



Asian Journal of Plant Sciences

ISSN 1682-3974

science
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Determination of the Effectiveness of Localized Irrigation Systems in Balochistan

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Abstract: To evaluate the effectiveness of the localized irrigation systems (Trickle and Bubbler) in the deciduous fruits, a survey was conducted in five deciduous fruit trees producing districts; Quetta, Pishin, Loralai, Ziarat and Khuzdar of Balochistan, Pakistan. During the survey 125 farmers were interviewed to get the data about the study. It was observed that only establish farmers having their own farms responded to the localized irrigation systems. Among the localized irrigation systems trickle irrigation was found the best and most practicable system among the farmers.

Key words: Localized irrigation systems, Trickle irrigation, Bubbler irrigation, deciduous fruit, Pakistan

Introduction

The upland plains of Balochistan are generally fertile and have dry climate with sunny days during most of the year. These natural conditions are best suited for the production of deciduous fruits i.e., apple (*Pyrus malus*), peach (*Pyrus persica*), apricot (*Prunus armeniaca*), plum (*Prunus domestica*), pear (*Pyrus communis*), cherry (*Prunus avium*), almond (*Prunus dulcis*), pomegranate (*Punica granatum*), pistachio (*Pistacia vera*) and grapes (*Vitis* spp.) in the region (Anonymous, 1993 and Malik, 1994). Availability of water is the main problem in this province (Anonymous, 1991). The main sources of water for irrigation in the province is ground water through tube wells, open hand dug wells and small streams (Anonymous, 1998-99). Due to the scarcity of water localized irrigation systems were introduced in the province (Abi-Samra, 1993). Localized irrigation refers to a system which causes wetting to the root zone of the plant only. Trickle or Drip (Anonymous, 1995a) and bubbler (Anonymous, 1995b) irrigation are the examples of the localized irrigation system (Vermeiren and Jobling, 1994). Balochistan is a poor province of Pakistan, where farmers could not meet the expenses of electricity to run the tube wells (Brown, 1980) thus the localized irrigation methods could provide a relief to them (Brouwer, 1985 a,b; Doonen and Westcot, 1984).

This study was conducted with a goal to evaluate the effectiveness of localized irrigation systems among farmers in response to the deciduous fruit production and conservation of resources.

Materials and Methods

To get the goal of this study a survey was conducted during 1994 in the five deciduous fruit producing districts of Balochistan. 125 respondents (farmers), which had adopted the localized irrigation system, were

interviewed in Quetta, Pishin, Loralai, Ziarat and Khuzdar districts. The study was based on the assumptions that respondents would provide the correct information. 125 respondent were randomly visited and data were obtained through a prescribed proforma which included respondent's name, father's name, age of the respondent, level of education of the respondent, location of orchard, orchard type, area of the holding, tenancy status, annual income, sources of irrigation, method of irrigation, benefits of the localized irrigation system over conventional and general views of the respondent about the localized irrigation systems. The farmers were interviewed at their places personally.

Results and Discussion

Quetta, Pishin, Ziarat, Loralai and Khuzdar are the main five deciduous fruit trees producing districts in Balochistan which have adopted the localized irrigation systems. Most of the respondents were of middle age (Table 1) and had primary education (Table 2). The survey proved that the localized irrigation systems were adopted mostly by the owners of the medium farms (Table 1). Non conventional irrigation systems need hand some amount of money to install (Hussain, 1990) thus only established farmers, having good annual income, has adopted the scheme (Table 2). The farmers of Quetta has shown good response in adopting the localized irrigation system (Table 2). Quetta is the provincial capital thus farmers has better approach to the Department of Agriculture. Mostly the farmers were in favor of Trickle irrigation system (Table 3). The initial cost is less than Bubbler irrigation system. This system is through small diameter polyethylene pipes which are durable in the dry and cool condition of Balochistan. Water dripping is at very low rate (4.5-27 L hour⁻¹), even more the water is applied very close to the root zone thus its utilization is about 100% (Anonymous, 1995a;

Table 1: Distribution of respondents according to their age, orchard size and tenancy status

	¹ Age (Years)			² Orchard Size			³ Tanacy		
	Young	Middle	Old	Small	Medium	Large	O	O/T	T
Number	10	65	50	35	65	25	100	15	10
%age ⁴	8.0	52	40	28	52	20	80	12	08

¹ Age (Young up to 30, middle 31-45, old >45); ²Orchard size (Small up to 2 ha, medium 2-4 ha, large > 4 ha); ³Tanacy (O = owner, O/T = owner/tenant, T = tenant); ⁴ %age is calculated by the total numbers (n = 125).

Table 2: Location of localized irrigation systems and distribution of respondents according to their education level and annual income

	¹ District			² Education						³ Income (Rs)				
	Qta	Psh	Zia	Lor	Khz	Ill	Pri	Mid	Mat	>M	Por	Avg	Mid	Ric
Number	30	20	25	25	25	22	40	33	20	10	00	15	67	43
%ag ⁴	24	16	20	20	20	18	32	26	16	8	00	12	54	34

¹District (Qta = Quetta, Psh = Pishin, Zia = Ziarat, Lor = Loralai, Khz = Khuzdar); ²Education (Ill = Illiterate, Pri = Primary, Mid = Middle, Mat = Matriculation, >M = above Matriculation); ³Income (Por = up to Rs 30,000, Avg = 31-60,000, Mid = 61-90,000, Ric = >90,000 per year); ⁴%age is calculated by the total numbers (n = 125).

Table 3: Respondents opinion about localized irrigation systems

Irrigation system	Usefulness	Number	*Percentage
Trickle	Yes	114	91.2
Bubbler	No	125	100

*%age is calculated by the total numbers (n = 125).

Samra and Iqbal, 1996). None of the farmers recommended Bubbler irrigation system (Table 3). Bubbler irrigation system has high discharge rate also requires high pressure which, some time requires extra reservoir and pumping booster, that increases the installation cost (Anonymous, 1995b). In view of the above discussion it is proved that the localized irrigation system is adoptable but requires money. The farmer must be well educated to get the decision to adopt the non conventional irrigation systems.

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