Water for Profit

SALTS IN THE CROP ROOT ZONE

WATERFORPROFIT

Excessive salt in the crop root zone can reduce crop quality and yield. Dissolved salts naturally occur in river water, groundwater and soils. Common salts include sodium, calcium, magnesium and potassium chlorides, sulphates and carbonates.

Sources of salt

When crops are irrigated, salt is deposited in the soil. Even good quality water typically has salt concentrations of 200-500 parts per million. Hence, for every megalitre of good quality irrigation water applied, between 200 and 500 kg of salt is applied to the soil. Using higher salinity irrigation water applies even more salt. Salts can enter the crop root zone from below. When the groundwater table rises to within two metres of the soil surface, plant roots and capillary rise may pull this water and the salt it contains into the crop root zone.

What does the salt do?

The ability of the plant to extract water from the soil is reduced as salt levels increase so crops may display symptoms of moisture stress even though the soil is moist. Very high levels of salinity can also have a toxic effect inhibiting root growth and killing the plant.

Do I have a salt problem?

If you have a salinity problem or are likely to experience a problem, you should check the salt levels of the soil and water used for irrigation. Salt levels are routinely checked in soil and water analyses or can be checked in the field using an electrical conductivity meter. The results are commonly reported in units of deci-Siemens per metre (dS/m). To convert to other units use this conversion formula:

1 dS/m = 1000 EC units = 1000 uS/cm = 640 ppm.

Salt tolerances for a range of horticultural crops are in Table 1 as a guide only - the effect will vary depending on soil type, leaching potential and irrigation method, and age and cultivar of the crop.

Table 1. Salinity tolerances of horticultural crops

Crop	Soil salinity		Water quality	
	Threshold	25% yield loss	Threshold	25% yield loss
Apple/pear	1.7	3.3	1.0	2.2
Apricot	1.6	2.6	1.1	1.8
Avocado	1.3	2.5	0.9	1.7
Beans	1.0	2.3	0.7	1.5
Broccoli	2.8	5.5	1.9	3.7
Cantaloupe	2.2	5.7	1.7	3.8
Capsicum	1.5	3.3	1.0	2.2
Carrot	1.0	2.8	0.7	1.9
Citrus	1.7	3.3	1.1	2.2
Grape	1.5	4.1	1.0	2.7
Lettuce	1.3	3.2	0.9	2.1
Onion	1.2	2.8	0.8	1.8
Peach	1.7	2.9	1.1	1.9
Potato	1.7	3.8	1.1	2.5
Strawberry	1.0	1.8	0.7	1.2
Sweet corn	1.7	3.8	1.1	2.5
Tomatoes	2.5	5.0	1.7	3.4

** Soil salinity: EC_e in dS/m*
** Water quality: EC_w in dS/m*

For more details contact Growcom on 07 3620 3844.

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