EFFECT OF DRIP IRRIGATION ON YIELD, WATER PRODUCTIVITY AND EVAPOTRANSPIRATION OF PEPPER (*Capsicum annum* L.)

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1. INTRODUCTION

- Pepper growing is considered one of the most susceptible crops to water stress.
- In practice there are several methods for determining the time of irrigation. The most used method is the water budget method. To schedule irrigation using the water budget method precise estimation of daily crop evapotranspiration (Et_d) is required.
- The most used methods to compute Et_d evapotranspiration of pepper are reference evapotranspiration (ET_o) and evaporation from an open water surface (E_o).
- In the situation of growing population, increasing food requirements and limited fresh water resources water use efficiency in irrigated agriculture is of particular importance. Irrigation water use efficiency (IWUE) provides a more realistic assessment of the irrigation effectiveness.
- The purpose of the study was to compare ET_o and E_o usually used for irrigation programs and prediction of ET_{crop}. In the case of statistical difference in yield and other tested parameters one of the methods will be recommended in irrigation scheduling of pepper in climatic conditions of the Vojvodina region.

2. MATERIAL AND METHODS

- The irrigation was scheduled on the basis of the water balance method (the soil water budget).
- Two methods were used to compute daily evapotranspiration of pepper (ET_d): reference evapotranspiration (ET_o) and evaporation from an open water surface (E_o). Crop coefficients (k_c) and crop factor (F) were used to convert ET_o and E_o values into ET_d. Kc and F were 0.3-0.4, 0.6-0.7, 0.9-1.1, 0.8-0.9 and 0.4, 0.7, 1.0 and 0.8 for initial, crop development, mid season, and and season respectively.
- ET_o was calculated by Hargreaves equation, the E_o values were measured by Class-A pan.
- The irrigation water use efficiency (IWUE) was calculated as fresh pepper yield (Y) divided by total seasonal irrigation water applied (I).
- Data reported for yield and yield components were subjected to analyses of variance (ANOVA). LSD test was used to group the means of irrigation when the F-test was significant. Different letters indicate significant differences between values.

4. CONCLUSION

Comparing Et_o and E_o methods which are usually use for irrigation programs and prediction of crop evapotranspiration it could be concluded that differences in the yield and irrigation water use efficiency were not statistically different.
That indicates that both methods can be recommended for irrigation scheduling programs of pepper in the climatic conditions of the Vojvodina region. However, priority should be given to the ET_o kc due to easy accessibillity and reliability of data.

3. RESUTS AND DISCUSSION

Tab. 1 Differences in yield components of pepper depending on the method used for comuting the daily water used on evapotranspiration

Var.	Replicate	No. of fruits per plant	Fruit weight (g)	Fruit lenght (cm)	Fruit diameter (cm)	Pericarp thickness (mm)	Content of dry matter (%)
Eo	1	9	87.6	13	5.6	4	8.0
	2	9	92.3	13	5.8	5	6.9
	3	8	97.8	12	5.9	4	7.3
	4	7	90.1	13	5.7	4	7.2
average		8[a]	92.0 [a]	12.8 [a]	5.8 [a]	4.2 [a]	7.4 [a]
ETo	1	8	96.3	13	5.8	4	6.6
	2	7	92.8	12	5.8	4	6.5
	3	9	84.6	13	6.5	4	7.0
	4	9	81.6	12	5.5	4	6.5
average		8[a]	88.8 [a]	12.5 [a]	5.9 [a]	4.0 [a]	6.7[b]

Tab. 2 Yield, IWUE and ETWUE of pepper

Variant	Replicate	Yield (t ha^{-1})	IWUE (kg m^{-3})
E_o	1	44.31	15.82
	2	44.59	15.92
	3	44.64	15.94
	4	36.80	13.14
	average	42.58 [a]	15.20 [a]
ET_o	1	42.21	15.08
	2	37.56	13.41
	3	41.49	14.82
	4	41.88	14.96
	average	40.78 [a]	14.56 [a]

Tab. 3 Reference evapotranspiration (ET_o), evaporation (E_o) and pepper evapotranspiration (ET_m, ET_d)

Part of vegetation season	ET_o (mm)	ETm (mm)	ETd (mm)	Eo (mm)	ETm (mm)	ETd (mm)
Initial 18. VI-1. VII	74.4	28.0	2.0	66.2	20.9	1.5
Crop development 2. VII-22. VII	110.1	69.7	2.2	114.3	61.7	2.0
Mid season	114.0	109.2	5.0	149.4	121.7	5.5
23. VII-13. VIII And season 14. VIII-20. IX	157.9	130.4	4.7	209.4	159.9	5.7
For the entire vegetation season	456.4	337.3	3.5	539.3	364.2	3.7

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