

Title: Water quality for agriculture ...

Originated by: Agriculture
Department

More details



REFERENCES

- Abrol I.P. 1982 Technology of chemical, physical and biological amelioration of deteriorated soils. Presented at Panel of Experts on Amelioration and Development of Deteriorated Soils in Egypt, 2–6 May 1982, Cairo.
- Abrol I.P., Bhumbla D.R. and Bhanqqua G.P. 1972 Some observations on the effect of groundwater table on soil salinization. Proc. Internat. Symp. on New Developments in the Field of Salt Affected Soils, 4–9 December 1972. Ministry of Agriculture, ARE, Cairo, p. 41–48.
- Aceves N.E. Stolzy L.H. and Mehuys G.R. 1975 Effects of soil osmotic potential produced with two salt species on plant water potential, growth and grain yield of wheat. Plant and Soil 42:619–627.
- Agency for International Development. 1975 Water engineers, development and disease in the tropics. (F.E. McJunkin). USAID, Department of State, Washington DC.
- Agency for International Development. 1982 Water and human health. (F.E. McJunkin et al.) USAID, Department of State, Washington DC.
- Ahmed B., Kemper W.D., Haider G. and Niazi M.A. 1979 Use of gypsum stones to lower the sodium adsorption ratio of irrigation water. Soil Sci. Soc. Amer. J. 43:698–702.
- Ahmed N. 1972 Groundwater resources of Pakistan. Water and Power Development Authority, Lahore.
- Amer S.A. 1983 The study and improvement of soil productivity under plastic tunnels and open field conditions. Technical Report No. AG:NECP/BAH/501/KUW, FAO, Rome.
- APHA. 1980 American Public Health Association Standard Methods for the Examination of Water and Wastewater, 15th Edition. APHA-AWWA-WPCF, Washington DC. 1000 p.
- Arad A. 1983 A summary of the Artesian Coastal Basin of Guyana. J. Hydrol. 63:299–313.
- Australian Water Resources Council. 1969 Quality aspects of farm water supplies. Department of National Development, Canberra. 45 p.
- Ayers R.S. and Branson R.L. (eds.). 1973 Nitrates in the upper Santa Ana River Basin in relation to groundwater pollution. California Agriculture Experiment Station Bulletin 861. 60 p.
- Ayers R.S. and Westcot D.W. 1976 Water quality for agriculture. FAO Irrigation and Drainage Paper 29, FAO, Rome. 97 p.

- Aziz M.H.A. 1968 Crop water requirements and water quality. Salinity control in Kuwait. FAO Project Report (mimeo). 43 p and Tables.
- Back W. and Hanshaw B. 1970 Comparison of chemical hydrogeology of carbonate peninsulas of Florida and Yucatan. J. Hydrol. 10:330–368.
- Bain R.C. and Esmaili H. 1976 Santa Rosa effluent irrigation study. Final Report by Brown and Caldwell Engineers.
- Beltran J.M. 1978 Drainage and reclamation of salt-affected soils, Bardenas Area, Spain. Publication 24, International Institute for Land Reclamation and Improvement (ILRI), Wageningen, The Netherlands.
- Bernstein L. 1964 Salt tolerance of plants. USDA Agricultural Information Bulletin 283. 23 p.
- Bernstein L. 1965 Salt tolerance of fruit crops. USDA Agricultural Information Bulletin 292 8 p.
- Bernstein L. and Ayers R.S. 1955 Sloping seedbeds. In: California Agriculture, November 1955, 8 p.
- Bernstein L. and Fireman M. 1957 Laboratory studies on salt distribution in furrow irrigated soil with special reference to the pre-emergence period. Soil Science 83:249–263.
- Bernstein L. Fireman M. and Reeve R.C. 1955 Control of salinity in the Imperial Valley. US Department of Agriculture, Agricultural Research Service Bulletin 41(4). 15 p.
- Bernstein L. and Francois L.E. 1973a Comparisons of drip, furrow and sprinkler irigation. Soil Science 115:73–86.
- Bernstein L. and Francois L.E. 1973b Leaching requirement studies: Sensitivity of alfalfa to salinity of irrigation and drainage waters. Soil Sci. Soc. Amer. Proc. 37:931–943.
- Bernstein L. and Francois L.E. 1975 Effects of frequency of sprinkling with saline waters compared with daily drip irrigation. Agron. J. 67(2):185–191.
- Bernstein L., Francois L.E. and Clark R.A. 1974 Interactive effects of salinity and fertility on yields of grains and vegetables. Agron J. 66:412–421.
- Bernstein L. and Hayward H.E. 1958 Physiology of salt tolerance. Ann. Rev. Plant Physiol. 9:24–26.
- Biezok I. 1972 Concrete corrosion Concrete protection. Hungarian Academy of Sciences, Budapest. 500 p.
- Bingham F.T., Mahler R.J. and Sposito G. 1979 Effects of irrigation water composition on exchangeable sodium status of a field soil. Soil Science 127(4):248–252.
- Bouwer H. 1969 Salt balance, irrigation efficiency and drainage design. Amer. Soc. Civil Engineers (ASCE), Proc. 95(IRI):153–170.
- Bower C.A., Ogata G. and Tucker J.M. 1968 Sodium hazard of irrigation waters are influenced by leaching fraction and by precipitation or solution of calcium carbonate. Soil Science 10:29–34.
- Bower C.A., Ogata G. and Tucker J.M. 1969 Rootzone salt profiles and alfalfa growth as

- influenced by irrigation water salinity and leaching fraction. Agron. J. 61:783–785.
- Bower C.A., and Wilcox L.V. 1965 Precipitation and solution of calcium carbonate in irrigation operations. Soil Sci. Soc. Amer. Proc. 29:93–94.
- Bower C.A., Wilcox L.V., Akin G.W. and Keyes M.G. 1965 An index of the tendency of CaCo³ to precipitate from irrigation waters. Soil Sci. Soc. Amer. Proc. 29:91–92.
- Branson R.L., Gustafson C.D., March A.W., Davis S. and Strohman R.A. 1974 Monitoring soil salinity and leaf nutrient levels in a young avocado orchard under drip irrigation. Proc. Second Internat. Drip Congress, San Diego, California. p. 364–369.
- Bucks D.A., Nakayama F.S. and Gilbert R.G. 1979 Trickle irrigation water quality and preventive maintenance. Agricultural Water Management 2:149–162.
- Burdon D.J. and Safadi C. 1963 Ras-el-Ain: The great karst spring of Mesopotamia. (FAO Study). J. Hydrol. 1:58–95.
- Busch C.D. and Turner F. Jr. 1967 Sprinkler irrigation with high salt-content water. Trans. Amer. Soc. Agric. Engineers (ASAE) 10(4):494–496.
- Carter M.R. and Webster G.R. 1979 Calcium deficiency in some solonetzic soils of Alberta. J. Soil Sci. 30:161–174.
- Chapman H.D. and Pratt P.F. 1961 Methods of analysis for soils, plants and waters. University of California, Division of Agricultural Science.
- City of Fresno. 1980 City of Fresno Industrial Pretreatment Programme. Report by the City of Fresno, California.
- Clarke F.E. 1980 Corrosion and encrustation in water wells: A field guide for assessment, prediction and control. FAO Irrigation and Drainage Paper 34. FAO, Rome. 95 p.
- Comisión de Recursos Hidráulicos. 1974 Plan de Desarrollo Economico y Social, Madrid.
- Crites R.W. 1974 Irrigation with wastewater in Bakersfield, California. Report by Metcalf and Eddy Inc., Palo Alto, California.
- Dewan H.C., Sharma R.K. and Shamsan F. 1977 Chemical composition and suitability of drinking water from some important towns of the Yemen Arab Republic. FAO Project: UNDP/FAO/YEM 73/010. 20 p.
- Dewan H.C. 1978 **et al.** Irrigation water quality in the Yemen Arab Republic. Report by Soil and Water Research Section, Central Agricultural Research Organization. UNDP/FAO/YEM 73/010. 9 p.
- Dewis J. and Freitas F. 1970 Physical and chemical methods of soil and water analysis. FAO Soils Bulletin 10. FAO, Rome. 275 p.
- Dieleman P.J. (ed.) 1963 Reclamation of salt affected soils in Iraq. ILRI Publication No. 11. Wageningen. 175 p.
- Dieleman P.J. and de Ridder N.A. 1963 Studies of the salt and water movement in the Bol Guini Polder, Chad Republic. J. Hydrol. 1:311–343.
- Dieleman P.J. and Trafford B.D. 1976 Drainage testing. FAO Irrigation and Drainage Paper

- 28. FAO, Rome. 72 p.
- Dieleman P.L. 1980 **et al.** Drainage design factors An Expert Consultation on Drainage Design Factors, 22–29 October 1979, FAO Irrigation and Drainage Paper 38. FAO, Rome. 52 p.
- Dietrich G. and Kilakos J. 1971 Groundwater quality in the Messara Plain in Eastern Crete, Greece. Working Document No. 18. FAO/UNDP/AGL:SF/GRE 17.
- Donaldson D.R., Ayers R.S., Kaita K.Y. and Cabral F. 1978 Use of high boron sewage effluent on golf greens Calistoga, Napa County (California, USA). Western Landscaping News 18(7):15–17 (July 1978).
- Doneen L.D. 1958 (ed). Quality of water for irrigation. Proc. Conference on Quality of Water for Irrigation, University of California. Water Resources Centre Contribution 14. 208 p.
- Doneen L.D. 1964 Water quality for agriculture. Department of Irrigation, University of California, Davis. 48 p.
- Doneen L.D. 1967 Water quality requirements for agriculture. National Symposium on Quality Standards for National Waters. Educational Series No. 161:213–218. University of Michigan, Ann Arbor.
- Doneen L.D. 1971 Irrigation practice and water management. FAO Irrigation and Drainage Paper 1. Rome. 84 p.
- Doneen L.D. and Westcot D.W. 1984 Irrigation practice and water management. FAO Irrigation and Drainage Paper 1 Rev. 1. Rome. 63 p.
- Doorenbos J. and Kassam A.H. 1979 Yield response to water. FAO Irrigation and Drainage Paper 33. Rome. 193 p.
- Doorenbos J. and Pruitt W.O. 1977 Guidelines for predicting crop water requirements (Revised). FAO Irrigation and Drainage Paper 24. Rome. 143 p.
- Durum W.H., Heidel S.G. and Tison L.J. 1960 World-wide runoff of dissolved solids. Internat. Assoc. Scientific Hydrology 51:618–628.
- Dutt G.R., Pennington D.A. and Turner F. Jr. 1984 Irrigation as a solution to salinity problems of river basins. In: Salinity in Watercourses and Reservoirs, R.H. French (ed). Ann Arbor Science, pp. 465–472.
- DWR. 1965 Bulletin No. 130–63: Hydrologic Data, 1963. California Department of Water Resources, Sacramento.
- Eaton F.M. 1944 Deficiency, toxicity and accumulation of boron in plants. J. Agric. Res. 69:237–277.
- Eaton F.M. 1950 Significance of carbonates in irrigatin waters. Soil Science 69:123–133.
- Eckenfelder W.W. 1980 Principles of water quality management. CBI Pub. Co., Massachusetts.
- Eckstein Y. J. Hydrol. 1982 56:163-174.
- Ehlig C.F. and Bernstein L. 1959 Foliar absorption of sodium and chloride as a factor in

- sprinkler irrigation. Proc. Amer. Soc. Hortic. Sci. 74:661-670.
- Environmental Improvement Agency. 1974 New Mexico Public Water Supplies Chemical Data. Report by Water Supply Regulation Section, Environmental Improvement Agency, New Mexico Health and Social Services Department. 200 p.
- EPA. 1979 Process design manual for land treatment of wastewater. US Environmental Protection Agency.
- Evans K.J., Mitchell I.G. and Salau B. 1979 Heavy metal accumulation in soils irrigated by sewage and effect in the plant-animal system. Progressive Water Technology (Pergamon Press) 11(4/5):339–352.
- Ewart G.Y. 1965 Defining osmotic pressure in salinity problems. Proc. 12th ISCCT Congress, Puerto Rico. p. 82–89.
- FAO. 1964 Groundwater Research Project, Lower Basin of the Rio Grande de San Miguel. Annex II: Hydrologic Appraisal and Chemical Characteristics of Water. Report No. FAO/SF:5/ELS. FAO, Rome.
- FAO. 1965a Land and Water Resources Survey, Mauritius. Final Report, Volume IV Geology and Hydrology. Report No. FAO/SF:78/MAR 6. FAO, Rome.
- FAO. 1965b Water Management Studies in the Cumra Irrigation Area. FAO Report to Turkey No. 1975. FAO, Rome.
- FAO. 1969 Study of Water Resources in the Chad Basin. FAO/UNDP/Unesco Special Project No. 1600/-BMS. RD/SCE. 151 p.
- FAO. 1970a Irrigation Development Plan: Lower Shire Valley, Malawi. Report by Lockwood Survey Corporation Ltd., Toronto. Report for FAO/UNDP/MAL, Annex III: Climate and Hydrology.
- FAO. 1970b Usutu, Mbuluzi, Komati and Lomati River Basins: General Plan. Technical Annex: 1. Physiology and Hydrology Report by Engineering and Power Development Consultants, Sidcup, Kent, UK. FAO/UNDP/SF/SWA. FAO Rome. pp. 30–32.
- FAO. 1970c Enquêtes sur les terres et les eaux dans la Plaine des Gonaives et le Département du NordOuest Haiti. Volume III Eaux. FAO Report No. FAO/SF:45/HAI/3. FAO, Rome.
- FAO. 1970d Reconocimiento sobre el uso de aguas y tierras para el desarrollo de la Cuenca del Rio Huaura. Volumen III: Hidrología y Climatología, e Hidrogeología y Geología. Aplicada a la Ingeniería. FAO Report: FAO/SF:88/PER/23. FAO, Rome.
- FAO. 1971 Kunduz Kahnabad Irrigation Feasibility Study, Afghanistan (Appendix III). Report No. AGL/ SF/AFG/20. FAO, Rome.
- FAO. 1972a National Seminar on Water Management and Control at the Farm Level. FAO, Bangkok.
- FAO. 1972b Projet de développement agricole de la Plaine de Morondava, Madagascar. Climatologie Hydrologie. Report by Groupement AHI-SATEC ESSEN, 1972. FAO Report No. LA:SF/MAG/14.
- FAO. 1972c Overall Study of the Messara Plain. Report on Study of the Water Resources and their Exploitation for Irrigation in Eastern Crete. FAO Report No. AGL:SF/GRE/31.

- FAO. 1973 Investigation and Feasibility Study of an Irrigation Project South of Lake Chad. Report by Sir M. MacDonald & Partners, London. Report No. AGL:SF/NIR/43. FAO, Rome.
- FAO. 1974 Development and Management of Water Resources, Jamaica. Rio Minho Milk River Basin. Annex III Water Quality. FAO Report No. AGL:DP/JAM/70/512. FAO, Rome.
- FAO. 1975 Improvement of Irrigation Facilities through Groundwater Development. Guimba Irrigation Development Project, Annex II, Water Reources Report No. AGO:DP/PHI/70/531. FAO, Rome.
- FAO. 1976 Prognosis of salinity and alkalinity. FAO Soils Bulletin 31. FAO, Rome.
- FAO. 1980a Irrigation and Drainage Rehabilitation of the Mechanized Farm. Report by Sir. M. MacDonald & Partners. Project FAO/UNDP/EGY/77/007. pp. 7–12.
- FAO. 1980b Groundwater Development in the Kamil/Wafi District, Sharqiya Region. Field Document No. 15. Project FAO/UNDP/OMA/77/001. FAO, Rome.
- FAO. 1981a Water Resources Development in the Molai Area, Greece. Technical Report, Volume II Appendixes. FAO Report AG:DP/GRE/77/023. FAO, Rome.
- FAO. 1981b Sistemas de Riego del Rio Pichanas Cordoba, Argentina. Project TCP/ARG/8904. Volumen I Borrador, INYPSA. FAO, Rome.
- FAO. 1983 Mission Report on Irrigation, Drainage and Related Aspects for a Centre for Intensive Pasture, Fodder and Livestock Production (Wongnute Ranch), People's Republic of China. FAO/UNDP, June 1983.
- FAO. 1984 Trace elements in agriculture. FAO Soils Bulletin (Draft), Soil Resources, Management and Conservation Service. FAO, Rome. 68 p.
- FAO/Unesco. 1973 Irrigation, Drainage and Salinity. An International Sourcebook. Paris, Unesco/Hutchinson (Publishers), London. 510 p.
- Fathi A. and Soliman F.H. 1972 Variations in soluble and insoluble constituents of Nile water after the High Dam. In: Internat. Symp. on New Developments in the Field of Salt Affected Soils, 4–9 December 1972. Ministry of Agriculture, Arab Republic of Egypt, Cairo.
- Feachem R., McGarry M. and Mara D. (eds). 1977 Water, Wastes and Health in Hot Climates. Wiley, Chichester, UK.
- Fireman M. and Branson R.L. 1965 Gypsum and other chemical amendments for soil improvement. California Experiment Station and Extension Service Leaflet No. 149. 4 p.
- Fong K.H. and Ulrich A. 1970 Calcium nutrition of white rose potato in relation to growth and leaf minerals. Communications in Soil Science and Plant Analysis 1(1):43–45.
- Ford H.W. and Tucker D.P.H. 1974 Water quality measurements for drip irrigation systems. Florida Agricultural Experiment Stations Journal Series No. 5598. Lake Alfred, Florida.
- Grove A.T. 1970 Rise and fall of Lake Chad. Geographical Magazine, London. March 1970. pp 332–339.

- Grove A.T. 1972 The dissolved and solids load carried by some West African Rivers: Senegal, Niger, Benue and Shari. J. Hydrol. 16:277–300.
- Haider G. and Ali T. 1975 Amelioration of saline-alkali gypsiferous soils. In: Proc. Internat. Conf. on Waterlogging and Salinity. Lahore, 13–17 October 1975. pp. 322–331.
- Halsey D. 1974 Growth and salt accumulation with desert drip irrigation. California Citograph, December, p. 47–48.
- Hanan J.J. 1973 Denver water quality. Colorado Flower Growers Association Bulletin No. 280, Denver, Colorado.
- Hanan J.J. 1976 Controlling salts in greenhouse soils. Colorado Flower Growers Association Bulletin No. 318. Denver, Colorado.
- Hanna A.B. and Al-Talbani K. 1970 Evaluation of water quality in Iraq. First Technical Conference, Arab Federation of Agricultural Engineers. Khartoum.
- Harding R.B., Miller M.P. and Fireman M. 1958 Absorption of salts by citrus leaves during sprinkling with water suitable for surface irrigation. Proc. Amer. Soc. Hortic. Sci. 71:248–256.
- Harlin C.C. 1980 Re-use of municipal wastewater in agriculture. Presented at WHO Seminar on Health Aspects of Treated Sewage Re-use, Algiers, 1–5 June 1980.
- Hayward H.E. and Bernstein L. 1958 Plant growth relationships on salt affected soils. Botanical Review 128:584–635.
- Hazen and Sawyer. 1979 Taiz Water Supply and Sewerage Project. Irrigation and Compensation Study, Yemen Arab Republic. Maghell E.T., Ayers R.S. and Fahey R.J. for Hazen and Sawyer, New York, and Tipton and Kalmback, Denver, Colorado.
- Hefny K. 1984 Water Data Reports. Research Institute for Groundwater, Cairo.
- Hibbs C.M. and Thilsted J.P. 1983 Toxicosis in cattle from contaminated well water. Veterinary and Human Toxicology 25(4) August 1983.
- Hoffman G.J. 1980 Guidelines for reclamation of salt-affected soils. Proc. Inter-American Salinity and Water Management Technology Conference. Juarez, Mexico. 11–12 December 1980. pp. 49–64.
- Hoffman G.J. **et al.** 1983 Salt tolerance of corn in the Delta. California Agriculture 37:7 July-August 1983.
- Howard D.D. and Adams F. 1965 Calcium requirement for penetration of subsoils by primary cotton roots. Soil Sci. Soc. Amer. Proc. 29:558–562.
- Hughes H.E. and Hanan J.J. 1978 Effect of salinity in water supplies on greenhouse rose production. J. Amer. Hortic. Sci. 103(5):694–699.
- Issar A., Bein A. and Mitchaeli A. 1972 On ancient water on the Upper Nubian Sandstone Aquifer in Central Sinai and Southern Israel. J. Hydrol. 17:353–374.
- Jacobson T. and Adams R.M. 1958 Salt and silt in ancient Mesopotamian agriculture. Science 128:1251–1258.

- Jacobson G. and Hill P.J. 1980 Groundwater resources of Niue Island. Bureau of Mineral Resources, Geology and Geophysics. Report No. 1980/14, Australia.
- Kessler J. (ed). 1973 Drainage principles and applications II: Theories of field drainage and watershed runoff. ILRI Publication 16, Wageningen. 374 p.
- Kobayashi J. 1959 Chemical investigation on river waters of southeast Asiatic countries Thailand. Reprint from: Berichte des Ohara Instituts, pp. 167–233.
- Koenigs F.F.R. and Brinkman R. 1964 Influence of partial sodium and magnesium saturation on the structural stability of clay soils. 8th International Congress of Soil Science, Bucharest. pp. 219–225.
- Kohler K.O. Jr. 1953 Contour-furrow irrigation. USDA Soil Conservation Service. Leaflet 324.
- Langelier W.F. 1936 The analytical control of anticorrosion water treatment. J. American Waterworks Association 28:1500–1521.
- Law L.P. 1968 Agricultural utilization of sewage effluent and sludge: An annotated bibliography. Federal Water Pollution Control Federation. Pub. No. CWR 2. Washington DC.
- Lawrence A.R. and Dharmaguna-Wardena H.A. 1983 Vertical recharge to a confined limestone aquifer in Northwest Sri Lanka. J. Hydrol. 63:287–297.
- Llerena V.F.A. **et al.** 1977 Trabajo de investigación desarrollados en el Distrito de Riego E1 Rio Yaqui, Sonora. la Parte. Memorandum Tecnico Num 364. Dirección General de Distritos de Riego, Mexico DF. 100 p.
- Loehr R.C. (ed). 1977 Land as waste management alternative. Ann Arbor Science, Michigan.
- Maas E.V. 1984 Salt tolerance of plants. In: The Handbook of Plant Science in Agriculture. B.R. Christie (ed). CRC Press, Boca Raton, Florida.
- Maas E.V. and Hoffman G.J. 1976 Crop salt tolerance: Evaluation of existing data. In: Proc. International Salinity Conference, Lubbock, Texas. August 1976. pp. 187–198.
- Maas E.V. and Hoffman G.J. 1977 Crop salt tolerance Current assessment. J. Irrigation and Drainage Division, ASCE 103(IRZ): 115–134. Proceeding Paper 12993.
- Maas E.V. and Hoffman G.J. 1983 Sensitivity of corn at various growth stages. California Agriculture Volume 37(7), July-August 1983.
- MacDonald and Partners. 1971 Lower Khalis Project Feasibility Report (Iraq). April 1971, London. pp. 15–17.
- Mann A.W. and Deutscher R.L. 1978 Hydrogeochemistry of a calcrete-containing aquifer near Lakeway, Western Australia. J. Hydrol. 38:357–377.
- Marsh A.W. 1974 Water use by drip and sprinkle irrigated avocados related to plant cover, evaporation and air temperature. Proc. Second International Drip Congress, San Diego, California. p. 346–350.
- Mather T.H. 1984 Environmental management for vector control in rice fields. FAO Irrigation

- and Drainage Paper No. 41. FAO, Rome. 152 p.
- Mazor E. and Verhagen B. Th. 1976 Hot springs of Rhodesia: their noble gases, isotropic and chemical composition. J. Hydrol. 28:29–43.
- Mazor E. **et al.** 1977 Northern Kalahari groundwaters: Hydrologic, isotropic and chemical studies at Orapa, Botswana. J. Hydrol. 34:203–234.
- McJunkin F.E. 1975 Water engineers, development and diseases in the tropics. US Agency for International Development, Department of State, Washington DC.
- McJunkin F.E. **et al.** 1982 Water and human health. US Agency for International Development, Department of State, Washington DC.
- Mikkelson D.S. and Brandon D.M. 1983 Diagnosis of zinc deficiency in rice. In: Soil and Plant Tissue Testing, University of California, Division of Agricultural Science Bull. 1879. 43 p.
- Mohamed N.A. and Amer F. 1972 Sodium carbonate formation in Ferhash area and possibility of biological dealkalization. Proc. Internat. Symp. on New Developments in the Field of Salt Affected Soils. 4–9 December 1972. Ministry of Agriculture, Cairo. p. 346.
- Mona Reclamation Project. 1972 Annual Report for Mona Reclamation Project: July 1971-June 1972 (7th year), USAID, Islamabad, Pakistan.
- Nakayama F.S. 1982 Water analysis and treatment techniques to control emitter plugging. Proc. Irrigation Association Conference, 21–24 February 1982. Portland, Oregon.
- National Academy of Sciences and National Academy of Engineering. 1972 Water quality criteria. United States Environmental Protection Agency, Washington DC. Report No. EPA-R373-033. 592 p.
- National Academy of Sciences. 1974 Nutrients and toxic substances in water for livestock and poultry. Washington DC. 93 p.
- National Irrigation Administration. 1978 Irrigation Development Plan for Central Luzon, Philippines. Appendix E. Water Resources and Utilization (Groundwater).
- National Irrigation Administration. 1984 Wata Data Files. Diliman, Quezon City, Philippines.
- National Research Council of Canada. 1974 Land for waste management. Proc. of an International Conference. Ottawa.
- Natural Resources Authority. 1978 Current status of potable water pollution in Jordan. Jordan National Water Symposium, 12–22 March 1978. NRA, Amman.
- Neja R.A., Ayers R.S. and Kasimatis A.N. 1978 Salinity appraisal of soil and water for successful production of grapes. Leaflet 21056, Division of Agricultural Sciences, University of California, Berkely.
- Nielson R.F. and Cannon O.S. 1975 Sprinkling with salty well water can cause problems. Utah Science, Agricultural Experiment Station 36(2):61–63.
- Ochtman L.H.J. and Debele B. 1975 Detailed soil survey and irrigability land classification of Gode Agricultural Research Station. Institute of Agricultural Research, Soil Survey

- Report No. 1. Addis Ababa.
- Ogilbee W. and Anderson H.R. 1965 Exploratory drilling for groundwater in Western Sokoto Province, Nigeria (Gwandu Formation). US Geological Survey Open File Report, July 1965.
- Oltman R.E. 1968 Reconnaissance investigation of discharge and water quality of the Amazon River. US Geological Survey Circular No. 552. 16 p.
- ONERN. 1973 Inventario, evaluación y uso racional de los recursos naturales de la Costa. Officina Nacional de Evaluación de Recursos Naturales (ONERN), República del Peru: Cuenca del Rio Pisco, 1971; Cuenca del Rio Ica, 1971; Cuenca del Rio Camana-Mojes, 1973.
- Oster J.D. and Rhoades J.D. 1977 Various indices for evaluating the effective salinity and sodicity of irrigation waters. In: Proc. International Salinity Conference, Lubbock, Texas, 16–20 August 1976. pp. 1–14.
- Oster J.D. and Rhoades J.D. 1983 Irrigation with saline water. In: Soil and Water Newsletter. University of California Cooperative Extension, Fall 1983, No. 56, pp. 1–3.
- Oster J.D. and Schroer F.W. 1979 Infiltration as influenced by irrigation water quality. Soil Sci. Soc. Amer. J. 43:444–447.
- Oster J.D., Willardson L.S. and Hoffman G.J. 1972 Sprinkling and ponding techniques for reclaiming saline soils. Trans. ASAE 15(6): 1115–1117.
- Ozkan A. 1978 Project 36 Water Well Drilling and Construction in Yemen Arab Republic. Ministry of Agriculture and Water, Water Resources Development Department, Kingdom of Saudi Arabia. Sana'a, Yemen Arab Republic.
- Page A.L. 1974 Fate and effects of trace elements in sewage sludge when applied to agricultural lands. US Environmental Protection Agency Report No. EPA670/2–74–005. 108 p.
- Paliwal K.V. and Gandhi A.P. 1976 Effect of salinity, SAR, Ca:Mg ratio in irrigation water, and soil texture on the predictability of exchangeable sodium percentage. Soil Science 122:85–90.
- Parra J.R. 1976 Consideraciones sobre la salinidad del suelo de la Cuenca del Lago de Maracaibo. En Jornadas de Ingeniería Hidráulica, Maracaibo, Venezuela.
- Pasternak D., Twersky M. and de Marach Y. 1975 Irrigation experiments with brackish water. Report BGUN-RDA-54–75, Ben Gurion University of The Negev, Israel.
- Payne B.R., Quiljano L. and Latorre C. 1979 Environmental isotopes in a study of the origin of salinity of groundwater in the Mexicali Valley, Mexico. J. Hydrol. 41:201–215.
- Pearson G.A. 1960 Tolerance of crops to exchangeable sodium. USDA Information Bulletin No. 216. 4 p.
- Perkins P.H. 1981 The corrosion resistance of concrete sanitary engineering structures. Concrete International. April 1981. p. 75–81.
- Pillsbury A.F. 1968 Sprinkler irrigation. FAO Agricultural Development Paper 88. FAO, Rome.

- Pratt P.F. 1972 Quality criteria for trace elements in irrigation waters. California Agricultural Experiment Station. 46 p.
- Prichard T.L. **et al.** 1983 Relationships of irrigation water salinity and soil-water salinity. California Agriculture 37(7): 11–15. July-August 1983.
- Pulawski B. and Obro H. 1976 Groundwater study of a volcanic area near Bandung, Java, Indonesia. J. Hydrol. 28:53–72.
- Rader L.F. Jr. et al. 1943 Salt index for fertilizers. Soil Science 55:201–208.
- Rahman W.A. and Rowell D.L. 1979 The influence of magnesium in saline and sodic soils: A specific effect or a problem of cation exchange? J. Soil Science 30:535–546.
- Rallings R. 1966 An investigation into the causes of failures of farm dams in the Brigalow Belt of Central Queensland. Bulletin 10, Water Research Foundation of Australia, New South Wales.
- Reeve R.C., Pillsbury A.F. and Wilcox L.V. 1955 Reclamation of a saline and high boron soil in the Coachella Valley of California. University of California, Hilgardia 24(4):69–91.
- Rhoades J.D. 1968 Leaching requirement for exchangeable sodium control. Soil Sci. Soc. Amer Proc. 32: 652–656.
- Rhoades J.D. 1972 Quality of water for irrigation. Soil Science 113:277–284.
- Rhoades J.D. 1974 Drainage for salinity control. In: Drainage for Agriculture. Van Schilfgaarde J. (ed). Amer. Soc. Agron. Monograph No. 17, pp 433–462.
- Rhoades J.D. 1977 Potential for using saline agricultural drainage waters for irrigation. Proc. Water Management for Irrigation and Drainage. ASCE, Reno, Nevada. 20–22 July 1977. pp. 85–116.
- Rhoades J.D. 1982 Reclamation and management of salt-affected soils after drainage. Proc. First Annual Western Provincial Conference on Rationalization of Water and Soil Research and Management, Alberta, Canada. pp. 123–197.
- Rhoades J.D. 1984a Reusing saline drainage waters for irrigation: A strategy to reduce salt loading of rivers. In: Salinity in Watercourses and Reservoirs, R.H. French (ed). Proc. 1983 Internat. Symp. on State-of-the-Art Control of Salinity, 13–15 July 1983, Salt Lake City, Utah. Ann Arbor Science. pp. 455–464.
- Rhoades J.D. 1984b New strategy for using saline waters for irrigation. In: Water Today and Tomorrow. Proc. Speciality Conference at Flagstaff Arizona. ASCE.
- Rhoades J.D. and Clark M. 1978 Sampling procedures and chemical methods in use at the United States Salinity Laboratory for Characterizing Salt-affected Soils and Waters. Memo Report. US Salinity Laboratory, Riverside, California.
- Rhoades J.D. and Merrill S.D. 1976 Assessing the suitability of water for irrigation: Theoretical and empirical approaches. In: Prognosis of Salinity and Alkalinity. FAO Soils Bulletin 31. FAO, Rome. po. 69–110.
- Rhoades J.D., Oster J.D., Ingvalson E.D., Tucker J.M. and Clark M. 1973 Minimizing the salt burdens of irrigation drainage waters. J. Environmental Quality 3:311–316.

- Richards L.A. 1954 Diagnosis and improvement of saline and alkali soils. USDA Agricultural Handbook No. 60, US Department of Agriculture, Washington DC. 160 p.
- Robinson F.E. 1973 Increase in conductivity of irrigation water during sprinkling. Agron. J. 65(1): 130.
- Robinson F.E. 1980 Irrigation rates critical in Imperial Valley alfalfa. California Agriculture. October 1980. p. 18.
- Roche M.A. 1974 Géochimie et tracage naturel ionique et isotropique, deux voies complémentaires pour l'étude de la régulation saline du système hydrologique du Lac Tchad. ORSTOM, Paris. 32 p.
- Roundy B.A. 1984 Estimation of water potential components of saline soils of Great Basin Rangelands. Soil Sci. Soc. Amer. J. 48:645–650.
- Saad K.F. 1970 Etude hydrogéologique de l'est du Mali. Unesco Report No. 1856/BMS.RD/SCF. Paris.
- Sagardoy J.A. 1980 Irrigation system rehabilitatin study Angostura Irrigation Scheme, Bolivia. Project FAO/UNDP/BOL/78/005. FAO, Rome.
- Savva A.P. 1972 Foliar absorption of sodium and chloride in citrus as influenced by sprinkler application rates. Master of Science Thesis, University of Arizona Library, Tuscon, Arizona. 56 pp.
- Savva A.P., Karam R., Fathi M. and Awartari M. 1978 Hamraniuah irrigation practices, Technical Report No. 2. FAO/UNDP/United Arab Emirates. June 1978.
- Savva A.P., Karam R., Thanki S.B., Fathi M. and Awartani M. 1981 Irrigation practices in relation to crop response, water use, and soil salinity. FAO/UNDP/United Arab Emirates. April 1981. 37 p.
- Savva A.P. **et al.** 1984 Irrigation practices in relation to crop response, water use and soil salinity (1980–1983). Technical Report No. 6. FAO/UNDP/UAE. FAO, Rome. 45 p.
- Schekel K.A. 1971 The influence of increased ionic concentrations on carnation growth. J. Amer. Soc. Hortic. Sci. 96(5):649–652.
- Schofield R.K. 1947 A ratio law governing the equilibrium of cations in the soil solution. International Congress of Applied Chemistry. Proc. 11 Meeting (London) 3:257–261.
- Sellasie T.G., Eticha G. and Kandiah A. 1983 Appraisal of Awash River water quality for irrigation in the Middle Awash. FAO Project Report, FAO, Rome. 10 p.
- Shainberg I. and Letey J. 1983 Response of soils to sodic and saline conditions. Hilgardia 52(2). University of California Press.
- Shalhavet J. 1984 Management of irrigation with brackish water. In: Soil Salinity under Irrigation. I. Shainberg and J. Shalhavet (eds). Ecological Studies 51:298–318. Springer-Verlag, New York.
- Shaw R.J. et al. 1981 Technical Bulletin, Queensland Department of Primary Industries, Queensland, Australia.
- Simson C.R., Corey R.B. and Summer M.E. 1979 Effect of varying Ca:Mg ratios on yield

- and composition of maize (**Zea mays**) and alfalfa (**Medicago sativa**). Communications in Soil Science and Plant Analysis 10:153–162.
- Sanha B.K. and Singh N.T. 1976 Salt distribution around roots of wheat under different transpiration rates. Plant and Soil 44:141–147.
- Soil Improvement Committee. 1975 Western Fertilizer Handbook. California Fertilizer Association, Sacramento, California. 250 p.
- Sopper W.E. and Kardos L.T. (eds). 1973 Recycling treated municipal wastewater and sludge through forest and crop land. Pennsylvania State University Press, Pennsylvania.
- State of Qatar. 1982 Analysis of irrigation water, Wadi el Araig, South Qatar. Water Laboratory, Water Department, State of Qatar.
- State Water Resources Control Board. 1981 Evaluation of agricultural irrigation projects using reclaimed water. Report prepared by Boyle Engineering Corporation for the Office of Water Recylcing, Sacramento, California.
- Stylianou Y. and Orphanos P.I. 1970 Irrigation of Shamouti oranges with saline water. Technical Bulletin No. 6, Cyprus Agricultural Research Institute, Nicosia.
- Suarez D.L. 1981 Relation between pHc and Sodium Adsorption Ratio (SAR) and an alternate method of estimating SAR of soil or drainage waters. Soil Sci. Soc. Amer. J. 45:469–475.
- Suarez D.L. 1982 Graphical calculation of ion concentrations in calcium carbonate and/or gypsum soil solutions. J. Environmental Quality 11:302–308.
- Subramanian V. 1979 Chemical and suspended-sediment characteristics of rivers of India. J. Hydrol. 44:37–55.
- Tanji K. 1976 Irrigation tailwater management. Water Science Report No. 4011 (1975–76 Annual Report), UC Davis, April 1976.
- Tanji K. 1977 Irrigation tailwater management. Water Science Report No. 4014 (1976–77 Annual Report), UC Davis, June 1977.
- Taylor W.H. 1977 Concrete Technology and Practice. 4th Edition. McGraw-Hill, Sydney. 450 p.
- Thien S.J. and Oster J.D. 1981 The international system of units and its particular application to soil chemistry. J. Agronomic Education 10:62–70, Nov-Dec 1981.
- Tietjen C., Bramm A., El-Bassam N. and Fleer H.O. 1978 Land treatment of wastewater in Braunschweig and in Wolfsburg, Germany. In: State of Knowledge in Land Treatment of Wastewater, Volume 1: Proc. International Symposium held 20–25 August 1978, Hanover, New Hampshire. pp. 221–229.
- Tijook T.K. 1983 Defluoridation of water supplies. Waterlines 2(1):26. July 1983.
- Tillman R.E. 1981 Environmental guidelines for irrigation. US Man and the Biosphere Program and US Agency for International Development. New York Botanical Garden Cary Arboretum, Millbrook, New York.

- Tipton and Kalmbach Inc. 1972 Feasibility of the Kufra Agricultural Project. 1971 Programme Development. 19 p.
- Tuolumne 1980 Regional Water District. Operations Manual for the District. Tuolumne Regional Water District, Sonora, California.
- Ulrich A. and Mostafa M.A.E. 1976 Calcium nutrition of the sugarbeet. Communications in Soil Science and Plant Nutrition 7(5):483–495.
- Unesco-UNDP. 1970 Research and training on irrigation with saline water. Technical Report of UNDP Project: Tunisia 5. 256 p.
- United States Bureau of Reclamation. 1975 Concrete Manual, 8th Edition. Washington DC. 350 p.
- United States Bureau of Reclamation and the South Delta Water Agency. 1980 Effects of the Central Valley Project upon the Southern Delta Water Supply, Sacramento-San Joaquin River Delta, California.
- United States Geological Survey. 1965 Water Supply Paper No. 1950, Washington DC. 316 p.
- United States Geological Survey. 1974 Quality of surface waters of the United States. Water Supply Papers Nos. 2145–2150.
- United States Geological Survey. 1975 Groundwater resources of American Samoa with emphasis on the Tafuna-Leone Plain, Tutuila Island. Prepared in cooperation with Department of Public Works, Pago Pago, American Samoa. Water Resources Investigation 29–75.
- University of California Committee of Consultants. 1974 Guidelines for interpretation of water quality for agriculture. University of California, Davis. 13 p.
- USDA/US Salinity Laboratory Staff. Salinity Management in Agriculture (in preparation).
- van Hoorn J.W. 1971 Quality of irrigation water, limits of use and prediction of long-term effects. In: FAO Irrigation and Drainage Paper 7, Salinity Seminar, Baghdad. FAO, Rome. p. 117–135.
- van Hoorn J.W. 1979 Effect of capillary flow on salinization and the concept of critical depth for determining drain depth. Paper No. 4.06. In: Proc. International Drainage Workshop, 16–20 May 1978. ILRI Publication No. 25, Wageningen. pp. 686–700.
- Van't Leven J.A. (ed). 1964 Report on the Seminar on Waterlogging in Relation to Irrigation and Salinity Problems, Lahore, Pakistan. 49 p.
- Van't Leven J.A. and Haddad M.A. 1968 Surface irrigation with saline water on a heavy clay soil in the Medjerda Valley, Tunisia. Institute for Land and Water Management Research, Technical Bulletin No. 54. Netherlands J. Agriculture, Wageningen 15:281–303.
- Van Schilfgaarde J., Bernstein L., Rhoades J.D. and Rawlins S.L. 1974 Irrigation management for salt control. J. Irrigation and Drainage Division, ASCE 100:321–338.
- Vermeiren L. and Jobling G.A. 1980 Localized irrigation Design, installation, operation and evaluation. FAO Irrigation and Drainage Paper 36. FAO, Rome.

- WAPDA. 1973 Effect of tubewell water of different salinities on soil conditions and crop growth. West Pakistan Water and Power Development Authority, Publication 25, 94 p.
- Water Development Department. 1978 Water Data Files, Nicosia.
- Westcot D.W. 1979 Waterlogging and salinity conditions in Sistema Nacional de Riego No. 1 (Cochabamba Valley, Bolivia). Report of Project UNDP/FAO/BOL/78/005. FAO, Rome. 8 p.
- WHO. 1973 Reuse of effluents: Methods of wastewater treatment and health safeguards. Report of a WHO Meeting of Experts. Tech. Rep. No. 517, WHO, Geneva.
- WHO. 1982 Biological control of vectors of disease. Sixth Report of the WHO Expert Committee on Vector Biology and Control. Tech. Rep. No. 679. WHO, Geneva. 39 p.
- Wilcox L.V. 1948 The quality of water for irrigation. US Dept. of Agric. Tech. Bull. No. 962:1–40.
- Wilcox L.V. 1960 Boron injury to plants. USDA Bulletin No. 211. 7 p.
- Wilcox L.V. 1963 Factors for calculating the Sodium Adsorption Ratio (SAR). US Salinity Laboratory Mimeo Report.
- Wilcox L.V. 1966 Tables for calculating the pHc values of waters. US Salinity Laboratory Mimeo Report. 8 p.
- Wilcox L.V., Blair G.Y. and Bower C.A. 1954 Effect of bicarbonate on suitability of water for irrigation. Soil Science 77:259–266.
- Wildes R.A. 1984 Irrigation with saline groundwater as a strategy for salinity control in the Shepparton Region of Northern Victoria, Australia. In: Salinity in Water Resources and Reservoirs. E.H. French (ed). Ann Arbor Science, pp. 255–264.
- Wilson C.W. and Beckett F.E. 1968 Municipal effluent for irrigation. Louisiana Tech. Foundation, Ruston, Louisiana.
- Worthington E.B. (ed). 1977 Arid Land Irrigation in Developing Countries: Environmental Problems and Effects. Pergamon Press, Oxford. 463 p.
- Wye College. 1975 Wadi Dhuleil, Jordan An Ex-post Evaluation. Wye College (University of London), Algerian Development Unit Occasional Paper No. 1.
- Yaron B., Danfors E. and Vaadia Y. (eds). 1973 Arid Zone Irrigation. Ecological Studies Volume 5, Springer-Verlag, New York.

FAO TECHNICAL PAPERS

FAO IRRIGATION AND DRAINAGE PAPERS

- 1 Irrigation practice and water management, 1972 ($Ar^* E^* F^* S^*$)
- 1 Rev.1 Irrigation practice and water management, 1984 (E)
- 2 Irrigation canal lining, 1971 (New edition, 1977, available in E, F and S in the FAO Land and Water Development Series, No. 1)
- 3 Design criteria for basin irrigation systems, 1971 (E*)
- 4 Village irrigation programmes a new approach in water economy, 1971 (E* F)

5 Automated irrigation, 1971 (E* F* S*) 6 Drainage of heavy soils, 1971 (E* F S*) 7 Salinity seminar, Baghdad, 1971 (E* F) 8 Water and the environment, 1971 ($E^* F^* S^*$) 9 Drainage materials, 1972 (E* F* S*) 10 Integrated farm water management, 1971 ($E^* F^* S^*$) 11 Planning methodology seminar, Bucharest, 1972 (E* F*) 12 Farm water management seminar, Manila, 1972 (E*) 13 Water use seminar, Damascus, 1972 (E* F*) 14 Trickle irrigation, 1973 (E* F* S*) Drainage machinery, 1973 (E* F*) 15 16 Drainage of salty soils, 1973 (C* E* F* S*) 17 Man's influence on the hydrological cycle, 1973 ($E^*F^*S^*$) 18 Groundwater seminar, Granada, 1973 (E* F S) 19 Mathematical models in hydrology, 1973 (E) 20/1 Water laws in Moslem countries - Vol. 1, 1973 (E* F) 20/2 Water laws in Moslem countries - Vol. 2, 1978 (EF) 21 Groundwater models, 1973 (E) 22 Water for agriculture - index, 1973 (E/F/S*) 23 Simulation methods in water development, 1974 (E F* S*) 24 Crop water requirements, (rev.) 1977 ($\mathbb{C}^* \to \mathbb{E} \to \mathbb{F} \to \mathbb{F}$) 25 Effective rainfall, 1974 (C* E* F* S*) 26/1 Small hydraulic structures - Vol. 1, 1975 (E F S) 26/2 Small hydraulic structures - Vol. 2, 1975 (E F S) 27 Agro-meteorological field stations, 1976 (E F* S*) 28 Drainage testing, 1976 (EFS) 29 Water quality for agriculture, 1976 ($E^* F^* S^*$) 29 Water quality for agriculture, 1985 (C** E F S) Rev.1 30 Self-help wells, 1977 (E) 31 Groundwater pollution, 1979 (C* ES) 32 Deterministic models in hydrology, 1979 (E) 33 Yield response to water, 1979 (C* EFS) 34 Corrosion and encrustation in water wells, 1980 (E) 35 Mechanized sprinkler irrigation, 1982 (CEFS) 36 Localized irrigation, 1980 (Ar C E F S) 37 Arid zone hydrology, 1981 ($C^{**}E^*$) 38 Drainage design factors, 1980 (Ar C E F S) 39 Lysimeters, 1982 (CEFS) 40 Organization, operation and maintenance of irrigation schemes, 1982 (C** E F S**) 41 Environmental management for vector control in rice fields, 1984 (E F S) 42 Consultation on irrigation in Africa, 1987 (EF) 43 Water lifting devices, 1986 (E) 44 Design and optimization of irrigation distribution networks, 1988 (E F^{**}) 45

Guidelines for designing and evaluating surface irrigation systems, 1989 (E)

- 46 CROPWAT a computer program for irrigation planning and management, 1992 (E F S)
- Wastewater treatment and use in agriculture, 1992 (E)
- The use of saline waters for crop production, 1993 (E)
- 49 CLIMWAT for CROPWAT, 1993 (E)
- 50 Le pompage éolien, 1994 (F)

Availability: December 1994

- Ar Arabic
- C Chinese
- E English
- F French
- P Portuguese
- S Spanish

Multil - Multilingual

- * Out of print
- ** In preparation

The FAO Technical Papers are available through the authorized FAO Sales Agents or directly from Distribution and Sales Section, FAO, Viale delle Terme di Caracalla, 00100 Rome, Italy.





