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## Genetic improvement of sugarcane for quality content and yield through breeding

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Sugarcane is an important cash crop of sugar industry. It is generally grown in tropics; however its productivity depends on the varieties cultivated from different group, the agro-climatic conditions of the region and cultural practices followed. An improvement of sugarcane for sugar content increases sugar yield with only a small marginal increase in costs of production. This makes gains in sugar content economically more beneficial than corresponding increase in cane yield. However, comparison of cultivars released in different years indicate that sugarcane breeding programs have delivered increased sugar yields via improvement in cane yield with much smaller contributions from sugar content. This is contrary to what might be expected given that sugar content normally has moderate to high heritability and is not substantially affected by competition effects in small plots which should make for easy gains from selections. Research has identified for more effective ways of structuring breeding and selection programs. As it is now unthinkable to imagine running a breeding and selection program without access to a computer to generate plans and labels, keep records and analyze data. Equally, it would be difficult to run a selection program without the provision of commercial harvesters and mobile weighing equipment. Breeding for traits such as better quality content, yield, disease & pest resistance or alternative products is receiving increased attention. The question is that whether the genetic improvement realized nowadays can be sustained and what some part of the emerging technologies will play in the future. While genetic engineering and molecular markers are likely to be useful tools for the plant breeder, traditional plant breeding methods based on quantitative genetic theory will remain the major delivery system of improved varieties well into the future.

### Biography

Rana D P Singh is a distinguished Plant Breeder with over 26 years of experience in Sugarcane Research, has assumed the office of the Joint Director, Sugarcane Research Station, India in the year 2014. Previously, he has worked as Head, Division of Plant Breeding, Sugarcane Research Station, India. He has also served as Nodal Officer, RKVY and Project Incharge, AICRP on Sugarcane at Sugarcane Research Station, India. He has obtained his MSc (Agriculture) and PhD degrees in Genetics and Plant Breeding from Institute of Agricultural Sciences, Banaras Hindu University, India. He has developed 12 sugarcane varieties and among these, sugarcane varieties UP 05125 & CoSe 96234 are popular in sub-tropical India. He has several national and international publications to his credit.

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