



### FACTORS TO USE FOR CONVERTING DATA

Producers often access articles with data in metric or SI units. This can be frustrating if the desire is to see the data in units that are familiar.

Below is a list of some common terms and units of measurement that are often presented in articles, and the process/steps/factors to use to convert those values into familiar units.

### CALCULATIONS FOR ACRE FURROW SLICE [AFS]

Often the term Acre Furrow Slice [AFS—top 6 in. of soil in an acre] is used to describe the soil zone that is the most important to crops. The value of 2,000,000 pounds is often given for an AFS, but this is a general value. The actual pounds of soil in an AFS is dependent on the soil bulk density [BD]. To understand just what value this term can have, see the following.

If soil BD = 1.3 grams [g] per cubic centimeter [g per cu cm], then there are 1,766,315 pounds of soil in an AFS.

If soil BD = 1.4 g per cu cm, then there are 1,902,185 lb of soil in an AFS.

If soil BD = 1.5 g per cu cm, then there are 2,038,055 lb of soil in an AFS.

If soil BD = 1.472 g per cu cm, then there are 2,000,000 lb of soil in an AFS.

As indicated in the above calculations, the actual pounds of soil in an AFS is dependent on the soil BD.

### PARTS PER MILLION [PPM] TO LB/ACRE

Results for major and minor elements in the soil are often reported in ppm on an elemental basis. This unit of measurement is equivalent to pounds of nutrient per million pounds of soil. One acre of mineral soil 6 inches deep [AFS] weighs about 2 million pounds [assumes a BD of 1.472—see above for examples of how BD affects the pounds of soil in an AFS].

Therefore, to convert ppm to lb/acre, multiply by 2. This makes calculations simple, but obtains only a general value that is based on a BD of 1.472 as shown above.

Example: Have 15 ppm phosphorus [P] in the soil and you need 40 ppm P. So you need to add 25 ppm of P/acre, or 50 lb/acre actual P/acre when multiplied by 2.

### PLANT NUTRIENT CONVERSION

Fertilizer amounts are usually reported as nitrogen [N],  $P_2O_5$  for P, and  $K_2O$  for potassium [K]. The amount of N is the value given. For the amount of actual P, multiply the amount of  $P_2O_5$  by 0.437. For the amount of actual K, multiply the amount of  $K_2O$  by 0.83.



## CONVERSION OF GRAIN WEIGHT AT MEASURED MOISTURE CONTENT TO EQUIVALENT AT 13% MOISTURE, THE STANDARD SOYBEAN MOISTURE CONTENT.

Procedure for conversion of a plot sample weight [Y] at measured moisture % to equivalent weight at 13% moisture [base moisture % for soybean]:

DWT [weight of grain sample at 0% moisture] =  $1 - \text{MOIS}$  [measured moisture % of grain]

X [dry weight of grain sample at 13% moisture] = Y [total sample weight] x DWT

YIELD [weight of sample at 13% moisture] =  $X / .87$

Example yield calculation for 3000-g soybean sample with 15% moisture content:

DWT =  $1 - 0.15 = 0.85$  [decimal fraction dry weight of grain with 0% moisture content]

X =  $3000 \times 0.85 = 2550$  g [dry weight of grain with 15% moisture content]

YIELD =  $2550 / 0.87 = 2931$  g of grain with 13% moisture, which is allowed standard.

Check:  $2931 \times 0.13 = 381$  g moisture at 13%.  $2931 - 381 = 2550$  g dry soybeans—same as X above.

## YIELD CONVERSIONS

kilograms per hectare [ $\text{kg ha}^{-1}$  or kg/ha] x 0.893 = lb/acre.

Soybean yield: kg/ha divided by 67.19 = bu/acre [60 lb/bu].

Corn yield: kg/ha divided by 62.71 = bu/acre [56 lb/bu].

Seed per hectare [seed/ha] divided by 2.47 = seed/acre.

## SOIL WATER MEASUREMENT UNITS

1 bar = 14.5 pounds per square inch [psi] or 0.987 atmospheres.

Bar x 0.01 = cb [centibar]; used in soil water content measurements of field capacity [ $\sim 1/3$  bar or 33 cb] and permanent wilting point [ $\sim 15$  bars].

Acre-inch x 102.8 = cubic meter [ $\text{m}^3$ ]

## WEIGHT, VOLUME, AREA, AND TEMPERATURE

Pounds x 454 = grams [454 g in 1 lb].

Kilograms x 2.205 = lb [2.205 lb in 1 kg].

Gallon [gal] x 3.78 = liters [L].



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Liters per hectare [ $\text{L ha}^{-1}$  or  $\text{L/ha}$ ]  $\times 0.107 = \text{gal/acre}$

Gal  $\times 231 = \text{cubic inch [cu in]}$

$\text{\$/ha}$  or  $\text{\$ ha}^{-1} \times .405 = \text{\$/acre}$ .

Hectares [ha]  $\times 2.47 = \text{acres [2.47 acres in 1 ha]}$ .

Meters [m]  $\times 3.28 = \text{feet [3.28 ft in 1 m]}$ .

Meters  $\times 39.37 = \text{inches [39.37 in. in 1 m]}$ .

1 degree of latitude =  $\sim 68.9$  miles.

$^{\circ}\text{C [centigrade]} = [^{\circ}\text{F} - 32] \times .55556$ .

$^{\circ}\text{F [Fahrenheit]} = [1.8 \times ^{\circ}\text{C}] + 32$ .

Click [here](#) for a useful online conversion tool.

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