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Unreaped yield potential in Cotton in India

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Abstract

Cotton is an important commercial crop in India and has been a major earner of foreign exchange. It is cultivated in about 11 m ha in India, of which about 35% area is under irrigation. The study included 85 major cotton growing districts (each having at least 10000 ha area under cotton) that accounted for about 92% of area under the crop in India. There was huge inter-district yield variation in cotton (biennial average yield) ranging from 112 to 879 kg/ha (lint yield). Factors such as climate, soil properties and access to irrigation are key determinants and explain substantial portion of this variation. The present study attempted to investigate further the variation within a group of districts that are homogeneous in terms of climatic and edaphic factors and per cent area under cotton having irrigation. Targeting this variation is expected to identify appropriate interventions for low yielding districts. Climate was assessed by moisture index computed from rainfall and potential evapo-transpiration. Edaphic factors like soil texture and soil depth were summarized by computing available water holding capacity (AWHC). The 85 districts were divided in to 13 groups using multivariate cluster analysis with Ward's method of hierarchical agglomeration algorithm. Any significant intra-cluster yield variation could then be attributed to the management factors, adoption of technologies, etc. In a cluster with 9 districts having moist semi-arid climate, reasonably good AWHC and relatively rainfed cotton, Guntur district of Andhra Pradesh produced 716 kg/ha where as Dharwad district of Karnataka produced 247 kg/ha. Examination of management factors in the above cluster revealed that use of HYV in Guntur was cent percent and use of nutrients like nitrogen, phosphate and potash were substantially high where as Dharwad has 36% of cotton area under HYV and nutrient use was less than 20% to that of Guntur. The achievable yield gap in case of Dharwad as found to be about 469 kg/ha. In another cluster having 11 districts with arid climate, high AWHC and highly irrigated cotton, Rajkot district produced a record yield of 844 kg/ha where as Ganganagar of Rajasthan could produce 400 kg/ha only. Percent HYV was 100 in both districts but nutrient use (N and P) in Rajkot was more than double to that of Ganganagar. The yield gap in case of Ganaganagar could be 444 kg/ha. The achievable yield gaps identified and interventions suggested may be useful to cotton farmers and other stakeholders associated with crop in bridging the yield gaps.

Biography

B.M.K. Raju has completed his PhD at the age of 28 years from Indian Agricultural Research Institute (IARI). He is currently working as Senior Scientist (Agricultural Statistics) at Central Research Institute for Dryland Agriculture (Indian Council of Agricultural Research), Hyderabad, India. He received Young Scientist Award of Indian Society of Agricultural Statistics for the year 2002. He has published 13 papers in peer reviewed journals and co-author in several reports.