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Role of soil physical properties in soil health management and crop productivity in *rainfed* systems-I- Soil physical constraints and scope

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Abstract

Soil physical degradation has become a serious problem in both *rainfed* and irrigated areas of India. According to an estimation, in India about 90 million hectare area is suffering from one or the other soil physical constraint. In *rainfed* regions, among several other constraints related to crop and climate, soil physical constraints are the key constraints which severely limit crop productivity. The predominant soil constraints which are governed by the principles of soil physics include: sub surface hard pan and compactness, crusting and hardening, slow and high permeability, non-optimal porosity, poor soil structure, poor water receptivity, retention and transmission etc. It is now well established that unless the soil physical environment is maintained at its optimum level, the genetic yield potential of a crop cannot be realized even when all the other requirements are fulfilled. It is beyond any doubt that optimum soil physical environment create the congenial condition for better crop production both in irrigated and *rainfed* regions.

Rainfed agriculture, often referred to as dryland agriculture is practised in areas that are relatively warmer (arid, semi arid) and dry sub humid regions of the country. These areas in India are highly diverse, ranging from resource rich areas with good

agricultural potential to resource-constrained areas with much more restricted potential. These regions represent a wide variety of soil type, agro-climatic and rainfall conditions. This paper comprehensively deals with the review related to the soil physical constraints in *rainfed* regions of India.

Key Words: Soil physical properties, r*ainfed* agriculture, soil physical constraints, *rainfed* soil order.