*Short Communication*

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# Effect of Saline Irrigation Water on the Fruit Yield of Cucumber (*Cucumis sativus* cv. Chipper)

S.M. ALAM

*Atomic Energy Agricultural Research Centre, Tandojam, Pakistan*

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Good quality irrigation water is limited in sandy desert of Thar and sub-soil water is generally brackish [1]. In such areas, sand and gravel materials have proved an alternative source of raising vegetable crops [2]. In this system, gravel or desert sand serves as a supporting medium for plants and use of chemical amendments generally reduce the toxicity of saline water by providing essential nutrients to plants. The present study was carried out to grow cucumber in desert materials using saline irrigation water.

Tube-well water was amended with Hoagland solution to give nutrient-wise balanced irrigation water covering salinity levels of control (1250), 2000, 3000 and 4000 ppm. The salinity levels were made up using major and micronutrient salts. The nutrient solution with each salinity level was stored in separate tanks. Cucumber seeds were sterilized with 3% chlorox for 3 mins and washed with water. The seeds were then sown in sand and gravel beds. There were eight beds, four each of desert sand and gravel. The size of each bed was 11.4m$^2$. The seedlings were thinned to 15 plants in each bed, and each plant in a bed was treated as a replicate. The plants were irrigated with salinized water. The gravel bed was irrigated daily, while desert sand was irrigated on every 4th day. Average temperature in pot house varied from 18-28°. The fruits were collected time to time and yield recorded. The results were analyzed to evaluate the treatments effect.

Increasing salinity levels significantly decreased the fruit yield of cucumber irrespective of growth medium (Table 1), except at 2000 ppm where the yield was significantly increased in desert sand to a level of 62% compared to control. This shows that 2000 ppm salinity has stimulatory effect on the fruit yield of cucumber. At the highest salinity (4000ppm.), the yield was significantly reduced both in gravel (90%) and desert sand (75%). This confirms the earlier findings [3-5].

The reduction in yield under a salt stressed environment may be due to the osmotic effect which lowers the osmotic potential of the medium causing water deficit and inhibition in nutrient uptake.

TABLE 1. EFFECT OF SALINITY ON FRUIT YIELD OF CUCUMBER.

| Salinity treatments (ppm) | Fruit yield (m. ton/ha) | |
|---|---|---|
| | Desert sand | Gravel |
| *Control* (1250) | 21.16 b* (-) | 12.79 a(-) |
| 2000 | 34.45 a (+62.81)+ | 7.50 b (-41.36) |
| 3000 | 18.75 c(-11.39) | 4.32 c (-66.22) |
| 4000 | 5.21 d(-75.38) | 1.23 d (-90.38) |

* In a column means followed by same letters do not differ significantly at 5% level. +Values in the parentheses indicate percent increase (+) or decrease (-) over control.

Desert sand proved to be a better medium for growth of cucumber than the gravel. This possibly might be due to the fact that desert sand with its fine texture retained moisture and nutrients for a longer period, whereas gravel caused a rapid percolation of water from the root zone. Cucumber plant grown in gravel apparently suffered from moisture stress, which was further aggravated by increased salinity levels. The present experiment effectively demonstrate the potential use of saline irrigation water, with suitable amendments for growing cucumber in desert environment.

*Key words:* Gravel and desert sand, Irrigation, Salinity.

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