

Irrigation water tests interpretation

Parameter	Unit	Low	Medium	High	Comments
Nitrate (NO ₃)	mg/L		10	100	Particularly important in recycling systems. High levels need to be taken into account in fertiliser programmes
Potassium (K)	mg/L				Adjust potassium if recycling. Potassium should be 2-5% of cations.
Ammonium nitrogen (NH ₄)	mg/L			10	High levels can lead to direct toxicity and contribute to downward pH drift.
Phosphorous (P)	mg/L		1-15	40	1 for phosphorous sensitive plants, 15 for other crops
Chloride (Cl)	mg/L		70-90	200	Tip and marginal burns in low leaching situations at higher levels.
Salinity , Electrical Conductivity (EC)	dS/m	0.3*	0.6	1.0	EC is the overall level of salts. If a high EC is from plant nutrients a higher result may be acceptable, but if the high result is from a non nutrient source it isn't. Results above 0.6 will see reduced growth and/or marginal leaf burns in sub- irrigation, low leaching situations and on sensitive species.
Bicarbonate	mg/L		60	90	Increasing problems with plant growth, and plant and container staining. At levels between 90 and 200 liming materials need to be adjusted accordingly,
Alkalinity (CaCO ₃)	mg/L	40	60	250	Alkalinity indicates the hardness of the water. As levels increase, the ability to change the pH of the growing medium increases
pH		5		7.0	pH results need to be considered along with alkalinity to determine the ability of water to change growing media pH.
Calcium (Ca)	mg/L				High levels can interfere with magnesium, and calcium carbonate may form scale. Ideal Ca:Mg ratio 2:1
Boron (B)	mg/L			0.3	Plants vary greatly in their tolerance to this nutrient.
Manganese (Mn)	mg/L			0.2	15 is the upper limit for plants supplied with P at moderate levels. Concentrations as low as 0.05 mg/l can lead to bacterial slime growth in pipes.
Copper (Cu)	mg/L	0.02*	0.05	0.2	Levels may rise where copper compounds are used for sterilisation or algal control in recycled systems.
Magnesium (Mg)	mg/L				Level of magnesium needs to be considered in conjunction with calcium and sodium. Ideal Ca:Mg ratio 2:1
Sulphate (SO ₄)	mg/L			250	Sulphur levels will be increased by the use of alum.
Zinc (Zn)	mg/L	0.2*		2	
Sodium (Na)	mg/L	60		100	Calcium, Magnesium and Potassium need increasing if high amounts of sodium are present.
Iron (Fe)	mg/L	0.3*		1	From an acidified sample. Increased problems with staining of plants and clogging of pipes at levels above 0.3, particularly in trickle irrigation systems. Polyphosphate can be injected to form a soluble compound that allows iron to pass through the irrigation.
Sodium Adsorption Ratio (SAR)	mg/L			3	This measure indicates the ability of the water to reduce calcium, magnesium and potassium availability.
Aluminium (Al)	mg/L			5	Monitor if using alum for flocculation. High concentrations may induce phosphorous deficiency.

Fluoride (Fl)	mg/L			1	High levels will damage sensitive plants
Molybdenum (Mo)	mg/L			0.01	
Total Dissolved Solids (TDS)	mg/L			500	A measure of the combined content of organic and inorganic substances.
Suspended Solids	mg/L			50	

Note: mg/L is milligrams/litre. This also equals parts per million (ppm)

Not all of the above parameters will appear in all tests.

* In sub-irrigation and trickle irrigation systems the low level is the appropriate level.

The laboratory will usually give an interpretation of how suitable the water is for the intended use and general guidelines of how acceptable the results are. The table gives additional information on different parameters that will be useful in interpreting the results of the tests.

Lex McMullin
Farm Management Systems Officer
Mob: 0400 005 236
Email: fms03@ngiq.asn.au