



CROPAIA

# Agronomy Toolkit

For agronomists and growers



## NUTRIENT FORM CONVERSIONS

From	To	Multiply by
$\text{NH}_4$	N- $\text{NH}_4$	0.821
$\text{NO}_3$	N- $\text{NO}_3$	0.226
N	$\text{NH}_4$	1.285
N	$\text{NO}_3$	4.427
$\text{P}_2\text{O}_5$	P	0.436
$\text{PO}_4$	P	0.326
P	$\text{P}_2\text{O}_5$	2.291
P	$\text{PO}_4$	3.066
$\text{K}_2\text{O}$	K	0.830
K	$\text{K}_2\text{O}$	1.205
$\text{CaCO}_3$	Ca	0.400
$\text{CaO}$	Ca	0.714
Ca	$\text{CaCO}_3$	2.497
$\text{MgO}$	Mg	0.603
Mg	$\text{MgO}$	1.657

## CONVERSION BETWEEN CONCENTRATION UNITS

Element	mmol/L	meq/L	ppm
N-NO <sub>3</sub>	1	1	14
N-NH <sub>4</sub>	1	1	14
P-H <sub>2</sub> PO <sub>4</sub>	1	1	31
K	1	1	39
Ca	1	2	40
Mg	1	2	24
Na	1	1	23
Cl	1	1	35.5
S-SO <sub>4</sub>	1	2	32
Fe	1	3	56
Mn	1	2	55
Zn	1	2	65
Cu	1	2	64
B-B <sub>4</sub> O <sub>7</sub>	1	2	11

## FERTILIZER RATE CONVERSIONS

From	To	Multiply by
kg/ha	lbs/ac	0.892
lbs/ac	kg/ha	1.12
t/ha	t/acre	0.446
t/acre	t/ha	2.24

## YIELD UNITS CONVERSIONS

From	To	Multiply by
Bushel/acre corn	MT/ha corn	62.8
Bushel/acre corn	lbs/acre corn	56
Bushel/acre wheat/soybeans	kg/ha wheat/soybeans	67.3
Bushel/acre wheat/soybeans	lbs/acre wheat/soybeans	60
Bushel/acre Barley	kg/ha barley	53.8

## SOIL ANALYSIS INTERPRETATION

### Phosphorus (P), ppm

Extraction method	Low	Medium	High	Excessive
Olsen	<10	10-30	30-40	>40
Saturated paste	<2.5	2.5-10	11-15	>15
Bray 1	<20	20-40	40-100	>100
Mehlich 3	<30	30-100	100-150	>150

### Potassium (K), ppm

Extraction method	Low	Medium	High	Excessive
Ammonium acetate	<150	150-250	251-800	>800
Mehlich 3	<35	35-65	66-130	>130
Saturated paste	<80	80-195	196-300	>300

### Calcium (Ca), ppm

Extraction method	Low	Medium	High	Excessive
Ammonium acetate	<1000	1.000-2.000	>2.000	
Mehlich 3	<500	501-655	656-835	>835
Saturated paste	<100	100-400	401-500	>500

### Magnesium (Mg), ppm

Extraction method	Low	Medium	High	Excessive
Ammonium acetate	<60	60-180	>180	
Mehlich 3	<20	20-65	66-135	>135
Saturated paste	<30	30-120	121-180	>180

### Boron (B), ppm

Extraction method	Low	Medium	High	Excessive
Agua caliente	<0.5	0.5-2.0	2.0-6.0	>6.0
Saturated paste	<1.0	1.0-1.5	>1.5	
Fosfato de Calcium	<0.5	0.5-1.0	>1.0	

### Iron (Fe), ppm

Extraction method	Low	Medium	High	Excessive
DTPA	<2.5	2.5-5.0	5.0-10	>10
Mehlich 3	<50	50-100	>100	

### Manganese (Mn), ppm

Extraction method	Low	Medium	High	Excessive
DTPA	<1.0	1.0-2.5	2.5-4.0	>4
Mehlich 3	<30	30-200	>200	

### Zinc (Zn), ppm

Extraction method	Low	Medium	High	Excessive
DTPA	<0.5	0.5-0.75	0.75-1.0	>10
Mehlich 3	<1.0	1.0-2.0	>2.0	

### Copper (Cu), ppm

Extraction method	Low	Medium	High	Excessive
DTPA	<0.2	0.2-0.3	0.3-0.6	>12
Mehlich 3	<1.6	1.6-4.5	>4.5	

### Sodium (Na), ppm

Extraction method	Low	Medium	High	Excessive
Ammonium acetate	<50	50-200	200-300	>300
Saturated paste	<45	45-115	116-160	>160

### Sulfur (S), ppm

Extraction method	Low	Medium	High	Excessive
KCl 40	<5	5-12	13-20	
Saturated paste	<160	160-480	481-640	>640

### Conversions from meq/100g to ppm

	meq/100g (cmol/kg)	ppm (g/kg)
Potassium (K <sup>+</sup> )	1	390
Calcium (Ca <sup>2+</sup> )	1	200.86
Magnesium (Mg <sup>2+</sup> )	1	120.7
Sodium (Na <sup>+</sup> )	1	230



## DESIRED ELEMENT CONCENTRATIONS IN THE IRRIGATION WATER

Element	Common concentration in irrigation water (mg/L)	Desired range (mg/L)
Potassium (K <sup>+</sup> )	0-10	5-10
Calcium (Ca <sup>2+</sup> )	10-150	60-120
Magnesium (Mg <sup>2+</sup> )	5-30	10-30
Sulfur (S-SO <sub>4</sub> <sup>2-</sup> )	5-30	30-80
Boron (B)	0-2	<0.5
Iron (Fe)	0-3	<1.0
Manganese (Mn)	0-2	<0.8
Bicarbonates (HCO <sub>3</sub> <sup>-</sup> )	30-500	30-120
Sodium (Na <sup>+</sup> )	5-130	0-50
Chlorides (Cl <sup>-</sup> )	0-350	<120





## How does it work?

- **LEARN AT YOUR OWN PACE**

Log in with your password and get 24/7 access to the course recordings. Downloadable materials.

- **START IMMEDIATELY**

You can start learning at any time, even right now!

- **BE CONNECTED**

The course instructor will be questions available to answer any of your questions via email and Whatsapp

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## FERTILIZATION AND IRRIGATION ONLINE COURSE

Learn the best practices and theory of fertilizer management, fertigation, irrigation scheduling, soil test interpretation and more.

The course “Fertilization and irrigation – Strategies and Best Practices” consists of 10 online sessions, 1.0-1.5 hours each, in which you will learn the best fertilization and irrigation practices.

Upon completing the course, you will master the fundamentals of fertilization and irrigation and will be capable of designing fertilization plans and irrigation schemes professionally