa
Bushels (dry)	0.03524	m <sup>2</sup>
Bushels	1.245	ft <sup>3</sup>
Calorie (cal)	4.184	Joules (J)
Centimeters (cm)	0.03281	Feet (ft)
cm	0.3937	Inches (in)
cm	0.1094	Yards (yd)
cm	0.01	Meters (m)
cm	10	Millimeters (mm)
cm/sec	1.9685	ft/min
cm/sec	0.0223694	MPH
cm <sup>2</sup> (square centimeters)	0.001076	ft <sup>2</sup>
cm <sup>2</sup>	0.1550	in <sup>2</sup>
cm <sup>3</sup> (cubic centimeters)	0.0610237	in <sup>3</sup>
cm <sup>3</sup>	0.0338	fl oz
Cup	8	fl oz
Cup	236.6	cm <sup>3</sup>
Feet (ft)	30.48	cm
ft	0.3048	m
ft	305	mm
ft <sup>2</sup> (square feet)	929	cm <sup>2</sup>
ft <sup>2</sup>	0.0929	m <sup>2</sup>
ft <sup>2</sup>	9.294 x 10 <sup>-6</sup>	Hectares (ha)
ft <sup>3</sup> (cubic feet)	0.0283	m <sup>3</sup>
ft <sup>3</sup>	7.4805	Gallons
ft <sup>3</sup>	1728	Cubic inches (in <sup>3</sup> )
ft <sup>3</sup>	0.037	Cubic yards (yd <sup>3</sup> )
ft <sup>3</sup>	28.32	Liters (L)
ft <sup>3</sup> /1,000 ft <sup>2</sup>	0.030463	m <sup>3</sup> /100 m <sup>2</sup>

**Metric Conversion Factors**

<b>To Convert</b>	<b>Multiply by</b>	<b>To Obtain</b>
Feet per minute	0.01136	MPH
Feet head of water	0.433	PSI
Foot candle	10.764	Lux
Gallons (gal)	3.785	Liters
Gal	3785	Milliliters
Gal	128	Ounces (liquid)
Gal	0.13368	ft <sup>3</sup>
Gal/acre	9.354	Liters/hectare
Gal/acre	2.938	oz/1,000 ft <sup>2</sup> (liquid)
Gal/1,000 ft <sup>2</sup>	4.0746	L/100 m <sup>2</sup>
Gal/minute	2.228 x 10 <sup>-3</sup>	Cubic feet/second
Gal/min	0.06309	L/sec
Gal/min	0.227125	m <sup>3</sup> /hr
Grams (g)	0.002205	Pounds
Gram	0.035274	oz
g/cm <sup>3</sup>	0.036127	lb/in <sup>3</sup>
g/cm <sup>3</sup>	62.428	lb/ft <sup>3</sup>
g/ha	0.000893	lbs/a
g/ha	0.014275	oz/a
g/kg	0.10	percent (%)
g/liter	1000	PPM
g/liter	10	Percent
g/liter	0.00834595	lbs/gal
g/sq.meter	0.00020481	lb/sq.feet
g/m <sup>2</sup>	0.20481	lbs/1,000 ft <sup>2</sup>
Hectares (ha)	2.471	Acres
Ha	107,639	ft <sup>2</sup>
Inches	2.540	Centimeters
Inches	0.0254	Meters
Inches	25.40	Millimeters
Inches of mercury	3.4	kilopascals (kPa)
in/ft	0.083	mm/mm
in <sup>2</sup>	6.4516	cm <sup>2</sup>
in <sup>3</sup>	16.3871	cm <sup>3</sup>
in <sup>3</sup>	0.55411	fl oz
in <sup>3</sup>	0.01732	qt
Kilograms (kg)	2.2046	Pounds
kg/hectare	0.892	Pounds/acre
kg/ha	0.02048	lb/1,000 ft <sup>2</sup>
kg/100 m <sup>2</sup>	2.048	lbs/1,000 ft <sup>2</sup>
kg/L	8.3454	lb/gal
Kilometers (Km)	100,000	Centimeters
Kilometers	3281	Feet

### Metric Conversion Factors

To Convert	Multiply by	To Obtain
Kilometers	1000	Meters
Kilometers	0.6214	Miles
Kilometers	1094	Yards
Km/h	0.62137	MPH
Km/h	54.6807	ft/min
Kilopascals (kPa)	0.145	Pounds/sq.in. (psi)
Liters (L)	0.2642	Gallons
L	33.814	Ounces
L	2.113	Pints
L	1.057	Quarts
L	0.035315	ft <sup>3</sup>
L/100 m <sup>2</sup>	0.2454	gal/1,000 ft <sup>2</sup>
L/100 m <sup>2</sup>	1.9634	pt/1,000 ft <sup>2</sup>
Liters/hectare	0.107	Gallons/acre
L/ha	0.314	oz/1,000 ft <sup>2</sup>
L/ha	0.855	pt/A
L/min	15.85	gal/hr
Meters (m)	3.281	Feet
Meters	39.37	Inches
Meters	1.094	yards
Meters	100	Centimeters
Meters	0.001	Kilometers
Meters	1000	Millimeters
Meters/sec	2.2369	mph
M <sup>2</sup> (square meters)	10.764	ft <sup>2</sup>
M <sup>2</sup>	1,550	in <sup>2</sup>
M <sup>2</sup>	1.196	yd <sup>2</sup>
M <sup>3</sup> (cubic meters)	35.3147	ft <sup>3</sup>
M <sup>3</sup>	1.30795	yd <sup>3</sup>
Miles (nautical)	1.1508	Miles (statute)
Miles (statute)	160,900	Centimeters
Miles	5280	Feet
Miles	1.609	Kilometers
Miles	1760	Yards
Miles/hour (mph)	1.467	Feet/second
mph	88	Feet/minute
mph	1.61	Kilometers/hour
mph	0.447	meter/second
mg/kg	1	Parts per million (ppm)
Milliliters (ml)	0.0338	Ounces (fluid)
Milliliters	0.0002642	Gallons
ml/m <sup>2</sup>	3.14	oz/1,000 ft <sup>2</sup>
ml/10,000 L	0.0128	fl oz/1,000 gal

**Metric Conversion Factors**

<b>To Convert</b>	<b>Multiply by</b>	<b>To Obtain</b>
Millimeters (mm)	0.03937	Inches
1 mm Hg @ 0 C	0.13332	kPa
1 mm Hg	133333.3	mPa
Ounces (fluid)	0.02957	Liters
Ounces (fluid)	29.573	Milliliters
Ounces (fluid)	0.03125	qt.
Oz (fluid)/gal	7.81	ml/L
Ounces (fluid)/acre	0.0731	L/ha
Ounces (fluid)/acre	73.1	ml/ha
Ounces (fluid)/1,000 ft <sup>2</sup>	3.18	L/ha
oz (weight)	28.35	Grams
oz (weight)	0.0625	lb
oz (weight)/acre	0.07	kg/ha
oz (weight)/acre	70	g/ha
oz (weight)/1,000 ft <sup>2</sup>	3.05	kg/ha
oz (weight)/ft <sup>2</sup>	305.15	g/m <sup>2</sup>
oz (weight)/gal	7.5	g/L
oz (weight)/1,000 ft <sup>2</sup>	0.305	g/m <sup>2</sup>
Percent (%)	10	g/kg
Pint (liquid)	0.473	liter
pt/A	1.1692	L/ha
pt/A	0.3673	oz/1,000 ft <sup>2</sup>
pt/1,000 ft <sup>2</sup>	0.50932	L/100 m <sup>2</sup>
Parts per million (ppm)	2.719	lb ai/acre foot of water
PPM	2.0	lbs/acre slice 7-in. deep
PPM	2.25	kg/ha slice 7-in. deep
PPM	0.001	g/L
PPM	8.34	lb/million gal
PPM	1	mg/kg
PPM	0.013	Ounces/100 gal of water
PPM	0.3295	Gal/acre-foot of water
PPM	8.2897	lbs/million gal of water
Pounds (lbs)	0.4536	Kilograms (kg)
Pounds	453.6	Grams
Pounds/acre	1.12	kg/hectare
Pounds/acre	1.0413	g/100 ft <sup>2</sup>
Pounds/acre	0.02296	lb/1,000 ft <sup>2</sup>
Pounds/acre	0.112	g/m <sup>2</sup>
Pounds/acre-foot	0.3682	g/m <sup>3</sup>
Pounds/acre-foot	0.0003682	kg/m <sup>3</sup>
Pounds/sq.ft.	4883	g/m <sup>2</sup>
Pounds/cu.ft.	16.23	kg/m <sup>3</sup>
Pounds/1,000 ft <sup>2</sup>	4.88	g/m <sup>2</sup>

### Metric Conversion Factors

To Convert	Multiply by	To Obtain
Pounds/1,000 ft <sup>2</sup>	48.83	kg/ha
Pounds/1,000 ft <sup>2</sup>	43.5597	lb/A
Pounds/1,000 ft <sup>2</sup>	488	g/100 m <sup>2</sup>
Pounds/1,000 ft <sup>2</sup>	0.4883	kg/100 m <sup>2</sup>
Pounds/yd <sup>3</sup>	0.0005937	g/cm <sup>3</sup>
Pounds/yd <sup>3</sup>	594	g/m <sup>3</sup>
Pounds/gallon	0.12	kg/liter
Pounds/1,000 gal	0.12	g/1,000 L
PSI (pounds per square inch)	6.89	Kilopascals (kPa)
PSI	0.06895	Bar
PSI	0.068046	Atmosphere (atm)
PSI	2.31	feet head of water
Quarts	0.9463	Liters
Quarts	946	Millimeters
Qt/A	2.3385	L/ha
Qt/A	0.7346	oz/1,000 ft <sup>2</sup>
Qt/100 gal	2.5	ml/L
Ton (2,000 lbs)	907	kg
Ton (2,000 lbs)/acre	2240	kg/ha
Ton (2,000 lbs)	0.907	Ton (metric)
Ton (2,000 lbs)/acre	2.241	Ton (metric)/ha
Ton (metric)	2,205	lb
Ton (metric)	1,000	kg
Ton (metric)	1.102	ton (2,000 lb)
Yards (yd)	91.44	Centimeters
Yards	0.9144	Meters
Yards	914.4	Millimeters
yd <sup>2</sup>	0.836	M <sup>2</sup>
yd <sup>3</sup> (cubic yards)	27	ft <sup>3</sup>
yd <sup>3</sup>	0.7645	m <sup>3</sup>
yd <sup>3</sup>	765	L
yd <sup>3</sup> /1,000 ft <sup>2</sup>	0.825	m <sup>3</sup> /100 m <sup>2</sup>
P <sub>2</sub> O <sub>5</sub>	0.437	P
K <sub>2</sub> O	0.830	K
CaO	0.715	Ca
MgO	0.602	Mg
meq Ca <sup>+2</sup> /100 g soil	400	lbs Ca <sup>+2</sup> per acre furrow slice
meq K <sup>+</sup> /100 g soil	780	lbs K <sup>+</sup> per acre furrow slice
meq Na <sup>+</sup> /100 g soil	460	lbs Na <sup>+</sup> per acre furrow slice
meq Mg <sup>+2</sup> /100 g soil	109	lbs Mg <sup>+2</sup> per acre furrow slice
meq Fe <sup>+3</sup> /100 g soil	372	lbs Fe <sup>+3</sup> per acre furrow slice

### Metric Conversion Factors

To Convert	Multiply by	To Obtain
meq Zn <sup>+2</sup> /100 g soil	654	lbs Zn <sup>+2</sup> per acre furrow slice
meq H <sup>+</sup> /100 g soil	20	lbs H <sup>+</sup> per acre furrow slice
meq Al <sup>+3</sup> /100 g soil	180	lbs Al <sup>+3</sup> per acre furrow slice
meq Ca <sup>+2</sup> /100 g soil	9.2	lbs Ca <sup>+2</sup> per 1,000 sq.ft. furrow slice
meq K <sup>+</sup> /100 g soil	18	lbs K <sup>+</sup> per 1,000 sq.ft. furrow slice
meq Na <sup>+</sup> /100 g soil	10.6	lbs Na <sup>+</sup> per 1,000 sq.ft. furrow slice
meq Mg <sup>+2</sup> /100 g soil	2.5	lbs Mg <sup>+2</sup> per 1,000 sq.ft. furrow slice
meq Fe <sup>+3</sup> /100 g soil	8.5	lbs Fe <sup>+3</sup> per 1,000 sq.ft. furrow slice
meq Zn <sup>+2</sup> /100 g soil	15	lbs Zn <sup>+2</sup> per 1,000 sq.ft. furrow slice
meq H <sup>+</sup> /100 g soil	0.46	lbs H <sup>+</sup> per 1,000 sq.ft. furrow slice
meq Al <sup>+3</sup> /100 g soil	4.1	lbs Al <sup>+3</sup> per 1,000 sq.ft. furrow slice

### Decimal and Millimeter Length Equivalents

Fraction (inch)	Decimals (inch)	Millimeters
<b>1</b>	<b>1.00</b>	<b>25.4</b>
15/16	0.9375	23.812
7/8	0.875	22.225
13/16	0.8125	20.638
<b>¾</b>	<b>0.75</b>	<b>19.05</b>
11/16	0.6875	17.462
5/8	0.625	15.875
9/16	0.5625	14.288
<b>½</b>	<b>0.5</b>	<b>12.70</b>
7/16	0.4375	11.112
3/8	0.3750	9.525
11/32	0.34375	8.731
5/16	0.3125	7.938
9/32	0.28125	7.144
<b>¼</b>	<b>0.25</b>	<b>6.350</b>
15/64	0.234375	5.953
7/32	0.21875	5.556
13/64	0.203125	5.159
1/5	0.200	5.08
3/16	0.1875	4.762
23/128	0.1797	4.564
11/64	0.171875	4.366
1/6	0.167	4.242
21/128	0.1641	4.168
5/32	0.15625	3.969
1/7	0.143	3.633
19/128	0.1484	3.769
9/64	0.140625	3.572
<b>c</b>	<b>0.1250</b>	<b>3.175</b>
7/64	0.109375	2.778
1/10	0.100	2.540
3/32	0.09375	2.381

5/64	0.078125	1.984
1/16	0.0625	1.588
3/64	0.046875	1.191
1/32	0.03125	0.794
1/64	0.015625	0.397

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**Slopes**

10%	=	6E	=	10:1	33%	=	18E	=	3:1
18%	=	10E	=	6:1	50%	=	26E	=	2:1
25%	=	14E	=	4:1	100%	=	45E	=	1:1