

3.7 Activities of Visiting Researcher

(1) Professor Elrick, D. E.

from University of Guelph, Canada (July 1, 1996 - December 31, 1996)

It has been both an honor and a pleasure to be a Visiting Professor at the Arid Land Research Center (ALRC) of Tottori University. The Visiting Foreign Research Fellow Program was initiated about six years ago and, in my opinion, has helped strengthen the teaching and research capabilities of the Center. The objective of the program is for the Visiting Fellow to "participate with the staff of the ALRC in jointly planned research in the general area of arid land studies". My main area of interest is in water and solute transport in soil and I was fortunate to be able to work with the Land Conservation Group of Professor Yamamoto. In particular, I was pleased to work most closely with Associate Professor M. Inoue on problems involving hydraulic conductivity measurements in Tottori dune sand and the modeling of salt accumulation under evaporative conditions in saline soils.

Not understanding the Japanese language has been a problem. Many thanks to the personnel in the administration, the faculty and the graduate students for helping us adjust to life in Japan and to making our stay both productive professionally and exciting and stimulating personally.

Seminars

The following two seminars were given at a number of Universities and Research Centers:

(A) Applications of the Convective Dispersion Equation (CDE) to Surface Accumulation and Leaching of Chemicals during Steady-State Flow in Variably Saturated Media.

(B) Field Measurement of the Hydraulic Conductivity of Soils using the Guelph Permeameter System.

Chronologically, seminars were given as follows:

1) August 8, Arid Land Research Center

Seminar entitled "Estimation of Hydraulic and Solute Transport Parameters using Vertically Installed TDR Probes".

1) September 2, Arid Land Research Center

Seminar (B).

2) September 9, Department of Environmental Science and Engineering, Hiroshima University

Seminar (A).

3) September 10, Department of Agricultural Sciences, Saga University

Seminar (B).

4) September 13, Department of Civil Engineering and the Biotron Institute, Kyushu University

Seminar (A).

5) September 24, Arid Land Research Center

Seminar (B).

6) October 24. Tsukuba Bioscience Hall, National Research Institute of Agricultural Engineering

Tsukuba. Day long Symposium on "The Movement of Water and Chemicals in Soil"

Seminars (A) and (B).

7) November 15. Faculty of Agriculture, Laboratory of Irrigation and Drainage, Kyoto University

Seminar (B).

Workshops and Lectures

During the month of August. An informal lecture most mornings on the theory, and applications of the Guelph Permeameter system to several faculty and graduate students

1) November 5-8

Four lectures on solute transport in soils were given to Associate Professor Inoue's graduate class.

2) November 22

A special lecture on " Field Measurement of Water Transport Parameters " and a field demonstration of the Pressure Infiltrometer in Tottori dune sand were presented to the Investigation Committee on Evaluation of Permeability of Unsaturated Soils of the Japanese Geotechnical Society.

International Symposium

Presented paper entitled "Surface Accumulation and Leaching of Salts during Unsaturated Steady-State Flow in Soils" by D. E. Elrick, M. Inoue, A. Mermoud and A. Nadler, Proc. Intl. Symp. on Development of Basic Technology for Sustainable Agriculture under Saline Conditions, p.21-28, Dec. 12, 1996, ALRC, Tottori university, JAPAN.

Research

- 1) Discussions with MSc students on basic principles of TDR for measuring water contents and electrical conductivity of soils.
- 2) Development of a Mathcad 6 program with Dr. Guo Yu Qiu to determine the apparent thermal diffusivity of dune sand from measurements of temperature vs. time at two depths. The procedure was developed by Horton et al., Soil Sci. Soc. Am. J. 47:25-32 (1983).
- 3) Design and development of a simple pressure infiltrometer to measure the extremely high hydraulic conductivity values of Tottori dune sand. A paper entitled " A simple pressure infiltrometer for hydraulic conductivity measurements in sands " by M. Inoue, T. Morii and D. E. Elrick is to be submitted to J. Soil Tech.

The Arid Land Dome

It has been exciting to watch the initial construction of the "Arid Land Dome". The Center's mandate is to carry out basic research on desertification and to develop sustainable agricultural practices on arid lands. Much of this work is cooperative in nature, with scientists and graduate students from developing countries (having arid lands) participating in the graduate and research programs of the Center. So, in spite of the fact that Japan has no arid land, it will now have the "Arid Dome", a marvelous new facility for conducting research on arid lands.