Effect of quality of water and irrigation regimes on temporal changes in soil EC and yield of greenhouse-grown bell pepper (*Capsicum annuum* L.)

Patil, V.C., K.A. Al-Gaadi and M.A. Wahb-Allah
Precision Agriculture Research Chair,
King Saud University,
Riyadh, Saudi Arabia
vpatil@ksu.edu.sa

Controlled polyethylene greenhouse

- Location: Dirab Research and Agricultural Experimental Station 50 km south west of Riyadh
- Design: Strip Split Plot design
- Replications : Three
- Crop genotype : Taranto
- Soil type: Sandy (84% sand)

Two water quality treatments

Q1- Good quality water with EC of 0.5 dSm^{-1}

Q2- Saline water with EC of 3.5 dSm^{-1}

Nine irrigation treatments

- Consisting of three levels of Evapotranspiration (ETc) 60%, 80% and 100% combined with
- Three growth stages:
  First-Vegetative (1-45 days from transplanting);
  Second- Flowering and fruit setting (46-90 days)
  Third- Harvest (90 - 210 days).

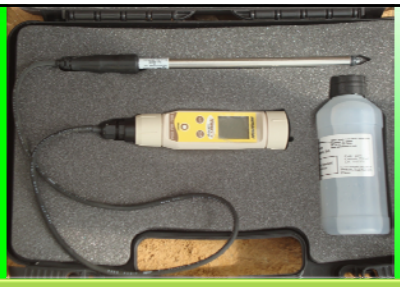
I_1	Irrigation at 100 ETc throughout growth period
I_2	Irrigation at 80% ETc throughout the growth period
I_3	80% ETc during stage I + 100% ETc the during other two stages
I_4	80% ETc during stage II + 100% ETc during the other two stages
I_5	80% ETc during stage III + 100% ETc during the other two stages
I_6	Irrigation at 60% ETc throughout the growth period
I_7	60% ETc during stage I + 100% Etc during the other two stages
I_8	60% ETc during stage II + 100% Etc during the other two stages
I_9	60% of ETc during stage III + 100% of Etc during the other two stages.

Cultural Practices

- Date of transplanting-October 4, 2010.
- Treatments imposed from November 1, 2010.
- Plant spacing - 1 m X 0.5 m.
- Irrigation water supplied to each plant with a dripper (4 l $hour^{-1}$).
- The amount of irrigation water based on crop evapotranspiration (ETc) was calculated as per Allen et al. (1998).
- Fertilizer application and other cultural practices as per Maynard and Hochmuth, (2007).

Data Collection and Analysis

- √ Soil EC - Depth of 7.5 cm
- √ Field Scout Soil EC meter (Spectrum Technologies, USA)
- √ Harvesting at weekly interval
- √ Number of harvests- Ten
- √ Statistical analysis using SAS software program (SAS Institute, Cary, NC).



FieldScout Direct Soil EC Meter
Spectrum Technologies, Inc.

Field scout meter readings were converted to equivalent Saturated Media Extract (SME) value by using the following formula:

$$SME = 2.7\ FS + 0.8$$

where, FS is the field scout meter reading

Table : Soil EC (dSm^{-1}) and yield of bell pepper as influenced by quality of water and irrigation regimes.

Date		6/12/10	3/1/11	7/2/11	5/3/11	9/4/11	Yield (g/plant)
Quality of Water	Q2	1.632	1.977	1.553	1.962	2.22	1039
	Q1	1.157	1.352	1.389	1.258	1.439	1451
	Mean	1.394	1.665	1.471	1.610	1.829	1244.7
	SE	0.014	0.018	0.051	0.034	0.07915	1.398
	LSD	0.060	0.074	0.221	0.147	0.0567	6.016
Irrigation levels	T1	1.381	1.684	1.501	1.721	2.000	1785
	T2	1.373	1.688	1.503	1.666	1.955	1135
	T3	1.368	1.68	1.496	1.565	1.832	1611
	T4	1.459	1.681	1.509	1.595	2.063	1675
	T5	1.426	1.679	1.463	1.628	1.793	1469
	T6	1.406	1.639	1.52	1.606	1.769	722
	T7	1.382	1.613	1.467	1.610	1.694	835
	T8	1.362	1.651	1.317	1.583	1.670	1234
	T9	1.407	1.664	1.461	1.517	1.692	734
	Mean	1.396	1.664	0.0828	1.610	1.066	1066.1
	SE	0.017	0.045	0.0828	0.069	0.217	1.371
	LSD	-	-	0.1686	-	-	2.793

Table 2. Fruit yield of bell pepper (g/plant) as influenced by interaction effects of quality of water and irrigation regimes.

	Saline water	Good quality water	Mean
I1	1701	1870	1785.5
I2	851	1419	1135
I3	1535	1687	1611
I4	1568	1782	1675
I5	1306	1633	1469.5
I6	455	990	722.5
I7	606	1064	835
I8	906	1563	1234.5
I9	421	1047	734
Mean	1038.78	1450.56	1244.67

For comparing means of main plot treatments: SE = 1.398 & LSD = 6.016
For Comparing means of sub plot treatments: SE = 1.371 & LSD = 2.793
For comparing two sub-plot treatments at the same level of main plot treatment:
SE = 2.301 & LSD = 4.6869
For comparing two main plot treatments at the same or different level of subplot treatment:
SE = 4.882 & LSD = 9.9442

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