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USE OF AGRICULTURAL, MUNICIPAL AND INDUSTRIAL
WASTE WATERS FOR IRRIGATION //

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December 14, 1961 //

BOOKS

1. Babbitt, H. E. and Baumann, E. R.
Sewerage and sewage treatment. 8th ed. 1958. 790p. John Wiley & Sons, N. Y. \$10.75.
Uses of sewage for irrigation discussed on pp. 386-396.
2. Davis, E. G., Suber, E. S., and Ehlers, W. F.; Compilers
Economics of irrigation in the United States; a list of annotated references. (Library List No. 66.) 1958. U. S. Department of Agriculture Library, Washington 25, D. C.
Covers the literature from 1950-1957. Contains a number of references on use of waste water for irrigation.
3. Erickson, P. R.
Effectiveness of spray irrigation as a method for the disposal of dairy plant wastes. June 1957. M. S. Thesis, University of Wisconsin, Madison, Wis.
Contains an extensive review of the literature. Reference not in Engineering Societies Library and not verified.
4. Graf, D. W.; Compiler
Irrigation; a selected bibliography. 1938. 631p. U. S. Department of Agriculture, Bureau of Agricultural Engineering, Washington, D. C.
Contains numerous references on utilization of waste water for irrigation.
5. Gurnham, C. F.
Principles of industrial waste treatment. 1955. 399p. John Wiley & Sons, Inc., N. Y.
Use of industrial waste water for irrigation discussed on pp. 343-348.
6. Hardenbergh, W. A. and Rodie, E. R.
Water supply and waste disposal. 1961. 503p. International Textbook Co., Scranton, Pa. \$11.00.
Disposal of sewage by irrigation discussed on pp. 324-326.



7. Houk, I. E.
Irrigation engineering. 2 vols. 1951. John Wiley & Sons, N. Y.
Chapters: "Irrigation water supplies", v. 1, p. 394-450 and
"Quality of irrigation water", p. 451-474, include discussions of
use of sewage and industrial waste for irrigation.
8. Imhoff, K. and Fair, G. M.
Sewage treatment. 2nd ed. 1956. 338p. John Wiley & Sons, Inc.,
N. Y. \$7.50.
Sub-chapter: "Irrigation", p. 103-107.
9. Isaac, P. G., Editor
Waste treatment. 1960. 477p. Pergamon Press, N. Y. \$15.00.
The following papers discuss uses of waste water for irrigation:
D. Dickinson: "The origin, treatment and disposal of effluents
in the food canning and freezing industries", p. 385-395; discussion,
p. 396.
P. H. McGahey: "Reclamation of water from domestic and industrial
wastes", p. 429-439; discussion, p. 439-442.
10. Steel, E. W.
Water supply and sewerage. 4th ed. 1960. 655p. McGraw-Hill Book
Co., N. Y. \$11.00.
Disposal of sewage and industrial wastes by irrigation discussed
on pp. 480-482.

PERIODICAL REFERENCES

1961

11. Bradakis, H. L.
Joint municipal-industry spray irrigation project. (Industrial
Water and Wastes, v. 6, July - Aug. 1961, p. 117-120.)
Describes system at Tipton, Ind.
 12. Wells, W. N.
Irrigation as a sewage re-use application. (Public Works, v. 92,
Aug. 1961, p. 116-118.)
Describes briefly system used at San Antonio, Tex.
 13. Wisniewski, T. F.
Irrigation disposal of industrial wastes. (Public Works, v. 92,
July 1961, p. 96.)
Describes briefly modern methods used in Wisconsin.
- 1960
14. Chase, W. J.
Spray disposal of domestic wastes. (Public Works, v. 91, May
1960, p. 137-141.)
Describes recent experiences with particular references to newly
irrigated areas in the State of Washington.
 15. Dietz, M. R. and Frodey, R. C.
Cannery waste disposal by Gerber Products. (Compost Science, v. 1,
Autumn 1960, p. 22-25.)
Describes briefly installation using waste water for spray irrigation.
 16. Hickerson, R. C. and McMahon, E. K.
Spray irrigation of wood distillation wastes. (Water Pollution
Control Federation. Journal, v. 32, Jan. 1960, p. 55-64.)
Gives results of tests carried out at the Wrigley plant of the
Tennessee Products & Chemical Corp.



17. Monson, H.
Cannery waste disposal by spray irrigation. (Compost Science, v. 1, Spring 1960, p. 41-44.)
Describes experiences at Green Giant Co., LeSueur, Minn.
18. Simmers, R. M.
Effluent disposal by irrigation. (New Zealand Engineering, v. 15, Nov. 15, 1960, p. 410-413.)
Describes use of waste waters from a meat freezing plant near Christchurch, New Zealand.
- 1959
19. Canham, R. A.
Industrial waste disposal by spray irrigation. (Southwest Water Works Journal, v. 41, Dec. 1959, p. 14-16, 18, 20, 22.)
Reference not in Engineering Societies Library and not verified.
20. Gellman, I. and Blosser, R. O.
Disposal of pulp and papermill waste by land application and irrigational use. (Proceedings of the Fourteenth Industrial Waste Conference, Purdue University, May 5-7, 1959. [Purdue University, Engineering Extension Series, Bulletin No. 104], p. 479-494.)
Summarizes investigations carried out by authors. Contains a bibliography of 30 references.
21. Hartmann, F. K.
Irrigation with waste water in woodland of the northwest Senne. (Wald und Wasser, No. 3, 1959, p. 13-31.) In German.
Reference not in Engineering Societies Library and not verified.
22. Koch, H. C. and Bloodgood, D. E.
Experimental spray irrigation of paperboard mill wastes. (Sewage and Industrial Wastes, v. 31, July 1959, p. 827-835.)
Gives results of experiments carried out at plant of Weston Paper and Manufacturing Co., St. Marys, Ohio.
23. Lawton, G. W., and others
Spray irrigation of dairy wastes. (Sewage and Industrial Wastes, v. 31, Aug. 1959, p. 923-933.)
Gives results of work carried out at the University of Wisconsin under contract with the U. S. Department of Agriculture. Contains a bibliography of 11 references.
24. Merz, R. C.
Waste water reclamation for golf course irrigation. (American Society of Civil Engineers. Proceedings, v. 85 [Journal of the Sanitary Engineering Division, No. SA6, Nov. 1959], p. 79-85.)
Gives results of study carried out at the University of Southern California. Discusses the general considerations for the use of reclaimed waste water for irrigation, and describes briefly a number of golf course irrigation installations.



25. Mierig, E.
Irrigation with waste waters in woodland. (Wald und Wasser, No. 3, 1959, p. 9-13.) In German.
Reference not in Engineering Societies Library and not verified.
26. Sander, P.
Milk trade waste waters and possibilities for their treatment in the conditions existing in the year 1957. (Abwassertechnische Vereinigung. Berichte, No. 10, 1959, p. 254-261.) In German.
Discusses uses of milk trade waste for irrigation. Reference not in Engineering Societies Library and not verified.
27. Schraufnagel, F. H.
Disposal of industrial wastes by irrigation. (U. S. Public Health Reports v. 74, Feb. 1959, p. 133-144.)
Review containing a bibliography of 7 references.
28. Scott, T. M.
Effluent grows crop on "sewer farm". (Wastes Engineering, v. 30, Sept. 1959, p. 486-489.)
Describes briefly irrigation system in San Joaquin Valley, Calif.
29. Webber, L. R.
Evaluating a soil for the disposal of wastes by spray irrigation. (Sixth Ontario Industrial Waste Conference, June 14-17, 1959, p.27-36.)
Outlines importance of filtering, purifying or decontaminating of the waste water to be used for spray irrigation, and discusses the soil properties that determine the amount of water a given soil can handle.
30. Williamson, G.
Spray irrigation for disposal of food processing wasters. (Sixth Ontario Industrial Waste Conference, June 14-17, 1959. Papers, p. 17-26.)
Describes briefly spraying installation and equipment.
- 1958
31. Canham, R. A.
Comminuted solids inclusion with spray irrigated canning waste. (Sewage and Industrial Wastes, v. 30, Aug. 1958, p. 1028-1049.)
Gives results of investigations carried out at plant of The Green Giant Co., Montgomery, Minn.
32. Crawford, S. C.
Spray irrigation of certain sulphate pulp mill wastes. (Sewage and Industrial Wastes, v. 30, Oct. 1958, p. 1266-1272.)
Describes experiences at plant of Union Bag-Camp Paper Corp., Franklin, Va.
33. Dye, E. C.
Crop irrigation with sewage effluent. (Sewage and Industrial Wastes, v. 30, June 1958, p. 825-828.)
Gives results of study carried out by the Texas State Health Department. Contains a bibliography of 8 references.



34. Ingols, R. S.
Treating food processing wastes. (Industrial Wastes, v.3, July-Aug. 1958, p. 95-98.)
Discusses conditions to be met for use of waste water from food processing plants for irrigation.
35. McDowall, F.H.
Dairy wastes; disposal by spray irrigation on pasture land. (Dairy Engineering, v. 75, No. 9, 1958, p. 251-254, 266.)
Describes methods used in New Zealand. Reference not in Engineering Societies Library and not verified.
36. Meighen, A.D.
Experimental spray irrigation of strawboard wastes. (Proceedings of the Thirteenth Industrial Waste Conference, Purdue University, May 5-7 1958, [Purdue University, Engineering Extension Series, Bulletin, No. 96], p. 456-464.)
Describes experiments carried out by the Weston Paper and Manufacturing Co., Terre Haute, Ind.
37. Monson, H.
Cannery waste disposal by spray irrigation--After 10 years. (Proceedings of the Thirteenth Industrial Waste Conference, Purdue University, May 5-7, 1958 [Purdue University, Engineering Extension Series, Bulletin No. 96] p. 449-455.)
Reviews experiences at Green Giant Co., Le Sueur, Minn.
38. Sedova, G. P.
Sanitary assessment of soil irrigation with sewage containing chromium. (Gigiena i Sanitariya, v. 23, No. 6, 1958, p. 15-19.) In Russian.
Reference not in Engineering Societies Library and not verified.
39. Werly, E. F.
Use of sprinkler irrigation systems for waste water disposal. (Irrigation Engineering and Maintenance, v.8, Jan. 1958, p. 21-27.)
Reference not in Engineering Societies Library and not verified.
40. Zabek, S.
Fat content in meadow soils as the result of irrigation with municipal sewage. (Roszniki Nauk Rolniczychi Lesnych, Series F, v.72, 1958, p. 1559-1563.) In Polish.
Reference not in Engineering Societies Library and not verified.
- 1957
41. Breska, G. J., and others
Objectives and procedures for a study of spray irrigation of dairy wastes. (Proceedings of the Twelfth Industrial Waste Conference, Purdue University, May 13-15, 1957 [Purdue University, Engineering Extension Series, Bulletin No. 94], p. 636-652.)
Gives results of research carried out at the University of Wisconsin under contract with the U. S. Department of Agriculture. Contains a bibliography of 19 references.



42. California State Water Pollution Control Board
 Third Report on the study of waste water reclamation and utilization. (California State Water Pollution Control Board. Publication No. 18, 1957, 112pp.)
 Includes discussion of use of waste water for irrigation. Contains a bibliography of 15 references.
43. Heukelekian, H.
 Utilization of sewage for crop irrigation in Israel. (Sewage and Industrial Wastes, v. 29, Aug. 1957, p. 868-874.)
 Discusses in a general way conditions under which crop irrigation with sewage becomes an attractive proposition, and describes briefly methods employed in Israel.
44. Kuhlmann, F.
 Utilization of milk trade waste waters. (Fette und Seifen, v. 59, 1957, p. 238-239.) In German.
 Discusses uses of milk trade waste for irrigation. Reference not in Engineering Societies Library and not verified.
45. McKee, F. J.
 Dairy waste disposal by spray irrigation. (Sewage and Industrial Wastes, v. 29, Feb. 1957, p. 157-164.)
 Discusses experiences at the Kraft Foods Co., Chicago, Ill.
46. Orenstein, A.S.
 End-products of sewage treatment and community health. (Institution of Sewage Purification. Journal, pt. 1, 1957, p. 76-78.)
 Discusses risks to public health caused by use of sewage effluents, for irrigation and concludes that filtered effluent may be used safely.
 Reference not in Engineering Societies Library and not verified.
47. Schnaufnagel, F. H.
 Dairy waste disposal by ridge and furrow irrigation. (Proceedings of the Twelfth Industrial Waste Conference, Purdue University, May 13-15, 1957 [Purdue University, Engineering Extension Series, Bulletin No. 94] p. 28-49.)
 Describes briefly various systems in Minnesota and Wisconsin. Contains a bibliography of 25 references.
48. Seabrook, B. L.
 Disposes billion gallons of waste water annually. (Food Engineering, v. 29, Nov. 1957, p. 112-114, 117-118.)
 Describes spray irrigation project at Seabrook Farms Co., N.J.
49. Toth, T. S.
 Some experiences with spray irrigation. (Fourth Ontario Industrial Waste Conference, June 9-12, 1957. Papers, p. 4-7.)
 Discusses briefly factors to be considered in design of irrigation systems using waste water.



1956

50. Brown, H. D., Hale, H.N., and Sheet, W. D.
Cannery wastes disposal by irrigation. (Industrial Wastes, v. 1, July-Aug. 1956, p. 204-208.)
Reviews briefly modern irrigation methods using waste water.
51. California Water Pollution Control Board
Report on continued study of waste water reclamation and utilization. (California State Water Pollution Control Board. Publication No. 15, 1956, 90pp.)
Includes discussion of use of waste water for irrigation.
52. Canham, R. A.
Spray irrigation for disposal and crop growth. (Fifth Southern Municipal and Industrial Waste Conference, University of North Carolina, April 5-6, 1956, p228-233; discussion, p. 234-237; similar article in Industrial Wastes, v. 2, May-June 1957, p. 57-60.)
Describes briefly irrigation systems using waste water from cannery plants. Contains a bibliography of 5 references.
53. Eick, J. F.
Tannery waste disposal by spray irrigation. (Industrial Wastes, v. 1, Nov.-Dec. 1956, p. 271-272.)
Describes practice of Eberle Tanning Co., Westfield, Pa.
54. Herzik, G. R., Jr.
Texas approves irrigation of animal crops with sewage plant effluents. (Wastes Engineering, v. 27, Sept. 1956, p. 418-421.)
Reviews recent studies on uses of sewage effluent for irrigating field crops.
55. McKee, F. J.
Spray irrigation for the disposal of milk wastes. (Third Ontario Industrial Waste Conference, June 10-13, 1956. Papers, p. 17-22.)
Describes various irrigation systems installed by the Kraft Foods Co., Chicago, Ill.
56. Merz, R. C.
Direct utilization of waste waters. (Water and Sewage Works, v.103, Sept. 1956, p. 417-423.)
Includes description of irrigation systems using sewage effluents.
57. Newerzella, B.
Effect of town sewage on the yield of potatoes in different soil conditions. (Deutsche Landwirtschaft [Berlin], v. 7, 1956, p. 605-610.)
In German.
Discusses uses for irrigation. Reference not in Engineering Societies Library and not verified.



58. Skulte, B. P.
Irrigation with sewage effluent. (Sewage and Industrial Wastes, v. 28, Jan. 1956, p. 36-43.)
Describes briefly German installations. Contains a bibliography of 10 references.
- 1955
59. Bell, J. W.
Spray irrigation for poultry and canning waste. (Public Works, v. 86, Sept. 1955, p. 111-112.)
Describes irrigation installation at the Steel Canning Co., Springdale, Ark.
60. Béraud, P., Torres, N. M., and Villegas, D. J.
Biological progress for the utilization of distillery residues. (Lima, Universidad Nacional Mayor de San Marco. Anales de la Facultad de Farmacia y Bioquímica, v. 4, 1955, p. 255-264.) In Spanish.
Discusses treatment of distillery waste for use in irrigation. Reference not in Engineering Societies Library and not verified.
61. Brown, H. D., Hale, H. H., and Sheets, W. D.
Disposal of cannery wastes by irrigation. (Food Packer, v.36, Aug. 1955, p. 28-30; Sept., p. 30, 32, 41.)
Reference not in Engineering Societies Library and not verified.
62. California State Water Pollution Control Board
Survey of direct utilization of waste water. (California State Water Pollution Control Board. Publication No. 12, 1955, 80pp.)
Includes discussion of use of waste water for irrigation. Contains a bibliography of 227 references.
63. Canham, R. A.
Some problems encountered in spray irrigation of canning plant waste. (Proceedings of the Tenth Industrial Waste Conference, Purdue University, May 9-11, 1955 [Purdue University, Engineering Extension Series, Bulletin No. 89], p. 120-134.)
Discusses in a general way factors to be considered in use of waste water, and reviews essential features of a spray irrigation system.
64. Dunstan, G. H. and Lunsford, J. V.
Cannery waste disposal by irrigation. (Sewage and Industrial Wastes, v. 27, July 1955, p. 827-834.)
Reviews briefly previous experiences, and gives results of tests carried out at plant of the Green Giant Co., Dayton, Wash. Contains a bibliography of 8 references.
65. Lane, L. C.
Disposal of liquid and solid wastes by means of spray irrigation in the canning and dairy industries. (Proceedings of the Tenth Industrial Waste Conference, Purdue University, May 9-11, 1955 [Purdue University, Engineering Extension Series, Bulletin No. 89], p. 508-513.)
Describes briefly typical spray system, and discusses experiences at various plants.



66. McKee, F. J.
 Spray irrigation of dairy wastes. (Proceedings of the Tenth Industrial Waste Conference, Purdue University, May 9-11, 1955 [Purdue University, Engineering Extension Series, Bulletin No. 89], p. 514-518.)
 Discusses experiences of the Kraft Foods Co., Chicago, Ill.
67. Rudolph, V. J. and Dils, R. E.
 Irrigating trees with cannery waste water. (Michigan State College, Agricultural Experiment Station. Quarterly Bulletin, v. 37, Feb. 1955, p. 407-411.)
 Reference not in Engineering Societies Library and not verified.
68. Sisson, D. R.
 Some principles of agricultural irrigation. (Proceedings of the Tenth Industrial Waste Conference, Purdue University, May 9-11, 1955 [Purdue University, Engineering Extension Series, Bulletin No. 89] p. 519-526.)
 Reviews principles, and discusses briefly uses of waste water.
69. Stone, R.
 Irrigation with waste water. (Public Works, v. 86, Nov. 1955, p. 97-98, 134-135.)
 Reviews briefly experiences in California.
70. Voights, D.
 Lagooning and spray disposal of neutral sulphite semi-chemical pulpmill liquors. (Proceedings of the Tenth Industrial Waste Conference, Purdue University, May 9-11, 1955, [Purdue University, Engineering Extension Series, Bulletin No. 89], p. 497-507.)
 Gives results of experiments carried out by American Box Board Co., Filer City, Mich.
71. Wisniewski, T. F., Wiley, A. J., and Lueck, B. F.
 Ponding and soil filtration for disposal of spent sulphite liquor in Wisconsin. (Proceedings of the Tenth Industrial Waste Conference, Purdue University, May 9-11, 1955 [Purdue University, Engineering Extension Series, Bulletin No. 89], p. 480-496.)
 Includes results of a small-scale field trial of spray irrigation.
- 1954
72. California State Water Pollution Control Board
 Studies of waste water reclamation and utilization. (California State Water Pollution and Control Board. Publication No. 9, 1954, 82pp.)
 Includes discussion of use of waste water for irrigation. Contains an extensive bibliography.
73. Cooper, T. B.
 Spray irrigation in the disposal of industrial wastes. Milk wastes. (First Ontario Industrial Waste Conference, June 15-18, 1954. Papers, p.47-49.)
 Discusses briefly Canadian experiences.



74. Henry, C. D., and others
Sewage effluent disposal through crop irrigation. (Sewage and Industrial Wastes, v. 26, Feb. 1954, p. 123-133; discussion, p. 133-135.)
Gives results of work carried out at the University of Wisconsin. Contains a bibliography of 11 references.
75. Hunt, H. J.
Supplemental irrigation with treated sewage. (Sewage and Industrial Wastes, v. 26, March 1954, p. 250-260.)
Reviews briefly history of sewage irrigation in the U. S. and gives results of recent studies. Contains a bibliography of 7 references.
76. Powell, H. W.
Spray irrigation in the disposal of industrial wastes. Cannery wastes. (First Ontario Industrial Waste Conference, June 15-18, 1954, Papers, p. 40-46.)
Discusses briefly advantages in use of cannery waste waters for spray irrigation, and outlines precautions to be taken.
77. Rockwell, F. L.
Effluent for irrigation. (American City, v. 69, Sept. 1954, p. 92.)
Describes briefly plant at Brownsville, Tex.
78. Steel, E. W. and Berg, E. J. M.
Effect of sewage irrigation upon soils. (Sewage and Industrial Wastes, v. 26, Nov. 1954, p. 1325-1339.)
Gives results of study carried out at the University of Texas.
- 1953
79. Abwassertechnische Vereinigung
Literature on agricultural utilization of sewage. (Abwassertechnische Vereinigung. Berichte, No. 4, 1953, p. 241-291; No. 6, 1955, p. 292-308.) In German.
Covers the literature from 1852-1955. Includes references on uses of sewage for irrigation. Reference not in Engineering Societies Library and not verified.
80. Amberg, H. R.
Spent sulfite liquor pollution-abatement programs in the Pacific Northwest (Paper Trade Journal, v. 136, Feb. 27, 1953, p. 20-21, 31.)
Includes discussion of uses of sulfite liquor for irrigation.
81. Baumann, H. and Olbertz, M. H.
Effect of town sewage on soil fertility, using excessive amounts of sewage. (Wasser und Boden, v. 5, 1953, p. 35-41.) In German.
Presents soil profiles from the Berlin irrigation fields. Reference not in Engineering Societies Library and not verified.



82. Dennis, J. M.
Spray irrigation of food processing wastes. (Sewage and Industrial Wastes, v. 25, May 1953, pl-591-595.)
Describes experiences in Tennessee.
83. Elam, F. L.
Corrals that waste water. (Western Lifestock Journal, v. 31, March 1, 1953, p. 56-59, 77-78.)
Discusses use of impounding waste water for pasture irrigation. Reference not in Engineering Societies Library and not verified.
84. Falkenhain, H. S.
Regulations for irrigation and the use of sewage sludge. (Wasserwirtschaft und Wassertechnik, v. 3, 1953, p. 293-294.)
In German.
Discusses proposed German regulations. Reference not in Engineering Societies Library and not verified.
85. Grubinger, H.
Problem of agricultural utilization of sewage. (Bodenkultur, v. 7, 1953, p. 279-291.) In German.
Discusses treatment of sewage and its use in spray irrigation. Reference not in Engineering Societies Library and not verified.
86. Mather, J. R.
Disposal of industrial effluent by woods irrigation. (Proceedings of the Eighth Industrial Waste Conference, Purdue University, May 4-6, 1953 [Purdue University, Engineering Extension Series, Bulletin No. 83], p. 439-454.)
Describes in detail investigations carried out at the Seabrook Farms Co., Seabrook, N.J.
87. Miller, P. E.
Spray irrigation at Morgan Packing Company. (Proceedings of the Eighth Industrial Waste Conference, Purdue University, May 4-6, 1953 [Purdue University, Engineering Extension Series, Bulletin No. 83], p. 284-287.)
Describes briefly use of waste water from vegetable canneries.
88. Monson, H.
Development of vegetable cannery waste disposal by land irrigation. (Proceedings of the Eighth Industrial Waste Conference, Purdue University, May 4-6, 1953 [Purdue University, Engineering Extension Series, Bulletin No. 83], p. 112-121.)
Describes practice at plants of Green Giant Co., Le Sueur, Minn.
89. Moorrees, G.
Irrigation with waste waters from food industries. (Technique de l'Eau, v. 7, No. 77, 1953, p. 34-35.) In French.
Reference not in Engineering Societies Library and not verified.



90. Rawm, A. M., Bowerman, F. R., and Stone, R.
Integrating reclamation and disposal of waste water. (American Water Works Association. Journal, v. 45, May 1953, p. 483-490.)
Includes discussion of use of waste water for irrigation.
91. Sanborn, N. H.
Disposal of food processing wastes by spray irrigation. (Sewage and Industrial Wastes, v. 25, Sept. 1953, p. 1034-1043.)
Reviews development of methods, and describes typical plants.
92. Wierzbicki, J. and Kovalinski, S.
Solid structure of fields irrigated with waste water. (Gaz, Woda i Technika Sanitarna, v. 27, 1953, p. 290-292.) In Polish.
Reference not in Engineering Societies Library and not verified.
- 1952
93. Dunlop, S. G.
Irrigation of truck crops with sewage contaminated water. (Sanitarian, v. 15, Nov.-Dec. 1952, p. 107-110.)
Reference not in Engineering Societies Library and not verified.
94. Hicks, W. M.
Disposal of fruit canning wastes by spray irrigation. (Proceedings of the Seventh Industrial Waste Conference, Purdue University, May 7-9, 1952 [Purdue University, Engineering Extension Series, Bulletin No. 79], p. 130-132.)
Describes briefly experience at plant of Michigan Fruit Cannery, Inc., Fennville, Mich.
95. Nelson, L. E.
Cannery wastes disposal by spray irrigation. (Wastes Engineering, v. 23, Aug. 1952, p. 398-400, 420.)
Describes installation at plant of Lakeside Packing Co., Plainview, Minn.
96. Sanborn, N. H.
Spray irrigation as a means of cannery waste disposal. (Canning Trade Journal, v. 74, March 3, 1952, p. 17-21.)
Describes typical installations. Reference not in Engineering Societies Library and not verified.
97. Stone, R. V., Jr., Gotaas, H. B., and Bacon, V. W.
Economic and technical status of water reclamation from sewage and industrial wastes. (American Water Works Association. Journal, v. 44, June 1952, p. 503-517.)
Includes discussion of use of reclaimed waste water for irrigation.



98. Wierzbicki, J.
 Action of sewage waters on soil. (Wroclawskiego Towarzystwa Naukowego. Prace, Series B, No. 46, 1952, 92pp.) In Polish.
 Discusses irrigation of soil with sewer waters. Contains a bibliography of 88 references. Reference not in Engineering Societies Library and not verified.
- 1951
99. Drake, J. A. and Bieri, F. K.
 Disposal of liquid wastes by the irrigation method at vegetable plants in Minnesota, 1948-1950. (Proceedings of the Sixth Industrial Waste Conference, Purdue University, Feb. 21-23, 1950 [Purdue University, Engineering Extension Series, Bulletin No. 76], p. 70-79.)
 Brief review of practice at various canning companies.
100. Mazzetti, G.
 Sewage treatment plants and the use of sewage in agriculture. (World Health Organization. Second Seminar for European Sanitary Engineers, Rome, 1951, p. 203-209.)
 Includes discussion of use of sewage effluent for irrigation. Reference not in Engineering Societies Library and not verified.
101. Petrik, M.
 Utilization of night soil, sewage and sewage sludge in agriculture. (World Health Organization. Second Seminar for European Sanitary Engineers, Rome, 1951, p. 220-246.)
 Discusses dangers involved in use of sewage for irrigational purposes. Reference not in Engineering Societies Library and not verified.
102. Reinke, E. A.
 California regulates use of sewage for crop irrigation. (Wastes Engineering, v. 22, July 1951, p. 364, 376.)
 Discusses briefly regulations issued by the California State Department of Public Health.
103. Rudolphs, W., Falk, L. L., and Ragotzkie, R. A.
 Contamination of vegetables grown in polluted soil. (Sewage and Industrial Wastes, v. 23, March 1951, p. 253-268; April, p. 478-485; May, p. 656-660; June, p. 739-751; July, p. 853-860; Aug., p. 992-1000.)
 Gives results of research carried out at Rutgers University including tests on vegetables grown on land irrigated with sewage effluent.
- 1950
104. Féraud, L.
 Utilization of waste waters, domestic garbage and marine muds. (Agriculture Pratique, v. 114, 1950, p. 270-272.) In French.
 Discusses use of sewage for irrigation with special reference to the Paris district. Reference not in Engineering Societies Library and not verified.



105. Pietrkowsky, Y. and Stock, E.
Water supply and sewage disposal in Israel. (Water and Sewage Works, v. 97, 1950, p. 349-353.)
Reports on a scheme for using treated sewage for irrigation.
106. Talati, R. P.
Sewage and sullage utilization in India for crop production. (Compost Bulletin, v. 3, No. 2, 1950, p. 47-62.)
Presents data on irrigation practice.
107. Trocme, S., Barbier, G., and Chabannes, J.
Chlorosis through manganese deficiency in soils irrigated by sewage. (Institut National de la Recherche Agronomique. Annales, Serie A, v. 1, 1950, p. 663-685.) In French.
Reference not in Engineering Societies Library and not verified.
108. Wierzbicki, J.
Effect of geographical factors on the widespread agricultural use of sewage. (Gaz, Woda i Technika Sanitarna, v. 24, 1950, p. 4074.) In Polish.
Discusses use of sewage as fertilizer and for irrigation in England, Central Europe, U.S.A., Poland and Russia. Reference not in Engineering Societies Library and not verified.
- 1949
109. Stephenson, R. E. and Bollen, B. W.
Field use of sulphite waste liquor in irrigation water. (Tappi, v. 32, Sept. 1949, p. 422-426.)
Gives results of field experiments carried out at plant of the Crown Zellerbach Corp., Lebanon, Ore.
- 1948
110. Wilcox, L. W. and Travaini, D.
Agricultural uses of reclaimed sewage effluent. (Sewage Works Journal, v. 20, Jan. 1948, p. 24-35.)
Discusses properties that determine the quality of water for irrigational purposes, and gives results of tests made with effluents from 9 sewage-treatment plants in California. Contains a bibliography of 15 references.
- 1947.
111. Bolton, P.
Disposal of canning plant wastes by irrigation. (Proceedings of the Third Industrial Waste Conference held at Purdue University, May 21-22, 1947 [Purdue University, Engineering Extension Series, Bulletin No. 64], p. 272-281.)
Describes practice in Iowa.
112. Jackson, L. M.
Sewage plant sells sludge and effluent for irrigation purposes and fertilizer. (Engineering News-Record, v. 137, July 10, 1947, p. 122-124.)
Describes briefly practice at treatment plant in Riverside, Calif.



1946

113. Wilson, M. A.

High rate filters treat creamery wastes. (Sewage Works Engineering and Municipal Sanitation, v. 17, June 1946, p. 309-311.)

Describes briefly waste treatment plant for creamery at Hillsboro, Can., and discusses uses of effluent for irrigation.

1945

114. Stephenson, R. E.

Fertilizing value of sulfite waste liquor used on soils in irrigation water. (Pulp and Paper Industry, v. 19, Dec. 1945, p. 68-70.)

Reference not in Engineering Societies Library and not verified.

115. Warrick, L. F., Wisniewski, T. F. , and Sanborn, N.H.

Cannery-waste disposal lagoons. (National Canners' Association, Research Laboratory, Bulletin, No. 29-L, 1945, 48pp.)

Includes discussion of cannery waste disposal by irrigation. Reference not in Engineering Societies Library and not verified.

1944

116. Bimanis, M.

Question of the agricultural utilization of sewage. (Gesundheits-Ingenieur, v. 67, 1944, p. 10-12.) In German.

Discusses uses of sewage for irrigation. Reference not in Engineering Societies Library and not verified.

1943

117. Holler, K.

Practical experience in agricultural utilization of municipal sewage. [Deutsche Landeskultur-Zeitung, v. 12, 1943, p. 194.] In German.

Discusses use of sewage for irrigation. Reference not in Engineering Societies Library and not verified.

118. Spencer, R.R.

Sewage disposal by irrigation (Public Health [South Africa], v. 7, Oct. 1943, p. 15-28; abstract in Sewage Works Journal, v. 16, May 1944, p. 655-656.)

Reviews South African experiences. Reference not in Engineering Societies Library and not verified.

119. Wetzell, A.

Economics of supply of nutrient matter in vegetable production on the irrigation fields of Berlin. (Wasser und Abwasser, v. 41, 1943, p. 314.) In German.

Reference not in Engineering Societies Library and not verified.

1942

120. Rossberg, H.

Die landwirtschaftliche Verwertung der Leipziger Abwässer. (Gesundheitsingenieur, v. 65, July 23, 1942, p. 239-242.)

Agricultural utilization of Leipzig sewage. Discusses use of sewage for irrigation.



121. Wetzel, A.
Fertilizing problems in the cultivation of vegetables on irrigation fields. (Ermährung der Pflanze, v. 38, No. 11/12, 1942, p. 65†.) In German.
Discusses cultivation of vegetables on land irrigated with sewage. Reference not in Engineering Societies Library and not verified.
- 1941
122. Geiger, J. C.
Beautification and irrigation of Golden Park with a clarified, disinfected sewage effluent. (California and Western Medicine, v. 55, Aug. 1941, p. 89-91.)
Reference not in Engineering Societies Library and not verified.
123. Griffin, F. C.
Sewage sludge as a starter for compost. (Indian Farming, v.2, 1941, p. 573†.)
Discusses use of effluent for irrigation. Reference not in Engineering Societies Library and not verified.
124. Neumann, E.
Technical requirements in the pumping system of a sewage-disposal plant. (Städtereinigung, v. 33, 1941, p. 121†.) In German.
Discusses pumping of sewage and sludge to irrigation fields. Reference not in Engineering Societies Library and not verified.
- 1940
125. Buttner, G. L.
Utilization of sewage by means of percolating filters. (Städtereinigung, v.32, 1940, p. 169†.) In German.
Includes discussion of use of sewage for spray irrigation. Reference not in Engineering Societies Library and not verified.
126. Christophersen, J.
Development of biological processes for the disposal of dairy waste water. (Molkereizeitung [Hildesheim], v. 54, 1940, p. 245†.) In German.
Discusses uses of dairy waste for irrigation. Reference not in Engineering Societies Library and not verified.
127. Ehlers, V. M.
Sewage irrigation. (Texas State Journal of Medicine, v. 20, No. 6, 1940, p. 15†.)
Reference not in Engineering Societies Library and not verified.
128. Hutchins, W. A.
Use of sewage effluents in irrigation. (Public Works, v. 71, Jan. 1940, p. 32.)
Brief general discussion of health hazards.



1939

129. Budanov, M. F.
Effect of irrigation of Odessa soils with sewage. (Pochvovedenie, No. 6, 1939, p. 94-103.) In Russian.
Reference not in Engineering Societies Library and not verified.
130. Carl, A.
Practice and developments in the agricultural utilization of sewage. (Städtereinigung, v. 31, 1939, p. 202.) In German.
Discusses utilization of sewage for irrigation. Reference not in Engineering Societies Library and not verified.
131. Gaibrois, R.
Present trends in the use of sewage for irrigation. (Obras Sanitarias [Buenos Aires] Boletin, v. 2, 1939, p. 287⁺.) IN Spanish.
Reference not in Engineering Societies Library and not verified.
132. Hensel, W.
Alteration in physical properties of soil from sewage irrigation. (Bodenkunde und Pflanzenernährung, v. 13, 1939, p. 257-304.) In German.
Reference not in Engineering Societies Library and not verified.
133. Hutchins, W.A.
Sewage irrigation as practiced in the Western States. (U. S. Department of Agriculture Technical Bulletin No. 675, March 1939, 60pp.)
Contains a bibliography of 52 references.
134. Kreuz, A.
Old and new methods of irrigation for agricultural utilization of sewage. (Deutsche Landeskultur-Zeitung, v. 8, 1939, p. 7+.) In German.
Discusses uses of sewage for irrigation. Reference not in Engineering Societies Library and not verified.
135. Regulations for use of sewage for irrigation. (California State Department of Public Health. Weekly Bulletin, v. 18, July 29, 1939, p. 106.)
Reference not in Engineering Societies Library and not verified.



