

Stewart, B.A., Nielsen, D.R. (ed.): *Irrigation of Agricultural Crops*. (Number 30 in the series Agronomy.) - American Society of Agronomy, Crop Science Society of America, Soil Science Society of America, Madison 1990. 1218 pp. US \$ 66.00.

This monograph replaces the monograph 11, the "Irrigation of Agricultural Lands", edited by R.M. Hagan, H.R. Haise and T.W. Edminster, and published 25 years ago. From that time the development of irrigation has been shifted from the expansion of an irrigated area to the water and energy conservation and to the influence of irrigation on the environment.

The content is divided into twenty eight chapters grouped into eight sections. The introduction of the first section, written by editors, offers an overview of the monograph. Section two, the "Irrigation Development", consists of the chapters on the irrigation development, environmental processes, crop water relations and irrigation management, and on the irrigation problems and development trends in the world agriculture. The next section "Soil-Water Relations" deals, in four chapters, with the nature and dynamics of soil water, the solute transport in soils and the leaching processes from the microscale of the pore-matrix complex up to the scale of the irrigated field, with the methods for measurement the soil water content and potential and the present knowledge of the most important features of the field soil water relations, its applications for the irrigated agriculture and the limitations to be overcome by future research.

The next two sections: "Plant Water Relations" and "Soil-Plant-Atmosphere Relations", written by well-known plant physiologists are the most interesting for *Biologia Plantarum* readers. In the fourth section, E.L. Fiscus and M.R. Kaufmann deal with the nature of water movement in plants. T.C. Hsiao discusses various parameters of the plant water status and their significance, considers more common techniques for measuring the plant water status, evaluates their significance and compares the results obtained by those methods. B. Klepper's chapter is devoted to the water movement into and through the root systems and to the interactions between the root growth and water uptake and M.B. Kirkham focuses his attention on plant responses to water deficit. In the next section, T.R. Sinclair reviews the relationships used to define the evaporation from an open surface of pure liquid water and examines more complicated situations of transpiration, when water is vapourized inside a leaf and consequently, the path of vapour flux is restricted by the leaf morphology and structure of respective plants and the whole canopy. J.T. Ritchie and B.S. Johnson define the factors needed to estimate the evaporation from the plant and the soil surface by mathematical models. T.A. Howell summarizes the voluminous information on the relationship between the crop production and evaporation and finally, J.L. Hatfield brings an overview on the current state of the knowledge of estimation the evapotranspiration by direct and indirect methods and simulation models. In section seven, the irrigation requirements and responses of selected agricultural crops (alfalfa, maize, wheat, soybean, peanut, sorghum, cotton, sunflower, sugarbeet, tobacco, sugarcane, potato, turfgrass, vegetables, grapevine, citrus, deciduous fruit and nut trees), as well as the cultural practices that result in an efficient use of water resources are presented.

The four chapters of the last section draw attention to the irrigation effect on the environment. Separate chapters are devoted to the drainage and return flow, salinity, soil erosion, pollution of streams and ground water and public health in relation to irrigation.

All chapters are supplemented by tables, figures and lists of references, the volume is closed by a well-arranged detail subject index. Generally, this is a well prepared and carefully edited book covering a whole spectrum of the problems connected with irrigation. It will be appreciated by everybody interested in different aspects of irrigation.

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