

## APPENDIX 1: IDENTIFYING SOIL TEXTURE CLASSES

- Add water to a small amount of soil to make a ball about 4 cm in diameter. Keep adding water until the ball starts to stick to your hand.
- Make a ribbon by squeezing the ball between your thumb and fingers, trying to keep the sample in one flat length. Note the length of the ribbon when it breaks.
- You can estimate the soil texture from the following table. There are other textures between the three major groups but you only need to classify your sample into one of the following;

Texture Class	Properties of moist ball of soil
1. Sand	Will not form a ball or only a fragile ball. Forms a ribbon less than 10mm long. Has a very sandy feel, and no stickiness.
2. Loam	Forms a smooth, spongy ball. Ribbon 25-40mm long. Feels slightly sandy or silky and moderately sticky.
3. Clay	Forms a very smooth, plastic ball. Ribbon 50-75mm long or more. Little evidence of sand. Feels very sticky.



*Group discussion on problems of waterlogging and salinity in a local catchment*

## APPENDIX 2: CONVERSION FACTORS FOR ELECTRICAL CONDUCTIVITY UNITS

- The standard units in Australia for measuring electrical conductivity(EC) is dS/m or decisiemens/metre. A number of other units are still commonly used because of historical precedents, compatibility with international groups or personal preference.
- Some important conversion factors between the different units are;

dS/m or decisiemens/metre = mS/cm or millisiemens/centimetre = mmho/cm or millimhos/centimetre

dS/m or decisiemens/metre X 100 = mS/m or millisiemens/metre

dS/metre or decisiemens/metre X 1000 =  $\mu$ S/cm or microsiemens/centimetre  
= umho/cm or micromhos/centimetre  
= EC units

dS/m or decisiemens/metre X 640\* = ppm or parts per million  
(ppm X 14.28 = grains per imp. gall.)  
= mg/L or milligrams/litre  
=  $\mu$ g/ml or micrograms/millilitre

dS/m or decisiemens/metre X 0.34 = % total soluble salts in a 1:5 soil  
water suspension

\* 640 is an accepted average as the correct factor varies from 530 to 900 depending on the type of salt present and its concentration.

## APPENDIX 3: THE EFFECT OF SOIL SALINITY ON PLANT GROWTH

Approximate EC readings of a 1:5 soil water suspension, which cause a 10% yield reduction.

Values may be different if the soil is not uniform, eg a sand topsoil over a clay subsoil.

Plant tolerance	1:5 EC (dS/m)		
	Sand	Loam	Clay
Sensitive eg field peas	less than 0.04	less than 0.08	less than 0.16
Moderately sensitive eg lucerne, faba beans, sunflower	0.04-0.08	0.08-0.16	0.16-0.32
Moderately tolerant eg wheat, oats, safflower	0.08-0.18	0.16-0.38	0.32-0.75
Tolerant eg triticale, barley	0.18-0.31	0.38-0.64	0.75-1.28
Very tolerant eg barley grass	0.31-0.49	0.64-1.02	1.28-2.03
Extremely tolerant eg salt bush	more than 0.49	more than 1.02	more than 2.03

- In practice the readings for sand may be higher because salt is more easily leached from a sandy soil, and so plants can tolerate a higher salt level.
- Plants are affected by salinity throughout the root zone and so it is best to use an average figure (surface and sub-surface) in the tables below. Sampling for salinity should be done when values in the topsoil reach their maximum due to surface evaporation. In southern Australia this is usually in late summer.
- Salinity usually reduces the amount of soil water available to plants. In some cases it may be toxic to plants if present at high levels.

[Modified from: Principles of Sustainable Agriculture Leaflet #4, Dryland Salinity - early indicators and control measures. Department of Natural Resources and Environment Vic, September 1992.]



#### APPENDIX 4: TOLERANCE OF PLANT SPECIES TO SOIL ACIDITY

Tolerance	Pasture species	Field crops	Vegetable crops	Fruit crops	Cut Flowers
Very tolerant	Serradella Lotus	Triticale, oats			Protea
Tolerant	Sub clover Perennial ryegrass Cocksfoot Tall Fescue Perennial veldt grass	Lupins, linseed, vetch, millet, acid-tolerant wheat	Bean, cucumber, garlic, potato, pumpkin, sweetcorn, turnip	Nectarine	Waratah
Moderately tolerant	Balansa clover White clover Persian clover Rose clover Murex medic				
Sensitive	Phalaris	Barley, wheat sunflowers, peas maize, soybeans	Cabbage, cauliflower celery, onion peas, tomato	Apple, peach, almond, citrus, grape, walnut, raspberry	Carnation, chrysanthemum, rose, daffodil, gladiolus, tulip, freesia, gypsophila, liliiums
Very sensitive	Lucerne Annual medics	Canola	Beetroot, broccoli, brussel sprouts, carrot, lettuce, parsnip, spinach	Pear, cherry, plum strawberry	

From: Acid Soils; their occurrence and management in South Australia. L. Keeley, Primary Industries SA, 1992