

SECOND YEAR REPORT TO USE OF ECO-WATER UNIT IN BANANA CULTIVATION UNDER SUBTROPICAL CONDITION

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ABSTRACT

Underground water is used banana cultivation in Turkey. However, due to the climatic changes, water shortage can be threated banana cultivation in the future. On the other hand, one of the most important cost of banana cultivation are using of electricity for irrigation. The objective of the study is to evaluate second year results of using the eco-Water unit in open-field banana cultivation under subtropical condition. The experiment was carried out in the Province of Gazipaşa, Antalya, Turkey. Dwarf Cavendish cultivar was used as the experimental material and drip irrigation was used. The effect of the eco-Water unit was examined on yield and quality of open-field banana cultivation. The experimental results showed that the eco-Water unit increased the yield and some quality parameters compare to the Control. Average annual yield with eco-Water was 11.32% higher than Control (46.75 t/ha compared with 52.04 t/ha). Furthermore, the most important quality parameter of finger weight and length were higher than Control.

MATERIAL AND METHOD

The experiment was conducted 2020 and 2021 growing season in Gazipaşa province of Antalya/Turkey. General view of open-field banana cultivation areas in the experimental place (Figure 1). Drip irrigation system was used in the experiment. Fertilizers were applied according to farmer's condition. Plant density was 1600 plant/ha. Eco-Water unit was used in the irrigation. Hand number, finger number, bunch weight, yield, finger weight, finger circumference, finger length were determined according to the treatment. Finger weight, peel rate and soluble solid content after ripening were also evaluated.



Figure 1. General view of banana cultivation area in Gazipaşa province of Antalya

RESULTS

Values of all the examined features were found to be higher with eco-Water Unit (Table 1). Average hand number 11.13 in Control and 11.60 in in eco-Water Unit. General view of Control and eco-Water unit bunches in the growing stage are shown Figure 2. The finger number and also bunch weight were found to be higher in eco-Water Unit compare to Control. Bunch weight was found 11.31% higher than in Control. Yield was also found to be higher in eco-Water Unit (52.04 ton/ha) than in Control (46.75 ton/ha). Compare to Control, yield was found 11.32% higher in eco-Water. General view of Control and eco-Water Unit bunches in the harvesting stage are shown Figure 3.

Table 1. The effects of eco-Water Unit on hand and finger numbers, bunch weight and yield

Treatments	Hand Number	Finger number	Bunch Weight (kg)	Yield (ton/ha)
Control	11.13 b	229.63 b	29.22 b	46.75 b
eco-Water Unit	11.60 a	243.90 a	32.53 a	52.04 a
LSD _{5%}	0.370	3.575	1.346	2.150

*Mean comparisons were significantly different at the 5% level according to the LSD test ($P \leq 0,05$)



Control



eco-Water Unit

Figure 2. General view of Control and eco-Water Unit bunches in the growing stage



Control



Eco-Water Unit

Figure 3. General view of bunches in the harvesting stage

Finger features are given in Table 2. Finger weight and finger length were found statistically different. However, finger circumference was not found statistically different. Finger weight was found higher with eco-Water (Table 2). Average finger weight 111.33 g in Control and 126.67 g in eco-Water. Finger circumference and finger length were measured as 11.30 and 11.78 cm in Control and 19.33 and 19.20 cm in eco-Water Unit, respectively.

Table 2. The effects of eco-Water Unit on finger weight and finger circumference and length

Treatments	Finger Weight (g)	Finger Circumference (cm)	Finger Length (cm)
Control	111.33 b	11.30	19.33 b
eco-Water Unit	126.67 a	11.78	20.26 a
LSD%5	2.980	N.S.*	0.692

*Mean comparisons were significantly different at the 5% level according to the LSD test ($P \leq 0,05$).

Finger weight was found higher with eco-Water Unit after ripening (Table 3). Average finger weight 103.43 g in Control and 119.77 g in eco-Water Unit. Peel rate and soluble solid content were not found statistically different. These were measured as 36.53 and 35.62 cm in Control and 19.40% and 19.50% in eco-Water Unit, respectively.

Treatments	Finger Weight (g)	Peel Rate (%)	Soluble Solid Content (%)
Control	103.43 b	36.53	19.40
eco-Water Unit	119.77 a	35.62	19.50
LSD%5	4.315	N.S.*	N.S.*

*Mean comparisons were significantly different at the 5% level according to the LSD test ($P \leq 0,05$).

CONCLUSION

The eco-Water unit increased yield and quality of banana compare to Control under subtropical condition in the second year. Yield was determined 11.32% higher than Control plants. Finger weight and length were found higher in eco-Water unit. However, peel ratio and soluble solid content were not affected to use of eco-Water unit.