



## Various technological interventions to meet vegetable production challenges in view of climatic change

B. AFROZA, K.P. WANI, S.H. KHAN, N. JABEEN, K. HUSSAIN, S. MUFTI AND A. AMIN

See end of the article for authors' affiliations

Correspondence to :

**B. AFROZA**

Department of  
Olericulture, Sher-e-  
Kashmir University of  
Agricultural Sciences and  
Technology (K), Shalimar,  
SRINAGAR (J&K) INDIA

### ABSTRACT

Various technological interventions which can reduce the harmful effect of climate change on vegetable production include improved agronomic practices, nutrient management tillage/residue management, water management, improved stress tolerance through grafting, developing climate resilient vegetables, climate profiling through genomics and biotechnology, engineering stress tolerance etc. are to be taken into consideration for meeting challenges put forth by the global climatic change to boost vegetable production.

Afroza, B., Wani, K.P., Khan, S.H., Jabeen, N., Hussain, K., Mufti, S. and Amit, A. (2010). Various technological interventions to meet vegetable production challenges in view of climatic change, *Asian J. Hort.*, 5 (2) : 523-529.

**Key words :** Climate change, Technological interventions, Vegetables

A significant change in climate on a global scale will impact agriculture and consequently affect world's food supply. Climate change *per se* is not necessarily harmful; the problems arise from extreme events that are difficult to predict (FAO, 2001). Unpredictable high temperature spells and more erratic rainfall patterns will consequently reduce crop productivity. Developing countries in the tropics will be particularly vulnerable. Latitudinal and altitudinal shifts in ecological and agro-economic zones, land degradation, extreme geophysical events, reduce water availability, and rise in sea level and salinization are postulated (FAO, 2004). Unless measures are undertaken to mitigate the affects of climate change, food security in developing countries will be under threat.

Vegetables are generally sensitive to environmental extremes, and thus high temperatures and limited soil moisture are the major causes of low yields in the tropics and will be further magnified by climate change. Climate changes will influence the severity of environmental stress imposed on vegetable crops. Moreover, increasing temperatures reduced irrigation water availability, flooding and salinity will be major limiting factors in sustaining and increasing vegetable productivity. Extreme climate conditions will also negatively impact on soil fertility and increase soil erosion. Thus, additional fertilizer application

or improved nutrient-use efficiency of crops will be needed to maintain productivity or harness the potential for enhanced crop growth due to increased atmospheric CO<sub>2</sub>. The response of plants to environmental stresses depends on the plant development stage and the length and severity of the stress (Bray, 2002). Plants may respond similarly to avoid one or more stress through morphological or biochemical or biochemical mechanisms (Capiati *et al.*, 2006). Environmental interactions may make the stress response of plants more complex or influence the degree of impact of climate change. Measures are needed to adapt to these climate changes as the induced stresses are critical for sustainable tropical vegetable production. Until now, the scientific information on the effect of environmental stresses on vegetables is overwhelmingly on tomato. There is a need to do more research on other vegetable crops in this aspect. However, there are certain technological interventions that can help in alleviating impact of climate change on vegetable production, *viz.*

### Enhancing vegetable production system:

Various management practices have the potential to raise the yield of vegetables grown under hot and wet conditions. Various technologies are being developed to