

Chapter 5

Improved Agronomic Practices and Input Use Efficiency for Potato Production under Changing Climate: Improved Practices for Potato Production

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ABSTRACT

In the emerging global economic order in which agricultural crop production is witnessing a rapid transition to agricultural commodity production, potato is appearing as an important crop, poised to sustain and diversify food production in this new millennium. Temperature and unpredictable drought are two most important factor affecting world food securities and the catalyst of the great famines of the past. Decreased precipitation could cause reduction of irrigation water availability and increase in evapo-transpiration, leading to severe crop water-stress conditions. Increasing crop productivity in unfavourable environments will require advanced technologies to complement traditional methods which are often unable to prevent yield losses due to environmental stresses. Various crop management practices such as improved nutrient application rate, mulching, raised beds and other improved technology help to raise the productivity. Conservation farming practices play important role to restore soil and enhancing soil health and play important role to combat climate change issue.

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POTATO

Scientific name: *Solanum tuberosum* L.

Family: Solanaceae

Origin: South America.

Chromosome No.: $2n = 4x = 48$.

A significant change in climate on a global scale will impact potato cultivation and agriculture as a whole, consequently affect the world's food supply. Internationally, agriculture is widely regarded as one of the sectors at most risk from a changing climate, due to the impact of increased temperatures, reduced rainfall and increased frequency of extreme events, not only in the tropics, but also in temperate environments such as the UK and Himalayan belt of India (Mukherjee, 2015). Climate transform will also impact on land suitability, the viability of rainfed potato production, and demand for supplemental irrigation (IPCC, 2007). Weather vary impacts on agriculture are being witnessed all over the world, but countries like India are more vulnerable in view of the high population depending on agriculture and excessive pressure on natural resources. The warming trend in India over the past 100 years (1901 to 2007) was observed to be 0.51°C with accelerated warming of 0.21°C per every 10 years since 1970 (Kumar 2009). More erratic rainfall pattern and impulsive high temperature spells consequently reduce crop efficiency, with shifting in weed distribution pattern and its physiology system (Mukhrjee, 2007). Developing countries in the tropics will be particularly vulnerable. Latitudinal and altitudinal shifts in ecological and agro-economic zones, land degradation, extreme geophysical events, reduced water availability, and rise in temperature and deteriorating soil condition make it difficult to cultivate the potato in particular zones in the world (Burke et al., 2009). Unless measures are undertaken to alleviate the effects of climate transform, food security in developing countries will be under threat and will jeopardize the future of the potato growers in these countries (Mukhrjee, 2014 d). Potato production in developed countries, especially in Europe and the Commonwealth of Independent States, has declined on average by one percent per annum over the past 20 years. However, output in developing countries has expanded at an average rate of five percent per year (Falloon & Betts, 2010). Asian countries, particularly China and India, fuelled this growth. In recent past, the developing countries' share of global potato output stood at 52 percent, surpassing that of the developed world. This is a remarkable achievement, considering that just 20 years ago the developing countries' share in global production was little more than 20 percent (Collier et al., 2008). Even so, world potato production and consumption are currently expanding more slowly than the global population. Fresh potato consumption, once the mainstay of world potato utilization, is decreasing in many countries, especially in developed

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