Hanks, J., Ritchie, J.T. (ed.): **Modeling Plant and Soil Systems**. - American Society of Agronomy, Crop Science Society of America, Soil Science Society of America, Madison 1991. 545 pp.

Mathematical modeling has been used in agronomical research for many years. Numerous models exist and many of them have both theoretical and practical utility also for people from other disciplines. Systems modeling techniques are now used not only in research laboratories but directly in farms thanks to the free accessibility of personal computers.

The wide-scale use of models is not without problems. Most models have implicit simplifications and assumptions made by the creator, and they are not always known to those who are unfamiliar with mechanistic simulation of ecological processes. Better understanding of basic principles and structure of various models is, therefore, much desirable.

The reviewed book was published as a joint effort by the American Society of Agronomy, Crop Science Society of America, and the Soil Science Society of America. Its aim is to provide basic information about various types of models which can be used in agrotechnology. Although most of the recent simulation approaches combine the soil, plant and climate submodels into one complex model, the editors considered the presentation of separate (and in some cases incompatible) submodels as more instructive. The contributions of about 30 scientists provide really wide range of examples of different approaches to modeling.

The book starts with seven chapters (one model in each) devoted to simulation of plant processes (growth and development of wheat, maize, and soybean, temperature responses of plants, root growth and canopy light-use efficiency). In several next chapters the models of soil processes are presented (infiltration, heat flow, evaporation, solute flow and water uptake by plant roots). Highly interesting are two examples of modeling nutrient dynamics in the whole soil-plant system. More specific and problem-oriented models are presented in the last section of the book (*e.g.*, irrigation scheduling, wind and water erosion, double-cropping economics).

All models are presented in a very simple form, easily understable even to nonspecialists. They will be especially useful for students who want to learn all the necessary details of simulation modeling of dynamic processes in soil-plant systems. This is important not only for a proper use of existing models, but also for construction of completely new models. To the most models presented in the book computer program listings are attached, so they can be easily tested.

There is no doubt that the models included in the monograph were selected very carefully and with emphasis on preset criteria listed in the Introduction (commonly available input data, reasonable computer requirements, comments on data output, *etc.*). Nevertheless, there are considerable differences in the level of details with which the individual models and their listings are commented. It would be useful to include flow charts in all cases and also to use the BASIC code where possible.

The book is well printed and bound, and the condensed information in it will be highly valuable for all workers interested in quantitative description of processes in soil-plant systems.

J. GLOSER (*Brno*)