

Germination of Some Seeds in Different Types of Clay Under Different Condition

Swanti A. Jain, Raxa B. Patel and K.P. Patel

Government Science College Ghanghinagar, Gujrat, India.

(Received: 18 March 2012; accepted: 24 May 2012)

In this present work, we have studied the seed germination of methi (*Trigonella foenum graecum* L.), cucumber (*Cucumis sativus* L.) and Ghobi (*Brassica oleracea* L. Var. Botrytis L.) and onion (*Allium cepa* L.) on the basis of different salinity levels. Different salinity levels of soil samples have been collected from the specific area of the Gujarat state like Ahmedabad, Surat and Gandhidham. Saline alkali soils in Gujarat state have been critically studied by Bhumbra *et al.* and Talati. Moreover, the study of the Rann of Kutch and master plan for this has been carried out by Fao team (Dutch experts) headed by Prof. Vlugter. Similar investigations has been done by a study team headed by Khemchandani.

Salinity mostly affects the seed germination and many times seeds are not germinated and ultimately farmers suffer from the economic losses. Present study will be helpful to the farmers and beneficial in farming the above crops. Plants like methi, cucumber, ghobi and onion are more sensitive towards salinity during germination and early seeding growth and some are during later stages of development. 0.2% and 0.4% salinity levels have affected during seed germination and hence taken up for the study.

Key words: Salinity, Seed germination, Vegetable crops.

Gujarat state is situated on the west coast between 20°06' to 24°42' north latitude and 68°10' to 74°28' east longitudes. About 1.214 million hectares suffers from the salinity problem, which occupies 6.2% area of the state. Some plants are much more sensitive towards salinity during germination and early seeding growth and some are during later stages of development where micronutrients of the soil play a vital role in germination of seeds¹.

In India, pioneering work has been done by the scientists of the central soil laboratory at Karnal. Saline alkali soils in Gujarat state have been critically studied by Bhumbra *et al.*,² and Talati³. Moreover, the study of the Rann of Kutchh and master plan for this has been carried out by FAO team (Dutch Experts)⁴ headed by Prof. Vlugter. Similar investigations have been done by a study team headed by Khemchandani⁵.

Salinity mostly affects the seed germination and many times seeds are not germinated and ultimately farmers suffer from the economics problems. Present study will be helpful to the farmers and will get great help in farming successfully, particularly the above crops.

The seed germination of choli (*Vigna unguiculata* L. Walp), gavar (*Cymoposis*

* To whom all correspondence should be addressed.
E-mail :dr.swantijain@gmail.com

The soil of Surat is K-M-I (kaolinite) type, the soil of Ahmedabad is (Montomorillonite) type and the soil of Gandhidham is K-I (Illite) type.

Soil sample were collected from each location of above mention cities, which were affected with salinity. For the study of seed germination, seeds were planted in petridishes, containing 200 Gms of soil. Moisture content was maintained at field level as suggested by Mehta⁷ losses in moisture contact were made up by weighting the dishes and adding the required quantity of distilled water everyday. The plants were kept in cage at room temperature the percentage of germination was recorded everyday and the experiment was terminated at the end of the 10th day by taking average shoot length. Normal, 0.2% and 0.4% salinity level taken for the present work because 0.2% and 0.4% salinity level generally are found to suppress the seed germination than lower concentration also, found that above vegetable species is more sensitive to salinity on that particular level.

RESULTS AND DISCUSSION

Results of the percentage of germination of seeds at a different salinity level are represented Table. 1

While experimenting for seed germination, the K-M-I clay proved to be best where as K-I type clay comes next in order.

Cucumber is the most salt tolerant and could bear nearly 0.4% salinity level out of four most common vegetables species of Gujarat taken for the experiment. While another three species are not salt tolerant.

In the same pattern, for K-M-I type soil Cucumber is the most tolerant than the other three vegetable species and in K-I type, Cucumber is the most tolerant than the ghobi and ghobi is the most tolerant than other to vegetable species i.e. onion and methi.

Different vegetables can be placed in order of tolerance as under:-

FOR K-M-I TYPE SOIL

0.4% NaCl level:- Cucumber > Methi > Ghobi > Onion

0.2% NaCl level:- Methi > Cucumber > Ghobi > Onion

FOR M TYPE SOIL

0.4% NaCl level:- Cucumber > Methi = Ghobi = Onion

0.2% NaCl level:- Cucumber > Onion > Ghobi = Methi

FOR K-I TYPE SOIL

0.4% NaCl level:- Cucumber > Ghobi = Onion = Methi

0.2% NaCl level:- Cucumber > Ghobi > Onion > Methi

To include, it is very much clear than different vegetable species are very highly susceptible salinity. K-M-I soil gives better seeds germination in Cucumber and methi in 0.4% NaCl level.

ACKNOWLEDGEMENTS

Thanks to Dr. Pragna Mem (principal) and Staff members, (Department of Chemistry) Government Science College, Ghanhinagar (Gujrat) of their suggestions and co-operation during the present work.

REFERENCES

1. R. Vijayakumar, A. Arokiaraj and P. Martin Deva Prasath, Macronutrient and Micronutrients status in Relation to soil characteristics in South-Eas coast plain-riverine soils of India. *Orient J. Chem.*, 27(2): 567-571 (2011).
2. Bhumbala, D.R., Kanwar, J.S, Mhajan, K.K. and Singh Bhajan "Effects of irrigation water with different sodium and salinity hazard on the growth of crops and the properties of the soil" on problem of Indian aride zone, Jodhpur, 174-178(1964).
3. FAO team, "Reclamation and development of Great Rann of Kutch" headed by Prof. Viget Rome., (1995).
4. Khemchandani, H.T "Reclamation and development of Great Rann of Kutch" report of a study team (1996).
5. Patel, G.R. and Patel, N.K. "seed Germination under different salinity levels." *Ad. Plant sci.* 17(11).701-704 (2004).
6. Talati, R.P. "Water quantity and use of saline water for crop reduction with special reference of Gujarat state" symp. soil and water management, Hissar ICAR, 300-301 (1969).
7. Mehta, B.V. Desai, R.S "Effect of soil salinity on germination of seed" *J. of water and soil conservation in India*, 46 (1): 169-179 (1998).