



Economic Analysis and Farmer's Response of Drip Irrigation Systems in Banana Fields of Guntur district

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ABSTRACT

The major crop cultivated in study area is banana, due to its age old traditional cultivation and also good market demand in the region. Andhra Pradesh state has pioneered in installing drip irrigation systems in farmers' fields through government subsidy schemes.. The authors strongly feel that the system design accuracy play a vital role in terms of energy saving, long life of pipe material and equipment. Farmer's satisfaction is also of paramount importance and the system performance and post maintenance aspects should be felt as research component too. Hence 40 farmers growing banana crop were identified from Guntur district of Andhra Pradesh state, whose fields were installed with drip system by various micro irrigation companies. Besides collecting the field technical parameters for checking the designs, a special questionnaire is prepared and the farmers were interviewed thoroughly for their response on drip irrigation system performance for banana crop which is reported in this paper along with brief benefit-cost analysis. The overall information on the drip systems for banana cultivation prove that it is very beneficial to the farmers in saving of fertilizers, water, electricity and labor costs. The drip system improves the quantity and quality of the produce by minimizing the cost of cultivation. The lowest price of banana of Rs.3500/- per tone is considered to calculated of benefit cost ratio. Even at this price farmers are getting Rs. 25,000/- to Rs. 60,000/- as profit per acre. The expenditure of the installed drip irrigation could be recovered with in 2 years. The benefit cost ratio of the forty farmers ranging 0.355 to 0.750.

Key words : Benefit cost ratio, Drip system, Economic analysis.

Water is the precious natural resource, a basic human need and a prime national asset. The extent to which the water is plentiful or scarce, clean or polluted, beneficial or destructive, profoundly influence the extent and quality of human life. The relentless increase in population and the resulting spurt in the demand for water require careful planning and management of the limited water resources. The available water resources are to be optimally harnessed and beneficially utilized with appropriate priorities of use. Drip irrigation is also known as Trickle irrigation or micro irrigation is an irrigation which minimizes the use of water and fertilizer by allowing water to drip slowly to the roots of plants, either in to the soil surface or directly in to the root zone, through a net work system of valves, pipes, tubing and emitters. The major crop cultivated in the study area is banana due to its age old traditional cultivation and also due to good market in the region.

Realizing the importance for economic use of precious ground water for irrigation, The Government of Andhra Pradesh, one of the leading states in India, launched the Andhra Pradesh Micro irrigation Project (APMIP), the first of its kind on November 3rd 2003. The project is aimed at bringing

2.48 lakh ha area under micro irrigation systems in 22 districts of Andhra Pradesh and reaching its targets. The project envisages in 1)Use of only BIS certified products 2) Compulsory use of fertigation unit 3) Agri-extension services for 2 years 4) Performance guarantee for 5 years by MI companies and 5) Penalties to MI companies for violation of guidelines. Farmers of Guntur District, knowing the advantages of drip system, in terms of increased yield, water saving, improved quality, fertilizer application efficiency, energy conservation, reduced labour costs, increased diseases and pest control, feasibility of irrigating difficult Terrain etc., opt for drip system for their banana crop which is found remunerative in certain parts of their district by virtue of the marketability, soils and farmers' choice as well. In the present study the authors report the benefit cost analysis for the crop with drip system which is a part of their study on field evaluation of drip system for banana crop as per the data collected directly by close interaction with the farmers.

MATERIAL AND METHODS

As part of this study and performance evaluation of drip irrigation systems in some of the

Table 1. Benefit Cost Ratio of Banana crop.

Field No	Extent (Ac)	Total cost (Rs)	Yield (Ton /Ac)	Value (Rs)	Profit (Rs)	Benefit / Cost
F1	3.00	68800	30	105000	36200	0.526
F2	2.00	57900	24	84000	26100	0.451
F3	1.00	57600	22	78050	20450	0.355
F4	4.00	56400	26	91700	35300	0.626
F5	1.50	48800	21	76300	27500	0.563
F6	3.50	55700	24	84000	28300	0.508
F7	4.00	45950	17	62405	16455	0.358
F8	1.50	61000	24	87010	26010	0.426
F9	4.50	63500	29	101500	38000	0.598
F10	5.00	60450	29	101500	44550	0.737
F11	2.00	48000	20	70000	22000	0.458
F12	3.50	60000	25	87500	27500	0.458
F13	2.50	51500	22	77000	25500	0.495
F14	2.00	46000	18	63000	17000	0.369
F15	3.00	58500	25	87500	29000	0.504
F16	5.00	58000	26	91000	33000	0.568
F17	4.50	59000	28	98000	39000	0.661
F18	3.75	50000	22	77000	27000	0.540
F19	4.25	56000	23	80500	24500	0.437
F20	4.50	60000	24	84000	24000	0.400
F21	5.00	69000	30	101500	32500	0.471
F22	3.00	57000	26	91000	34000	0.596
F23	2.50	48000	24	84000	36000	0.750
F24	3.00	58000	26	91000	33000	0.568
F25	4.00	49000	23	80500	31500	0.643
F26	4.50	51000	25	87500	36500	0.716
F27	5.50	60000	28	98000	38000	0.633
F28	3.00	54000	22	77000	23000	0.426
F29	2.50	45000	20	70000	25000	0.555
F30	2.00	46000	21	73500	27500	0.598
F31	3.00	56000	25.5	89250	33250	0.593
F32	2.50	490000	24	84000	35000	0.714
F33	2.00	47500	22	77000	29500	0.621
F34	3.25	51000	23	80500	29500	0.578
F35	2.75	49500	20	70000	29500	0.595
F36	1.75	40200	18	63000	22800	0.567
F37	2.40	52000	21	73500	21500	0.413
F38	1.60	39500	18	63000	23500	0.594
F39	2.00	47000	20	70000	23000	0.489
F40	2.50	49500	22	77000	27500	0.555

Note: The market price of banana is considered lowest price Rs:3500 per ton

villages in Mangalagiri and Thulluru mandals of Guntur district, the data collected from various organizations like Andhra Pradesh Micro Irrigation Project (APMIP) office, Micro Irrigation(MI) companies etc.. Also the technical parameters like pump details, design details, field evaluation of pressure variation, discharge variation along the laterals were measured and recorded. In this paper, the farmers response and brief benefit-cost analysis for banana rising under drip system in the study area is reported. A simple questioner is prepared to the basic important data and to calculate the benefit cost ratio, which is enclosed in Annexure –I and II.

Study area

As many farms are installed with drip systems under Andhra Pradesh Micro Irrigation Project (APMIP) in Mangalagiri and Thulluru mandals, some of the villages namely Mandadam, Venkatapalem, Lingaya palem, Rayapudi, Nuthakki, Kaza, Needamarru are selected for the present study.

RESULTS AND DISCUSSION

Domenico et al., (2006) it is clear that fertigation has the greatest impact on the yield and the quality of the produce if maintained properly. When a query was conducted to know the response of the farmers using fertigation unit they expressed mixed response. Many farmers are aware of the benefits of the fertigation unit and are correctly adopting the fertigation schedule to achieve higher yields. But a few farmers who installed drip in their fields are still following the traditional method of fertilizer application during the initial stages of the crop growth. This is due to high cost of water soluble fertilizers. The overall study revealed that many of the farmers got benefited by the use of water soluble fertilizers and also the quantity of the fertilizer used has reduced by about 35 % to 40%. The drip system installing companies are providing the required guidance and assistance in the use of fertigation unit for the newly installed systems.

Benefit cost ratio of different farms

A study was conducted by interacting with the farmers to calculate the benefit cost ratio after installing the drip irrigation systems in the farmer's fields under different cropping patterns like banana, maize and vegetables. All the farmers have expressed that the installed system caused benefit in their cultivation of respective crops in their fields. The format include the parameters considered for the study of benefit cost ratio such as land

preparation cost, cost of suckers, fertilizers cost and drip irrigation system cost, weeding labour cost etc. The lowest market price of banana of Rs.3500/- per tonne is considered to calculate this benefit cost ratio. Even at this cost, farmers are getting Rs 25,000/- to 60,000/- as profit per acre. The expenditure of the installed drip irrigation system could be recovered within two years. The benefit cost ratio of the forty farmer's field's cultivation ranged 0.355 to 0.750 (Table 1).

Farmer's response on the drip systems for growing banana crop

The farmers of all the villages of the study area expressed a positive response when enquired about the benefits of drip systems for banana crop in addition to some minor problems.

1. The farmers of all the banana growing villages reported that cost of cultivation has tremendously reduced with the use of drip systems. The problems like scarcity of labour and high labour costs are solved with the drip systems as the labour required for the maintenance of drip systems is very less as compared to the traditional practices.
2. The drip irrigation system has not only lowered the cost of production but also increased the quality and quantity of the produce as the water is applied in a right quantity at the right time. With the use of the drip system there will be early fruit bearing stage which provides a better chance for the cultivation of other crop in the second season.
3. The flower and vegetable growing farmers expressed that drip irrigation system is the best in terms of water needs of the crop, as the water is applied frequently in 4 to 5 times in a day.
 1. The drip irrigation system can be used for crops like turmeric, maize and banana without any modification in terms of design. The operation and maintenance of the drip system is easy
 2. With drip system, as the water is applied only at the root zone of the plants the remaining area of the field except at the plant root zone, remains dry which reduces the growth of weeds.
 3. The fertigation unit provided good results by reducing the quantity of fertilizers to be used in drip systems. The application rate of fertilizers is reduced from 5-6 kg/day to 1-2 kg/day as expressed by many banana growing farmers. But as the cost of the soluble fertilizers are high compared to the ordinary fertilizers, some of the farmers are not using the fertigation unit

Annexure –I
Cost of cultivation and benefit cost ratio in the experimental fields for F1 farmer

Items	Amount (Rs.)
1) Weeding labour cost	:1500
2) Acid treatment cost	:1500
3) Cost of Supporting sticks	:5000
4) Cost of suckers	:10000
5) Field preparation charges	:1300
6) Organic matter cost	:4000
7) Fertiliser cost	:14500
8) Electricity cost	:2500
9) Labour cost	:9900
10) Drip Installtion Cost	:18600
11) Miscellaneous costs	:_____
12) Total cost	:68800
13) Total Yield	:30tons x 3500 per ton = 105000
14) Profit	:36200
15) Benefit cost ratio	: Profit / total cost = 0.526

in the early stages of the crop growth. Also many farmers reported that they lack of knowledge in the scheduling of fertigation time and in procuring the good fertilizers suitable for the drip systems.

4. There is good awareness among the farmers about the use and cleaning of filtration unit. Many farmers responded that they clean the filters by observing the drop in pressure in the filter with the help of pressure gauges provided. But most of the farmers clean the filters regularly, twice in a week etc., which also keeps the filter in good operating conditions.
5. As the quality of water in the study area is good, there is no frequent clogging of the emitters due to the salt encrustation. Also there are no major damages to the lateral pipes by rodents, rats etc.

Conclusions

Almost all the farmers have expressed that the installed system caused benefit in their cultivation of respective crops in their fields. The lowest market price of banana of Rs3500/- per tonne is considered to calculate this benefit cost ratio. The expenditure of the installed drip irrigation system could be recovered within two years. The benefit cost ratio of the forty farmer's field's cultivation ranged 0.355 to 0.750 (Annexure I). This type of study would lead to explore such crops and areas for getting maximum net profit besides saving water and labour.

LITERATURE CITED

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(Received on 27.03.2012 and revised on 11.06.2012)