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## Adoption of improved cultivation practices of progressive and non progressive sugarcane growers

**Deepak Kamatar, Dipak Kumar Bose and Prakash Tamagond**

**Abstract**

A study on progressive and non progressive sugarcane growers carried out during 2015-16 with the main objective of knowing their adoption of improved cultivation practices in a purposive selected Bagalakot district of Northern Karnataka. A sample of 120 progressive and non progressive sugarcane growers was selected on random from the selected five taluks. The study revealed that majority of progressive (55.00%) and non progressive farmers (60.00%) were found in high and low adoption category. With regard to recommended variety adopters majority of progressive (75.00%) and non progressive farmers (53.33%) adopted Co-86032 variety and meagre percentage (3.33%) of progressive and non progressive farmers (10.00%) adopted Co -8011 variety.

**Keywords:** Adoption, improved cultivation practices, sugarcane

**Introduction**

Agriculture is the predominant sector of Indian economy that meets the basic requirements such as food, clothing and shelter of the people, which contributes nearly 26.00 per cent to the national income. India has a wide diversity of crops, among them food grains occupy a major portion of the land area, while sugarcane and fibre crops occupy relatively lesser acreage. Sugarcane is one of the important commercial crops of the world. The sugarcane production in India during 2012-13 was 338.96 mt from an area of 50.64 lakh ha with a productivity of 66.94 t/ha. Sugar industry is the largest agro processing industry next to textiles in India. Karnataka is blessed with a favourable climatic conditions for the cultivation of sugarcane, hence the area under sugarcane has expanded to 4.25 lakh ha with a production of 35.73 mt and productivity of 84.07 t/ha (2012-13). The increased production can be realized as a result of adoption of improved cultivation technologies. Still there is a wide gap between the potential yield (>200 t/ha) and realised yield (66.94 t/ha). Many of the improved technologies failed to be adopted by the farmers may be due reluctance of the farmers to adopt new practices, the poor capacity to persuade farmers to adopt them, limited availability of varieties and necessary inputs at right time etc... In some instances inspite of great extension efforts we observed a negligible or low rate of adoption of improved technologies by the farmers. This shows the adoption is not only determined by the availability of technologies but also on various factors.

**Methodology**

The study was conducted purposively Bagalkot district of North Karnataka. Out of ten taluks in district five taluks were selected. From each taluks four villages and from the list of farmers three progressive farmers (whose tonnage is above 70) and three non progressive farmers (whose tonnage is below 70) were selected using simple random procedure. From each village to constitute the total population of 120 farmers, comprising 60 progressive and 60 non progressive sugarcane farmers. A draft interview schedule against set objectives for measuring the variables of the study was prepared. The data were collected through personal interview method and data was processed and analyzed with the help of suitable statistical tools.

**Results and Discussion**

### Overall adoption of improved cultivation practices of progressive and non progressive sugarcane growers

Table 1 indicates that majority of progressive (55.00%) and non progressive farmers (60.00%) were found in high and low adoption category, respectively. Further, considerable percentage (25.00%) of progressive and non progressive farmers (21.66%) were found in medium

adoption category followed by 20.00 per cent of progressive farmers were found in low adoption and 18.33 per cent of non progressive farmers were found in high adoption category.

### Variety

The adoption table 2 indicated that cent per cent of both progressive and non progressive farmers adopted recommended varieties. Among recommended variety adopters majority of progressive (75.00%) and non progressive farmers (53.33%) adopted Co-86032 variety followed by 21.66 per cent progressive and 36.66 per cent non progressive farmers adopted Co-265 variety. Further, meagre percentage (3.33%) of progressive and non progressive farmers (10.00%) adopted Co -8011 variety. The studies were supported by the findings of Devaraj (2005) <sup>[2]</sup> and Nagaraja (2002) <sup>[3]</sup>.

### Planting time

It was observed from the table that cent per cent of both progressive and non progressive farmers adopted recommended planting time. Among the planting time adopters, majority of the progressive farmers (63.33%) and non progressive farmers (46.66%) planted cane in the month of July-August and October-November, respectively. Whereas, an (20.00%) of the progressive farmers planted in July-October and 16.66 percent farmers planted cane in the month of October-November, whereas, 40.00 per cent of non progressive farmers planted in the month of July-August followed by 10.00 per cent planted in July-October. None of the progressive farmers and negligible percentage (3.33%) of non progressive farmers planted in the month of January-February. The studies were supported by the findings of Devaraj (2005) <sup>[2]</sup> and Nagaraja (2002) <sup>[3]</sup>.

### Sett treatment

It is observed that nearly half (58.33%) of the progressive farmers fully adopted sett treatment with chemicals, however none of the non progressive farmers fully adopted sett treatment. Whereas, considerable percentage (41.66%) of progressive and 20.00 per cent non progressive farmers partially adopted sett treatment. Further, among partial adopters 31.66 per cent of the progressive farmers treated setts with chloropyriphos and a meagre percentage (10.00%) treated the setts with carbendazim. Further, only 20.00 per cent of the non progressive farmers partially adopted sett treatment with carbendazim and large majority (80.00%) of non progressive farmers not adopted sett treatment.

### Seed rate

Regarding adoption of seed rate, cent per cent of both progressive and non progressive farmers adopted recommended seed rate. Out of which majority of progressive farmers (63.33%) adopted double eye budded setts, whereas, majority of non progressive farmers (66.67%) adopted three eye budded setts. An (25.00%) of progressive farmers adopted single eye budded setts and 33.33 percent non progressive farmers adopted double eye budded setts, respectively. A meagre percentage (11.67%) of progressive farmers adopted three eye budded setts. Whereas, none of the non progressive farmers adopted single eye budded setts.

### Age of the planting material

Regarding age of the planting material as high as 66.67 per cent of the progressive and only 31.66 per cent of non progressive farmers adopted recommended aged setts for

planting. Further, more than one third of progressive farmers (33.33%) and nearly three fourth of non progressive farmers (68.33%) not adopted recommended age of planting material.

### Planting methods

It is clear from table that, cent per cent of the both progressive and non progressive farmers adopted recommended planting methods. Among the recommended methods cent per cent of the progressive farmers and large majority (100.00%) of progressive farmers and non progressives farmers adopted ridge and furrow method of planting. The studies were supported by the findings of Devaraj (2005) <sup>[2]</sup>.

### Spacing

Regarding spacing, cent per cent of the both progressive and non progressive farmers adopted recommended spacing for planting. However, among the recommended spacing cent per cent of progressive farmers and majority (80.00%) of non progressive farmers adopted wider row spacing (120 cm × 60 cm). Further, only 20.00 per cent of non progressive farmers adopted narrow spacing (90 cm × 60 cm).

### Organic manures

With respect to application of organic manures, majority of progressive farmers (65.00%) and non progressive farmers (53.00%) partially adopted application of organic manure, whereas, only 35.00 per cent of progressive farmers and 16.66 per cent of non progressive farmers fully adopted. Among full adopters of progressive farmers considerable percentage (23.33%) adopted FYM application and only 11.67 per cent adopted FYM+Pressmud application. Among full adopters of non progressive farmers, all are adopted FYM application only. Whereas, among partial adopters considerable percentage (15.00%) of progressive farmers and non progressive farmers (16.66%) partially adopted the FYM+Pressmud. Further, among partial adopters of progressive farmers 25.00, 13.33, 15.00 and 11.67 per cent applied FYM, FYM+Vermicompost, FYM+Pressmud and FYM+Vermicompost+Pressmud, respectively. Whereas, among partial adopters of non progressive farmers 31.66, 5.00 and 16.66 per cent applied FYM, FYM+Vermicompost and FYM+Pressmud, respectively. The findings of the study are in line with Maraddi (2007) <sup>[4]</sup>

### Green leaf manuring

The table indicated that only 41.66 per cent of progressive farmers and 33.33 per cent of non progressive farmers adopted green manuring, while, majority (58.33%) of progressive and non progressive farmers (66.66%) not adopted green leaf manuring. Further, appreciable percentage (33.33%) of the progressive farmers and 33.33 per cent of non progressive farmers adopted sun hemp for green manuring.

### Chemical fertilizers

It was noticed from the results presented in the table that, large majority of both progressive (95.00%) and non progressive farmers (90.00%) fully adopted the application of total dose of nitrogenous fertilizers while cent per cent of progressive and non progressive farmers fully adopted the application of phosphorous fertilizers. Whereas, majority (60.00%) of progressive farmers and non progressive farmers (98.33%) fully and partially adopted the application of potash fertilizers, respectively. Further, the results in the Table 2 with respect to application of fertilizers at the time of planting indicated that majority of progressive farmers (95.00 and

88.33%) and non progressive farmers (90.00 and 83.33%) applied fully the nitrogen and phosphorous fertilizers, respectively, as per recommendation. While majority of progressive farmers (60.00%) and non progressive farmers (98.33%) fully and partially adopted application of potash, respectively.

The results in the Table also indicated that majority of progressive farmers and non progressive farmers fully adopted application of 20.00 per cent of nitrogen 6 weeks after planting (95.00% and 83.33%) and 30.00 per cent of nitrogen 10 weeks after planting (63.33% and 58.33%), respectively, whereas, majority of progressive farmers (65.00) and non progressive farmers (66.67%) partially adopted application of nitrogen 14 weeks after planting for top dressing.

#### Micronutrients

Application of micronutrients indicated that majority of progressive farmers applied Zinc sulphate (63.33%) and Magnesium sulphate (56.67%) while considerable percentage of progressive farmers applied Iron sulphate (38.33%), Borax (21.67%) and Copper sulphate (15.00%) as per recommendations. On the non progressive hand large majority of non progressive farmers not applied micronutrients as per recommendations.

#### Inter crop

Regarding inter crop, 23.33 per cent progressive and 33.33% of non progressive farmers adopted inter crop. Among the adopters 18.33 per cent of progressive farmers had grown onion and 5.00 per cent had grown soybean as an inter crop. While, 23.33 per cent of non progressive farmers had grown onion and 10.00 per cent had grown soybean. Whereas, majority of progressive farmers (76.66%) and non progressive farmers (66.66%) not adopted inter crop.

#### Irrigation method

Adoption of irrigation method showed that cent per cent of the progressive and non progressive farmers adopted recommended method. Further, among the recommended irrigation methods, majority (66.67%) of progressive and non progressive farmers (95.00%) adopted furrow method. While, considerable percentage (33.33%) of progressive farmers and negligible percentage of non progressive farmers (5.00%) adopted drip method.

#### Irrigation schedule

Cent per cent of the both progressive and non progressive farmers fully adopted recommended schedule of irrigation at

germination stage and tillering stage, whereas, majority of progressive (73.33% and 75.00%) and non progressive farmers (91.67% and 90.00%) partially adopted irrigation schedule at development stage and maturation stage, respectively.

#### Weed control

The results with respect to weed control indicated that cent per cent of progressive farmers and non progressive farmers adopted weed control practices. Among various methods, as high as 36.66 per cent of progressive farmers and 25.00 per cent non progressive farmers adopted Atrazine+2-4D+Hand weeding for controlling the weeds. Further, 30.00 per cent of progressive farmers and 21.67 per cent of non progressive farmers adopted Atrazine + Hand weeding, 40.00 per cent of progressive farmers and 33.33 per cent of non progressive farmers followed 2-4D+hand weeding. Whereas, only 25.00 per cent of progressive farmers and 20.00 per cent of non progressive farmers followed only hand weeding for controlling weeds.

#### Inter cultivation

It was noticed from the table that majority (58.33%) of progressive farmers fully adopted inter cultivation practice. Whereas, majority of non progressive farmers (80.00%) partially adopted inter cultivation practices.

#### Disease control

Regarding disease control measures, 41.66 per cent of the progressive farmers and only 8.33 per cent of the non progressive farmers adopted control measures for rust disease.

#### Insect control

Regarding insects control measures, majority (65.00%) of the progressive farmers and nearly half of the non progressive farmers (40.00%) adopted control measures for woolly aphid. Further, 25.00 per cent of the progressive farmers and 13.33 per cent of the non progressive farmers adopted control measures for the root grub.

#### Trash management

As high as 35.00 per cent of the progressive farmers and meagre percentage (8.33%) of non progressive farmers adopted decomposed trash in the field. Whereas, large majority of both progressive (65.00%) and non progressive farmers (91.67%) adopted burning of the trash.

**Table 1:** Distribution of progressive and non progressive sugarcane growers according to overall adoption of improved cultivation practices of sugarcane

Category	Progressive farmers (n=60)		Non progressive farmers (n=60)	
	F	%	F	%
Low	12	20.00	36	60.00
Medium	15	25.00	13	21.67
High	33	55.00	11	18.33
Mean =97.12 SD=6.99				

**Table 2:** Adoption of improved cultivation practices of sugarcane by progressive and non progressive sugarcane growers

. SI. No	Practices	Progressive farmers (n=60)			Non progressive farmers (n=60)		
		FA	PA	NA	FA	PA	NA
		f (%)	f (%)	f (%)	f (%)	f (%)	f (%)
1	<b>Variety</b>	60 (100.00)	-	0 (0.00)	60 (100.00)	-	0 (0.00)
	a) Co- 86032	45 (75.00)			32 (53.33)		
	b) Co- 265	13 (21.66)			22 (36.66)		
	c) Co- 8011	2 (3.33)			6 (10.00)		
2	<b>Planting time</b>	60 (100.00)	-	0 (0.00)	60 (100.00)	-	0 (0.00)
	a) January-February	0 (0.00)			2(3.33)		
	b) July- August	38 (63.33)			24 (40.00)		
	c) July-October	12(20.00)			6 (10.00)		
	d) October –November	10(16.66)			28 (46.66)		
3	<b>Sett treatment</b>	35 (58.33)	25 (41.66)	0 (0.00)	0 (0.00)	12(20.00)	48 (80.00)
	a) Carbendazim + Chloropyriphos +Urea	35 (58.33)	19 (31.66)				
	b) Chloropyriphos		6 (10.00)			12(20.00)	
	c) Carbendazim						
4	<b>Seed rate</b>	60 (100.00)		0 (0.00)	60 (100.00)		0 (0.00)
	a) Single eye budded (7.5 qt)	15 (25.00)			0 (0.00)		
	b) Double eye budded (10 qt)	38 (63.33)			20 (33.33)		
	c) Three eye budded (3 tonne)	7(11.67)			40 (66.67)		
5	<b>Age of the planting material (8-10months)</b>	40 (66.67)		20 (33.33)	19 (31.66)		41 (68.33)

6	<b>Planting method</b>	60 (100.00)		0 (0.00)	60 (100.00)		0 (0.00)
	a) Ridge and furrow method	60 (100.00)			60 (100.00)		
	b) Paired row method	0 (0.00)			0 (0.00)		
7	<b>Spacing</b>	60 (100.00)		0 (0.00)	60 (100.00)		0 (0.00)
	a) 90 × 60 cm	0 (0.00)			12 (20.00)		
	b) 120 × 60 cm	60(100.00)			48 (80.00)		
8	<b>Organic Manures</b>	21 (35.00)	39 (65.00)	00 (0.00)	10 (16.66)	32(53.33)	18 (30.00)
	a) FYM	14 (23.33)	15 (25.00)		10 (16.66)	19(31.66)	
	b) FYM + Vermicompost	0 (0.00)	8 (13.33)		0 (0.00)	3 (5.00)	
	c) FYM + Press mud	7 (11.67)	9 (15.00)		0 (0.00)	10(16.66)	
	d) FYM + Vermicompost + Pressmud	0 (0.00)	7 (11.67)		0 (0.00)	0 (0.00)	
9	<b>Green leaf manure used</b>	25 (41.66)		35 (58.33)	20 (33.33)		40 (66.66)
	a) Daincha	5 (8.33)			0 (0.00)		
	b) sun hemp	20 (33.33)			20 (33.33)		
10	<b>Chemical fertilizer</b> N:P:K 100:30:75 Kg/ acre	60 (100.00)	0 (0.00)	0 (0.00)	60 (100.00)	0 (0.00)	0 (0.00)
	<b>Fertilizer at the time of planting</b>						
	a) 10% Nitrogen	60 (100.00)			56 (93.33)	4 (6.67)	
	b) 100% Phosphoros	60 (100.00)			55 (91.67)	5(8.33)	
	c) 100% Potassium	60 (100.00)			56 (93.33)	4(6.67)	
	<b>Top dressing with N</b> 20% after 6 weeks of planting 30% after 10 weeks planting 40% after 14 weeks planting	13(21.66)	47(78.33)	0(0.00)	5(8.33)	55(91.67)	0(0.00)
11	<b>Micronutrients</b>						
	a) Zinc sulphate	38 (63.33)		22(36.66)	9 (15.00)	0(0.00)	51(85.00)
	b) Manganese sulphate	34 (56.67)		26 (43.33)	5 (8.33)	0(0.00)	55(91.67)
	c) Iron sulphate	23 (38.33)		37(61.67)	6 (10.00)	1(1.67)	53(88.33)
	d) Borax	13 (21.67)		47 (78.33)	11 (18.33)	0(0.00)	49(81.67)
	e) Copper sulphate	9 (15.00)		51 (85.00)	2 (3.33)	1(1.67)	57(95.00)
	f) Ammonium molybdate	7 (11.67)		53 (88.33)	6(10.00)	0(0.00)	54(90.00)
12	<b>Inter crop</b>	14 (23.33)		46 (76.66)	20 (33.33)		40 (66.66)
	a) Sugarcane + onion	11 (18.33)			14 (23.33)		
	b) Sugarcane + soybean	3 (5.00)			6 (10.00)		
13	<b>Irrigation Method</b>	60 (100.00)		0 (0.00)	60(100.0)		0 (0.00)
	a) Furrow method	40 (66.67)			57 (95.00)		
	b) Drip method	20 (33.33)			3(5.00)		
14	<b>Irrigation schedule</b>						
	a) Germination stage	60 (100.00)	0 (0.00)	0 (0.00)	60 (100.00)	0 (0.00)	0 (0.00)
	b) Tillering stage	60 (100.00)	0 (0.00)	0 (0.00)	60 (100.00)	0 (0.00)	0 (0.00)
	c) Development stage	16 (26.67)	44 (73.33)	0 (0.00)	5 (8.33)	55(91.67)	0 (0.00)

	d) Maturation stage	15 (25.00)	45 (75.00)	0 (0.00)	6 (10.00)	54(90.00)	0 (0.00)
15	<b>Weed control</b>	60 (100.00)		0 (0.00)	60(100.0)		0 (0.00)
	a) Atrazine+2-4D+ Hand weeding	22 (36.66)		38 (63.33)	15 (25.00)		45 (75.00)
	b) Atrazine + Hand weeding	18 (30.00)		44 (73.33)	13 (21.67)		47 (78.33)
	b) 2-4D + Hand weeding	24 (40.00)		36 (60.00)	20 (33.33)		40 (66.67)
	d) Hand weeding	15 (25.00)		45 (75.00)	12 (20.00)		48 (80.00)
16	<b>Inter cultivation</b> Harrowing ang Earthing up	35 (58.33)	25 (41.66)	0 (0.00)	12 (20.00)	48(80.00)	0 (0.00)
17	<b>Diseases control measures</b>						
	Rust	25 (41.66)		35 (58.33)	5 (8.33)		55 (91.67)
18	<b>Insects control measures</b>						
	a) Wooly aphid	39(65.00)		21 (35.00)	24 (40.00)		36 (60.00)
	b) Root grub	15 (25.00)		45 (75.00)	8(13.33)		52 (86.66)
19	<b>Trash management</b>						
	a) Burning	60 (100.00)		0 (0.00)	60 (100.00)		0 (0.00)
	b) Decomposition						
		39 (65.00)			55 (91.67)		
		21 (35.00)			5 (8.33)		

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