B.C. Agricultural Drainage Manual

Bibliography

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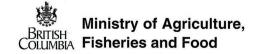
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The primary purpose of the B.C. Drainage Manual is to provide farmers as well as water management professionals and consultants with technical information on the design, installation and maintenance of agricultural drainage systems.

Individual chapters may rely on information that is presented in other chapters of the manual. There is a risk that downloading individual chapters may not present all of the required information in its entirety. A complete bound manual is available from the Irrigation Industry Association of BC.

While every effort has been made to ensure the accuracy and completeness of these materials, additional materials may be required to design and implement more advanced subsurface drainage systems. Advice of appropriate professionals and experts may provide additional local or site information that is not covered in this Manual.

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Bibliography

- ANSI/ASAE EP302.4 AUG93. 1994. "Design and Construction of Surface Drainage Systems On Agricultural Lands in Humid Areas." In: *ASAE Standards 1994: Standards, Engineering Practices and Data.* 41st Edition. American Society of Agricultural Engineers. St. Joseph, Michigan. p 679 686.
- ASAE Engineering Practice: ASAE EP479. 1994. "Design, Installation and Operation of Water Table Management Systems for Subirrigation/Controlled Drainage in Humid Areas." In: *ASAE Standards* 1994: Standards, Engineering Practices and Data. 41st Edition. American Society of Agricultural Engineers. St. Joseph, Michigan. p 779 782.
- ASAE EP260.4 DEC93. 1994. "Design and Construction of Subsurface Drains in Humid Areas." In: ASAE Standards 1994: Standards, Engineering Practices and Data. 41st Edition. American Society of Agricultural Engineers. St. Joseph, Michigan. p 650 660.
- ASAE. December 1987. "Drainage Design and Management." Proceedings of the Fifth National Drainage Symposium. ASAE Publication 07-87. American Society of Agricultural Engineers. St. Joseph, Michigan.
- BC Forage Council. 1991. "Grassing Waterways." Factsheet 91-31. Forage Information Series. In: BC Forage Reference Binder. BC Forage Council/ B.C. Ministry of Agriculture, Fisheries and Food. Victoria.
- BCMAFF. 1995. Blueberry Establishment Budget Hand Harvest,. Fraser Valley Spring 1995. Agdex 235-810. Planning For Profit Series. Victoria.
- BC Ministry of Agriculture. 1976. Climate of British Columbia, Tables of Temperature, Precipitation, and Sunshine. Report for 1976. Victoria.
- BCMAFF. 1994. Environmental Guidelines for the Nursery and Turf Industry in British Columbia. 1994. Issue. Victoria.
- BCMAFF. 1992. Forage Production on Poorly Drained Soils in the Southern Interior of British Columbia. Victoria.
- BCMAFF. 1997. Vegetable Production Guide for Commercial Growers 1997/98 Edition. Victoria.
- Bertrand, R.A., G.A. Hughes-Games, D.C. Nikkel. 1991. Soil Management Handbook for the Lower Fraser Valley. 2nd Edition. BC Ministry of Agriculture, Fisheries and Food. Victoria.
- Bomke, A.A., L.E. Lowe, M.D. Novak, W.D. Temple. February 1996. "Conservation Farming Systems in the Western Fraser Valley." Final Report for Project #S2205; Canada-British Columbia Soil Conservation Agreement. UBC Soil and Water Conservation Group. Vancouver.
- Boundary Bay Water Control Project, ARDSA Project. 1981 1993. Unpublished Data. BC Ministry of Agriculture, Fisheries and Food. Resource Management Branch. Abbotsford.

- Brady, N.C. 1990. *The Nature and Properties of Soils*. 10th Edition. Cornell University and United States Agency for International Development. MacMillan Publishing Company, New York.
- Broughton, R.S., F. Papineau, E. McKyes. January 1991. "Special Considerations for Installing Drainpipes in Soft, or Sensitive, Clay Soils." Presented at: The Ontario Farm Drainage Association Annual Meeting. London, Ontario. 6 pages.
- Canada Department of Agriculture, Research Branch. 1979. Glossary of Terms in Soil Science, Publication 1459. Ottawa.
- Carter, M.R. 1993. Soil Sampling and Methods of Analysis. Lewis Publishers. Boca Raton, Florida.
- Chieng, S.T. 1982. Drainage Design Criteria Determination for Subsurface Drainage Systems. ASAE Paper 82-2563. St. Joseph, Michigan: ASAE.
- Chieng, S.T., G.A. Hughes-Games. August 1991. "Effects of Subirrigation and Controlled Drainage on Crop yield, Water Table Fluctuation and Soil Properties." Presented at: The International Conference on Subirrigation and Controlled Drainage. USDA Soil Conservation Service. Michigan State University.
- Conseil des Productions Végétales du Québec. 1994. La Chambre de Contrôle de Drainage, Génie Rural Section Environnement et Ressources Agricoles. Agdex 754. Ministère de l'Agriculture, des Pêcheries et de l'Alimentation. Governement du Québec. 4 pages.
- Conseil des Productions Végétales du Québec. 1989. *Drainage Southerrain, Cahier des Normes*. Agdex 555. Ministère de l'Agriculture, des Pêcheries et de l'Alimentation. Governement du Québec. 78 pages.
- de Riddler N.A., Editor-in-Chief. 1974. "Surveys and Investigations. Drainage Principles and Applications." Publication 16. Volume 3. Edited from: Lecture notes of the International Course on Land Drainage. International Institute For Land Reclamation And Improvement, Wageningen, Netherlands.
- de Vries, J. August 1984 "Entrapment in the Vicious Circle of Inadequate Drainage, Wet Soils Compaction and Ways to Escape." In: *Proceedings and Related Papers of the British Columbia Drainage Workshop*. BC Ministry of Agriculture and Food. Victoria.
- Doorenbos. J., W.O. Pruitt, et.al. 1977. "Guidelines for Predicting Crop Water Requirements. Irrigation and Drainage." Paper Number 24. Food and Agriculture Organization of the United Nations. Rome.
- Driehuyzen, M.G. February 1985. *Boundary Bay Water Control Project*. ARDSA Project. BC Ministry of Agriculture and Food. Surrey.
- Ernst, D. 1995. *The Farmer's Earthworm Handbook: managing your underground money-makers.*Lessiter Publications. Brookfield, Wisconsin.
- Evans, R.O., J.W. Gilliam, R.W. Skaggs. 1991. Controlled Drainage Management Guidelines for Improving Drainage Water Quality. Publication AG-443. Cooperative Extension Service, North Carolina State University. Raleigh, North Carolina.

- Gaye, M-M. March 1994. Final Report: Part 3 Organic Soil Management for Vegetable Farmers.

 Cloverdale Soil Conservation Group, Project No. S1107 under the Canada-British Columbia Soil Conservation Program. Surrey.
- Gough, N.A., G.A. Hughes-Games, D.C. Nikkel. 1994. *Soil Management Handbook for the Okanagan and Similkameen Valleys.* 1st Edition. BC Ministry of Agriculture, Fisheries and Food. Victoria.
- Hausenbuiller, R.L. 1972. *Soil Science Principles and Practices*. Wm. C. Brown Company Publishers. Dubuque, Iowa. Chapters 5 and 6.
- Hermawan, B. 1995. Soil Structure Associated with Cover Crops and Grass Leys in Degraded Lowland Soil of Delta. Ph.D. Thesis, Soil Science Department, University of British Columbia. Vancouver.
- Hillel, D. 1980. Applications of Soil Physics. Academic Press. New York.
- Hillel, D. 1980. Fundamentals of Soil Physics. Academic Press. New York.
- Hughes-Games, G.A. 1983. Soil Moisture Conditions: Boundary Bay Water Control Project, Spring 1990. Soils Notes. Publication Order No: 619.100-4. Ministry of Agriculture and Food. Victoria.
- Irwin, R.W. 1985. *Drainage Benefits*. Factsheet Order No: 85-118. Ontario Ministry of Agriculture and Food.
- Irwin, R.W. 1986. Drainage Guide for Ontario. Publication 29. Ontario Ministry of Agriculture and Food.
- Irwin, R.W. 1991 *Handbook of Drainage Principles*. Publication 73. Ontario Ministry of Agriculture and Food.
- Irwin, R.W. 1983 "Hydraulic Roughness in Corrugated Plastic Tubing." In: *Proceedings of the 2nd International Drainage Workshop, Washington, D.C. December 1992.* The Corrugated Plastic Tubing Association of the United States and Canada. Carmel, Indiana.
- Koerner, R.M. 1990. Designing with Geosynthetics. 2nd Edition. Prentice-Hall Inc. New Jersey.
- Lalonde, V. 1993. *Some Hydrologic and Environmental Benefits of Water Table Management*. M.Sc. Thesis, Department of Agricultural Engineering. Macdonald Campus of McGill University. Ste-Anne de Bellevue, Quebec.
- Liu, A. 1995. "Soil Organic Components and Aggregation as Influenced by Cover and Ley Crops." M.Sc. Thesis, Soil Science Department, University of British Columbia. Vancouver.
- Luttmerding, H.A. et. al. 1990. "Describing Ecosystems in the Field." MOE Manual 11. 2nd Edition. BC Ministry of Environment, Lands and Parks. Victoria.
- Metzger, J.F. 1983. "Benefits of Drainage." Engineering Notes. Publication Order No: 528.000-1. Ministry of Agriculture and Food. Victoria.
- Palmquist, R. 1991. "Groundwater Resource Protection." In: Groundwater Resource Assessment Series.

 Applied Geotechnology Inc. Bellevue, Washington.

- Perkins, R.J. 1989. Onsite Wastewater Disposal. Lewis Publishers Inc. Chelsea, Michigan.
- Pons L.J. 1972. "Outline of the Genesis, Characteristics, Classification and Improvement of Acid Sulphate Soils." In: Dost, H., Introductory Papers and Bibliography. Proceedings of the International Symposium on Acid Sulphate Soils. International Institute For Land Reclamation And Improvement, Wageningen, Netherlands. 3 -27
- Schwab, G.O., R.K. Frevert, T.A. Edminster, K.K. Barnes. 1981. *Soil and Water Conservation Engineering*. 3rd Edition. John Wiley & Sons, Inc. New York.
- Skaggs, R.W. 19981. "Water Movement Factors Important to the Design and Operation of Subirrigation Systems." In: *Transactions of the American Society of Agricultural Engineers*. Vol. 24. No. 6. American Society of Agricultural Engineers. St. Joseph, Michigan. pp 1553-1561.
- Smedema, L.K., D.W. Rycroft. 1983. *Land Drainage: Planning and Design of Agricultural Systems*. Cornell University Press. Ithaca, New York.
- Soil Conservation Service. 1979. Engineering Field Manual for Conservation Practices. 3rd Printing, Engineering Division, Soil Conservation Service, US Department of Agriculture. Washington, DC
- Soil Conservation Service, US Department of Agriculture. 1973. Drainage of Agricultural Land, A Practical Handbook for the Planning, Design, Construction, and Maintenance of Agricultural Drainage Systems. Water Information Center Inc. Port Washington, New York.
- Temple, W.D. November 1994. "Final Report: Delta Farmers' Soil Conservation Group, Project #S1202 under the Canada-British Columbia Soil Conservation Agreement." Delta.
- Timmenga, H.L. 1992. *Earthworms in Agriculture*. In: B.J. Cade-Menun, Perspectives in Soil Ecology, Proceedings of the 15th Soil Science Workshop. Pacific Regional Soil Science Society, Vancouver. 37-40.
- Van der Gulik, T.W., C.T. Chieng, F.J. Smith. 1986. *BC Agricultural Drainage Manual*. BC Ministry of Agriculture and Food, Engineering Branch. Victoria.
- Van Schilfgaarde, J. 1974. *Drainage for Agriculture*. American Society of Agronomy, Inc. Madison, Wisconsin.
- Van Beers, W.F.J. 1958. *The Auger Hole Method*. Bulletin. No. 1. International Institute for Land Reclamation and Improvement. Wageningen, Netherlands.