

Arid Horticulture: An Overview

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Abstract: The arid region is spread over 38.7 million hectares mainly in the states of Rajasthan, Gujarat, Haryana, Punjab, Karnataka, Andhra Pradesh besides cold arid region situated in Leh, Laddakh and Himachal Pradesh. The region is marked by extreme environmental constraints due to which the cultivation of traditional crops is not economical. In a situation such as this, arid horticulture has ample scope to develop the hot arid and semi-arid regions. At present, the climatic scenario of arid region is also changing and the problems like frost, low temperature is becoming a challenge for cultivation of many crops. The available genetic resources of many fruit and vegetable crops have been conserved and utilized for crop improvement and increased production. For crop improvement, biotechnological methods have been tried. For large scale multiplication of quality planting material, technology has been standardized in arid zone fruits. In the present paper, an overview of the technologies developed in the field of arid horticulture, which can be used to make arid ecosystem a horticultural bowl and provide food, nutrition and livelihood security to the inhabitants has been discussed.

Key words: Arid horticulture, nutrition, food, biotechnology, climate change, arid region.

Indian arid zone is characterized by high temperature and low and variable precipitation, which limit the scope for high crop productivity. However, these conditions greatly favor the development of high quality produce in a number of fruit crops such as date palm (*Phoenix dactylifera*), ber (*Ziziphus mauritiana*), aonla (*Embllica officinalis*), bael (*Aegle marmelos*), pomegranate (*Punica granatum*), kinnow, lasoda (*Cordia myxa*) and in vegetables such as cucurbits, legumes and solanaceous crops, spices, medicinal and aromatic plants. The existing low productivity could be increased by following improved new technologies and inputs. It is now realized that there is a limited scope for quantum jump in fruit and vegetable production in the traditional production areas. The amelioration of the extreme conditions is also considered vital for life support to the inhabitants of this area. The recent awareness regarding the potential of these ecologically fragile lands for production of quality produce has not only opened up scope for providing nutritional sustainability for the people of this region, but also for bringing in new areas to increase horticultural production (More *et al.*, 2012). The area and yield potential of arid horticultural crops has increased many-fold because of the development of new varieties and agro-techniques in arid region.

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Constraints in Arid Region

The soils of arid region are very poor in availability of nutrients, water holding capacity, etc. The soils of the north-western arid region described as 'desert soils', and 'grey brown soils' of the Order Aridisols, are light textured. Most of arid areas (about 64.6%) are duny, where the soils often contain only about 3.2-4.0% clay and 1.4-1.8% silt. Besides this, about 5.9% area is covered by soils having hard pan, 5.6% is under hills and pediments, 6.8% area is alluvial dunes and 1.6% is sierozems extending from the soils of Haryana and the Punjab. In the peninsular India, a considerable part of arid region has red sandy soil and some parts have mixed black soils. The soils are poor in organic matter having 0.03% OC in bare sand dunes to 0.1% in the stabilized dunes. Soils are generally rich in total potassium and boron, but are low in nitrogen, phosphorus and micronutrients such as copper, zinc and iron. The soils often have high salinity. The ground water is not only limited owing to poor surface and sub-surface drainage, but is also saline in quality. The irrigation water resources in the region are seasonal rivers and rivulets, surface wells and some runoff water storage devices (e.g., *nadi*, *tanka*, *khadins*) and canal irrigation in arid region. Thus, the water resources in arid region are limited and can irrigate hardly 4% of the area.