

Benefits and Constraints in Adoption of Drip Irrigation Among the Plantation Crop Growers*

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Abstract : The study was conducted during 2003-04 among areca nut and banana growers of Shimoga and Davanagere districts of Karnataka. The results revealed that majority of drip irrigation farmers had expressed the advantages like saving of water (95.55%), saving in labour cost for irrigation (92.22%) and uniform application of water (91.11%). Improved quality of the produce was expressed by 70.00 per cent of farmers. Drip irrigation had shown increased yield in arecanut and banana to the extent of 5.94 and 3.54 per cent, respectively as compared to surface irrigation. Similarly the returns were increases to the extent of 5.92 and 3.54 per cent, respectively. Drip irrigation had resulted in higher B:C ratio (1:3.36) as compared to surface irrigation (1:2.81). The quality parameters of banana (Yelakki bale) crop grown under drip system had shown more number of hands per bunch (12), fingers per bunch (103), length of fruit (4.73 inches) and fruit thickness (2.53 inches). The drip irrigation had minimized the days for harvesting (398 days) and also increased self-life (15 days) in banana.

Keywords : Drip irrigation, Arecanut growers, Banana growers, comparative yields, quality parameters

Introduction

Land and water are the basic needs for agriculture and economic development of any country. No doubt High Yielding Varieties, use of fertilizers and pesticides and improved farming techniques have played a significant role, it would still have been difficult to realize the full potential of land without irrigation. Hence, irrigation has been considered essential for the fast growth in agriculture and it will continue to be a major factor in future too.

Drip irrigation is an efficient method of providing irrigation water directly into soil at the root zone of plants and thus, minimizes conventional losses such as deep percolation, runoff and soil erosion. Unlike surface irrigation, drip irrigation is more suitable and economical if it is introduced in water scarce areas having undulated topography, shallow and sandy soils and for wide spaced high value crops. It also permits the utilization of fertilizers, pesticides and other water-soluble chemicals along with irrigation water resulting in higher yields and better quality produce. Hence, drip irrigation system is regarded as panacea for many of the problems in dry land agriculture and improving the efficiency in irrigated agriculture. In this direction various schemes to promote drip irrigation are being implemented in Karnataka. Thus, in the process of achieving higher efficiency of drip irrigation, it is necessary for the drip irrigation farmers to know the benefits and the constraints of the system. Keeping all these in view, the present study was designed to study the extent of benefits derived from drip irrigation in plantation crop and to identify the constraints encountered by farmers in adopting the drip irrigation for plantation crops.

Material and Methods

The present study was conducted during 2003-04 in Shimoga and Davanagere districts of Karnataka. The ex post-facto research design was used for the study. A sample consisting of 90 drip irrigation farmers and 30 surface irrigation farmers were selected randomly from the purposively selected 23 villages of Shimoga, Shikaripura, Channgeri and Honnali taluks, where in maximum area of plantation crops is irrigated by drip method. The questionnaire was developed keeping the objectives of the study in the background, presented in non sampling area and then employed for collecting the required data from the respondents. The data collected were tabulated and analyzed by using frequency and percentage for interpretation.

Results and Discussion

The advantages of drip irrigation as presented in the table 1 highlight that a high per cent of farmers had felt the advantages like saving of water (95.55%), saving of labour cost for irrigation (92.22%) and uniform application of water (91.11%). The improved quality produce was expressed by 70.00 per cent of farmers, followed by half of the respondents with the benefited advantage of easy method of irrigation. The benefit of decreased weed growth was highlighted by twenty per cent of farmers. These differential perception of advantages imply that drip irrigation farmers might have not planned with the objective of reaping expected benefits. Hence, there is need for witnessing these benefits by laying out demonstrations by the concerned department.

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Benefits and Constraints.....

Table 1. Advantages of drip irrigation

Sl. No.	Type of advantage	Drip irrigation farmers expressing the advantages	
		Number	Per cent
1.	Saving of water	86	95.55
2.	Saving of labour cost for irrigation	83	92.22
3.	Uniform application	82	91.11
4.	Improved quality of produce	63	70.00
5.	Easy method of irrigation	45	50.00
6.	Decreased weed growth	36	40.00
7.	Increased crop yield	22	24.44

Note : Multiple responses possible

Similarly, the results of increased yield, water saving, labour saving, quality produced and reduced weed growth have been reported by Kandaswamy (1990), and Shivakumar *et al.* (2001). Lastly, benefits of extended self-life of produce also get the support from the study of Patil *et al.* (1993).

The results presented in table 2 indicate that the average yield in arecanut and banana under drip irrigation in comparison to surface irrigation method has shown an increase of 5.94 and 3.54 per cent, respectively. Similarly, total returns shown an increase to the extent of 5.92 and 3.54 per cent, respectively. On the whole, arecanut and banana intercropping system under drip irrigation had given an increased total gross return to the extent of 4.98 per cent.

Table 2. Comparison of Yield and return in arecanut and banana inter cropping system under drip and surface method of irrigation

Particulars	Yield and return (per acre)				Per cent increase	
	Drip irrigation (n=30)		Surface irrigation (n=30)		under drip	
	Arecanut	Banana	Arecanut	Banana	Arecanut	Banana
Average yield (qt/ac)	32.29	39.60	30.37	38.20	5.94	3.54
Total return (Rs.)	35,510.00	23,760.00	33,407.00	22,920.00	5.92	3.54
Gross return (Rs.)	59,279.00		56,327.00		4.98	
Cost of production (Rs.)	17,609.00		20,005.00		- 13.60	
Net return (Rs.)	41,669.00		36,321.00		12.83	
B:C ratio	1:3.36		1:2.81		-	

It was also observed that the cost of production of arecanut and banana intercropping under drip system (Rs. 17609 per acre) has shown the decrease to the extent of 13.60 per cent in comparison to surface irrigation method (Rs. 20005 per acre). And also the net return of drip irrigation (Rs. 41669 per acre) registered 12.83 per cent increase over surface method (Rs. 36321 per acre). Consequently the B: C ratio was higher under drip system (1:3.36) as compared to surface method (1:2.81).

The findings of an increased yield was reported in the study of Patil (1990) Where as, research results of Kandaswamy (1990), which highlighted the similar yield levels under drip and surface irrigation found to contradict the present results. The data presented in table 3 reveals that all the enlisted quality parameters of banana crop grown under drip irrigation have shown an increasing trend. It was evident that the average length of fruit, average thickness of fruit, average number of hands/

bunch and average number of fingers/bunch under drip system (4.73 inch, 2.53 inch, 12 and 103, respectively) were more as compared to surface irrigation method (4.52 inch, 2.32 inch, 10 and 92, respectively). Further, it was observed that colour of fruit grown under drip irrigation was yellow, where as light green in case of surface method. Similarly, the benefits like controlled leaf spot and leaf yellowing with 5 days extended self-life were also noticed. The average number of days taken for harvesting was lesser in case of drip irrigation (398 days) as compared to surface method of irrigation (435 days).

The constraints experienced by the respondents in the adoption of drip irrigation as presented in table 4 indicates that a high per cent of farmers had expressed the problem of non-availability of quality material (95.55%) and no follow up services by drip agencies (81.11%). The other constraints like high initial investment cost, lack of capital to cover maximum holding under drip irrigation and delay in sanction of loan were experienced by 62.22, 56.66 and 53.33 per cent of farmers, respectively. Lastly one third of respondents (36.66%) expressed the problem of leakage in the present drip system. Similarly, the comparative quality parameters of banana crop under drip irrigation were also reported by Patil (1990).

The benefits of above said quality parameters of produce shows that the respondents might have not reaped benefits of drip irrigation to the maximum extent which might be

Table 3. Comparative quality parameters of banana (Yelakki bale) crop under drip and surface method of irrigation

Sl. No.	Parameters	Drip irrigation (n=30)	Surface irrigation (n=30)
1.	Average number of hands/bunch	12	10
2.	Average number of fingers/bunch	103	92
3.	Average length of fruit (inch)	4.73	4.52
4.	Average thickness of fruit (Inch)	2.53	2.32
5.	Colour of fruit	Yellow	Light green
6.	Cracking of fruit (No. per bunch)	Absent	4%
7.	Incident of leaf spots & yellowing of leaf	Controlled	3%
8.	Average number of days taken for harvesting	398	435
9.	Shelf life of fruit (number of days)	15	10

due to non-adoption of recommended management practices. Hence, there is need for educating the farmers through demonstration and other extension activities in a planned manner by the concerned departments and agencies.

Hence, it is clear from the study that the drip irrigation agencies, financing institutions and others to supply adequate standard spare parts and other appropriate measures to ensure the satisfactory situation for proper adoption of drip irrigation method.

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Table 4. Constraints in adoption of drip irrigation system

Sl. No.	Constraints	Number	Per cent
1.	Non-availability of quality spares of system	88	95.55
2.	No follow up service by drip agency	73	81.11
3.	High initial investment cost	56	62.22
4.	Lack of capital to cover maximum holding under drip irrigation	51	56.66
5.	Delay in sanction of loan	48	53.33
6.	Leakage of system	33	36.66

Note: Multiple responses possible