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DEVELOP A TOMATO IRRIGATION SCHEDULE

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ABSTRACT

Under greenhouse conditions, tomato plants were irrigated using drippers based on FAO's CropWAT program[1]. The effect of soil salinity, dug and un-dug indicator, seedling placement scheme, light duration and temperature on the productivity and water consumption of tomato plants was studied.

KEYWORDS: Irrigation schedule, excavated greenhouse, soil salinity, density of seedlings.

INTRODUCTION

One of the important issues in the steady growth of the population of the Republic of Uzbekistan, ensuring food security and increasing the country's export potential is the development of greenhouses[2,3]. The role of greenhouses in meeting the demand for vegetable products in rural areas, even in the cold winter days, and in the production of quality tomato plants for consumption, which are low in heavy metals, nitrates and other harmful substances is a comparison.

MATERIALS AND METHODS

The studies were conducted in a greenhouse and laboratory setting. In particular, the Uzbek Institute for Vegetable, Melon and Potato Research (ITI), Irrigation and Water Problems (ITI), statistical analysis was performed using MathCAD and Microsoft Yexsel programs to study the impact of greenhouse indicators on productivity. Irrigation regime for greenhouse conditions was developed using CropWAT 7.0 program[1,6,8].

RESULTS AND DISCUSSION

With a soil salinity of 4 ds / m, the plant was required to provide more water. As a result of irrigation water, the salts in the soil gradually fell to the lower layers. In greenhouses under excavated conditions, less evaporation was observed than in non-excavated conditions, which in turn reflects the plant's demand for water. Irrigation water supplied to the tomato plant under excavated conditions was used 180-220 m3 less than under non-excavated conditions.

Country Lo	cation 19				Station	ANDIZAN		
Altitude 4	77 m.	La	atitude 40.7	3 "N 🕶	Longitude 72.33			
Month	Min Temp	Max Temp	Humidity	Wind	Sun	Rad	ETo	
	"C	°C	\$	km/day	hours	MJ/m²/day	mm/day	
January	13.0	16.2	75	61	2.8	5.9	0.96	
February	13.0	16.6	74	78	36	8.4	1.30	
March	15.0	18.7	70	104	4.9	12.4	2.13	
April	19.0	23.5	60	138	6.9	17.6	3.63	
May	23.0	31.1	56	147	8.9	22.3	5.27	
June	26.0	36.7	50	147	11.1	26.1	6.73	
July	28.0	41.0	52	112	11.5	26.2	6.97	
August	26.0	36.4	58	104	10.9	23.7	5.90	
September	22.0	28.7	65	95	9.7	19.0	4.13	
October	13.0	16.6	75	78	7.0	12.5	1.85	
November	13.0	15.4	76	69	4.7	7.8	1.00	
December	13.0	15.6	77	61	25	5.1	0.73	
Average	18.7	24.8	66	99	7.0	15.6	3.38	

Figure 3.1.1. Climate Index (CropWAT)

	Bain	Eff rain
	mm	mm
January	0.0	0.0
February	0.0	0.0
March	0.0	0.0
April	0.0	0.0
May	0.0	0.0
June	0.0	0.0
July	0.0	0.0
August	0.0	0.0
September	0.0	0.0
October	0.0	0.0
November	0.0	0.0
December	0.0	0.0
Total	0.0	0.0

Figure 3.1.2. precipitation (CropWAT)



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Figure 3.1.3. Development (CropWAT) Figure



Figure 3.1.5. Water Demand (CropWAT)

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37 Aut		10	8.8	1.00	108	41	8.0	6.0	6.0	8.4	614	
10.44	8		8.0	1.00	100	- 19	8.8	0.0	0.0	11.4	346	
21.04			8.0	1.00	100	34	8.8	0.0	0.0	11.4	0.66	
2 /149	18	84	6.0	1.00	100	24	2.8	0.0	0.0	.16.7	042	
4.A.m	18	14	68	1.00	100	11	2.0	6.0	6.0	\$2.7	362	
EAeg	14	44	8.0	1.00	100		7.8	0.0	0.0	48.7	842	
8 Arts	16		- 64	1.00	100	11	2.5	0.0	0.0	16.7	942	
18 Ases	18	64	6.0	1.00	100	30	25	0.0	0.0	11.7	042	
17 Aug	25		8.0	1.00	100	#1	10.8	0.0	0.0	15.2	258	
Dave at	24	14	88	1.00	100	- 10	10.6	0.0	6.0	11.2	3.75	
TS Area	27		8.0	1.00	100	17	10.6	0.0	0.0	11.2	219	
22 Anna	38			1.00	100		11.3	0.0	0.0	16.2	9.62	
25 Aug	33	1.	8.0	1.00	100		11.7	0.0	0.0	18.7	211	
28 Auto	38	Dex	84	1.00	100	27	11.7	0.0	0.0	\$8.7	0.04	
21 Aug	21	Beer	8.8	1.00	100	25	11.7	0.0	0.0	16.7	014	
35.00	47	-	64	1.00	100	44	35.5	0.0	0.0	38.6	9.63	
& Gep	45	5wu	8.8	1.00	100	41	15.1	0.0	0.0	29.4	0.48	
95ep	41	Den	8.0	1.00	1.00		15.3	0.0	6.0	23.8	2.01	
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30 Legt	81	100	4.8	1.00	100		11.3	0.0	0.0	14.7		
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Figure 3.1.7. Crop irrigation schedule CropWAT

Irrigation of tomato plants in the initial (pre-flowering), development (flowering period), middle (harvesting), and late (ripening) phases was carried out in accordance with the CropWAT program. In the initial (pre-flowering) period, the topsoil was kept moist for 25 days. During the development (flowering) period, moisture in the 0.40 m layer was provided by watering every 3-5 days for 35 days. Irrigated for 35 days during the medium (harvest) period. During the last (harvest) period, 0.4-0.5 m of soil layer was

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provided with moisture and irrigated for 8-12 days to cook and harvest the entire crop [4,5].



Figure 3.1.8. Irrigation regime of tomato plants in uncultivated conditions (2018-2019 yy.)

Under excavated conditions, in the initial phase, the top 0-0.2 m layer of soil is provided with moisture every 3-5 days for 25 days, while in the development phase, the 0.4 m layer is provided with moisture for 35 days. irrigated. In the middle (harvest) phase, it was watered every 4-5 days to provide 0.4 m of moisture. In the final (ripening) phase, the crop was irrigated for 6-8 days to cook and harvest everything. The FAO method was used to develop the irrigation scheme [7].



Figure 3.1.9. Irrigation regime of tomato plants under excavated conditions (2018-2019 yy.)

The dynamics of moisture change during the improvement process were determined based on the formulas described in Section 3.1. The dynamics of root development of tomato plants was determined in accordance with Chapter 3[5]. Soil moisture was determined using the following formulas:

3 points (0.2h, 0.6h and 0.8h):

$$W_{\breve{y}P} = \frac{W_{0,2h} + 2W_{0,6h} + W_{0,8h}}{3};$$
(3.1.1)
5 points (0.07h, 0.2h, 0.6h, 0.8h va 0.93h);

5 points (0,07h, 0,2h, 0,6h, 0,8h va 0,93h):

$$W_{\breve{y}P} = \frac{W_{0,07h} + 3W_{0,2h} + 3W_{0,6h} + 2W_{0,8h} + W_{0,93h}}{5}; \qquad (3.1.2)$$

In this case; W_i – Wi is the moisture in the layer.

Conclusion: Based on the CropWAT program of FAO, the production capacity is 0.75-1 m. Seasonal irrigation does not decrease from 4500-5000 m3/ha to 3500-4000 m3/ha. 4510-5012 m3/ha of water was consumed in the traditional method, while 3510-4015 m3/ha of water was consumed as a result of fractional production. Irrigation water was saved by 20-22%.

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