بسم الله الرحمن الرحيم

MONA MAGHRABY

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

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شبكة المعلومات الجامعية

التوثيق الإلكتروني والميكروفيلم

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

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ESTIMATING OF CROP COEFFICIENT FOR WATERMELON AND ONION PLANTS UNDER DELTA NILE CONDITIONS

By

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B.Sc. Agric. Sci. (Horticulture), Ain Shams University, 2013

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ABSTRACT

Hend Mohamed Mahmoud Nassar: Estimating of crop coefficient for watermelon and onion plants under Delta Nile conditions. Unpublished M.Sc. Thesis, Department of Horticulture, Faculty of Agriculture, Ain Shams University, 2020.

Egypt is a semi-arid region and consequently agriculture in Egypt depends on specific sources of water; the most important of which is limited and constant supply of the River Nile. So, the rationalization of water of irrigation is essential and the evaluation of water requirements is necessary for each crop. Water consumption can be calculated from the different methods. The volumetric lysimeter is one of the direct methods to estimate the water requirements. The estimation of water requirements is dependent on calculating the crop coefficient (ETc = ETo × Kc), where the crop coefficient (Kc) was registered as the proportion of potential and crop ET and the reference evapotranspiration (ETo) was determined according to the Food and Agricultural Organization (FAO) by Penman-Monteith strategy. Therefore, the objectives of this study were to estimate crop coefficient (Kc) for different growth stages for onion (*Allium cepa* L.) and watermelon (*Citrullus lanatus*). The study was carried out at the Experimental Farm of the Institute of Post-Graduate Studies and Research in Arid Lands (ALAR), Ain Shams University at Shubra El Kheima, Qalyubia Governorate, Egypt. Two experiments were conducted in 2014/2015 and 2015/2016 seasons under conditions of volumetric lysimeter (dimensions 1 × 1 × 1m) and filled with three types of soil (clay, sand and sandy clay) with three levels of water requirement (75 ,100, and 125% of ETc) for the crops. Onion cv. Giza 61 and watermelon cv. kamarosa were used. For onion, the results indicated that the increases of irrigation water levels (100 and 125% ETc) were the best treatments for some growth parameters. The averages of crop coefficient values were 0.47, 0.5, 1.24 and 0.99 through establishment, development, mid-season and end-season growth phases, respectively. Water use efficiency (WUE)

for onion was determined for all treatments and the effects showed that the application of 75 and100% ETc gave the highest values in the first and second seasons. Concerning the watermelon crop, the application with 100 and 75% ETc gave the highest values of WUE in the first and second seasons. The average of Kc values of watermelon through initial, crop development, mid-season and late season phases were 0.73, 0.76, 1.22 and 0.98, respectively. However, it is recommended to use the treatment of 75 % ETc for onion and watermelon in Delta Nile conditions.

Key words: Onion, *Alium cepa* L., Watermelon, *Citrullus lanatus*, Water requirement, Evapotranspiration, Crop coefficient (Kc), Drainage lysimeters, Penman-Monteith.

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