ASSESSMENT OF THE CROPWAT 8.0 SOFTWARE RELIABILITY FOR EVAPOTRANSPIRATION AND CROP WATER REQUIREMENTS CALCULATIONS

Abstract

The results of the study devoted to assessment of accuracy and reliability of the CROPWAT 8.0 software application calculations of the evapotranspiration and crop water requirements are represented in the article.

The study was based on the results of the perennial field experiments, conducted during the period from 2012 to 2017 at the irrigated lands of the South of Ukraine with different crops, namely: sweet corn, grain corn, soybean, sorghum. We assessed accuracy of the CROPWAT 8.0 software application by the comparison of the calculated values with the real ones. We determined considerable differences between the calculated crops evapotranspiration values and crops irrigation requirements and the real ones obtained in the field experiments. The difference was the most essential in case of the drip-irrigated sweet corn crop and averaged to 46.05% for evapotranspiration and 89.20% for irrigation water requirements, correspondingly. Overhead sprinkler irrigated crops are likely to be more suitable for accurate evapotranspiration prediction by using the CROPWAT 8.0. The slightest discrepancy between the calculated and actual values of the studied parameters were determined on the overhead sprinkler irrigated grain corn crops, where the differences averaged just to 15.86% for evapotranspiration and 41.63% for irrigation norm. The results of the study gave us an opportunity to conclude that CROPWAT 8.0 software application should not be used without previous calibration and adjustment of the crop coefficients for the concrete agricultural production conditions.

Key words: CROPWAT, evapotranspiration, grain corn, irrigation, sweet corn, soybean, sorghum, water requirements