

CHAPTER III

REVIEW OF LITERATURE

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#### REVIEW OF LITERATURE AND WORK

Lot of work has been done on evaluation of various irrigation methods such as borders, furrows, sprinklers and drips. An attempt has been made to review the research work done on the comparison of the irrigation methods with respect to water saving, increase in yield and economics of the system.

1) Watson et al (1985)\* during their study of Australian experience of drip irrigation on vineyard have observed that there was a significant increase by 11 percent in the coverage of drip irrigation for grapes from 1981 to 1984. This was due to the fact that the wine producers could not risk the vagaries of climate and fickle changes of the market when it come to investing in vineyards.

They further observed that many of the leading wineries located in South Australia have been leaders in the adoption of drip irrigation for grape-wine and also developed its application on many other crops as well.

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\* Watson, K.A. et al

" Drip Irrigation - An Australian Experience".

Drip/Trickle Irrigation In Action,

Proceedings of the Third International Drip/Trickle Irrigation Congress, November 18-21, 1985.

American Society of Agricultural Engineers - Michigan, USA, 1985. PP 127-32.

Their conclusions were mostly favourably disposed towards the adoption of the drip irrigation system as an efficient method of irrigation. They noted an increase in the yields per acre and also in the quality of grapes. These improvements encouraged others to go in for the drip system of irrigation.

2) Bucks, D.A. et al (1985)\* cited some references in their research paper.

Goldberg et al (1971) noted that relative water use efficiency was positively affected by the shorter trickle interval.

Smart et al (1974) found that daily and alternate day trickle irrigations on six year old wine grapes at 0.4 pan evaporation produced yields similar to those of furrow irrigated vines at 0.5 pan evaporation.

Peacock et al (1977) compared the response of wine grapes to trickle, flood and sprinkler irrigation on a sandy-loam soils and found that the main benefit of trickle irrigation helped increased water use efficiency.

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\* Buck, D.A. et al  
"Trickle Irrigation Management for grape production"  
Drip/Trickle Irrigation In Action,  
Proceedings of the Third International Drip/Trickle Irrigation  
Congress, November 18-21, 1985.  
American Society of Agricultural Engineers -  
Michigan, USA, 1985. PP 204-10.

Buck D.A. et al (1985) studied the available data on sandy looms soil using trickle and furrow irrigation on mature table grape vineyard near Phoenix, Arizona for the year 1973-77.

It was their observation that the yield and food quality were maintained or slightly increased with two trickle emitters per vine over furrow irrigation.

The flushable type emitters became partially clogged during the second year of operation and were reclaimed by treating with high concentrations of hypochlorite acid. Therefore the system performance was maintained by continuous water treatment with lower chemical concentrations.

3) Sivanappan, R.K. and Kottiswaram, S.V. (1985)\* have experimented with drip irrigation for coconuts. For the study purpose four hectares well irrigated coconut farms were selected. Fully grown trees in that area were giving 30 to 40 nuts per tree, per year. They further observed that after

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\* Sivanappan, R.K. and Kottiswaram, S.V.

" Drip Irrigation for coconut in India"

Drip/Trickle Irrigation In Action.

Proceedings of the Third International Drip/Trickle Irrigation Congress, November 18-21, 1985.

American Society of Agricultural Engineers  
Michigan, USA, 1985 P. 198.

adopting drip irrigation the entire area was irrigated and some more area was brought under cultivation. Due to the drip irrigation system, the yield increased to 60 to 75 nuts per tree per year within a year of installation of drip irrigation system.

A lot of research work on drip irrigation is being done in Maharashtra.

4) Bangal, G.B. et al (1987)\* compared drip and check basin method of irrigation for pomegranate orchards. Irrigation water was applied (in both methods for the period January 1980 to August 1980). It required 108 cm of irrigation water by check basin and 60 cm by drip method in addition to 26.6 cm by of rain. Chemical analysis showed no practical difference in fruit quality with respect to T.S.S., acidity and sugar content.

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\* Bangal, G.B. et al

\* Comparison of Drip and Check basin method of Irrigation for Pomegranate orchard<sup>o</sup>.

National Seminar on Drip and Sprinkler irrigation methods - Adoption Abstract of Research Papers.

Mahatma Phule Agricultural University, Rahuri,  
April 10-12, 1987 P. 6.

5) Gorantiwar, S.D. et al (1987)\* experimented at Rahuri the response of cabbage crop to furrow irrigation and drip irrigation methods. They came to the conclusion that the yield in drip (16.94 t/ha) was higher than the yield in furrows (14.67 t/ha). Water saving to the extent of 46 percent was observed in drip over furrow method.

6) Deshmukh, M.T. (1987)\*\* describes in his paper that appropriate drip irrigation technology had been extended to small and marginal farmers for mango grafts of the Konkan region. The average water application rates over fixed time durations had been determined from discharge hydrographs and interpreted in relation to the hydrolic conductivity of the lateric soil.

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\* Gorantiwar, S.D. et al

" Response of cabbage Crop to trickle Irrigation method".  
National Seminar on Drip and Sprinkler Irrigation Methods -  
Adoption Abstract of Research Papers.  
Mahatma Phule Agricultural University, Rahuri,  
April 10-12, 1987 P. 7.

\*\* Deshmukh, M.T.

" Development of appropriate drip irrigation technology  
for raising mango grafts in Konkan".  
Ibid P. 18.

7) Patil B.P. and Pulekar C.L. (1987)\* experimented at Wakavali with Drip irrigation system for mango graft and observed that nearly 50 percent of water was saved in the initial stages and the cost of irrigation reduced by 74 percent.

8) Wayse V.S. and Kulkarni N.R. (1987)\*\* conducted a Study of grape cultivators irrigating their vine-yards with drip irrigation in Sangli District.

They observed that the advantages of the drip irrigation system lay in savings of various types e.g. Savings on expenditure towards water, use of fertilizers, plant protection as well as on labour; besides, cost in

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\* Patil, B.P. and Pulekar, C.L.  
" Drip Irrigation for Konkan soil"  
Shetkari, February - 1987. (In Marathi)

\*\* Wayse, V.S. and Kulkarni N.R.  
" Evaluation of Drip Irrigation performance of farmers,  
field for grape in Sangli District".  
National Seminar on Drip and Sprinkler Irrigation Methods-  
Adoption Abstract of Research Papers,  
Mahatma Phule Agricultural University, Rahuri,  
April 10-12, 1987 P. 20.

installation of the drip system is quite high which would be well justified provided the farmers would not be faced with a number of problems emanating from the drip irrigation system itself. The problems faced by farmers in Sangli District, according to this study included the cracking of flexible pipes, uneven distribution of water as well as non-availability of information on scheduling.

They suggested that in order to remedy the situation the Government has to play an important role and Scientists must focus their attention on scheduling, on irrigation, placement of emitters, even distribution of water, maintenance of soil health and control of diseases and pests, the fertilizers and the quality of PVC pipe to be used.