



## Acknowledgements

This guidelines publication is an outcome of a FAO Consultation on "Water, Soil and Crop Management Relating to the Use of Saline Water" held in 1989 in Rome. A number of ideas and the conceptual framework of the guidelines were developed at this Consultation. The authors wish to acknowledge the resource persons of the consultation, namely Messrs. I.P. Abrol (India), A. Hamdy (Italy), A. Meiri (Israel) and A.H.M. Rady (Egypt) who have contributed to this publication through the Expert Consultation.

A good part of the research findings reported in these guidelines has come from the United States Salinity Laboratory, Riverside, California, and the authors gratefully acknowledge the staff of the Laboratory for their outstanding contribution.

The authors wish to express their gratitude to Mr. S.F. Scott, Chief, Water Resources, Development and Management Service, and Mr. R. Brinkman, Chief, Soil Resources, Management and Conservation Service, for their support and encouragement in the preparation of the guidelines. A number of people have reviewed the document and proofread the text; the authors are grateful to them.

Thanks are also due to Ms. C.D. Redfern for her assistance in the preparation of the final camera-ready text and to Mr. D. Mazzei for the revision of the illustrations.

It is hoped that the guidelines will be useful to the many research and extension workers and the farmers who currently use, or will use in the future, the largely untapped resource of "saline water" for agriculture in a sustainable manner.

USEFUL CONVERSION FACTORS AND FORMULAS	
$\text{TDS (mg/l)} \approx \text{EC (dS/m)} \times 640$	for EC between 0.1 and 5.0 dS/m
$\text{TDS (mg/l)} \approx \text{EC (dS/m)} \times 800$	for EC < 5.0 dS/m
$\text{TDS (lbs/ac} \approx \text{ft)} = \text{TDS (mg/l)} \times 2.72$	
$\text{TDS (tons/ac} \approx \text{ft)} = \text{TDS (mg/l)} \times 0.00136$	
$\text{sum of cations/anions (meq/l)} \approx \text{EC (dS/m)} \times 10$	for EC between 0.1 and 5.0 dS/m
$\log \text{ cations/anions (mmol}_c\text{/l)} \approx 0.955 + 1.039 \log \text{ EC (dS/m)}$	
$\log \text{ total soluble salts (mmol}_c\text{/l)} \approx 0.990 + 1.055 \log \text{ EC (dS/m)}$	
$\text{ionic strength (mol/l)} \approx \text{EC (dS/m)} \times 0.0127$	
$\text{osmotic pressure (atm)} \approx \text{EC (dS/m)} \times 0.40$	for EC between 3 and 30 dS/m

### List of abbreviations

SAR	= sodium adsorption ratio
EC	= electrical conductivity
EC <sub>iw</sub>	= electrical conductivity of irrigation water
SAR <sub>sw</sub>	= sodium adsorption ratio of soil water
dS/m	= deciSiemens per metre
mmol <sub>c</sub> /l	= millimol per litre
EC <sub>e</sub>	= electrical conductivity of soil saturated extract
TDS	= total dissolved solids
mg/l	= milligrams per litre
BCM	= billion cubic metres
MCM	= million cubic metres
ESP	= exchangeable sodium percentage
Y <sub>r</sub>	= relative yield
T	= tolerant crop
MT	= moderately tolerant crop
MS	= moderately sensitive crop
S	= sensitive crop
g/m <sup>3</sup>	= grams per cubic metre
RSC	= residual sodium carbonate
EC* <sub>e</sub>	= water uptake weighted electrical conductivity of soil saturation extract
π	= osmotic potential
π *	= water uptake weighted osmotic potential
adj. SAR	= adjusted sodium adsorption ratio
τ	= metric water potential
φ	= total water potential
$\bar{C}$	= mean salt concentration
V <sub>iv</sub>	= volume of infiltrated irrigation water
V <sub>dw</sub>	= volume of drainage water
LF	= leaching fraction
C <sub>iw</sub>	= salt concentration of irrigation water
C <sub>dw</sub>	= salt concentration of drainage water
$\bar{\tau}$	= mean metric water potential
φ <sub>f</sub>	= total water potential at any given point for irrigation scheduling
kPa	= killopascal
pCO <sub>2</sub>	= partial pressure of carbon dioxide (pascal Pa)

