



Co 0238

An Extraordinary Sugarcane Variety

Benefitted Millions by
Reaping Billions



सत्यमेव जयते

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भारतीय
ICAR



Co 0238 -An Extraordinary Sugarcane Variety **Benefitted Millions by Reaping Billions**


The sugarcane variety Co 0238 developed by ICAR-Sugarcane Breeding Institute, Regional Centre, Karnal, has revolutionized sugar production in the country. It gives high average yield (>81 t/ha) with a sugar recovery of >12 per cent. The Variety has generated a cumulative gross value of ₹120.8 thousand crores during 2014-15 to 2017-18, accounting to ₹ 30,192 crores per year. The total additional benefit from sugar and by-products during the period was ₹ 28,795 crores or ₹ 7,199 crores per year, bringing livelihood-security and prosperity to millions of farmers in sub-tropical states especially Uttar Pradesh, Punjab, Haryana, Bihar and Uttarakhand.

Prologue

Sugarcane is the second most important commercial crop in the country. This is grown in about five million hectare area and sustains the sugar industry which is the second largest agro-industry. At present, the crop engages about 123.4 lakh farmers and farm workers. The average sugarcane productivity and sugar recovery have however hovered around 59.6-71.7 t/ha and 10.03-10.55 per cent, respectively in the country during 2001-02 to 2013-14, whereas cane productivity and sugar recovery in sub-tropical part of India (including Uttar Pradesh, Punjab, Haryana, Bihar and Uttarakhand) varied from 52.3-60.3 t/ha and 8.98-9.21 per cent, respectively during the same period. The sugarcane variety Co 0238 (CoLk 8102 x Co 775) developed by ICAR-Sugarcane Breeding Institute, Regional Centre, Karnal and released for commercial cultivation in North West Zone (Punjab, Haryana, Rajasthan, Uttarakhand, Central and Western Uttar Pradesh) has revolutionized sugarcane cultivation in the sub-tropical part of the country.

Salient Features of Co 0238

Co 0238 has high average yield with 81 t/ha against 68 t/ha of the zonal check variety CoJ 64. However, its yield potential of 329.6 t/ha has been reported in the farmer's field (Shri Achal Mishra S/o Shri Udhav Mishra, Village - Neraipurva, Distt. - Lakhimpukheri, Uttar Pradesh in the State Competition Plot, 2017-18). This variety has 18 per cent sucrose in juice at 300 days crop age that steadily increases to more



than 20 per cent during March-April as against 17.9 per cent sucrose in the check variety. Co 0238 has given more than 13 per cent sugar recovery in eleven sugar mills in 2017-18. The variety is moderately resistant to red rot and smut diseases. It is also tolerant to water deficit, water logging, salinity and low temperature, making it widely adaptable to all parts of the sub-tropical region and suitable for all planting seasons, viz. autumn, spring and summer. Good ratoonability and tolerance to low temperature further makes it suitable for second ratoon crop. Owing to thicker canes, Co 0238 is suitable for wider row planting, which is a pre-requisite for mechanical harvesting.

Spread of Co 0238 in sub-tropical India

Co 0238 with its remarkably impressive field stand and agronomic performance including superior cane yield and juice quality, spread at an exceptionally faster rate in Uttar Pradesh, Punjab, Haryana, Bihar and Uttarakhand (Fig. 1).

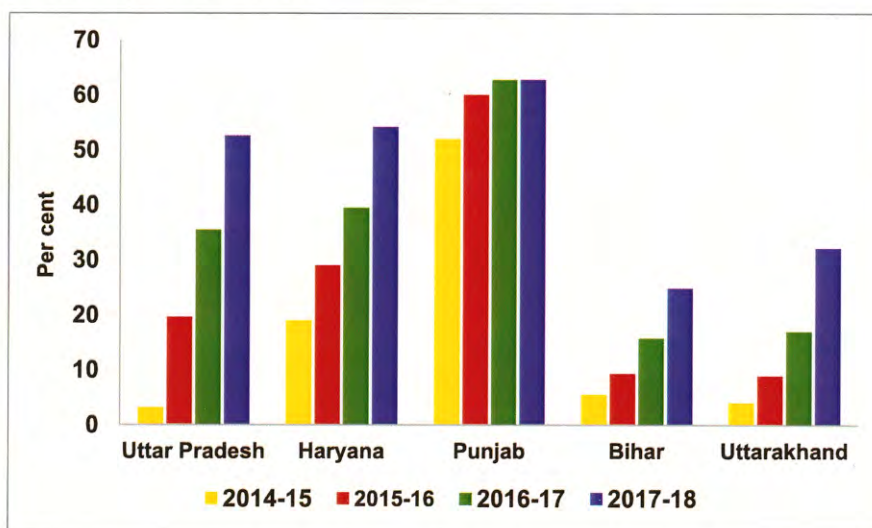


Fig. 1. Area of Co 0238 in per cent

The area occupied by this variety increased from 2.70 (2014-15) to 14.75 (2017-18) lakh hectares in sub-tropical region, which is the highest ever area (30.3 per cent) occupied by a single variety in the country in a very short span of time. Before the introduction of Co 0238 in 2012-13, the share of sub-tropical region in sugarcane area and production of the country was 55.8 per cent and 49.4 per cent which increased to 59.6 and 57.9 per cent, respectively during 2017-18.

Impact of Co 0238 on cane yield and sugar recovery

The impact of Co 0238 on cane yield and sugar recovery per cent in subtropical states was assessed during 2014-15 to 2017-18 with 2013-14 as base year. Area under this variety increased from 10 per cent (2.70 lakh ha) in 2014-15 to 50.4 per cent (14.75 lakh ha) in 2017-18 (Fig. 2). The average cane yield increased by 19 t/ha (*i.e.* from 60.0 t/ha in 2013-14 to 79 t/ha in 2017-18) and average sugar recovery improved by 1.49 units (*i.e.* from 9.21 per cent in 2013-14 to 10.70 per cent in 2017-18) in the five states.

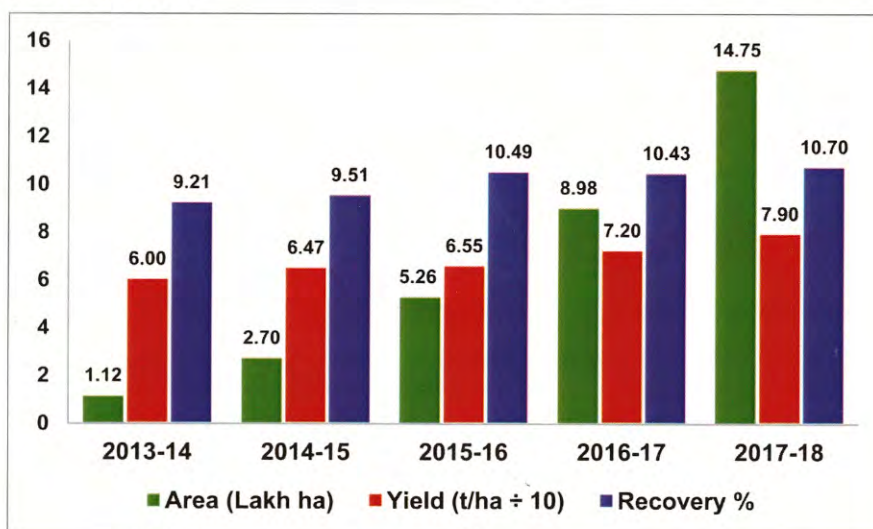


Fig. 2. Impact of Co 0238 on cane yield and sugar recovery in five states of subtropical India

Economic impact of Co 0238

(I) Gross economic value: Economic impact of Co 0238 was assessed based on its area covered in five subtropical states (Uttar Pradesh, Punjab, Haryana, Bihar and Uttarakhand) from 2014-15 to 2017-18. During this period, 2,750.6 lakh tonnes cane of value ₹ 86,237 crores and 319.0 lakh tonnes sugar worth ₹1,16,982 crores were produced from Co 0238 (Table 1). This variety also produced 357.6 lakh tonnes fodder fetching ₹1,848 crores, 123.8 lakh tonnes molasses of value ₹5,249 crores, 825.2 lakh tonnes bagasse of value ₹ 16,257 crores and 8.3 lakh tonnes pressmud of value ₹16.3 crores. The cumulative gross value of Co 0238 from sugar and additional quantity of its by-products is estimated to be ₹1,20,770 crores during the four years of its cultivation.



Table 1. Quantity of cane and sugar produced and their values since 2014-15 to 2017-18

State	Cane produced (lakh tonnes)	Value of cane (₹ in Crores)	Sugar produced (lakh tonnes)	Value of sugar (₹ in Crores)
Uttar Pradesh	2,267.3	71,332	271.0	99,651
Punjab	200.9	6,021	19.6	6,987
Haryana	170.0	5,477	17.6	6,407
Bihar	77.4	2,298	7.3	2,653
Uttarakhand	35.0	1,109	3.5	1,284
Total	2,750.6	86,237	319.0	1,16,982

(II) Additional profit to farmers and sugar mills: Due to increased cane yield, Co 0238 has produced additional 450.1 lakh tonnes sugarcane of worth ₹ 14,076 crores during 2014-15 to 2017-18 (Table 2). Similarly, higher sugar recovery of Co 0238 led to production of an additional 67.4 lakh tonnes sugar worth ₹ 25,007 crores.

Co 0238 yielded an additional return of ₹ 28,795 crores in four years (2014-15 to 2017-18) from sugar and by-products (58.5 lakh tonnes of fodder worth about ₹ 305 crores, 135.0 lakh tonnes of bagasse worth ₹ 2,643 crores, 20.3 lakh tonnes of molasses worth ₹ 837 crores and 1.35 lakh tonnes of pressmud worth about ₹ 2.7 crores). Hence, the total additional benefit from sugar and by-products was estimated to be ₹ 7,199 crores per year. During this period, Co 0238 has fetched an additional return of ₹ 14,381 crores to the farmers (from sugarcane and fodder) in Uttar Pradesh, Punjab, Haryana, Bihar and Uttarakhand. As a result, the profit of farmers increased by about ₹ 45,405 per hectare. The Economic Surplus Model was fitted to estimate the total gain to society / economy due to adoption of Co 0238 and its distribution among consumers and producers. Accordingly, the total annual economic gain (surpluses) was ₹ 10,064.3 crores, distributed in the share of 40:60 between consumers and producers, respectively.





Table 2. Additional benefit to farmers and sugar mills (2014-15 to 2017-18)

State	Additional cane produced (lakh tonnes)	Additional benefit to farmers (₹ in Crores)	Additional sugar produced (lakh tonnes)	Value of additional sugar & by-products (₹ in Crores)	Yearly additional benefit (₹ in Crores)
Uttar Pradesh	400.1	12,515	62.84	26,729	6,682.25
Punjab	16.8	509	1.30	610.3	152.58
Haryana	15.6	508	2.10	897.5	224.38
Bihar	13.5	412	0.75	381.7	95.43
Uttarakhand	4.1	132	0.39	176.2	44.05
Total	450.1	14,076	67.38	28,794.7	7,198.69

Co 0238 has greatly contributed towards achieving the highest ever sugar production (32.1 million tonnes) in the country during 2017-18, that in turn led to a Government's Policy decision on permitting direct conversion of sugarcane juice into ethanol.

Co 0238 thus has brought in a *Sweet Revolution* and has benefited the farmers and sugar industry in the country. Crossing the zonal boundaries, this wonder variety is all set to swing its magic wand in the adjoining states in the coming years.



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