

My main research efforts are directed to understanding and elucidating the major processes affecting the behavior and fate of organic chemicals, particularly pesticides and major organic pollutants, in soils. The research aims are both to optimize the use of agrochemicals and to prevent soil and groundwater pollution by these chemicals in order to maintain agricultural and environmental sustainability. Important amongst these are (a) the sorption and fate of pesticides and organic molecules in the soil including the effects of irrigation with treated sewage effluents on pesticide behavior in soils, (b) pollution of soils and ground water by petroleum products and (c) reducing pesticide usage through controlled release formulations.

CURRICULUM VITAE

University Education and Additional Training

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|-------------|---|
| 1966 – 1971 | B.Sc. in Soil Science at Cornell University, Ithaca, N.Y. |
| 1971 - 1974 | M.Sc. (with honors) in Soil Science at the Faculty of Agriculture, Hebrew University of Jerusalem.
Title of thesis: <u>Status and Behavior of Iron Adsorbed on Montmorillonite</u>
Supervision by: Prof. Amos Banin |
| 1974 - 1979 | Ph.D. in Soil Chemistry from the Hebrew University of Jerusalem.
Title of thesis: <u>Parathion-Attapulgate interactions</u>
Supervision: Dr. Bruno Yaron and Prof. Eshel Bresler |
| 1978 | Postdoctoral position at the Department of Agricultural Sciences, University of Oxford, Oxford, England with Peter Nye
Research subject: Diffusion of parathion in agricultural soils |
| 1982 - 1983 | Sabbatical at the Pesticide Degradation Laboratory, USDA, Beltsville Agricultural Research Center, Maryland, U.S.A. with |

Dr. C.S. Helling

- 1989 **Research subject:** Bound pesticide residues in soils
Sabbatical leave in the Soil Science Department, IFAS, University of Florida, Gainesville, FL, U.S.A. with Prof. P.S.C. Rao
Research subject: Pesticide transport in soils as affected by sorption/desorption kinetics
- 2007-2008 Sabbatical leave in the Department of Environmental Sciences, Rutgers University, New Brunswick, NJ, U.S.A. with Prof. W. Huang
Research subject: Fate and behavior of environmental contaminants in soils and water

Positions Held and Academic Status

- 1978 to date Research Scientist at the ARO, The Volcani Center, Institute of Soil, Water and Environmental Sciences
- 1984 Promoted to Senior Scientist.
- 1991 Promoted to Associate Research Professor
- 1996 – 1998 Head, Department of Soil Physical & Environmental Chemistry
- 1998-2001 Director, Institute of Soil, Water & Environmental Sciences

Articles in Reviewed Journals

Nasser, A., U. Mingelgrin and **Z. Gerstl** (2008). The effect of soil moisture on the release of alachlor from alginate based controlled release formulations. *J. Agric. Food Chem.* 56:1322-1327.

Sorek, A., N. Atzmon, O. Dahan, **Z. Gerstl**, L. Kushisin, Y. Laor, U. Mingelgrin, A. Nasser, D. Ronen, L. Tsechansky, N. Weisbrod and E.R. Graber (2007). 'Phytoscreening': The Use of Trees for Discovering Subsurface Contamination by VOCs. *Environ. Sci. Technol.* 42:536-542.

Rav-Acha, C., L. Groisman, U. Mingelgrin, Z. Kirson, Y. Sasson and **Z. Gerstl** (2006). A mechanistic study of methyl-parathion hydrolysis by a bifunctional organoclay. *Environ. Sci. Technol.* 41:106-111.

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Groisman, L., C. Rav-Acha, **Z. Gerstl** and U. Mingelgrin (2004). Sorption of organic compounds of varying hydrophobicities from water and industrial wastewater by long- and short-chain organoclays. *Appl. Clay Sci.* 24:159-166.

Dror, I., **Z. Gerstl**, R. Prost and B. Yaron (2002). Aboitic behavior of entrapped petroleum products in the subsurface during leaching. *Chemosphere* 49:1375-1388.

Polubesova T., S. Nir, **Z. Gerstl**, M. Borisover, and B. Rubin (2002). Imazaquin sorbed on pillared clay and crystal violet-montmorillonite complexes for reduced leaching in soil. *J. Environ. Qual.* 31:1657-1664.

Wauchope, R.D.; S. Yeh; J.B.H.J. Linders; R. Kloskowski; K. Tanaka; B. Rubin; A. Katayama; W. Kordel; **Z. Gerstl**; M. Lane; and J.B. Unsworth (2002). Pesticide soil sorption parameters: theory, measurement, uses, limitations and reliability. *Pest Management Science* 58:419-445.

Gerstl, Z. (2002). Quantitative structure-activity relationships (QSARs) as a tool for predicting the sorption of organic chemicals in soils. *Israel J. Chem.* 42:55-65.

Russo, D., J. Zaidel, A. Laufer, and **Z. Gerstl** (2001). Numerical analysis of transport of trifluralin from a subsurface dripper. *Soil Sci. Soc. Am. J.* 65(6):1648-1658.

Dror, I., **Z. Gerstl** and B. Yaron (2001). Temporal changes in kerosene content and composition in field soil as a result of leaching. *J. Contamin. Hydrol.* 48:305-323.

Borisover, M., E.R. Graber, F. Bercovich and **Z. Gerstl** (2001). Suitability of dye-clay complexes for removal of non-ionic organic compounds from aqueous solutions. *Chemosphere* 44:1033-1040.

Gerstl, Z. (2000). An update on the Koc concept in regard to regional scale management. *J. Crop Protec. Res.* 19:643-648.

Dror, I., **Z. Gerstl**, R. Prost and B. Yaron (2000). Behaviour of neat and enriched volatile petroleum hydrocarbon mixtures in the subsurface during leaching. *Land Contamination and Reclamation* 8:67-73.

Dror, I., **Z. Gerstl**, C. Braester, H. Rubin and B. Yaron (2000). *In situ* effect of soil amendments on the dynamics of kerosene attenuation. *Land Contamination and Reclamation* 8:1-8.

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Cohen, R., S. Pivonia, D. Shtienberg, M. Edelstein, D. Raz, **Z. Gerstl**, & J. Katan (1999). Efficacy of fluazinam in suppression of *Monosporascus cannonballus*, the causal agent of sudden wilt of melons. *Plant Dis.* 83:1137-1141.

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Gerstl, Z., C. Sluszny, A. Alayof and E.R. Graber (1997). The fate of terbuthylazine in test microcosms. *Science of the Total Environment* 196:119-129.

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Graber, E.R., **Z. Gerstl**, E. Fischer and U. Mingelgrin (1995). Enhanced transport of atrazine under irrigation with effluent. *Soil Sci. Soc. Am. J.* 59:1513-1519.

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Frenkel, H., **Z. Gerstl** and N. Alperovitch (1989). Exchange induced dissolution of gypsum and the reclamation of sodic soils. *J. Soil Sci.* 40:599-611.

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White, R. E., J. S. Dyson, **Z. Gerstl** and B. Yaron (1986). Leaching of herbicides through undisturbed cores of a structured clay soil. *Soil Sci. Soc. Am. J.* 50:277-283.

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Gerstl, Z. (1984). Adsorption, decomposition and movement of oxamyl in soil. *Pestic. Sci.* 15:9-17.

Gerstl, Z. and N. Albasel (1984). Field distribution of pesticides applied via a drip irrigation system. *Irrig. Sci.* 5:181-193.

Gerstl, Z. and U. Mingelgrin (1984). Sorption of organic substances by soils and sediments. *J. Environ. Sci. Health* B19:297-312.

Gerstl, Z. and B. Yaron (1983). Behavior of bromacil and napropamide in soils. I. Adsorption and degradation. *Soil Sci. Soc. Am. J.* 47:474-478.

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Mingelgrin, U. and **Z. Gerstl** (1982). Re-evaluation of partitioning as a mechanism of nonionic chemical adsorption in soils. *J. Envir. Qual.* 12:1-11.

Gerstl, Z. and B. Yaron (1981). Stability of parathion on attapulgite as affected by structural and hydration changes. *Clays Clay Minerals* 29:53-59.

Gerstl, Z., S. Saltzman, L. Kliger and B. Yaron (1981). Distribution of herbicides in soil in a simulated drip irrigation system. *Irrigation Sci.* 2:155-166.

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Books, Chapters and Invited Reviews

Karyo, R., **Z. Gerstl** and D. Minz (2008). Effects of municipal wastewater irrigation on soil microbiology In: Use of treated sewage water in agriculture: impacts on crop and soil environment. G.J. Levy, P. Fine, A. Bar-Tal (Eds.). Blackwell Publishing, Oxford, U.K. (accepted for publication).

Gerstl, Z. and E. R. Graber (2008). Impact of irrigation with treated wastewater on pesticides and other organic microcontaminants in soils. In: Use of treated sewage water in agriculture: impacts on crop and soil environment. G.J. Levy, P. Fine, A. Bar-Tal (Eds.). Blackwell Publishing, Oxford, U.K. (accepted for publication).

Waldman, M., **Z. Gerstl** and M. Turner (2007). Environmental Sciences. In: Encyclopaedia Judaica 2nd Edition, Volume 6:449-454.

Gerstl, Z., L. Groisman, Ch. Rav-Acha and U. Mingelgrin (2006). Sorption and hydrolysis of environmental pollutants by organoclays. In: C.J. Clayton Jr. and A.S. Lindner (Eds.) Remediation of Hazardous Waste in the Subsurface – Bridging Flask and Field. ACS Symposium Series NO. 940:65-84.

Dror, I.** , **Z. Gerstl**, H. Rubin, C. Braester and B. Yaron (2000). Persistence of a petroleum hydrocarbon mixture in the soil profile during leaching: a field experimnt. In: R.L. Lipnick, D.C.G. Muir and J.L.M. Hermens (Eds.) Persistent, Bioaccumulative, and Toxic Chemicals I: Fate and Exposure ACS Symposium Series No. 772 pp. 70-84.

Muzkat, L. and **Z. Gerstl** (1999). Pesticides and Organic Micropollutants in the Environment In: Ben-Hur, M., U. Mingelgrin, U. and Z. Gerstl (Eds.) Soils and the Environment Agricultural Research in Israel (in Hebrew) 10:169-193.

Ben-Hur, M., U. Mingelgrin, U. and **Z. Gerstl** (1999). Soils and the Environment. Agricultural Research in Israel (Hebrew with English abstracts) Vol 10 pp 258.

Mingelgrin, U. and **Z. Gerstl** (1993). A Unified Approach to the Interaction of Small Molecules with Macrospecies. In: A.J. Beck et al. (Eds.) Organic Substances in Soil and Water: Natural Constituents and their Influence on Contaminant Behaviour. Royal Society of Chemistry, Cambridge. Chapter 5 pp 102-127.

Gerstl, Z. (1990). Behavior of organic agrochemicals in irrigated soils. In: M. Richardson (Ed.) Chemistry, Agriculture and the Environment. Royal Society of Chemistry, Cambridge. pp. 332-369.

Gerstl, Z., Y. Chen, U. Mingelgrin and B. Yaron (1989). Toxic Organic Chemicals in Porous Media. Springer Verlag, Heidelberg 384pp.

Gerstl, Z. (1989). Predicting toxic organic chemical mobility and availability based on chemical properties. In: Gerstl, Z. et al. (Eds.) Toxic Organic Chemicals In Porous Media. Springer Verlag, Heidelberg. p 151-162.