

INFLUENCE OF METEOROLOGICAL PARAMETERS ON SOIL WATER BALANCE FOR THE AREA OF METEOROLOGICAL STATION BUTMIR

Tanja JAKISIC^{1*}, Gordana SEKULARAC², Milena DJURIC², Dragica STOJILJKOVIC³

¹Faculty of Agriculture, University of East Sarajevo, Republic of Srpska, Bosnia and Herzegovina,

²Faculty of Agronomy, University of Kragujevac, Cacak, Serbia

³Department of Water Management, Faculty of Agriculture, University of Novi Sad, Novi Sad, Serbia

(Corresponding author: tanjai26@yahoo.com)

Abstract

This thesis evaluates the soil water balance in the region of Sarajevo for the average, driest and wettest hydrological years over the period 1991-2010.

High air temperatures in summer period cause significantly high values of potential evapotranspiration, which reaches maximum in July and August. High air temperatures and high values of potential evapotranspiration lead to deficits of soil water during summer months, while low air temperatures, reduced values of potential evapotranspiration and increase of rainfall's during winter months lead to excessive amount of water in it.

The predominant type of soil in the area of meteorological station Butmir is alluvial soil (fluvisol) and it has favorable chemical characteristics on the aspect of mechanical composition it can be listed as light mechanical composition soil.

Key words: *climate elements, water deficits, water sufficits, potential evapotranspiration*

Introduction

Primary task of designing irrigation systems is to determine rational system of irrigation. Irrigation system is determined by climate conditions, evaporation, optimal content of accessible water in the area of root system and depth of first outcrop.

Climate conditions determinate annual precipitation income, consumption of water, evapotranspiration as well as necessity for irrigation. The most significant ones are natural precipitation because they should provide constant of water for normal growth of plants. Different plants have different needs for water. Amount of water needed for growth of agricultural plants is determined by potential evapotranspiration..

Needs of agricultural plants for water is expressed through evapotranspiration (Doorenbos and Pruitt, 1977), including plant transpiration and evaporation emitted from plant covered soil.

Base for quantity change of water amount in soil (water balance) during certain time period in specific area is provided by elements that contribute such water fluctuation. Those elements are water income (precipitation, P, capillary rise, irrigation, subsurface inflow), as well as water outlay emitted from soil (evapotranspiration, PET, runoff, deep percolation, change in soil water content). Issue of calculating water balance has been occupation of many authors, insufficiency of soil water for the area of meteorological station Vrsac appear in July-October in amount of 340 mm (Stojiljković et al., 2001).

Yearly forecast of soil water balance of bare soil deficit for the area of Cacak is 285 mm every 10, 235 mm every 5 and 143 mm every 2 years. (Šekularac and Pavlović, 1996).

