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Agricultural Research Service, U.S. Department of Agriculture

Irrigation Water Quality

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Irrigation Water Quality

1. Accumulation of micronutrients and heavy metals by plants irrigated with sewage effluent.

Sadik, M. K.; Ali, M. E.; Rabie, M. H.; Khalil, M. E. A.

Second African Soil Science Society Conference on Soil and Water Management for Sustainable Productivity proceedings of the conference at the Egyptian International Center for Agriculture, Cairo, Egypt, November 4-10, 1991 / African Soil Science Society Conference on Soil and Water Management for Sustainable Productivity. Cairo, Egypt : [Ain Shams University, Faculty of Agriculture], 1993.. p. 457-465. Includes references.

Descriptors: citrus-; phaseolus-; lupinus-; irrigation-; sewage-effluent; trace-elements; heavy-metals; egypt-
NAL Call No.: S599.5.A1A37-1991

2. Agricultural and municipal use of wastewater.

Bouwer, H.

Water-Sci-Technol-J-Int-Assoc-Water-Pollut-Res-Control v.26,
p.1583-1591. (1992).

In the series analytic: Water Quality International '92. Part
4 / edited by M. Suzuki, et al. Proceedings of the Sixteenth
Biennial Conference of the International Association on
Water Pollution Research and Control, held May 24-30, 1992,
Washington, D.C.

Descriptors: refuse-; waste-water-treatment; water-reuse;
irrigation-water; water-quality; quality-standards

NAL Call No.: TD420.A1P7

3. Agroforestry drainage management model. I. Theory and
validation.

Karajeh, F. F.; Tanji, K. K.; King, I. P.

J-irrig-drain-eng v.120, p.363-381. (1994).

Includes references.

Descriptors: tile-drainage; drainage-water; eucalyptus-;
roots-; uptake-mechanisms; agroforestry-systems;
two-dimensional-flow; groundwater-level; soil-water;
water-reuse; salinity-; water-management; seasonal-variation;
mathematical-models; california-; root-water;
san-joaquin-valley

NAL Call No.: 290.9-AM3Ps-IR

4. Agroforestry drainage management model. III. Field salt
flow.

Karajeh, F. F.; Tanji, K. K.

J-irrig-drain-eng v.120, p.397-413. (1994).

Includes references.

Descriptors: tile-drainage; drainage-water; water-reuse;
salinity-; agroforestry-systems; eucalyptus-; roots-;
groundwater-level; two-dimensional-flow; gypsum-;
irrigated-farming; mathematical-models; california-;
san-joaquin-valley

NAL Call No.: 290.9-AM3Ps-IR

5. Anaerobic/aerobic pretreatment of sugarcane mill
wastewater for application of drip irrigation.

Yang, P. Y.; Chang, L. J.; Whalen, S. A.

Water-Sci-Technol-J-Int-Assoc-Water-Pollut-Res-Control v.24,
p.243-250. (1991).

In the series analytic: Wastewater Reclamation and
Reuse/edited by R. Mujeriego and T. Asano. Proceedings of the
International Symposium of Wastewater Reclamation and Reuse,
September 24-26, 1991, Costa Brava, Spain.

Descriptors: sugarcane-; sugar-factory-waste;
waste-water-treatment; aerobic-treatment;
anaerobic-treatment; pretreatment-; water-reuse; irrigation-
water; trickle-irrigation; organic-compounds; solid-wastes;

removal-; hydraulics-; retention-; time-; aeration-;
lagoons-; cost-analysis; hawaii-
NAL Call No.: TD420.A1P7

6. An analysis of changing constraints and planning for flexibility in a water reclamation program.
Bailey, H. E.; Moutes, J. G.; Schlesinger, F. D.

Water-Sci-Technol-J-Int-Assoc-Water-Pollut-Res-Control v.26,
p.1525-1535. (1992).

In the series analytic: Water Quality International '92. Part 4 / edited by M. Suzuki, et al. Proceedings of the Sixteenth Biennial Conference of the International Association on Water Pollution Research and Control, held May 24-30, 1992, Washington, D.C.

Descriptors: waste-water-treatment; water-reuse; irrigation-water; landscape-; irrigation-; urban-areas; california-

NAL Call No.: TD420.A1P7

7. An animal model to assess the potential for viral disease transmission from lawns irrigated with wastewater.
Deming, E. J.; Mote, C. R.; Von Bernuth, R. D.; Potgieter, L. N. D.

J-Environ-Sci-Health-Part-A-Environ-Sci-Eng v.27,
p.2199-2211. (1992).

Includes references.

Descriptors: lawns-and-turf; irrigation-; waste-water; contamination-; porcine-enterovirus; pigs-; disease-transmission; animal-models; disease-models; human-diseases; infection-; risk-

NAL Call No.: TD172.J6

8. Appropriate industrial waste management technologies: the New Zealand meat industry.
Rao Bhamidimarri, S. M.

Water-Sci-Technol-J-Int-Assoc-Water-Pollut-Res-Control v.24,
p.89-95. (1991).

Paper presented at the "First IAWPRC East African Regional Conference on Industrial Wastewaters," October 25-28, 1989, Nairobi, Kenya.

Descriptors: meat-and-livestock-industry; industrial-wastes; waste-treatment; technology-; organic-fertilizers; organic-farming; water-reuse; irrigation- water; new-zealand; thermophilic-compositing

NAL Call No.: TD420.A1P7

9. Appropriate wastewater treatment and reuse in Morocco-Boujad: a case study.
Niedrum, S. B.; Karioun, A.; Mara, D. D.; Mills, S. W.

Water-Sci-Technol-J-Int-Assoc-Water-Pollut-Res-Control v.24,
p.205-213. (1991).

In the series analytic: Wastewater Reclamation and
Reuse/edited by R. Mujeriego and T. Asano. Proceedings of the
International Symposium of Wastewater Reclamation and Reuse,
September 24-26, 1991, Costa Brava, Spain.

Descriptors: effluents-; waste-water-treatment; stabilizing-;
ponds-; water-reuse; irrigation-water; water-quality;
microbial-contamination; public-health; health-protection;
case-studies; algae-; organic-fertilizers;
yield-response-functions; morocco-; demonstration-scheme

NAL Call No.: TD420.A1P7

10. Breeding for salinity-stressed environments: recombinant
inbred wheat lines under saline irrigation.

Kelman, W. M.; Qualset, C. O.

Crop-Sci v.31, p.1436-1442. (1991).

Includes references.

Descriptors: triticum-aestivum; inbred-lines;
line-differences; salt-tolerance; irrigation-water;
saline-water; water-reuse; stress-response; genotype-
environment-interaction; application-rates;
nitrogen-fertilizers; genetic-variance; heritability-;
crop-yield; grain-; harvest-index; dry-matter- accumulation;
plant-breeding; california-

Abstract: Disposal of saline drainage water poses a
difficulty in some cropping systems. This study investigated
the reuse of such water for irrigating winter-planted spring
wheat (*Triticum aestivum* L.) in the San Joaquin Valley of
California. Uniform salinization with a controlled degree of
salinity presents a new target cropping system for plant
breeding. Our objectives were to measure genetic and
environmental variance components for agronomic traits and
stress susceptibility index (S), using 43 recombinant inbred
lines (RILs) and their parents, 'Anza' and 'Cajeme 71',
grown under three saline irrigation treatments (control, 0.6;
intermediate, 7.0; and high, 14.0 dS m⁻¹) and two N
fertilization rates (160 and 260 kg N ha⁻¹) in 2 yr. Soil
water conductivities at harvest time were 1.2, 4.4, and 9.4
dS m⁻¹ (2 yr means) after the three irrigation treatments.
Grain yield reductions after the 7.0 and 14.0 dS m⁻¹
treatments were 5 and 19% in the first year and 36 and 68% in
the second year. In both years genetic variances were
significant and genotype X environment interaction variances
were not significant for grain and biomass yields and
harvest index. Broad-sense heritabilities estimated each year
were low for grain yield (0.30 and 0.10) and biomass (0.07
and 0.02). Differences in S, based on grain yields in the
low and intermediate salinity treatments, were nonsignificant
in both years among RIL, but indicated a higher salinity
tolerance of Anza than Cajeme 71. It was suggested that
selection in low salinity environments would produce
cultivars with high yield potential for environments with
moderate salinity stress (soil conductivity of approximately
7 dS m⁻¹), as may be prescribed with a controlled saline

irrigation cropping system for wheat.

NAL Call No.: 64.8-C883

11. Bureau of Reclamation contract renewal policies : oversight hearing before the Subcommittee on Water, Power, and Offshore Energy Resources of the Committee on Interior and Insular Affairs, House of Representatives, One Hundred Second Congress, first session, on findings and recommendations of the General Accounting Office: reclamation laws--changes needed before water service contracts are renewed : hearing held in Washington, DC, October 29, 1991. United States. Congress. House. Committee on Interior and Insular Affairs. Subcommittee on Water, P. a. O. E. R.

Washington : U.S. G.P.O. : For sale by the U.S. G.P.O., Supt. of Docs., Congressional Sales Office, 1992 [i.e. 1993] iii, 195 p. : ill., maps.

Distributed to some depository libraries in microfiche.

Descriptors: United-States-Bureau-of-Reclamation-Procurement; Public-contracts-California; Water-reuse-California; Water-supply-California; Irrigation-water-California; Water-resources-development-California

NAL Call No.: KF27.I5474-1991c

12. The Carini experimental station for wastewater reuse in agriculture--preliminary indications.

Croce, F.; Pollara, J. R.; Oliveri, R. L.; Torregrossa, M. V.; Valentino, L.

Water-Sci-Technol-J-Int-Assoc-Water-Pollut-Res-Control v.26, p.2617-2620. (1992).

In the series analytic: Water Quality International '92. Part 5 / edited by M. Suzuki, et.al. Proceedings of the Sixteenth Biennial Conference of the International Association on Water Pollution Research and Control held May 24-30, 1992, Washington, D.C.

Descriptors: waste-water-treatment; water-reuse; irrigation-water; soil-pollution; human-diseases; pathogens; sicily-

NAL Call No.: TD420.A1P7

13. Characterization and control of domestic wastewater in Bahrain: assessment of possible applications.

Akhter, M. S.; Madany, I. M.

J-Environ-Sci-Health-Part-A-Environ-Sci-Eng v.26, p.971-979. (1991).

Includes references.

Descriptors: waste-water; water-reuse; waste-water; treatment-; chemical-analysis; irrigation-water; groundwater-recharge; landscaping-; bahrain-

NAL Call No.: TD172.J6

14. Chemical analysis of irrigation waters in Bahrain.
Akhter, M. S.

Water-Sci-Technol-J-Int-Assoc-Water-Pollut-Res-Control v.23,
p.2159-2164. (1991).

Paper presented at the "Fifteenth Biennial Conference of the
International Association on Water Pollution Research and
Control," July 29- August 3, 1990, Kyoto, Japan.

Descriptors: sewage-; waste-water-treatment; water-reuse;
springs-water; chemical-analysis; water-quality;
saline-water; irrigation-water; bahrain-

NAL Call No.: TD420.A1P7

15. The clogging capacity of reclaimed wastewater: a new
quality criterion for drip irrigation.

Teltsch, B.; Juanico, M.; Azov, Y.; Ben Harim, I.; Shelef, G.

Water-Sci-Technol-J-Int-Assoc-Water-Pollut-Res-Control v.24,
p.123-131. (1991).

In the series analytic: Wastewater Reclamation and
Reuse/edited by R. Mujeriego and T. Asano. Proceedings of the
International Symposium of Wastewater Reclamation and Reuse,
September 24-26, 1991, Costa Brava, Spain.

Descriptors: waste-water-treatment; water-reuse;
irrigation-water; trickle-irrigation; water-quality;
requirements-; filtration-; capacity-; water-pollution;
particles-; control-methods; biological-techniques;
freshwater-fishes; plankton-; concentration-; israel-;
filter-clogging; screen-filters; hypophthalmichthys-molitrix

NAL Call No.: TD420.A1P7

16. Collection of subsurface drainage for irrigation.

Mahin, G. G.

1991. vii, 55 leaves : ill., map.

Typescript.

Descriptors: Irrigation-water-Recycling; Alfalfa-Irrigation;
Water-reuse-Research

NAL Call No.: NvU Thesis-2819

17. Comparison between chlorine dioxide and chlorine for use
as a disinfectant of wastewater effluents.

Narkis, N.; Kott, Y.

Water-Sci-Technol-J-Int-Assoc-Water-Pollut-Res-Control v.26,
p.1483-1492. (1992).

In the series analytic: Water Quality International '92. Part
4 / edited by M. Suzuki, et al. Proceedings of the Sixteenth
Biennial Conference of the International Association on
Water Pollution Research and Control, held May 24-30, 1992,
Washington, D.C.

Descriptors: refuse-; waste-treatment; effluents-;
disinfection-; disinfectants-; comparisons-; water-reuse;
irrigation-water; israel-

NAL Call No.: TD420.A1P7

18. Contamination of lettuces with nematode eggs by spray irrigation with treated and untreated wastewater.
Ayres, R. M.; Stott, R.; Lee, D. L.; Mara, D. D.; Silva, S. A.

Water-Sci-Technol-J-Int-Assoc-Water-Pollut-Res-Control v.26, p.1615-1623. (1992).

In the series analytic: Water Quality International '92. Part 4 / edited by M. Suzuki, et al. Proceedings of the Sixteenth Biennial Conference of the International Association on Water Pollution Research and Control, held May 24-30, 1992, Washington, D.C.

Descriptors: waste-water-treatment; infestation; ascaridia-galli; ascaris-lumbricoides; water-reuse; irrigation-water; sprinkler-irrigation; lactuca-sativa; brazil-

NAL Call No.: TD420.A1P7

19. Control of emitter clogging in drip irrigation with reclaimed wastewater.
Ravina, I.; Paz, E.; Sofer, Z.; Marcu, A.; Shisha, A.; Sagi, G.

Irrig-sci v.13, p.129-139. (1992).

Includes references.

Descriptors: emitters; blockage; performance-testing; trickle-irrigation; water-quality; irrigation-water; water-reservoirs; waste-water; water-reuse; chlorine; chemical-treatment; filtration; washing; water-flow; discharge; seasonal-fluctuations; clogging-susceptibility

Abstract: Experiments were carried out to evaluate the performance of various types of drip irrigation emitters, widely used in Israel, using waste water from a storage reservoir. Fine particulate matter agglomerated by microbial by products and in-line developed biomass were the principal clogging agents. Clogging fluctuated, increased as water quality deteriorated and decreased when it improved. There were definable differences between emitters of various types as to their clogging susceptibility which were not directly correlated with differences in emitter flow-rate, although, for any particular type, the emitter with smaller discharge was always more sensitive to clogging. The clogging process generally started with emitters located at the far end of the lateral and partial emitter clogging was more common than complete plugging. Overflow was also found in most emitter types and was more common in regulated emitters. Reliable long term operation of most emitter types was achieved with filtration at 80 mesh (180 micromoles opening) combined with daily chlorination and bimonthly lateral flushing. Regular lateral discharge monitoring was found to be a convenient way to detect the initiation of the clogging process. Chlorination was most efficient when applied before the emitters became massively clogged.

NAL Call No.: S612.I756

20. Creeping bentgrass damaged by low levels of atrazine in irrigation water.

Nus, J. L.; Sandburg, M. A.

HortScience v.26, p.392-394. (1991).

Includes references.

Descriptors: agrostis-stolonifera-var; -palustris; lawns-and-turf; treatment-; atrazine-; irrigation-water; culture-; phytotoxicity-; application-rates; models- ; crop-quality; evaluation-

Abstract: Throughout the north-south climatic transition zone of the eastern United States, cool- and warm-season turfgrasses are used adjacently. A greenhouse study with creeping bentgrass (*Agrostis palustris* Huds.) was initiated to determine threshold concentrations of atrazine, an effective pre- and postemergence herbicide for warmseason turfgrasses, that would result in unacceptable levels of phytotoxicity to seedling and mature creeping bentgrass. Mature and 8-week-old seedling 'Penncross' creeping bentgrass were given 6.5 mm of daily irrigation of untreated water or water containing atrazine at 0.01, 0.02, 0.04, 0.08, 0.16, 0.32, 0.64, 1.28, or 2.56 mg.liter⁻¹. A model of quality ratings taken 20 days after the initiation of treatments indicated threshold concentrations resulting in unacceptable turf quality to be approximately 0.05 and 0.08 mg.liter⁻¹ for seedling and mature bentgrass, respectively.

NAL Call No.: SB1.H6

21. Dairy wastewater treatment and reuse.

Hadjivassilis, I.

Water-Sci-Technol-J-Int-Assoc-Water-Pollut-Res-Control v.24, p.83-87. (1991).

Paper presented at the "First IAWPRC East African Regional Conference on Industrial Wastewaters," October 25-28, 1989, Nairobi, Kenya.

Descriptors: dairy-industry; industrial-wastes; waste-water-treatment; water-reuse; activated-sludge; irrigation-water; cyprus-

NAL Call No.: TD420.A1P7

22. The Dan Region sewage wastewater treatment and reclamation scheme.

Shelef, G.; Azov, Y.; Kanarek, A.; Zac, G.; Shaw, A.

Water-sci-technol v.30, p.229-238. (1994).

In the series analytic: Water Quality International '94. 9. Special applications and emerging technologies; specific pollutants and treatment technologies; water reuse--industrial and municipal applications / edited by D. Ballay, T. Asano, R. Bhamidimarri, et al.

Descriptors: sewage-effluent; waste-water;

waste-water-treatment; water-reuse; irrigation-water;
water-quality; israel-
NAL Call No.: TD420.A1P7

23. Deep-bed filtration of SBR effluent for agricultural
reuse: pilot plant screening of advanced secondary and
tertiary treatment for domestic wastewater.
Brenner, A.; Shandalov, S.; Oron, G.; Rebhun, M.

Water-sci-technol v.30, p.219-227. (1994).

In the series analytic: Water Quality International '94. 9.
Special applications and emerging technologies; specific
pollutants and treatment technologies; water
reuse--industrial and municipal applications / edited by D.
Ballay, T. Asano, R. Bhamidimarri, et al.

Descriptors: sewage-effluent; waste-water-treatment;
biological-treatment; equipment-; filtration-; sand-;
filters-; water-reuse; irrigation-water; israel-;
sequencing-batch-reactors

NAL Call No.: TD420.A1P7

24. Defining water quality.
Adams, E. B.

Ext-Bull-Wash-State-Univ-Coop-Ext-Serv. Pullman, Wash. : The
Service. Nov 1992. (1721) 8 p.

Descriptors: water-quality; surface-water; groundwater-;
drinking-water; irrigation-water; regulations-;
quality-standards; contaminants-; washington-

NAL Call No.: 275.29-W27P

25. Desalination of municipal wastewater for horticultural
reuse: process description and evaluation.
Jolis, D.; Campana, R.; Hirano, R.; Pitt, P.; Marinas, B.

Desalination v.103, p.1-10. (1995).

Paper presented at the American Desalting Association 1994
Biennial Conference on Membrane and Desalting Technologies,
September 11-15, 1994, Palm Beach, Florida.

Descriptors: water-reuse; desalinization-; waste-water;
reverse-osmosis; reclamation-; water-purification;
irrigation-water; irrigation-; applications-; california-

NAL Call No.: TD478.D4

26. Design & management of irrigation wastewater systems: a
consultant's perspective.
DeHaan, D.; George, J. A.; Grabs, G.

Pap-Am-Soc-Agric-Eng. St. Joseph, Mich. : American Society of
Agricultural Engineers,. Summer 1994. (94-2066/94-2090) 17 p.
Paper presented at the "1994 International Summer Meeting
sponsored by The American Society of Agricultural Engineers,"
June 19-22, 1994, Kansas City, Missouri.

Descriptors: irrigation-; waste-water
NAL Call No.: 290.9-Am32P

27. Design methods for the development of wastewater land disposal systems.

Thoma, K.; Baker, P. A.; Allender, E. B.

Water-Sci-Technol-J-Int-Assoc-Water-Pollut-Res-Control v.27, p.77-86. (1993).

In the series analytic: Appropriate waste management technologies / edited by G. Ho and K. Mathew. Proceedings of the International Conference, held November 27-28, 1991, Perth, Australia.

Descriptors: waste-water; waste-disposal-sites; application-to-land; systems-; design-; industrial-wastes; irrigation-; eucalyptus-; forest-plantations; soil-pollution; south-australia

NAL Call No.: TD420.A1P7

28. The development of health guidelines for wastewater reclamation.

Shuval, H. I.

Water-Sci-Technol-J-Int-Assoc-Water-Pollut-Res-Control v.24, p.149-155. (1991).

In the series analytic: Advanced Wastewater Treatment and Reclamation / edited by J. Kurbiel. Proceedings of the IAWPRC Conference, September 25-27, 1989, Cracow, Poland.

Descriptors: waste-water-treatment; water-reuse; water-purification; irrigation-water; health-hazards; guidelines-; microbial-contamination; helminths-; water-quality; quality-standards; stabilization-; ponds-; who-; public-health; health-protection; water-pollution; control-methods; israel-; developing-countries

NAL Call No.: TD420.A1P7

29. Diagnostic evaluation of wastewater utilization in agriculture, Morelos State, Mexico.

Rodriguez Zavaleta, C.; Oyer, L.; Cisneros, X.

Environmentally sound agriculture proceedings of the second conference 20-22 April 1994 / p.423-430. (1994).

Includes references.

Descriptors: waste-water; waste-utilization; water-reuse; application-to-land; agricultural-land; irrigated-farming; ecosystems-; environmental-impact; land-productivity; sustainability-; mexico-; agroecosystems-

NAL Call No.: S589.7.E57-1994

30. Direct and indirect water re-use.

Westerhoff, G. P.; Anderson, J.; Mancuso, P. C. S.; Rodrigues, J. M. C.; Filho, J. L.; Zachariou, M.; Rantala, P.; Bersillon, J. L.; Zanarek, A.; Michail, M.

Water-supply v.12, p.IR9-1-IR9/29. (1994).
Paper presented at the "19th International Water Supply
Congress and Exhibition," October 2-8, 1993, Budapest,
Hungary.
Descriptors: water-reuse; groundwater-recharge;
irrigation-water; waste-water; australia-; brazil-; cyprus-;
finland-; france-; israel-; italy-; japan-; netherlands-;
portugal-; sweden-; uk-; usa-
NAL Call No.: TD201.W346

31. Double reuse of citrus processing effluent for treatment
and conservation.
Allhands, M. N.; Prochaska, J. F.

Pap-Am-Soc-Agric-Eng. St. Joseph, Mich. : American Society of
Agricultural Engineers, . Summer 1991. (916003) 7 p.
Paper presented at the "1991 International Summer Meeting
sponsored by the American Society of Agricultural Engineers,"
June 23-26, 1991, Albuquerque, New Mexico.
Descriptors: citrus-; waste-water; irrigation-;
water-conservation; water-quality
NAL Call No.: 290.9-Am32P

32. Dripper-clogging factors in wastewater irrigation.
Adin, A.; Sacks, M.

J-Irr-Drain-Eng v.117, p.813-826. (1991).
Includes references.
Descriptors: trickle-irrigation; irrigation-water;
waste-water; effluents-; physicochemical-properties;
blockage-; emitters-; filtration-
NAL Call No.: 290.9-AM3PS-IR

33. Effect of effluent quality and application method on
agricultural productivity and environmental control.
Oron, G.; DeMalach, Y.; Hoffman, Z.; Manor, Y.

Water-Sci-Technol-J-Int-Assoc-Water-Pollut-Res-Control v.26,
p.1593-1601. (1992).
In the series analytic: Water Quality International '92. Part
4 / edited by M. Suzuki, et al. Proceedings of the Sixteenth
Biennial Conference of the International Association on
Water Pollution Research and Control, held May 24-30, 1992,
Washington, D.C.
Descriptors: households-; waste-water-treatment; effluents-;
water-quality; water-reuse; irrigation-water;
trickle-irrigation; sprinkler-irrigation; food- crops;
israel-
NAL Call No.: TD420.A1P7

34. Effect of excess MgSO4 or Mg(HCO3)2 in irrigation water
on corn growth.

Franklin, W. T.; Olsen, J. S.; Soltanpour, P. N.

Commun-Soil-Sci-Plant-Anal v.22, p.37-47. (1991).

Includes references.

Descriptors: zea-mays; calcareous-soils; fertigation-;
greenhouse-crops; bicarbonates-; magnesium-;
magnesium-sulfate; phytotoxicity-; irrigation-water;
saline-water; tap-water; crop-yield; growth-; transpiration-
NAL Call No.: S590.C63

35. Effect of selenite and selenate on plant uptake of cadmium by maize (*Zea mays*).

Shanker, K.; Mishra, S.; Srivastava, S.; Srivastava, R.;
Dass, S.; Prakash, S.; Srivastava, M. M.

Bull-environ-contam-toxicol v.56, p.419-424. (1996).

Includes references.

Descriptors: zea-mays; cadmium-; uptake-; irrigation-;
translocation-; selenium-; pretreatment-; heavy-metals;
toxic-substances; metabolic- detoxification; shoots-; roots-;
phytotoxicity-; pot-experimentation; toxic-metals

NAL Call No.: RA1270.P35A1

36. Effect of treated sewage water on vegetative and reproductive growth of date palm.

El Mardi, M. O.; Salama, S. B.; Consolacion, E.; Al Shabibi, M. S.

Commun-soil-sci-plant-anal v.26, p.1895-1904. (1995).

Includes references.

Descriptors: phoenix-dactylifera; irrigation-;
irrigation-water; sewage-effluent; application-to-land;
fruits-; leaves-; plant-composition; macronutrients-;
trace-elements; nutrient-content; heavy-metals; uptake-;
oman-

Abstract: The effect of treated sewage water on the vegetative and reproductive growth of date palms was assessed. Leaves and fruits samples were collected from locations irrigated with treated sewage (TSW), desalinated, and well water. Samples were analysed for their calcium (Ca), magnesium (Mg), iron (Fe), lead (Pb), copper (Cu), and zinc (Zn) content by atomic absorption spectrophotometry and for sodium (Na) and potassium (K) by flame photometry. The Mg, Fe, and Zn content of fruits and Na in the leaves were not found to be significantly different. Treated sewage water from University campus utilities significantly increased the Na, K, and Cu and reduced Ca in leaves and Zn in fruits of date palms. But no significant effect was observed on the K, Ca, Mg, and Na contents in fruits of the same palms. The different concentrations of Ca, Mg, Fe, and Zn in the fruits of date palms grown along the same TSW line were attributed to variations in the soil; however, those in Pb content of leaves could be attributed to motor vehicle combustion. The general trend indicated that fruits contained higher K, Na, and Fe contents, but lower Ca, Mg, Cu, Zn, and Pb contents

than the leaves. Furthermore, leaves of date palms irrigated with desalinated and well water contained higher Ca and Zn, but lower K, Mg, Na, Cu, Fe, and Pb contents than those of palms irrigated with treated sewage water. Desalinated water reduced the K, Ca, Na, and Zn contents, but it increased the Mg, Fe, Cu, and Pb content of leaves compared to well water. None of the examined metal were found to reach toxic level to man or plant.

NAL Call No.: S590.C63

37. Effect of wastewaters on plant growth and soil properties.

Al Jaloud, A. A.; Hussain, G.; Al Saati, A. J.; Karimullah, S.

Arid-soil-res-rehabil v.7, p.173-179. (1993).

Includes references.

Descriptors: zea-mays; sorghum-bicolor; waste-water; irrigation-water; salinity-; biomass-production; dry-matter-accumulation; soil-salinity; exchangeable-sodium; sodium-; adsorption-; ratios-; waste-utilization; water-reuse; sodicity-

NAL Call No.: S592.17.A73A74

38. Effects of intermittent acidic irrigations on soybean yields and frog eye leaf spot.

Walker, J. T.; Philips, D. V.; Melin, J.; Spradlin, D.

Environ-exp-bot v.34, p.311-318. (1994).

Includes references.

Descriptors: glycine-max; cercospora-; microsphaera-; acid-deposition; irrigation-water; acidity-; irrigation-; phytotoxicity-; crop-yield; seeds-; plant-composition; sulfur-; dry-matter-accumulation; susceptibility-; leaf-spotting; fungal-diseases; cercospora-sojina; powdery-mildew; microsphaera-diffusa

NAL Call No.: 450-R11

39. Effects of metsulfuron-treated water on some winter season crops.

Balyan, R. S.; Malik, R. K.

Tests-agrochem-cultiv p.94-95. (1993).

Supplement to Annals of applied biology, volume 122.

Descriptors: irrigated-stands; winter-; phytotoxicity-; metsulfuron-; irrigation-water; application-rates; india-

NAL Call No.: S587.T47

40. Effects of reclaimed wastewater on leaf and soil mineral composition and fruit quality of citrus.

Zekri, M.; Koo, R. C. J.

Proc-Annu-Meet-Fla-State-Hortic-Soc. [S.l.] : The Society.

June 1991. v. 103 p. 38-41.
Meeting held December 17-19, 1990, Lake Buena Vista, Florida.
Descriptors: citrus-; irrigation-; waste-water;
water-conservation; crop-quality; foliar-diagnosis;
mineral-nutrition; soil-water; florida-
NAL Call No.: SB319.2.F6F56

41. Effects of regenerant wastewater irrigation on growth and ion uptake of landscape plants.
Wu, L.; Chen, J. Q.; Lin, H.; Van Mantgem, P.; Harivandi, M. A.; Harding, J. A.

J-environ-hortic v.13, p.92-96. (1995).
Includes references.
Descriptors: hydrangea-macrophylla; nandina-domestica;
athyrium-filix-femina; raphiolepis-indica;
rosa-sempervirens; pittosporum-tobira; jasminum- sambac;
buxus-japonica; rhododendron-; irrigation-water; waste-water;
waste-utilization; chloride-; ion-uptake; plant-composition;
calcium-; potassium-; magnesium-; growth-rate; rhododendron-;
formosa-; water-softeners
NAL Call No.: SB1.J66

42. Effects of salinity on growth and ionic composition of Coleus blumei and Salvia splendens.
Ibrahim, K. M.; Collins, J. C.; Collin, H. A.

J-Hortic-Sci v.66, p.215-222. (1991).
Includes references.
Descriptors: coleus-blumei; salvia-; greenhouse-culture;
irrigation-water; saline-water; sodium-chloride;
concentration-; growth-; plant-analysis; sodium-; potassium-;
ions-; selection-criteria; salt-tolerance
NAL Call No.: 80-J825

43. Effects on crops of irrigation with facultative pond effluent.
Monte, H. M. d.; Sousa, M. S.

Water-Sci-Technol-J-Int-Assoc-Water-Pollut-Res-Control v.26, p.1603-1613. (1992).
In the series analytic: Water Quality International '92. Part 4 / edited by M. Suzuki, et al. Proceedings of the Sixteenth Biennial Conference of the International Association on Water Pollution Research and Control, held May 24-30, 1992, Washington, D.C.
Descriptors: refuse-; waste-water-treatment; lagoons-; effluents-; water-reuse; irrigation-; water-; crop-yield; crop-quality; portugal-
NAL Call No.: TD420.A1P7

44. Effluent reuse by trickle irrigation.
Oron, G.; DeMalach, Y.; Hoffman, Z.; Manor, Y.

Water-Sci-Technol-J-Int-Assoc-Water-Pollut-Res-Control v.24,
p.103-108. (1991).

In the series analytic: Wastewater Reclamation and
Reuse/edited by R. Mujeriego and T. Asano. Proceedings of the
International Symposium of Wastewater Reclamation and Reuse,
September 24-26, 1991, Costa Brava, Spain.

Descriptors: effluents-; waste-disposal; waste-treatment;
fertigation-; trickle-irrigation; water-reuse;
irrigation-water; sprinkler-irrigation; soil-; crops-;
contamination-; zea-mays; sweetcorn-; bacteria-; viruses-;
counting-; israel-

NAL Call No.: TD420.A1P7

45. Effluents quality along a multiple-stage wastewater
reclamation system for agricultural reuse.
Azov, Y.; Shelef, G.

Water-Sci-Technol-J-Int-Assoc-Water-Pollut-Res-Control v.23,
p.2119-2126. (1991).

Paper presented at the "Fifteenth Biennial Conference of the
International Association on Water Pollution Research and
Control," July 29- August 3, 1990, Kyoto, Japan.

Descriptors: waste-water-treatment; effluents-; quality-;
irrigation-water; gossypium-; israel-

NAL Call No.: TD420.A1P7

46. Enhanced transport of atrazine under irrigation with
effluent.
Grabner, E. R.; Gerstl, Z.; Fischer, E.; Mingelgrin, U.

Soil-Sci-Soc-Am-j. [Madison, Wis.] Soil Science Society of
America. Nov/Dec 1995. v. 59 (6) p. 1513-1519.

Includes references.

Descriptors: atrazine-; transport-processes;
movement-in-soil; irrigation-water; water-quality;
sewage-effluent; groundwater-pollution

Abstract: Enhanced transport of atrazine

(2-chloro-4-(ethylamino)-6-(isopropylamino)-s-triazine;
C₈H₁₄ClN₅) applied to a corn (Zea mays L.) field was
observed after irrigation with secondary effluent. Cores to 4
m were obtained from 10 effluent-irrigated and 10
high-quality water-irrigated plots after two growing seasons
and two winter rainy seasons. In most of the
effluent-irrigated cores, atrazine was widely distributed
with depth, with an average center of atrazine mass at 115
+/- 39 cm and a mean variance around the center of mass of
142 cm. In the high-quality water- irrigated cores, atrazine
was concentrated in the upper soil horizons with an average
center of mass at 63 +/- 64 cm and a mean variance around
the center of mass of 58 cm. The mean centers of atrazine
mass in the effluent-irrigated profiles and high-quality
water-irrigated profiles are significantly different
(Student's t-test, P = 0.06). The equilibrium sorption
isotherm for atrazine in the presence of high-quality water

was nonlinear, with a Freundlich n of 0.87 and a distribution coefficient (Kf) of 1.07. The atrazine isotherm in the presence of effluent had a similar n (0.86) but a significantly lower Kf of only 0.93. Atrazine at a rate of 4 mg/kg-1 was added to soil columns filled with the < 1-mm size fraction of the 0 to 30-cm horizon of soil from an uncultivated site adjacent to the field site. Three replicate columns were leached with 0.85 pore volumes of either secondary effluent or 0.005 M CaCl2 solution at constant head. Atrazine in the effluent-treated columns was more strongly leached from the upper columns and peaked at higher concentrations lower in the columns.

NAL Call No.: 56.9-So3

47. Environmentally sound agriculture through reuse and reclamation of municipal wastewater.
Roberts, A.; Vidak, W.

Environmentally sound agriculture proceedings of the second conference 20-22 April 1994 / p.415-422. (1994).
Includes references.

Descriptors: waste-water; waste-utilization; water-reuse;
application-to-land; agricultural-land;
environmental-protection; water-management; management-;
florida-; nutrient-management

NAL Call No.: S589.7.E57-1994

48. Evaluation of spray irrigation as a methodology for on-site wastewater treatment and disposal on marginal soils.
Monnett, G. T. 1.

1992. xiv, 250 leaves : ill..
Vita.

Descriptors: Sprinkler-irrigation; Sewage-;
Land-treatment-of-wastewater

NAL Call No.: ViBlbV LD5655.V856-1992.M663

49. Evaluation of spray irrigation for on-site wastewater treatment and disposal on marginal soils.
Monnett, G. T.; Reneau, R. B. Jr.; Hagedorn, C.

Water-environ-res v.68, p.11-18. (1996).
Includes references.

Descriptors: sewage-effluent; waste-water-treatment;
sewage-effluent-disposal; sprinkler-irrigation;
silt-loam-soils; water-quality; nitrogen-; nitrate- nitrogen;
ammonium-nitrogen; removal-; phosphorus-; soil-water-content;
application-to-land; virginia-; domestic-sewage-effluent;
individual-household-domestic-effluent

NAL Call No.: TD419.R47

50. Evaluation of the California wastewater reclamation criteria using enteric virus monitoring data.

Asano, T.; Leong, L. Y. C.; Rigby, M. G.; Sakaji, R. H.

Water-Sci-Technol-J-Int-Assoc-Water-Pollut-Res-Control v.26,
p.1513-1524. (1992).

In the series analytic: Water Quality International '92. Part
4 / edited by M. Suzuki, et al. Proceedings of the Sixteenth
Biennial Conference of the International Association on
Water Pollution Research and Control, held May 24-30, 1992,
Washington, D.C.

Descriptors: regulations-; refuse-; evaluation-;
reclamation-; indicators-; enterovirus-; water-reuse-;
irrigation-water; california-

NAL Call No.: TD420.A1P7

51. The Evaluation of water quality criteria for selenium,
boron, and molybdenum in the San Joaquin River Basin.
University of California (System). Committee of Consultants
on San Joaquin River Water Quality Objectives.

[Davis, Calif.?] : The Task Force : The Center, [1988] 18, 7
leaves.

Cover title.

Descriptors:

Water-Standards-California-San-Joaquin-River-Watershed-Evaluation-;
Water-quality-California-San-Joaquin-River-Watershed-;
Irrigation- water-California-San-Joaquin-Valley-Quality-;
Agricultural-pollution-California-San-Joaquin-Valley-;
Drainage-California-San-Joaquin-Valley

NAL Call No.: TD224.C2T43-1988

52. Fate of heavy metals in a land treatment system irrigated
with municipal wastewater.

Yediler, A.; Grill, P.; Sun, T.; Kettrup, A.

Chemosphere v.28, p.373-381. (1994).

Includes references.

Descriptors: waste-water; sewage-; sewage-effluent-;
application-to-land; oryza-sativa; irrigation-water-;
irrigation-; cadmium-; copper-; mercury-; lead-; zinc-;
uptake-; roots-; leaves-; seeds-; liaoning-

NAL Call No.: TD172.C54

53. Feasibility of cyclic reuse of saline drainage in a
tomato-cotton rotation.

Shennan, C.; Grattan, S. R.; May, D. M.; Hillhouse, C. J.;
Schachtman, D. P.; Wander, M.; Roberts, B.; Tafoya, S.;
Bureau, R. G.; McNeish, C.; Zelinski, L.

J-environ-qual v.24, p.476-486. (1995).

Includes references.

Descriptors: lycopersicon-esculentum; gossypium-hirsutum-;
rotations-; saline-water; drainage-water; water-quality-;
crop-quality; tomatoes-; crop-yield; soil-salinity-;
profiles-; boron-; selenium-; california-

Abstract: Use of saline drainage water for crop irrigation has been proposed as a strategy to reduce drainage volume and conserve good quality water. Over a 6-yr period, two cyclic drainage-water reuse practices were tested in a 3-yr rotation of processing tomato (*Lycopersicon esculentum* L.) and cotton (*Gossypium hirsutum* L.). In both practices, drainage water ($EC_i = 7.4 \text{ dS m}^{-1}$ and $0.74 \text{ mmol L}^{-1} \text{ B}$) was applied to processing tomato after first bloom to take advantage of salt-induced enhancement of fruit quality and increased crop salt tolerance at later developmental stages. In one practice, drainage water was also applied to the following cotton crop after thinning. Nonsaline water was used for irrigation at all other times and throughout for the control. When saline water was applied once every 3 yr, yields of both crops were unaffected. Tomato yields were generally lowest when saline water was applied 2 out of 3 yr, but saline water improved tomato fruit quality by increasing Brix in most years. Changes in soil chemical and physical quality may limit long-term reuse. Both B and salts accumulated in the soil over time, particularly at depth (60-140 cm), whereas Se was more readily leached and showed greater fluctuations in the rootzone with irrigation treatment. Calculations Using reclamation formulae estimated that for low B drainage water, the amount of drainage water used exceeded that of nonsaline water needed to return soil EC_e to control levels, resulting in significant water savings. For high B drainage water, more than twice the amount of nonsaline water was needed to fully reclaim the profile than was saved by reuse. However, moderately B-tolerant crops could be successfully irrigated with nonsaline water supplies, or as a means to reduce effluent volumes.

NAL Call No.: QH540.J6

54. Furrow infiltration and design with cannery wastewater.
Xanthoulis, D.; Wallender, W. W.

Trans-A-S-A-E v.34, p.2390-2396. ill. (1991).

Includes references.

Descriptors: sorghum-; surface-irrigation; waste-water; design-; furrows-; infiltration-; cannery-wastes; tomatoes-; waste-disposal; california-

Abstract: Surface irrigation is used to apply food processing wastewater. A newly developed flow-through infiltrometer was developed to measure the influence of wastewater quality on infiltration and irrigation performance. Steady infiltration rate decreased with increased loading of BOD and TS of tomato processing wastewater. Using a hydraulic model to simulate irrigation performance, it was shown that ignoring the decline in infiltration with increased loading and using the unadjusted infiltration function reduced predicted application efficiency 23%. Surface irrigation system design should therefore include the effect of wastewater quality.

NAL Call No.: 290.9-AM32T

55. Golf course irrigation with reclaimed wastewater.

Mujeriego, R.; Sala, L.

Water-Sci-Technol-J-Int-Assoc-Water-Pollut-Res-Control v.24,
p.161-171. (1991).

In the series analytic: Wastewater Reclamation and
Reuse/edited by R. Mujeriego and T. Asano. Proceedings of the
International Symposium of Wastewater Reclamation and Reuse,
September 24-26, 1991, Costa Brava, Spain.

Descriptors: waste-water-treatment; water-reuse;
irrigation-water; requirements-; golf-courses; public-health;
health-protection; microbial- contamination; water-resources;
water-quality; physicochemical-properties; operation-;
maintenance-; costs-; spain-

NAL Call No.: TD420.A1P7

56. Guidelines for evaluating water quality related to crop
growth.

Marsh, A. W.

Tech-Conf-Proc-Irrig-Assoc p.69-74. (1982).

Paper presented at meeting " Water, energy and economic
alternatives," held February 21-24, 1982, Portland, Oregon.

Descriptors: crops-; growth-; irrigation-water;
water-quality; salinity-; permeability-; phytotoxicity-

NAL Call No.: 55.9-SP8

57. Health guidelines and standards for wastewater reuse in
agriculture: historical perspectives.

Shuval, H. I.

Water-Sci-Technol-J-Int-Assoc-Water-Pollut-Res-Control v.23,
p.2073-2080. (1991).

Paper presented at the "Fifteenth Biennial Conference of the
International Association on Water Pollution Research and
Control," July 29- August 3, 1990, Kyoto, Japan.

Descriptors: waste-water; water-reuse; irrigation-water;
health-protection; regulations-; historical-records; usa-

NAL Call No.: TD420.A1P7

58. Heavy metals in soils and alfalfa (*Medicago sativa* L.)
irrigated with three sources of wastewater.

Carrillo G, R.; Cajuste, L. J.

J-Environ-Sci-Health-Part-A-Environ-Sci-Eng v.A27,
p.1771-1783. (1992).

Includes references.

Descriptors: waste-water; irrigation-; heavy-metals;
trace-elements; soil-properties; medicago-sativa; uptake-;
leaves-; roots-; pollution-; mexico-

NAL Call No.: TD172.J6

59. Heavy metals in some water- and wastewater-irrigated
soils of Oman.

Abdelrahman, H. A.; Al Ajmi, H.

Commun-soil-sci-plant-anal v.25, p.605-613. (1994).

Includes references.

Descriptors: water-conservation; water-quality;
waste-water-treatment; discharge-; waste-water; water-reuse;
irrigation-water; irrigated-soils; soil- pollution;
heavy-metals; oman-

NAL Call No.: S590.C63

60. Human waste use: health protection practices and scheme monitoring.

Strauss, M.

Water-Sci-Technol-J-Int-Assoc-Water-Pollut-Res-Control v.24, p.67-79. (1991).

In the series analytic: Wastewater Reclamation and Reuse/edited by R. Mujeriego and T. Asano. Proceedings of the International Symposium of Wastewater Reclamation and Reuse, September 24-26, 1991, Costa Brava, Spain.

Descriptors: man-; wastes-; waste-utilization;
agricultural-production; aquaculture-; public-health;
health-protection; waste-water; water-reuse; guidelines-;
waste-water-treatment; irrigation-water

NAL Call No.: TD420.A1P7

61. Induction of phytoestrogen production in *Medicago sativa* leaves by irrigation with sewage water.

Shore, L. S.; Kapulnik, Y.; Gurevich, M.; Wininger, S.;
Badamy, H.; Shemesh, M.

Environ-exp-bot v.35, p.363-369. (1995).

Includes references.

Descriptors: medicago-sativa; coronilla-varia;
plant-estrogens; plant-composition; leaves-; coumestrol-;
irrigation-; irrigation-water; sewage-effluent

NAL Call No.: 450-R11

62. Infiltration percolation for reclaiming stabilization pond effluents.

Brissaud, F.; Restrepo Bardon, M.; Soulie, M.; Joseph, C.

Water-Sci-Technol-J-Int-Assoc-Water-Pollut-Res-Control v.24, p.185-193. (1991).

In the series analytic: Wastewater Reclamation and Reuse/edited by R. Mujeriego and T. Asano. Proceedings of the International Symposium of Wastewater Reclamation and Reuse, September 24-26, 1991, Costa Brava, Spain.

Descriptors: waste-water-treatment; stabilizing-; ponds-;
infiltration-; percolation-; construction-; water-reuse;
irrigation-water; lawns-and-turf; landscape-gardening;
france-

NAL Call No.: TD420.A1P7

63. Influence of irrigation water salinity on optimal nitrogen, phosphorus, and potassium liquid fertilizer rates for *Spathiphyllum* 'Petite'.

Campos, R.; Reed, D. W.

J-environ-hortic v.12, p.104-107. (1994).

Includes references.

Descriptors: spathiphyllum-; ornamental-foliage-plants; npk-fertilizers; application-rates; liquid-fertilizers; irrigation-water; saline-water; salt-tolerance; growth-rate; plant-composition; nutrient-uptake; sodium-; calcium-; chloride-; phytotoxicity-

NAL Call No.: SB1.J66

64. International perspective on water resources management and wastewater reuse--appropriate technologies.

Bartone, C. R.

Water-Sci-Technol-J-Int-Assoc-Water-Pollut-Res-Control v.23, p.2039-2047. (1991).

Paper presented at the "Fifteenth Biennial Conference of the International Association on Water Pollution Research and Control," July 29- August 3, 1990, Kyoto, Japan.

Descriptors: waste-water; water-reuse; irrigation-water; aquaculture-

NAL Call No.: TD420.A1P7

65. Investigation of typhoid fever and cholera transmission by raw wastewater irrigation Santiago, Chile.

Shuval, H. I.

Water-Sci-Technol-J-Int-Assoc-Water-Pollut-Res-Control v.27, p.167-174. (1993).

In the series analytic: Health-related water microbiology 1992 / edited by R.W. Morris, W.O.K. Grabow and A.P. Dufour. Proceedings of an International Symposium, Water Quality International '92, Sixteenth Biennial Conference and Exposition, International Association on Water Pollution Research and Control, May 24-30, 1992, Washington, D.C.

Descriptors: irrigation-water; waste-water; salmonella-typhi; vibrio-cholerae; disease-transmission; chile-

NAL Call No.: TD420.A1P7

66. Irrigating with municipal sewage effluent in a rural environment.

Hayes, G. J.; De Walle, F.

J-environ-sci-health,-Part-A,-Environ-sci-eng. New York, Marcel Dekker. 1993. v. A28 (6) p. 1229-1247.

Includes references.

Descriptors: sewage-effluent; irrigation-water; groundwater-pollution; surface-water; water-quality; rural-areas; environmental-impact; california-; nevada-;

alpine-county

NAL Call No.: TD172.J6

67. Irrigation management and investment under saline, limited drainage conditions. 3. Policy analysis and extensions.

Knapp, K. C.

Water-Resour-Res v.28, p.3099-3109. (1992).

Includes references.

Descriptors: irrigation-; management-; water-policy; drainage-water; irrigation-water; salinity-; water-quality; water-reuse; gossypium-; lycopersicon- esculentum; rotations-; water-costs; water-demand

Abstract: Water demand is characterized for the cotton-cotton-tomatoes rotation considered in the previous paper (Knapp, this issue (b)). Demand is found to be price inelastic. However, currently low water prices imply that fairly moderate increases in water prices can result in large water savings. A marginal cost curve for source control of drain water emissions is constructed. Moderate increases in drainage emissions fees can result in large reductions in drain water emissions with relatively small impacts on income. Management response and income effects from increased water salinity are estimated. The model is also extended to consider drain water reuse. Typical optimal management with reuse is low- volume, low-quality water on first-year cotton, improved quality and quantity on second-year cotton, and the highest quality water on salt-sensitive tomatoes. An approach to maximization of multifield farm-level returns is proposed using decentralized pricing and the field-level optimization model.

NAL Call No.: 292.8-W295

68. Irrigation of bananas with secondary treated sewage effluent. II. Effect on plant nutrients, additional elements and pesticide residues in plants, soil and leachate using drainage lysimeters.

Johns, G. G.; McConchie, D. M.

Aust-j-agric-res v.45, p.1619-1638. (1994).

Includes references.

Descriptors: musa-acuminata; sewage-effluent; irrigated-conditions; plant-nutrition; size-; nutrients-; leaves-; stems-; pulps-; peel-; pesticide-residues; leachates-; lysimeters-; plant-size

NAL Call No.: 23-Au783

69. Irrigation of citrus with reclaimed water.

Perry, T. C.

1991. xv, 241 leaves : ill., maps.

Typescript.

Descriptors: Citrus-Irrigation; Water-reuse-Research

NAL Call No.: FU LD1780-1991.P465

70. Irrigation of eucalypt plantations on deep sands using sewage effluent: a proposed alternative to ocean disposal near Perth, Western Australia.
Manning, C. R.; Kirkman, H.

Aust-For v.56, p.80-89. (1993).
Includes references.

Descriptors: eucalyptus-; forest-plantations; irrigation-; sewage-effluent; western-australia

NAL Call No.: 99.8-AU74

71. Irrigation of temperate fruit crops with saline water.
Noble, C. L.; West, D. W.

Acta-hortic p.257-260. (1989).

Paper presented at the Australian Temperate Fruits Review Conference held May 22-27, 1988, Roseworthy, Australia.

Descriptors: temperate-fruits; temperate-tree-fruits; irrigation-; saline-water; irrigation-water; salinity-; sodium-chloride; phytotoxicity-

NAL Call No.: 80-Ac82

72. Irrigation of turfgrass with secondary sewage effluent: soil quality.
Mancino, C. F.; Pepper, I. L.

Agron-J v.84, p.650-654. (1992).
Includes references.

Descriptors: cynodon-dactylon; lawns-and-turf; irrigation-water; sewage-effluent; waste-utilization; waste-water; soil-chemistry; electrical-conductivity; potassium-; soil-ph; sodium-; phosphorus-; soil-fertility; zinc-; iron-; manganese-; copper-; soil-organic-matter; soil-bacteria; arizona-

Abstract: Effluent and other secondary waters have become important sources of irrigation water in the U.S. Southwest. Information is inadequate relative to potential long-term effluent irrigation effects on turfgrass and soil chemical quality. The objective of this field research was to determine the influence of secondarily treated municipal wastewater irrigation on the chemical quality of bermudagrass (*Cynodon dactylon* L.) turf soil (Sonoita gravelly sandy loam: coarse-loamy, mixed, thermic Typic Haplargid) when compared to similarly irrigated potable water plots. Research plots were irrigated using a 20% leaching fraction. After 3.2 yr of use, effluent water increased soil electrical conductivity by 0.2 ds m⁻¹, Na by 155 mg kg⁻¹, P by 26 mg kg⁻¹, and K by 50 mg kg⁻¹ in comparison to potable irrigated plots. Soil pH was not significantly affected by effluent irrigation. The concentrations of Fe, Mn, Cu, and Zn were found to be within the range considered normal for agricultural soil. Effluent irrigation increased soil total

organic carbon and nitrogen during the first 1.3 yr of irrigation only. Total aerobic bacteria populations were similar in all irrigated plots indicating these microbes were not promoted or inhibited by the use of this wastewater. In summary, the irrigation of this turf soil for 3.3 yr with the secondarily treated wastewater used in this study had no serious detrimental effects on soil quality.

NAL Call No.: 4-AM34P

73. Irrigation with sewage effluents: the Israeli experience. Avnimelech, Y.

Environ-Sci-Tech v.27, p.1278-1281. (1993).

Special issue: Israel's growing environmental consciousness.

Descriptors: sewage-effluent; fertigation;

waste-water-treatment; water-reuse; water-purification;

saline-water; israel-

NAL Call No.: TD420.A1E5

74. Long term use of saline water for irrigation.

Ayars, J. E.; Hutmacher, R. B.; Schoneman, R. A.; Vail, S.

S.; Pflaum, T.

Irrig-sci v.14, p.27-34. (1993).

Includes references.

Descriptors: gossypium-hirsutum; triticum-aestivum;

beta-vulgaris-var; -saccharifera; rotations-; salt-tolerance;

saline-water; drainage-water; water-reuse; irrigation-water;

water-quality; trickle-irrigation; furrow-irrigation;

soil-salinity; salts-in-soil; electrical-conductivity;

profiles-; chlorine-; sulfates-; boron-; selenium-;

soil-toxicity; ion-uptake; phytotoxicity-; leaching-;

soil-depth; groundwater-level; water-management; water-

requirements; evapotranspiration-; rain-; water-uptake;

california-; drainage-water-management; shallow-groundwater

Abstract: Use of saline drainage water in irrigated

agriculture, as a means of its disposal, was evaluated on a

60 ha site on the west side of the San Joaquin Valley. In

the drip irrigation treatments, 50 to 59% of the irrigation

water applied during the six-year rotation was saline with an

EC(w) ranging from 7 to 8 dS/m, and containing 5 to 7 mg/L

boron and 220 to 310 micrograms/L total selenium. Low

salinity water with an EC(w) of 0.4 to 0.5 dS/m and B

approximately equal to 0.4 mg/L was used to irrigate the

furrow plots from 1982 to 1985 after which a blend of good

quality water and saline drainage water was used. A

six-year rotation of cotton, cotton, cotton, wheat, sugar

beet and cotton was used. While the cotton and sugar beet

yields were not affected during the initial six years, the

levels of boron (B) in the soil became quite high and were

accumulated in plant tissue to near toxic levels. During

the six year period, for treatments surface irrigated with

saline drainage water or a blend of saline and low salinity

water, the B concentration in the soil increased throughout

the 1.5 m soil profile while the electrical conductivity

(EC(e)) increased primarily in the upper 1 m of the profile. Increases in soil EC(e) during the entire rotation occurred on plots where minimal leaching was practiced. Potential problems with germination and seedling establishment associated with increased surface soil salinity were avoided by leaching with rainfall and low-salinity pre-plant irrigations of 150 mm or more. Accumulation of boron. irrigation. This is particularly true in areas where toxic materials (salt, boron, other toxic minor elements) cannot be removed from the irrigated area. Continual storage within the root zone of the cropped soil is not sustainable.
NAL Call No.: S612.I756

75. Long term use of sodic waters in North India and the reliability of empirical equations for predicting their sodium hazard.
Manchanda, H. R.

Tasks-Veg-Sci p.433-438. (1993).
In the series analytic: Towards the rational use of high salinity tolerant plants. 2. Agriculture and forestry under marginal soil water conditions / edited by H. Lieth and A.A. Al Masoom. Proceedings of the 1st ASWAS Conference held December 8-15, 1990, Al Ain, United Arab Emirates.
Descriptors: irrigation-; sodic-water; sodium-; phytotoxicity-; equations-; water-quality; saline-water; crops-; rotations-; sodium-adsorption-ratio
NAL Call No.: QK1.T37

76. Meeting regional septage disposal needs.
Giggey, M. D.; Marcy, G. J.

Biocycle v.35, p.74-76, 78, 80, 82. (1994).
Descriptors: septic-tank-effluent; waste-water-treatment; waste-disposal; composting-; water-reuse; irrigation-water
NAL Call No.: 57.8-C734

77. Microsprinkler irrigation of grapefruit in the flatwoods using reclaimed wastewater. Final report: microsprinkler irrigation of grapefruit in the flatwoods using reclaimed wastewater.
Davies, F. S. 1.; Graetz, D. A. D. A. 1.; St. Johns River Water Management District.

[Florida? : s.n., 1994] xi, 131 p. : ill. ; c 28 cm..
At head of title: "Final report".
Descriptors: Sewage-irrigation-Florida;
Citrus-fruits-Irrigation-Florida;
Sprinkler-irrigation-Florida
NAL Call No.: TD760.M49--1994

78. Microsprinkler irrigation of young 'Redblush' grapefruit trees using reclaimed water.

Maurer, M. A.; Davies, F. S.

HortScience v.28, p.1157-1161. (1993).

Includes references.

Descriptors: citrus-paradisi; fertigation-; sprinkler-irrigation; water-reuse; waste-water; irrigation-water; water-quality; application-rates; age-of-trees; growth-rate; plant-composition; sodium-; chloride-; boron-; phosphorus-; potassium-; nitrogen-; nutrient-deficiencies; florida-

Abstract: Two field studies conducted from 1990 to 1991 evaluated the effects of reclaimed water on growth and development of 1- and 2-year-old 'Redblush' grapefruit (*Citrus paradisi* Macf.) trees on Swingle citrumelo [*Citrus paradisi* (L.) Osb. X *Poncirus trifoliata* (L.) Raf.] rootstock. Treatments were arranged as a 3 (water sources) X 3 (irrigation levels) factorial at two locations on an Arredondo (well drained) and Kanapaha (poorly drained) fine sand near Gainesville, Fla. Irrigation treatments included 1) reclaimed water, 2) reclaimed water plus fertigation, and 3) well water plus fertigation. The reclaimed water was formulated to simulate that of a sewage treatment plant at Vero Beach, Fla. Irrigation was applied at 20% soil moisture depletion, or at 19 or 25 mm.week-1 regardless of rainfall. In both experiments, visual ratings of tree vigor, and measured tree height and trunk diameter, were significantly lower for trees watered with reclaimed water without fertilizer than for the others in both years. Moreover, there was no fourth leaf flush in 1991 with reclaimed water. There was a significant increase in leaf Na, Cl, and B concentrations for the reclaimed water and reclaimed water plus fertigation treatments in 1990; however, in 1991 only leaf B concentrations showed a similar trend. In 1991, there were no significant differences in leaf Cl concentrations. Visual symptoms of N deficiency were observed by the end of the first season in trees grown with reclaimed water. Irrigation levels generally did not affect tree growth.

NAL Call No.: SB1.H6

79. Monitoring large scale wastewater reclamation systems--policy and experience.

Azov, Y.; Juanico, M.; Shelef, G.

Water-Sci-Technol-J-Int-Assoc-Water-Pollut-Res-Control v.26, p.1545-1553. (1992).

In the series analytic: Water Quality International '92. Part 4 / edited by M. Suzuki, et al. Proceedings of the Sixteenth Biennial Conference of the International Association on Water Pollution Research and Control, held May 24-30, 1992, Washington, D.C.

Descriptors: waste-water-treatment; effluents-; quality-controls; monitoring-; programs-; water-reuse; irrigation-water; israel-

NAL Call No.: TD420.A1P7

80. Monitoring the quality of secondary effluents reused for unrestricted irrigation after underground storage.
Azov, Y.; Juanico, M.; Shelef, G.; Kanarek, A.; Priel, M.

Water-Sci-Technol-J-Int-Assoc-Water-Pollut-Res-Control v.24, p.267-275. (1991).

In the series analytic: Wastewater Reclamation and Reuse/edited by R. Mujeriego and T. Asano. Proceedings of the International Symposium of Wastewater Reclamation and Reuse, September 24-26, 1991, Costa Brava, Spain.

Descriptors: waste-water-treatment; reclamation-; systems-; effluents-; water-reuse; irrigation-water; water-quality; monitoring-; underground-storage; microbial-contamination; israel-

NAL Call No.: TD420.A1P7

81. Municipal effluent irrigation of fast-growing hybrid popular plantations near Vernon, British Columbia.
Carlson, M.

For-Chron v.68, p.206-208. (1992).

Paper presented at "Contribution of Salicaceae Family to Ameliorating our Environment." Joint Popular Council of Canada/US Popular Council Annual Meeting held Sept. 26-29, 1991, Ottawa, Ontario, Canada.

Descriptors: populus-deltoides; populus-trichocarpa; populus-nigra; hybrids-; clones-; forest-plantations; irrigation-; sewage-effluent; waste-water; growth-; plant-height; volume-; british-columbia

NAL Call No.: 99.8-F7623

82. Municipal water reuse at Tallahassee, Florida.
Allhands, M. N.; Allick, S. A.; Overman, A. R.; Leseman, W. G.; Vidak, W.

Trans-ASAE v.38, p.411-418. (1995).

Includes references.

Descriptors: fodder-crops; irrigation-; water-reuse; waste-water; soil-depth; organic-matter; cation-exchange-capacity; nutrient-uptake; soil-ph; florida-
Abstract: Characteristics of municipal reclaimed water (treated wastewater) and of the soil affect design and operation of a land application system for crop production. In this study field measurements showed an exponential decrease with soil depth in organic matter, cation exchange capacity, exchangeable acidity, and available phosphorus. A linear increase in dry matter yield plant N uptake, and plant K uptake with harvest interval was observed for warm-season bermudagrass. For a harvest interval of six weeks and a seasonal loading rate of 194 kg N/ha, 33 kg P/ha, and 97 kg K/ha, bermudagrass production was estimated as 7.43 Mg/ha dry matter yield and plant uptake of 108 kg N/ha, 22 kg P/ha, and 53 kg K/ha. Corresponding values for winter rye were 4.25 Mg/ha, 145 kg N/ha, 23 kg P/ha, and 66 kg K/ha. The cation exchange capacity of the soil was dominated by calcium, due

to calcium in the city water supply from a limestone aquifer, with only about 2% occupied by potassium. Soil pH stabilized at 7.0 in response to reclaimed water pH of 7.5. At the soil surface soil phosphorus was 90 mg P/kg soil, cation exchange capacity 3.0 meq/100 g soil, and organic matter 1%. Flexibility in management proved essential for success of the farming operation. A Farm Information Committee meets quarterly to discuss matters of mutual interest for the farm, public utility, and research.

NAL Call No.: 290.9-Am32T

83. Nitrate management with subsurface drip irrigation.
Phene, C. J.; Ruskin, R.

Clean water, clean environment, 21st century team agriculture, working to protect water resources conference proceedings, March 5-8, 1995, Kansas City, Missouri /. St. Joseph, Mich. : ASAE, c1995.. v. 2 p. 159-162.

Includes references.

Descriptors: trickle-irrigation; subsurface-irrigation; waste-water; water-reuse; irrigation-water; nitrate-; nitrate-nitrogen; leaching-; ammonium-; nutrient-uptake; zea-mays; nitrification-; nitrogen-fertilizers; fertigation-
NAL Call No.: TD365.C54-1995

84. Nitrogen fixation in a white clover-grass pasture irrigated with saline groundwater.
Smith, C. J.; Chalk, P. M.; Noble, C. L.; Prendergast, J. B.; Robertson, F.

Irrig-sci v.13, p.189-194. (1993).

Includes references.

Descriptors: trifolium-repens; paspalum-dilatatum; lolium-perenne; nitrogen-fixation; grassland-soils; irrigated-conditions; saline-water; irrigation- water; groundwater-; water-reuse; victoria-

Abstract: Nitrogen (N₂) fixation in an irrigated white clover-grass sward was estimated using the (15)N isotope dilution technique following the addition of K(15)NO₃ at 0.5 g N m⁻² and 80 atom % (15)N in a field study during the 1990-91 season. Two water salinity treatments (channel water; EC_w = 0.07 and groundwater; 2.4 dSm⁻¹) and four irrigation frequencies were included in a factorial design with four replicates. The channel water treatments were irrigated when pan evaporation minus rainfall equalled 50 mm, whereas the groundwater treatments were irrigated at deficits of 40, 50, 65 or 80 mm. Cumulative dry matter of the clover was significantly less in treatments irrigated with saline groundwater compared to channel water at day 164, and soil salinities (EC_e) increased on average from 2.3 to 5.07 dSm⁻¹. In contrast, salinity of the irrigation water had no effect on the cumulative yield of grass. Cumulative dry matter of the grass and clover were not affected by groundwater irrigation frequency. Total N accumulation by the grass did not differ significantly between treatments.

However, total N accumulation in white clover was significantly less ($P < 0.05$) in all treatments irrigated with groundwater compared to channel water. Neither the N concentrations of the grass nor the clover differed significantly between the salinity treatments. Salinity and irrigation frequency had no effect on the proportion of clover N (P atm) derived from N_2 fixation. The values of P atm were high throughout, and increased progressively from 0.78 at day 39 to 0.91 at day 164 ($P < 0.01$). Thus to moderate soil salinity did not affect the symbiotic dependence of clover, but the yield of.

NAL Call No.: S612.I756

85. Nitrogen-fixing heterotrophic bacteria and presumptive coliforms in sewage treatment plants and irrigation reservoirs in Libya.

Betaieb, M.; Jones, K.

Lett-Appl-Microbiol v.15, p.32-33. (1992).

Includes references.

Descriptors: coliform-bacteria; enterobacteriaceae-; nitrogen-fixing-bacteria; microbial-contamination; irrigation-water; water-reservoirs; sewage-effluent; sewage-effluent-disposal; waste-water-treatment; libya-

NAL Call No.: QR1.L47

86. Occurrence of Phytophthora species in recirculated nursery irrigation effluents.

MacDonald, J. D.; Ali Shtayeh, M. S.; Kabashima, J.; Stites, J.

Plant-dis. [St. Paul, Minn., American Phytopathological Society]. June 1994. v. 78 (6) p. 607-611.

Includes references.

Descriptors: phytophthora-; species-; detection-; irrigation-; runoff-water; waste-water; water-reuse; water-quality; seasonal-fluctuations; runoff-irrigation

NAL Call No.: 1.9-P69P; DLC PAR; PPUSDA x

87. Pepper (Capsicum annuum) cultivar response to metolachlor in three New Mexico soils.

Schroeder, J.

Weed-Technol-J-Weed-Sci-Soc-Am v.6, p.366-373. (1992).

Includes references.

Descriptors: capsicum-annuum; cultivars-; varietal-susceptibility; crop-damage; metolachlor-; phytotoxicity-; crop-yield; yield-losses; irrigation-water; water-quality; herbicide-resistance; new-mexico

NAL Call No.: SB610.W39

88. Performance of an integrated ponding system operated in arid zones.

Puskas, K.; Esen, I. I.; Banat, I.; Al Daher, R.

Water-Sci-Technol-J-Int-Assoc-Water-Pollut-Res-Control v.23, p.1543-1552. (1991).

Paper presented at the "Fifteenth Biennial Conference of the International Association on Water Pollution Research and Control," July 29- August 3, 1990, Kyoto, Japan.

Descriptors: waste-water-treatment; ponds-; integrated-systems; arid-regions; water-reuse; irrigation-water; algae-; biomass-production; kuwait-NAL Call No.: TD420.A1P7

89. Photosynthetic and growth responses of two broad-leaf tree species to irrigation with municipal landfill leachate. Shrive, S. C.; McBride, R. A.; Gordon, A. M.

J-environ-qual v.23, p.534-542. (1994).

Includes references.

Descriptors: acer-rubrum; populus-; landfill-leachates; waste-disposal; application-to-land; irrigation-; application-rates; photosynthesis-; leaf- conductance; stomata-; phytotoxicity-; leaves-; toxic-substances; ontario-
Abstract: A study was undertaken to investigate leaf photosynthesis and stem growth responses of saplings of two broad-leaf tree species to irrigation with municipal solid waste (MSW) leachate in a northern temperate climate at Ontario, Canada. The objective was to quantify plant stresses or changes in plant productivity that could be attributed to this low technology option for the treatment and disposal of groundwater contaminated by municipal refuse. Red maple (*Acer rubrum* L.) and hybrid poplar [*Populus* spp. *nigra* X *maximowiczii* (NM6)] were subjected to two consecutive seasons of leachate irrigation in a three factor, RCBD split-plot field experiment. The three factors were irrigant type (MSW leachate, water), mode of application (spray, surface trickle, subsurface irrigation), and rate of application (3.5, 7.0, and 14.0 mm d⁻¹). The main treatment plots in each of three blocks were split into subplots planted to different tree species. In the second irrigation season, the mean seasonal photosynthesis rates increased for irrigated saplings of both species relative to rain-fed control saplings, irrespective of irrigant type. Mean seasonal photosynthesis rates for red maple increased with irrigant application rate, but were unaffected by irrigant type. Incremental stem diameter and height growth for this species were largely unaffected by the experimental treatments. Mean seasonal photosynthesis rates for hybrid poplar were unaffected by either irrigant type or application rate, but stem growth did increase significantly with leachate irrigation. The mode of irrigant application was not a significant factor in explaining plant response for either species. Direct exposure of. induce phytotoxic symptoms in the saplings. Irrigation of a MSW leachate of relatively high ionic strength can be carried out successfully on clay soils under Ontario climatic conditions without causing significant adverse effects on saplings of

these tree species. Treatment and disposal of MSW leachates in tree plantations may offer a low technology, low cost option to municipalities.

NAL Call No.: QH540.J6

90. Physicochemical treatment of tropical wastewaters: production of microbiologically safe effluents for unrestricted crop irrigation.

Gambrill, M. P.; Mara, D. D.; Silva, S. A.

Water-Sci-Technol-J-Int-Assoc-Water-Pollut-Res-Control v.26, p.1449-1458. (1992).

In the series analytic: Water Quality International '92. Part 4 / edited by M. Suzuki, et al. Proceedings of the Sixteenth Biennial Conference of the International Association on Water Pollution Research and Control, held May 24-30, 1992, Washington, D.C.

Descriptors: households-; waste-water; stabilizing-; ponds-; waste-water-treatment; technology-; effluents-; microbiology-; health-; safety-; water-reuse; irrigation-water; brazil-

NAL Call No.: TD420.A1P7

91. Planning and implementation of water reuse projects.

Asano, T.

Water-Sci-Technol-J-Int-Assoc-Water-Pollut-Res-Control v.24, p.1-10. (1991).

In the series analytic: Wastewater Reclamation and Reuse/edited by R. Mujeriego and T. Asano. Proceedings of the International Symposium of Wastewater Reclamation and Reuse, September 24-26, 1991, Costa Brava, Spain.

Descriptors: waste-water-treatment; costs-; water-reuse; irrigation-water; planning-; constraints-; water-; resources-; water-supply; groundwater- recharge; urban-areas; municipal-wastewater

NAL Call No.: TD420.A1P7

92. Planning for reuse. Developing a strategy for the Northern Territory, Australia.

Burgess, M. D.

Water-Sci-Technol-J-Int-Assoc-Water-Pollut-Res-Control v.24, p.31-43. (1991).

In the series analytic: Wastewater Reclamation and Reuse/edited by R. Mujeriego and T. Asano. Proceedings of the International Symposium of Wastewater Reclamation and Reuse, September 24-26, 1991, Costa Brava, Spain.

Descriptors: waste-water-treatment; water-reuse; irrigation-water; economic-analysis; environmental-impact; planning-; waste-disposal; drinking-water; water-resources; australian-northern-territory

NAL Call No.: TD420.A1P7

93. Pollution and public health problems related to irrigation.
Hornsby, A. G.

Agronomy p.1173-1188. (1990).
In the series analytic: Irrigation of agricultural crops/edited by B.A. Stewart and D.R. Nielsen.
Descriptors: irrigation-; water-pollution; pollutants-; agricultural-land; public-health; assessment-
NAL Call No.: 4-Am392

94. Possible reuse of treated municipal wastewater for Citrus spp. plant irrigation.
Lapena, L.; Cerezo, M.; Garcia Augustin, P.

Bull-environ-contam-toxicol v.55, p.697-703. (1995).
Includes references.
Descriptors: citrus-; waste-water; irrigation-water; irrigation-; waste-utilization; mineral-content; phytotoxicity-; growth-; spain-
NAL Call No.: RA1270.P35A1

95. Problems of irrigation drainage water utilization for the prevention of surface water pollution.
Sanin, M. V.

Water-sci-technol v.28, p.489-496. (1993).
Paper presented at the IAWQ First International Conference on "Diffuse (Nonpoint) Pollution: Sources, Prevention, Impact, Abatement." September 19-24, 1993, Chicago, Illinois.
Descriptors: irrigation-water; drainage-water; loads-; body-water; water-reuse; surface-water; water-pollution; salinization-; prevention-; ussr-
NAL Call No.: TD420.A1P7

96. Public health concerns in wastewater reuse.
Cooper, R. C.

Water-Sci-Technol-J-Int-Assoc-Water-Pollut-Res-Control v.24, p.55-65. (1991).
In the series analytic: Wastewater Reclamation and Reuse/edited by R. Mujeriego and T. Asano. Proceedings of the International Symposium of Wastewater Reclamation and Reuse, September 24-26, 1991, Costa Brava, Spain.
Descriptors: waste-water; water-use; water-resources; irrigation-water; groundwater-; recharge-; drinking-water; public-health; health-protection; water- pollution
NAL Call No.: TD420.A1P7

97. Public health criteria for the aquatic environment: recent Who Guidelines and their application.
Helmer, R.; Hespanhol, I.; Saliba, L. J.

Water-Sci-Technol-J-Int-Assoc-Water-Pollut-Res-Control v.24,
p.35-42. (1991).

In the series analytic: Health-Related Water Microbiology
1990 / edited by W.O.K. Grabow, R. Morris, and K. Botzenhart.
Descriptors: drinking-water; irrigation-water;
microbial-contamination; public-health; health-hazards;
helminths-; shellfish-; contamination-; who-; guidelines-
NAL Call No.: TD420.A1P7

98. Quality criteria for reclaimed water.
Crook, J.

Water-Sci-Technol-J-Int-Assoc-Water-Pollut-Res-Control v.24,
p.109-121. (1991).

In the series analytic: Wastewater Reclamation and
Reuse/edited by R. Mujeriego and T. Asano. Proceedings of the
International Symposium of Wastewater Reclamation and Reuse,
September 24-26, 1991, Costa Brava, Spain.

Descriptors: waste-water-treatment; water-reuse;
irrigation-water; water-quality; quality-standards;
microbiology-; chemicals-; public-health; health- protection;
guidelines-; who-; usa-
NAL Call No.: TD420.A1P7

99. The quality of Arizona irrigation waters.
Smith, H. V. H. V. l.; Draper, G. E.; Fuller, W. H.

Tucson, Ariz. : Agricultural Experiment Station, University
of Arizona, 1964. 96 p. : ill., maps.

Bibliography: p.21-22.

Descriptors: Water-supply-Arizona; Water-Composition;
Irrigation-water; Water,-Underground-Arizona

NAL Call No.: 100-Ar4M-no.223

100. Re-use systems in the Kerang region.
Victoria. Dept. of Agriculture.

[Kerang, Vic.?] : Dept. of Agriculture, [1994] ii, 20 p. :
ill. (some col.).

Cover title.

Descriptors: Water-reuse-Australia-Victoria-Kerang;
Irrigation-Australia-Victoria-Kerang-Management

NAL Call No.: TD429.R48--1994

101. Recent developments in membrane water reuse projects.
Freeman, S. D. N.; Morin, O. J.

Desalination v.103, p.19-30. (1995).

Paper presented at the American Desalting Association 1994
Biennial Conference on Membrane and Desalting Technologies,
September 11-15, 1994, Palm Beach, Florida.

Descriptors: water-reuse; waste-water; factory-effluents;

sewage-effluent; membranes-; reverse-osmosis;
water-purification; reclamation-; irrigation- water;
irrigation-; groundwater-recharge; florida-; california-;
mexico-; arizona-; secondary-municiple-effluent

NAL Call No.: TD478.D4

102. Reclaimed wastewater for irrigation of citrus in Florida.

Davies, F. S.; Maurer, M. A.

HortTechnology v.3, p.163-167. (1993).

Paper presented at the "Workshop on Waste Product Utilization and Disposal in Horticultural Crops", held at the 89th American Society for Horticultural Science, August 5, 1992, Honolulu, Hawaii.

Descriptors: citrus-paradisi; irrigation-water;
water-quality; waste-water; waste-utilization;
crop-production; crop-yield; crop-quality; growth-rate;
fruit-; fertigation-; florida-

NAL Call No.: SB317.5.H68

103. Reclaimed water to the rescue.

Engle, M.

Calif-Grow v.16, p.35. (1992).

Descriptors: water-reuse; irrigation-; irrigation-systems;
gray-water

NAL Call No.: SB379.A9A9

104. Reclamation Wastewater and Groundwater Study Act and Reclamation Projects Authorization and Adjustment Act of 1990 : hearing before the Subcommittee on Water and Power of the Committee on Energy and Natural Resources, United States Senate, One Hundred First Congress, second session, on S. 2657 ... H.R. 2567 ... September 27, 1990.

United States. Congress. Senate. Committee on Energy and Natural Resources. Subcommittee on Water and Power.

Washington [D.C.] : U.S. G.P.O. : For sale by the Supt. of Docs., Congressional Sales Office, U.S. G.P.O., 1991. iii, 72 p. : ill., maps.

Distributed to some depository libraries in microfiche.

Descriptors:

Water-resources-development-Law-and-legislation-United-States;
Water-reuse-United-States; Irrigation-laws-United-States

NAL Call No.: KF26.E559-1990d

105. Recycling drainage water in San Joaquin Valley, California.

Oron, G.

J-irrig-drain-eng v.119, p.265-285. (1993).

Includes references.

Descriptors: drainage-water; saline-water; waste-water;
water-reuse; recycling-; decision-making;
mathematical-models; gossypium-hirsutum; arid- regions;
semiarid-zones; california-
NAL Call No.: 290.9-AM3Ps-IR

106. Recycling wastewater in Florida.
Woods, C. T.

Yearb-agric. Washington, D.C. : U.S. Dept. of Agriculture :
For sale by the Supt. of Docs., U.S. G.P.O., [1980-. 1991.
p. 264-266.
In the series analytic: Agriculture and the Environment /
edited by D. Takiff Smith.
Descriptors: water-reuse; recycling-; waste-water;
waste-water-treatment; irrigation-water; resource-allocation;
environmental-protection; florida-
NAL Call No.: 1-Ag84y

107. Reduction of lead accumulation by ethylenediamine
tetraacetic acid and nitrilo triacetic acid in okra
(Abelmoschus esculentus L.) grown in sewage-irrigated soil.
Denduluri, S.

Bull-Environ-Contam-Toxicol v.51, p.40-45. (1993).
Includes references.
Descriptors: abelmoschus-esculentus; sewage-; waste-water;
irrigation-water; lead-; uptake-; phytotoxicity-; edta-;
nitrilotriacetic-acid
NAL Call No.: RA1270.P35A1

108. Removal of trace metals from wastewater during long-term
storage in seasonal reservoirs.
Juanico, M.; Ravid, R.; Azov, Y.; Teltsch, B.

Water-air-soil-pollut v.82, p.617-633. (1995).
Includes references.
Descriptors: copper-; zinc-; chromium-; lead-; aluminum-;
removal-; water-quality; water-reservoirs; waste-water;
sewage-effluent; water-reuse; irrigation-water;
geological-sedimentation; israel-; stabilization-reservoirs
NAL Call No.: TD172.W36

109. A report from Malta: water supply and liquid and solid
wastes collection and disposal in the Maltese Islands.
Jaccarini, J. M.; Degaetano, J. C.

J-Inst-Water-Environ-Manag v.7, p.431-435. (1993).
Includes references.
Descriptors: water-supply; water-pollution;
water-purification; water-reuse; irrigation-water; malta-
NAL Call No.: TD420.W374

110. Residual contamination of crops irrigated with effluent of different qualities: a field study.
Armon, R.; Dosoretz, C. G.; Azov, Y.; Shelef, G.

Water-sci-technol v.30, p.239-248. (1994).
In the series analytic: Water Quality International '94. 9. Special applications and emerging technologies; specific pollutants and treatment technologies; water reuse--industrial and municipal applications / edited by D. Ballay, T. Asano, R. Bhamidimarri, et al.
Descriptors: horticultural-crops; sprinkler-irrigation; irrigation-water; water-reuse; sewage-effluent; waste-water-treatment; microbial-contamination; salmonella-; fecal-coliforms; bacteriophages-; indicator-species; coliform-bacteria; water-quality; vegetables-; coliphages-
NAL Call No.: TD420.A1P7

111. Residual faecal contamination on effluent-irrigated lettuces.
Vaz da Costa Vargas, S. M.; Mara, D. D.; Vargas Lopez, C. E.

Water-Sci-Technol-J-Int-Assoc-Water-Pollut-Res-Control v.24, p.89-94. (1991).
In the series analytic: Wastewater Reclamation and Reuse/edited by R. Mujeriego and T. Asano. Proceedings of the International Symposium of Wastewater Reclamation and Reuse, September 24-26, 1991, Costa Brava, Spain.
Descriptors: lactuca-sativa; irrigated-stands; septic-tank-effluent; sprinkler-irrigation; crops-; contamination-; fecal-flora; decontamination-; irrigation-water; waste-water-treatment; water-reuse; public-health; health-protection; quality-standards; portugal-
NAL Call No.: TD420.A1P7

112. Response of young olive trees to sodium and boron excess in irrigation water.
Benlloch, M.; Arboleda, F.; Barranco, D.; Fernandez Escobar, R.

HortScience v.26, p.867-870. (1991).
Includes references.
Descriptors: olea-europaea; cultivars-; responses-; saline-water; irrigation-water; boron-; tolerance-; rooting-; cuttings-; shoots-; growth-; elements-; distribution-; leaves-; ratios-; maturity-stage; salt-tolerance; phytotoxicity-; culture-media; greenhouse-culture; nutrient-excesses; sodium-; potassium-; spain-
Abstract: The influence of sodium and boron excess in the irrigation water on shoot growth and on the distribution of these elements within various leaf types was studied on rooted olive cuttings (*Olea europaea* L.). 'Lechin de Granada' was more tolerant than 'Manzanillo' to sodium excess, as indicated by greater shoot growth and lower accumulation of sodium, especially in the young leaves. 'Picual' was more

tolerant to boron than 'Manzanillo', with less accumulation in adult leaves. The results suggest the avoidance of toxicity by an ionic exclusion mechanism that is more effective in some cultivars than others. Also, the results reveal cultivar differences in the tolerance of olive to sodium and boron excess in the culture medium.

NAL Call No.: SB1.H6

113. Reuse of waste water for irrigation in the West Bank: some aspects.

Sbeih, M. Y.

Stud-environ-sci. Amsterdam ; New York, Elsevier Scientific Publishing Co. 1994. v. 58 p. 339-350.

In the series analytic: Water and peace in the Middle East / edited by J. Isaac and H. Shuval.

Descriptors: water-resources; water-management; sewage-effluent; sewage-; irrigation-water; israel-; occupied-palestinian-territories; water-reuse; water-reclamation

NAL Call No.: QH540.S8

114. Reuse of wastewater from meat processing plants for agricultural and forestry irrigation.

Russell, J. M.; Cooper, R. N.; Lindsey, S. B.

Water-Sci-Technol-J-Int-Assoc-Water-Pollut-Res-Control v.24, p.277-286. (1991).

In the series analytic: Wastewater Reclamation and Reuse/edited by R. Mujeriego and T. Asano. Proceedings of the International Symposium of Wastewater Reclamation and Reuse, September 24-26, 1991, Costa Brava, Spain.

Descriptors: meat-and-livestock-industry; industrial-wastes; chemical-composition; water-reuse; irrigation-water; irrigated-pastures; forestry-; groundwater-pollution; nitrates-; new-zealand

NAL Call No.: TD420.A1P7

115. Reuse simulation in irrigated river basin.

Smedema, L. K.; Wolters, W.; Hoogenboom, P. J.

J-irrig-drain-eng v.118, p.841-851. (1992).

Includes references.

Descriptors: basin-irrigation; irrigation-water; drainage-water; water-reuse; simulation-models; pakistan-

NAL Call No.: 290.9-AM3Ps-IR

116. Revision of standards and specifications for water management at farm level.

Pakistan Agricultural Research Council.

Islamabad : Pakistan Agricultural Research Council, 1993.

iii, 38 p. : ill..

"Final technical report of the PL-480 coordinated research project on, "Revision of Standards and Specifications for Water Management at Farm Level" under USDA grant numbers FG-Pa404 to 408 (PK-ARS 246 to 250) implemented from July 1986 to June 1990."

Descriptors: Irrigation-farming-Pakistan

NAL Call No.: S616.P18R49--1993

117. Role of groundwater recharge in treatment and storage of wastewater for reuse.

Bouwer, H.

Water-Sci-Technol-J-Int-Assoc-Water-Pollut-Res-Control v.24, p.295-302. (1991).

In the series analytic: Wastewater Reclamation and Reuse/edited by R. Mujeriego and T. Asano. Proceedings of the International Symposium of Wastewater Reclamation and Reuse, September 24-26, 1991, Costa Brava, Spain.

Descriptors: waste-water-treatment; water-storage; water-quality; requirements-; water-reuse; irrigation-water; irrigated-stands; vegetables-; microbial- contamination; pathogens-; groundwater-recharge; application-to-land; aquifers-; public-health; health-protection; drinking-water

NAL Call No.: TD420.A1P7

118. The role of wastewater reclamation and reuse in the USA.

Asano, T.; Tchobanoglous, G.

Water-Sci-Technol-J-Int-Assoc-Water-Pollut-Res-Control v.23, p.2049-2059. (1991).

Paper presented at the "Fifteenth Biennial Conference of the International Association on Water Pollution Research and Control," July 29- August 3, 1990, Kyoto, Japan.

Descriptors: waste-water-treatment; water-reuse; irrigation-water; health-protection; water-resources; water-management

NAL Call No.: TD420.A1P7

119. Saline drain water reuse in agroforestry systems.

Tanji, K. K.; Karajeh, F. F.

J-irrig-drain-eng v.119, p.170-180. (1993).

Paper presented at the "ASCE Irrigation and Drainage National Conference", July 22-26, 1991, Honolulu, Hawaii.

Descriptors: drainage-water; saline-water; water-reuse; eucalyptus-; subsurface-drainage; california-; san-joaquin-valley

NAL Call No.: 290.9-AM3Ps-IR

120. Saline irrigation of cv. Manzanillo and Uovo di Piccione trees.

Klein, I.; Ben Tai, Y.; Lavee, S.; Malach, Y. de.; David, I.

Acta-hortic p.176-180. (1994).
Paper presented at the "Second International Symposium on
Olive Growing," September 6-10, 1993, Jerusalem, Israel.
Descriptors: olea-europaea; irrigation-water; saline-water;
trickle-irrigation; salinity-; phytotoxicity-; sodium-;
mineral-content; roots-; shoots-; crop- yield; israel-
NAL Call No.: 80-Ac82

121. Satellite wastewater reclamation plants: how to get what
you bargain for.
McHaney, S. X.

Desalination v.88, p.215-223. (1992).
Proceedings of the NWSIA 1992 Biennial Conference on
"Desalting and Recycling: Meeting Today's Water Challenges,"
August 23-27, 1992, Newport Beach, California. Volume 2.
Descriptors: urban-areas; waste-water; reclamation-;
utilization-; irrigation-water; lawns-and-turf; landscape-;
public-parks; golf-courses; california-
NAL Call No.: TD478.D4

122. Sensitivity of tobacco (*Nicotiana tabacum*) and vegetable
crop seedlings to fluridone in irrigation water.
Kay, S. H.; Monks, D. W.; Hoyle, S. T.; Robinson, D. K.

Weed-technol v.8, p.250-257. (1994).
Includes references.
Descriptors: nicotiana-tabacum; lycopersicon-esculentum;
capsicum-annuum; cucumis-sativus; seedlings-;
irrigation-water; herbicide-residues; nontarget-effects;
fluridone-; phytotoxicity-; irrigation-scheduling;
crop-damage; abiotic-injuries; application-rates;
aquatic-weeds; weed- control; chemical-control; ponds-
NAL Call No.: SB610.W39

123. Sequential batch-fed effluent storage reservoirs: a new
concept of wastewater treatment prior to unrestricted crop
irrigation.
Mara, D. D.; Pearson, H. W.

Water-Sci-Technol-J-Int-Assoc-Water-Pollut-Res-Control v.26,
p.1459-1464. (1992).
In the series analytic: Water Quality International '92. Part
4 / edited by M. Suzuki, et al. Proceedings of the Sixteenth
Biennial Conference of the International Association on
Water Pollution Research and Control, held May 24-30, 1992,
Washington, D.C.
Descriptors: waste-water-treatment; effluents-; storage-;
reservoirs-; water-reuse; irrigation-water; israel-
NAL Call No.: TD420.A1P7

124. Significance and current status of wastewater reuse in
Sicily.

Croce, F.; Dardanoni, L.

Water-Sci-Technol-J-Int-Assoc-Water-Pollut-Res-Control v.24,
p.45-54. (1991).

In the series analytic: Wastewater Reclamation and
Reuse/edited by R. Mujeriego and T. Asano. Proceedings of the
International Symposium of Wastewater Reclamation and Reuse,
September 24-26, 1991, Costa Brava, Spain.

Descriptors: waste-water; water-reuse; irrigation-water;
water-resources; water-pollution; water-conservation;
fresh-water; deficiency-; saline-water; desalinization-;
public-health; health-protection; drinking-water; sicily-

NAL Call No.: TD420.A1P7

125. Soil and sweet cherry responses to irrigation with
wastewater.

Neilsen, G. H.; Stevenson, D. S.; Fitzpatrick, J. J.;
Brownlee, C. H.

Can-J-Soil-Sci v.71, p.31-41. (1991).

Includes references.

Descriptors: prunus-avium; sandy-soils; irrigation-water;
waste-water; waste-utilization; nitrogen-fertilizers;
soil-ph; electrical-conductivity; foliar- nutrition;
nutrient-uptake

NAL Call No.: 56.8-C162

126. Soil denitrification rates at wastewater irrigation
sites receiving primary-treated and anaerobically treated
meat-processing effluent.

Russel, J. M.; Cooper, R. N.; Lindsey, S. B.

Bioresource-Technol v.43, p.41-46. (1993).

Includes references.

Descriptors: meat-and-livestock-industry; effluents-;
anaerobic-treatment; waste-water; irrigation-; soil-;
denitrification-

NAL Call No.: TD930.A32

127. Standards for irrigation water quality : details. Ti 1
pan. Nung tien kuan kai shui chih piao chun : hsiang chieh.
Wang, T. j.; T'eng, C.

Pei-ching : Chung-kuo nung yeh k'o chi ch'u pan she : Hsin
hua shu tien Pei-ching fa hsing so fa hsing, 1992. 245 p.,
[8] p. of plates : ill. (some col.),

Descriptors: Irrigation-water-China; Water-quality-China

NAL Call No.: S618.45.N86--1992

128. Studies on the influence of long-term municipal
sewage-effluent irrigation on soil physical properties.

Mathan, K. K.

Bioresour-technol v. 48, p.275-276. (1994).

Includes references.

Descriptors: soil-physical-properties; irrigation-water;
water-; sewage-effluent; sandy-loam-soils; bulk-density;
soil-depth; hydraulic-conductivity; india-; well-water

NAL Call No.: TD930.A32

129. Subsurface microirrigation with effluent.

Oron, G.; DeMalach, J.; Hoffman, Z.; Cibotaru, R.

J-Irr-Drain-Eng v.117, p.25-36. (1991).

Includes references.

Descriptors: gossypium-hirsutum; zea-mays; triticum-aestivum;
pisum-sativum; trickle-irrigation; subsurface-irrigation;
emitters-; sewage-effluent; waste-water; nutrient-content;
crop-yield; productivity-; semiarid-zones; arid-zones;
israel-

NAL Call No.: 290.9-AM3PS-IR

130. Suitability of petrochemical industry wastewater for
irrigation.

Aziz, O.; Manzar, M.; Inam, A.

J-environ-sci-health, -Part-A, -Environ-sci-eng v.A30,
p.735-751. (1995).

Includes references.

Descriptors: waste-water; irrigation-; application-to-land;
triticum-aestivum; cultivars-; growth-; crop-yield;
soil-properties; crop-quality; india-

NAL Call No.: TD172.J6

131. Tips on irrigating woody plants with gray water.

Agfocus-Publ-Cornell-Coop-Ext-Orange-Cty p.11. (1992).

Descriptors: woody-plants; irrigation-; water-reuse

NAL Call No.: S544.3.N7A4

132. Tolerance of putting green turfgrasses to simazine in
irrigation water.

Murphy, T. R.; Johnson, B. J.

Weed-Technol-J-Weed-Sci-Soc-Am v.6, p.328-332. (1992).

Includes references.

Descriptors: lawns-and-turf; golf-; sports-grounds;
irrigation-water; mixtures-; simazine-; phytotoxicity-;
cynodon-; cynodon-dactylon; hybrids-; lolium- perenne;
agrostis-stolonifera-var; -palustris; crop-damage;
crop-quality; cynodon-transvaalensis

NAL Call No.: SB610.W39

133. Treated municipal wastewater for citrus irrigation.

Zekri, M.; Koo, R. C. J.

J-plant-nutr v.17, p.693-708. (1994).

Includes references.

Descriptors: irrigation-water; waste-water; sewage-effluent;
irrigation-; citrus-paradisi-x-citrus-reticulata;
citrus-sinensis; mineral-uptake; mineral- content; leaves-;
mineral-nutrition; citrus-soils; florida-

Abstract: Treated, reclaimed municipal wastewater was evaluated on citrus trees in central Florida for over six years. The effects of irrigation with reclaimed wastewater on soil water content, soil chemical analysis, leaf mineral status, and fruit quality were compared with those of irrigation with well water. Irrigation with reclaimed water increased mineral residues in the soil profile, altered leaf mineral concentration and fruit quality, and promoted better tree performance and more weed growth relative to irrigation with well water. Higher accumulation of nitrogen (N), potassium (K), calcium (Ca), and magnesium (Mg) in soils irrigated with reclaimed water were not significantly reflected in leaf mineral status. Although leaf sodium (Na), chloride (Cl), and boron (B) concentrations were noticeably higher in reclaimed water treatments than in those of well water, they are still far below the toxicity levels. This highly treated wastewater in central Florida has been found to be a very safe and good option for increasing water supplies, but not a significant source of plant nutrients to citrus trees.

NAL Call No.: QK867.J67; LNSU QK867.J67

134. Treatment of wastewater from the textile industry.
Nicolaou, M.; Hadjivassilis, I.

Water-Sci-Technol-J-Int-Assoc-Water-Pollut-Res-Control v.25,
p.31-35. (1992).

Paper presented at the "International Specialized
Conference," November 20-22, 1990, Nicosia, Cyprus.

Descriptors: textile-industry; waste-water-treatment;
chemical-treatment; coagulation-; chemical-precipitation;
activated-sludge; irrigation-water; water- reuse; cyprus-

NAL Call No.: TD420.A1P7

135. Treatment, reuse, and disposal of drain waters.
Lee, E. W.

J-irrig-drain-eng v.119, p.501-513. (1993).

Includes references.

Descriptors: drainage-water; agricultural-land;
trace-elements; salts-in-soil; treatment-; water-reuse;
disposal-; california-; agricultural-drainage-water

NAL Call No.: 290.9-AM3Ps-IR

136. The urban water cycle, including wastewater use in
agriculture.

Pescod, M. B.

Outlook-Agric. Oxon : C.A.B. International. Dec 1992. v. 21
(4) p. 263-270. ill.

Special issue: Focus on water.

Descriptors: waste-water; water-resources; health-hazards;
irrigation-; rural-areas; urban-areas

NAL Call No.: 10-OU8

137. Use of aquaculture effluent as a supplemental source of
nitrogen fertilizer to wheat crop.

Al Jaloud, A. A.; Hussain, G.; Alsadon, A. A.; Siddiqui, A.
Q.; Al Najada, A.

Arid-soil-res-rehabil v.7, p.233-241. (1993).

Includes references.

Descriptors: triticum-aestivum; aquaculture-; waste-water;
water-reuse; irrigation-water; nitrogen-; nutrient-sources;
nitrogen-fertilizers; urea-; application-rates; crop-yield;
grain-; wheat-straw; yield-components; plant-height;
biomass-production; dry-matter-accumulation; tillering-;
tillers-; waste-utilization; saudi-arabia;
greenmatter-production; tillers-per-plant

NAL Call No.: S592.17.A73A74

138. Use of reclaimed water for irrigation and fertigation of
young 'Redblush' grapefruit trees.

Maurer, M. A.; Davies, F. S.

Proc-annu-meet-Fla-State-Hort-Soc. [S.l.] : The Society, . May
1994. v. 106 p. 22-30.

Meeting held October 19-21, 1993, Miami Beach, Florida.

Descriptors: citrus-paradisi; irrigation-; water-reuse;
fertilizers-; fertigation-; plant-development;
mineral-deficiencies; crop-quality; crop-yield

NAL Call No.: SB319.2.F6F56

139. Use of tomato (*Lycopersicon esulentum*) seedlings to
detect bensulfuron and quinclorac residues in water.

Barreda, D. G. de.; Lorenzo, E.; Carbonell, E. A.; Cases, B.;
Munoz, N.

Weed-technol v.7, p.376-381. (1993).

Includes references.

Descriptors: oryza-sativa; weed-control; chemical-control;
herbicide-residues; quinclorac-; bensulfuron-; detection-;
water-pollution; pollutants-; bioassays-; phytotoxicity-;
lycopersicon-esculentum; water-quality; irrigation-water;
irrigation-systems; spain-

NAL Call No.: SB610.W39

140. Using effluent water on your golf course.

Kopec, D.; Mancino, C.; Nelson, D.

USGA-Green-Sect-rec v.31, p.9-12. (1993).

Includes references.

Descriptors: golf-courses; irrigation-systems;
waste-water-treatment; sewage-effluent; fertilizers-;
cost-benefit-analysis; salts-; sodium-; bicarbonates-; ions-;
usa-

NAL Call No.: 60.18-UN33

141. Wastewater disposal by sub-surface trickle irrigation.
Oron, G.; DeMalach, Y.; Hoffman, Z.; Keren, Y.; Hartman, H.;
Plazner, N.

Water-Sci-Technol-J-Int-Assoc-Water-Pollut-Res-Control v.23,
p.2149-2158. (1991).

Paper presented at the "Fifteenth Biennial Conference of the
International Association on Water Pollution Research and
Control," July 29- August 3, 1990, Kyoto, Japan.

Descriptors: waste-water-treatment; water-reuse; disposal-;
irrigation-water; zea-mays; sweetcorn-; trickle-irrigation;
crop-yield; israel-

NAL Call No.: TD420.A1P7

142. Wastewater irrigation: January 1990 - June 1993.
Schneider, K.

Quick-bibliogr-ser. Beltsville, Md., National Agricultural
Library. July 1993. (93-55) 65 p.

Updates QB 90-64.

Descriptors: waste-water; irrigation-; bibliographies-

NAL Call No.: aZ5071.N3

143. Wastewater irrigation onto managed forest lands.
Rubin, A. R.; Frederick, D.; Milosh, R.

Pap-Am-Soc-Agric-Eng. St. Joseph, Mich. : American Society of
Agricultural Engineers,. Summer 1993. (932009) 14 p.

Paper presented at the "1993 International Summer Meeting
sponsored by The American Society of Agricultural Engineers,
and The Canadian Society of Agricultural Engineering," June
20-23, 1993, Spokane, Washington.

Descriptors: irrigation-; forests-; waste-water

NAL Call No.: 290.9-Am32P

144. Wastewater reclamation and water resources management.
Shelef, G.

Water-Sci-Technol-J-Int-Assoc-Water-Pollut-Res-Control v.24,
p.251-265. (1991).

In the series analytic: Wastewater Reclamation and
Reuse/edited by R. Mujeriego and T. Asano. Proceedings of the
International Symposium of Wastewater Reclamation and Reuse,
September 24-26, 1991, Costa Brava, Spain.

Descriptors: waste-water-treatment; water-reuse;
irrigation-water; water-resources; water-quality;

requirements-; economic-evaluation; israel-
NAL Call No.: TD420.A1P7

145. Wastewater reuse case studies in the Middle East.
Banks, P. A.

Water-Sci-Technol-J-Int-Assoc-Water-Pollut-Res-Control v.23,
p.2141-2148. (1991).

Paper presented at the "Fifteenth Biennial Conference of the
International Association on Water Pollution Research and
Control," July 29- August 3, 1990, Kyoto, Japan.

Descriptors: waste-water; water-reuse; irrigation-water;
water-quality; quality-standards; waste-water-treatment;
case-studies; middle-east

NAL Call No.: TD420.A1P7

146. Wastewater reuse for golf course irrigation. Waste
water reuse for golf course irrigation.
United States Golf Association.

Boca Raton : Lewis Publishers, c1994. vii, 294 p. : ill.,
maps.

Papers presented at a conference held in 1993.

Descriptors: Sewage-irrigation-Congresses;
Golf-courses-Congresses

NAL Call No.: TD760.W354--1994

147. Wastewater reuse for irrigation in the Near East Region.
Arar, A.

Water-Sci-Technol-J-Int-Assoc-Water-Pollut-Res-Control v.23,
p.2127-2134. (1991).

Paper presented at the "Fifteenth Biennial Conference of the
International Association on Water Pollution Research and
Control," July 29- August 3, 1990, Kyoto, Japan.

Descriptors: waste-water-treatment; water-reuse;
irrigation-water; public-health; health-protection;
middle-east

NAL Call No.: TD420.A1P7

148. Wastewater treatment and reuse aspects of Lake Valencia,
Venezuela.

Lansdell, M.; Carbonell, L. M.

Water-Sci-Technol-J-Int-Assoc-Water-Pollut-Res-Control v.24,
p.19-30. (1991).

In the series analytic: Wastewater Reclamation and
Reuse/edited by R. Mujeriego and T. Asano. Proceedings of the
International Symposium of Wastewater Reclamation and Reuse,
September 24-26, 1991, Costa Brava, Spain.

Descriptors: waste-water-treatment; water-reuse; lakes-;
irrigation-water; drinking-water; water-resources;
water-quality; venezuela-

NAL Call No.: TD420.A1P7

149. Water conservation approaches for commercial nurseries.
Engle, M.

Calif-Grow v.16, p.33-34. (1992).

Descriptors: nurseries-; water-conservation;
irrigation-systems; trickle-irrigation; water-reuse;
water-use-efficiency; public-relations; california-
NAL Call No.: SB379.A9A9

150. Water quality criteria for irrigation with highly saline
water.

Suarez, D. L.; Lebron, I.

Tasks-Veg-Sci p.389-397. (1993).

In the series analytic: Towards the rational use of high
salinity tolerant plants. 2. Agriculture and forestry under
marginal soil water conditions / edited by H. Lieth and A.A.
Al Masoom. Proceedings of the 1st ASWAS Conference held
December 8-15, 1990, Al Ain, United Arab Emirates.

Descriptors: irrigation-water; saline-water; water-quality;
soil-salinity; soil-physical-properties; crop-production
NAL Call No.: QK1.T37

151. Water reclamation and reuse.

Smith, R. G.

Water-Environ-Res v.65, p.371-374. (1993).

Literature review.

Descriptors: water-pollution; water-purification;
waste-water-treatment; water-reuse; irrigation-water; usa-;
u; s; -environmental-protection-agency

NAL Call No.: TD419.R47

152. Water reclamation and reuse.

Smith, R. G.; Walker, M. R.

Water-environ-res v.66, p.378-383. (1994).

Includes references.

Descriptors: water-; reclamation-; water-reuse; planning-;
management-; irrigation-water; drainage-water;
literature-reviews

NAL Call No.: TD419.R47

153. Water reclamation and reuse.

Smith, R. G.

Water-environ-res v.67, p.488-495. (1995).

Includes references.

Descriptors: water-reuse; groundwater-recharge;
water-resources; waste-water; irrigation-; irrigation-water;

literature-reviews; water-recycling
NAL Call No.: TD419.R47

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