



Doubling Farmers' Income through Innovative Sugarcane Cultivation Practices: The Success Story & KVK Success Case

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INTRODUCTION

Sugarcane is a clonally propagated crop with the planting of sugarcane setts traditionally. In this traditional method, the issues like requirement of high seed cane, low germination rate, difficulty in seed cane transportation, seed quality, etc. are affecting the cost of cultivation as well as sugarcane production. Doubling of farmers' income, the flagship programme of the present government, can be achieved by increasing the productivity and reducing the cost of cultivation. Transplanting sugarcane single-bud/ bud-chip settling can save seed cane requirement up to 80 per cent besides providing healthy plants and good field establishment. It is less expensive and labour saving in comparison with conventional sett planting. This method also reduces the initial water requirement of the crop and reduces crop duration in main field. Transplanting sugarcane settling in wider row spacing provides more space and sunlight for a longer duration which increases cane productivity, and also facilitates intercropping and mechanization of sugarcane agriculture from transplanting to harvesting.

Resources Possessed:

Mr Sachin Singh possess 08 hecter of land with three tube-well, Sprinkler, drip irrigation/fertigation system, sugarcane bud cutter, weeder for sugarcane etc.

Sources of Motivation:

Mr. Sachin Kumar Singh had heard about the importance of sugarcane settling transplanting technique through Harinagar Sugar Mill (HSM) officials, Scientists of RPCAU, Pusa and newspaper etc. He also exposed his keen interest to HSM officials and KVK scientists for adoption of settling transplanting technique for sugarcane production in their farm.

Technology and Innovation Adopted:

Sugarcane settling transplanting technique (STT) with intercropping of short duration and short statured crop like potato, field pea, lentil and wheat. Farmers becoming aware that saving of water and cost of fertilizers through use of drip and fertigation system in sugarcane crop, saving

of power consumption and irrigation labour costs, wider row spacing and intercropping is one of the most important cultural practices for decreases insect-pests and diseases as well as increases doubling farmers income, nutritional and livelihood security.

Table 1: Income generation before adoption of technological interventions

SN	Components	Names	Area (acre/no.)	Period (2020-21)			% Increase over base year	
				Production (qt./lit./no.)	Gross Income (Rs)	Net Income (Rs)	Production	Income
1.	Field crop 1	Sugarcane + Potato/Field pea/Lentil/Wheat	15	5250 qt.	1653750	978750	250.00	312.11
2.	Field crop 2	Paddy-Wheat	5	79 qt.	143700	80700	23.44	54.60
3.	Livestock 1	Cow	4	3600 lit.	108000	76000	20.00	74.71
Total income per year				1905450	1135450	253.06	240.77	

Achievements/ Results:

Mr. Sachin Singh adopted sugarcane settling transplanting technique with intercropping of sugarcane + potato, sugarcane + field pea, sugarcane + lentil and sugarcane + wheat for higher production, income and their livelihood security. He also adopted other package and practices with proper insect-pest and disease management as per suggestion of KVK scientists. He harvested 5250 qt production of sugarcane including intercropped yield from 15-acre lands during 2020-21. He also harvested 79 qt. produce (paddy and wheat) during 2020-21.

He is producing about 3600 litre milks from their 4 cows and receiving net income about Rs. 76000/- annually from their livestock's, which is 74.71 per cent more over previous baseline period. He got net returns of Rs. 978750/- and Rs. 80700/- from sugarcane STT with intercropping and paddy and wheat, respectively during 2020-21. It was 312.11 and 54.60 per cent more over previous baseline period. He received total net income of Rs. 1135450/- during 2020-21, which was 240.77 per cent more over previous baseline period (Rs. 333200/-during 2016-17).

Table 2: Impact of adoption of sugarcane STT with intercropping and other enterprises

SN	Components	Names	Area (acre/no.)	Benchmark (Baseline period 2016-17)		
				Production (qt./lit./no.)	Gross Income (Rs)	Net Income (Rs)
1.	Field crop 1	Sugarcane	5	1500 qt.	397500	237500
2.	Field crop 2	Paddy-Wheat	5	64 qt.	82200	52200
3.	Livestock 1	Cow	2	3000 lit./year	60000	43500
					539700	333200

Contributing Factors for Success of the Enterprise:

Basically, his activeness, sincerity and hard-working nature has contributed in his success in addition to technical guidance from experts from KVK, Universities, ICAR Institutes and State agriculture department officials. With those of his qualities and timely technical advice and proper timely implementation has transformed

his life which he never thought.

Awards/ Recognitions Received:

- Abhinav Kisan Puraskar-2022 by Dr Rajendra Prasad Central Agricultural University, Pusa, Samastipur, Bihar.
- Received Cane-Ovator Award 2021 (Innovative Sugarcane Farmer Award) from ICAR- Sugarcane Breeding Institute, Coimbatore.

Importance of other Farmers:

The partner farmers and neighboring farmers were fully convinced about sugarcane settling transplanting technique (STT) with intercropping of short duration and short statured crop like potato, field pea, lentil and wheat. Farmers becoming aware that saving of water and cost of fertilizers through use of drip and fertigation system in sugarcane crop, saving of power consumption and irrigation labour costs, wider row spacing and intercropping is one of the most important cultural practices for decreases insect-pests and diseases as well as increases doubling farmers income, nutritional and livelihood security. Intercropping in sugarcane crop has indicated more benefits in terms of net profits mainly resulting reduces cost of cultivation, reduction of incidence of insect pests and diseases and greater resource utilization and fulfils the diversified needs of the farmers. Farmer's confidence improved with KVK scientist and sugar mill officials to have face to face discussion and facilitated sharing of knowledge with experiences. Intercropping with sugarcane STT encouraged the partner and neighboring farmers to act their farm work in a more systemic and specific manner and also reducing plant protection input/other input costs and providing various environmental benefits.

Brief Highlights of Success:

Mr. Sachin Kumar Singh had heard about the importance of sugarcane settling transplanting technique through Harinagar Sugar Mill (HSM) officials, Scientists of RPCAU, Pusa and newspaper etc. He also exposed his keen interest to HSM officials and KVK scientists for adoption of settling transplanting technique for sugarcane production in their farm. He started their work on said technology with intercropping of potato, field pea, lentil and wheat since 2017-18. He also adopted drip irrigation system for irrigation in STT methodology. By taking the technical knowledge from KVK scientists and HSM officials. Now, he is doing sugarcane production technology through settling transplanting technique with intercropping in an area of 15 acre with other recommended package

of practices. All the necessary arrangement made by Harinagar Sugar Mill officials and KVK, technocrats regarding scientific cultivation of sugarcane settling transplanting technique with intercropping during 2020-21.

Methodology adopted by the farmers

Major steps involved in raising single bud or bud-chip settlings and intercropping are given below.

- Preparation of single-bud setts or bud-chips for one acre, 6–8-month-old plant crop (6-7 qt. seed cane), protray (50 cavity-200 no.), cocopeat (25 kg), vermicompost/FYM (7 qt.), jaivik shakti compost manure (1 qt.), sand (25 kg), fungicide (100 g), insecticide (500 ml), NPK powder 100g, humic acid 30 ml, use single bud sett cutter or bud chip machines available locally are required. Mr. Singh collected the all materials for settling production as per norms.
- Single bud setts cut by single bud cutter machine and treated with nutrients and pesticides (0.1% each of Urea, FeSO₄ and ZnSO₄; and 0.04% Propiconazole fungicide) manually.
- Planted single budded setts vertically/bud-chips with buds facing upwards in protrays/ cavity trays using above mentioned ratio potting mixture of sand: soil: decomposed FYM/cocopeat/vermicompost etc.
- Stacked the sett filled protray vertically one over others and cover the trays with polythene sheet and leave it for 5-6 days.
- After 5 days unpacked the trays, spread it horizontally. Watering followed in the settlings regularly. The settlings will be ready for transplanting by 30-35 days.
- He transplanted 30-35 days old settlings in the main field using the sugarcane settling transplanting technique manually with normal planting spacing of 5 x 2 feet (row x plant) distance in a paired row and zig-zag (5000 settling/acre) and also at 4 x 1.5 feet (row x plant) distance in a single line (8000 settling/acre). He

irrigates the field immediately after transplanting and also used settling as in gap filling in their field for maintaining the plant populations. He used drip irrigation and fertigation system in their sugarcane plots for proper delivery of water and fertilizers at active root zone

resulting in higher water and fertilizer use efficiency.

In wider row spacing, planted sugarcane + potato, sugarcane + field pea, sugarcane + lentil and sugarcane + wheat in their farm field.



13. Action Photographs



Single bud cutter



Bud cutting by farmer through single bud cutter



Settling germination started



Grown up settling in protrays on farmer's



Sugarcane + Wheat



Sugarcane + Field pea



Sugarcane + Lentil



Sugarcane potato



Sugarcane plot