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Socio-economic characteristics of onion growers using drip irrigation system in Tamil Nadu

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Abstract

Onions are economically and nutritionally important vegetable crop. Despite advances in technology and acreage, Indian onion growers face challenges in realizing their full productivity potential. Drip irrigation technology in onion cultivation emerges as a promising solution to address water use inefficiencies while optimizing crop yields and qualities. This study investigates the socio-economic characteristics of onion growers using percentage analysis. The survey was conducted to collect primary data from 119 cotton growing farmers in Thondamuthur block of Coimbatore district. Findings reveal that three-fifths (60.50%) of the respondents belonged to middle age group, more than half (51.26%) of the drip owners were having secondary level of education, more than half (58.82%) the respondents possessed medium category of annual income, more than two-fourths (53.78%) of the onion farmers had 1.1 to 2.0 ha of area under drip irrigation, about half (49.58%) the respondents fall under medium level of information seeking behaviour, almost two-thirds (62.18%) of the drip farmers used tube well as their source of irrigation followed by well (20.17%), more than two-fifths (42.86%) of the respondents had medium farming experience using drip irrigation system, almost three-fourths (73.95%) of the respondents had high procurement of irrigated area, more than half (54.62%) the respondents had medium effect of dis on production, about three-fifths (59.66%) of the respondents had medium care of maintenance of system, nearly three-fourths (72.27%) of the respondents were members of social organization, more than two-thirds (69.75%) of the respondents had medium category of economic motivation, more than half (54.62%) of the respondents had medium category of scientific orientation, more than two-thirds (68.07%) of the respondents had not undergone any trainings in the past three years related to drip irrigation system and more than three-fourths (75.63%) of the respondents had medium satisfaction with drip irrigation system. The socio-economic characteristics of the farmer respondents plays a crucial role in identifying the impact of drip irrigation among the Onion growers. This paper will address the socio-economic characteristics of the onion growers which will help in designing targeted interventions to overcome barriers and encourage more farmers to adopt this technology.

Keywords: Drip irrigation, onion growers, profile

Introduction

Drip irrigation is a highly efficient method of watering crops, delivering water directly to the root zone of plants. This technique has gained significant attention in onion farming due to its numerous benefits. One of the primary advantages of drip irrigation in onion farming is the enhanced water use efficiency. Research indicates that drip irrigation can reduce water usage by up to 50% compared to traditional methods like furrow or sprinkler irrigation. (Yang *et al.* 2023) ^[1]. This is particularly beneficial in arid and semi-arid regions where water scarcity is a major concern. (Burt and Styles, 2011) ^[2].

Moreover, drip irrigation helps in improving crop yield and quality. Studies have shown that onions grown under drip irrigation systems exhibit better growth parameters, such as increased plant height, number of leaves, and bulb size. Shock *et al.* 2013. This method also reduces the incidence

of diseases and pests by keeping the foliage dry, thereby minimizing the conditions favourable for their proliferation. (Enciso *et al.* 2015) ^[4].

Another significant benefit is the reduction in fertilizer and nutrient leaching. Drip irrigation allows for precise application of fertilizers through fertigation, ensuring that nutrients are delivered directly to the plant roots. This not only enhances nutrient uptake but also reduces the environmental impact by minimizing runoff and leaching. Additionally, drip irrigation systems can be tailored to suit various field conditions, making them versatile and adaptable. They are particularly effective in fields with uneven topography or varying soil textures, where traditional irrigation methods may be less efficient. Identifying the socio-economic and demographic factors of the farmers that influence the adoption of drip irrigation can help in designing targeted interventions to overcome

barriers and encourage more farmers to adopt this technology. With this background, the present study aimed at finding out the socio-economic characteristics of onion growers using drip irrigation system percentage analysis.

Materials and Methods

The study was conducted in the Thondamuthur block of Coimbatore district, Tamil Nadu. Coimbatore ranks first in the productivity of small Onion in Tamil Nadu. Horticultural crops are predominantly grown in the Thondamuthur block, among which small Onion tops the table with high productivity. The study was conducted in five villages of the block, with maximum production viz., Devarayapuram, Ikkarai Boluvampatti, Narasipuram, Vellimalaipattinam and Pooluvampatti. The ex-post facto

research design was used in the study. A sample size of 119 was selected as total, from two per cent of the Onion farmers using the drip irrigation system in that specified block by using Proportionate Random Sampling method. The statistical tools used in this paper was Percentage analysis to find out the socio-economic characteristics of onion growers using drip irrigation system.

Results and Discussions

The socio-economic characteristics of the farmer respondents plays a crucial role in identifying the impact of drip irrigation among the Onion growers. They were defined, studied and data were analyzed and presented in the subsequent tables.

Table 1: Socio-Economic Characteristics of Onion growers using drip irrigation system

S. No.	Profile of respondents	Category	Total (n=119)	
			No	%
1.	Age	Young (Upto 35 years)	01	0.84
		Middle (36-50 years)	72	60.50
		Old (More than 50 years)	46	38.66
2.	Educational Status	Illiterate	01	0.84
		Primary	18	15.13
		Secondary	61	51.26
		Senior Secondary	25	21.01
		Graduate and above	14	11.76
3.	Annual Income	Low	8	6.72
		Medium	70	58.82
		High	41	34.46
4.	Area under drip irrigation	Up to 1.0 ha	35	29.41
		1.1 to 2.0 ha	64	53.78
		2.1 to 4.0 ha	18	15.13
		Above 4.0 ha	2	1.68
5.	Information seeking behaviour	Low	45	37.82
		Medium	59	49.58
		High	15	12.60
6.	Source of irrigation	Well	24	20.17
		Tube well	74	62.18
		Canal / pond	21	17.65
7.	Farming experience in drip irrigation	Less	20	16.80
		Medium	51	42.86
		More	48	40.34
8.	Procurement of irrigated area	Low	06	5.04
		Medium	25	21.01
		High	88	73.95
9.	Effect of drip irrigation system on production	Low	23	19.33
		Medium	65	54.62
		High	31	26.05
10.	Maintenance of system	Low	29	24.37
		Medium	71	59.66
		High	19	15.97
11.	Social participation	Not holding any position in social organization	30	25.21
		Member of social organization	86	72.27
		Office bearer of social organization	03	2.52
12.	Economic motivation	Low	21	17.65
		Medium	83	69.75
		High	15	12.60
13.	Scientific orientation	Low	38	31.93
		Medium	65	54.62
		High	16	13.45
14.	Trainings undergone	Attended	81	68.07
		Not attended	38	31.93
15.	Satisfaction with drip irrigation system	Low	14	11.76
		Medium	90	75.63
		High	15	12.61

Age

It is evident from the data presented in table 1 that three-fifths (60.50%) of the respondents belonged to middle age group followed by old age category and young age category. The potential reasons might be that young farmers were less intrigued to keep cultivating as their ancestors did and they had moved to other business endeavours. The young farmers were additionally occupied with non-farming ventures like business, owning shops, development works and private jobs. While old farmers may have pulled back from farming and given over the grounds to other people. Similar findings have been reported by Mahesh (2016) ^[5].

Educational status

Educational status refers to the attainment or perceived level of education completed by an individual drip owner at the time of study. It can be observed from table 1 that more than half (51.26%) of the drip owners were having secondary level of education followed by senior secondary level of education. The probable reason may be due to the easy accessibility of secondary school in that locality than higher educational institutions. The findings are on par with the findings of Misra (2018) ^[6].

Annual income

It refers to the total annual earning of an individual respondent from all possible sectors. From table 1, it is inferred that less than three-fifths (58.82%) of the respondents had medium annual income. The trend might be due to the fact that as small Onion is the major crop of Thondamuthur block, majority of the farmers cultivate small Onion, hence due to high competition and production among the farmers and seasonality of small Onion production the profit is uncertain. The findings are in accordance with the findings of Ojha (2015) ^[7].

Area under drip irrigation

It is measured as the actual number of hectares of land owned by drip owners. The data furnished from table 1 indicated that more than two-fourths (53.78%) of the drip owners had 1.1 to 2.0 ha of area under drip irrigation. This might be due to the reason that most of the farm areas have been segregated of between the family members and most of the agricultural lands being converted to the construction of plots which makes them financially precarious they were reluctant to embrace the progressions first however they were anxious for new changes. The above findings show correspondence with Shantaram (2014) ^[8].

Information seeking behaviour

It refers to the degree of information obtained from all possible sources. The result tabulated in the table 1 depicted that nearly half (49.58%) the respondents fall under medium level of information seeking behaviour. This may be due to the reason that most of the respondents preferred local agro input dealers (or) drip irrigation system dealer, as they frequently visited the farmers field and suggested remedies and had regular meet ups with the farmers. The findings are in line with the findings of Bhuriya (2015) ^[9].

Source of irrigation

It refers to the availability of irrigation water through various sources namely well, tube well and canal/pond. From table 1, it is clarified that almost two-thirds (62.18%) of the drip farmers use tube well as their source of irrigation. This may be due to the possible reason that the underground water accessibility of Coimbatore District is

very low. Subsequently, the greater part of the farmers preferred tube well as their source of irrigation due to its easy, continuous availability of irrigation water and compatibility with the drip irrigation system. The findings are in line with the findings of Singh (2010) ^[10].

Farming experience in drip irrigation

Farming experience acquired by a farmer in drip irrigation system may pave way for reliable farming and it may have its own influence on the benefits of using drip irrigation system. Data collected from table 1 opined that more than two fifths (42.86%) of the respondents have medium farming experience using drip irrigation system. The probable reason might be that majority of the farmers belong to the age group of 35-50 years, hence they are new to farming as they have taken over farming from their parents. The findings are in accordance with the findings of Mahesh (2016) ^[5].

Procurement of irrigated area

After the usage of drip irrigation system, the irrigated area found to increase to some extent and with different level of irrigation. It is obvious from table 1 that nearly three-fourths (73.95%) of the respondents had high procurement of irrigated area. This may be presumably because of decreased utilization of the water through the usage of a drip irrigation system by the farmers. The findings are on par with the findings of Patidar (2015) ^[12].

Effect of DIS on production

Production of crop (small Onion) is either directly or indirectly dependent on drip irrigation system, as it enhances the quality, quantity, size, colour, texture, taste and profit of the produce. It is inferred from table 1 that more than half (54.62%) the respondents had medium effect of DIS on production. The probable reason could be that the benefits from the drip irrigation like reduced water usage, opportune and non-stop water application, reduced expenses and the usage of drip irrigation system could have had a good effect of production among the farmers. The findings are in accordance with the findings of Parihar (2017) ^[11].

Maintenance of system

The maintenance of drip irrigation system depends on how farmers maintain and service the drip irrigation system after installing it. From the above table, it is understood that almost three-fifths (59.66%) of the respondents had medium care of maintenance of system. The feasible basis could be that, the farmers themselves maintain their drip irrigation system, by continuous cleaning and evacuating blocks. The findings are supported by the findings of Parihar (2017) ^[11].

Social participation

It refers to the participation of drip irrigation system using Onion grower in any social or political organization. From table 1, it is perceived that nearly three-fourths (72.27%) of the respondents were members of social organization. The reason behind this may be that only a few social organizations are active in the villages which are affluent to the higher sections of the people whereas the small and marginal farmers were not in reach of these social organizations which prevented their participation in social activities. The findings are in accordance with the findings of Misra (2018) ^[6].

Economic motivation: It refers to the intent or outlook for

which drip farmer provides priority to improve and increase the profit. From the data presented in the table 1, it is opined that more than two-thirds (69.75%) of the respondents had medium level of economic motivation. This could be due to the reason that majority of the farmers still consider farming as a livelihood occupation and not perceive it as a profit-making avenue. The findings are in line with the findings of Radhakrishnan *et al.* (2016) ^[13].

Scientific orientation

Scientific orientation seems to be a respondents' strategy to the latest agricultural innovation implemented in cultivation. From the above table, it is evident that more than half (54.62%) of the respondents had medium category of scientific orientation. This may be due to the case that was learned during the survey that the majority of drip farmers were in longing for information on logical advancements. The findings are parallel to the findings of Nargave (2016) ^[14].

Trainings undergone

Training's are crucial as it helps to sharpen the farmers to upgrade and re-build their inner and outer knowledge, skills, ability, attitude and experiences. From the above table, it is noticed that more than two-thirds (68.07%) of the farmers had attended the training. This could be due to the possible rationale that the farmers highly preferred village leaders, progressive farmers, friends, agro-input dealers and drip irrigation system dealers when compared to agricultural officers and department personnel. This is in level with the findings of Deepika (2018) ^[15].

Satisfaction with drip irrigation system

Satisfaction is a psychological feeling of fulfilment of one's wishes, expectations, or needs, or the pleasure derived after utilizing its maximum benefit.

From the table, it is obvious that more than three-fourths (75.63%) of the respondents had medium satisfaction with drip irrigation system. This trend may be due to the educational status of the respondents, experience gained in using drip irrigation system and the benefits like less water requirement, low labour usage, reduced usage of inputs and moderate profit obtained from all seasons.

The findings assimilate the findings of Vijay (2011) ^[16].

Conclusion

Drip irrigation is known to significantly improve water use efficiency. By understanding the characteristics of growers who adopt this technology, we can identify best practices and promote them among other farmers. Growers using drip irrigation often experience higher yields and better quality produce. Profiling these growers can help in understanding the economic benefits and challenges, leading to better support and policies. Drip irrigation reduces water wastage and minimizes the leaching of fertilizers into the groundwater. Studying the growers' profiles helps in assessing the environmental benefits and promoting sustainable farming practices. Thus, understanding the specific needs and challenges of different groups of growers allows for the development of customized training and support programs, ensuring that all farmers can benefit from drip irrigation.

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Competing Interests

The authors have declared that no competing interests exist.

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