

Constraints and Knowledge Level of Tomato Growers on Precision Farming Practices

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ABSTRACT: Tomato is one of the important and popular vegetable. It is mostly grown in traditional way by majority of the farmers, but success of tomato cultivation depends on adoption of improved cultivation methods with relevant to changing climate. Increase in maximum temperature seriously affects the fruit set and yield. Knowledge is an important component for adoption of any practices. Keeping in view, this study was conducted to analyse the knowledge level of precision farming practices and constraints faced by the tomato growers in Palacode and Karimangalam blocks of Dharmapuri district. A proportionate random sampling procedure was applied to select 120 respondents. Data were collected by using well structured interview schedule and analysed statistically. The study revealed that most of the respondents (57.00%) had high level of knowledge on tomato cultivation under precision farming. The important constraints reported were high cost of labour, inadequate water supply, non availability of credit, damage to the drip irrigation system, delay in getting subsidy, difficulty in taking intercultural operations, high cost of inputs, high investment for drip installation, intervention of middle man, chocking of drippers, price fluctuation and difficulty in transporting produce to distant market. The findings will be of use for the officials of state department of Horticulture, researchers and policy makers to modify the extension programmes so as to eliminate the constraints of tomato growers in order to achieve increased production at farm level by adopting precision farming practices.

Key words: Constraints, Knowledge, Precision farming, Tomato cultivation.

I. INTRODUCTION

The concept of Precision agriculture is precise application of agriculture inputs based on soil, weather and crop requirement to maximize sustainable productivity, quality and profitability. Today because of increasing input cost and decreasing commodity prices, the farmers are looking for new ways to increase efficiency and cut cost. Precision Technology would be there viable tool to improve productivity and profitability. It helps in avoiding unwanted practices to a crop and reduces labour, water, inputs success fertilizers, pesticides extra and assures quality produce. Hence, a project was implemented by the state government to augment the productivity of major crops in the name of Tamil Nadu Precision farming project. It was implemented by Tamil Nadu Agricultural University, Coimbatore at Dharmapuri and Krishnagiri districts during 2004 to 2007. It is a state level mega demo which had trained the former and empowered technically, economically and socially.

Vegetables play a crucial role in human diet. Tomato is one of the major vegetable crops which plays a very important role in daily diet. In India it has become almost an essential article of diet of both rich and poor people (Jeewanram Jat, et al., 2011). Tomato is known as productive as well as protective food and it is a rich source of vitamin A and C. It also contains minerals like iron, phosphorus, lycopene and beta carotene pigments. Tomato is valued added in the form of preserved products like ketchup, sauce, chutney, soup, paste etc (et al., 2016).

Tomato crop is substantially contributing to the agricultural economy and it requires enough care right from sowing to post harvesting operations. Necessary package of practices must be followed for better yield. It demands complete knowledge of production and post harvest technology. It must be adopted by farmers in right manner and at right time. There is always a high demand for the vegetables like tomato. In the recent past its productivity is reduced during summer months due to high day temperature caused by changing climate. In order to meet the growing demand our production targets have to rise up. It would be possible only by adopting improved technologies like precision farming technologies in tomato cultivation. Knowledge is a prerequisite for adoption of any Technologies, hence the study was taken up to analyse the constraints and knowledge level of tomato growers adopting Precision farming practices.

II. METHODOLOGY

The study was taken up in Dharmapuri district of Tamilnadu because it is one of the potential districts for cultivation of vegetable crop under precision forming. Totally, 120 respondents were selected as a sample size from Palacode and Karimangalam

blocks by proportionate random sampling procedure. Data were collected with the help of structured and pre-tested interview schedule. The collected data were analysed using cumulative frequency distribution and percentage analysis. A teacher made knowledge test was used to measure the knowledge level. Twenty knowledge items were selected for testing the knowledge level of the respondents.

III. FINDINGS AND DISCUSSION

Overall knowledge level of tomato growers

It could be observed from table 1 that more than 50.00 per cent of the respondents (57.00%) had high level of knowledge followed by medium (32.00%) and low level (11.00%) of knowledge. The reason for high level of knowledge might be due to high level of extension agency contact and experience in precision farming. This finding is in line with the findings of Vasanta Kumar (2012) sugarcane cultivation under precision farming.

Table 3.1: Distribution of respondents according to their knowledge level on precision farming practices in tomato (n=120)

S.No.	Category	Number	Per cent
1	Low	13	11.00
2	Medium	39	32.00
3	High	68	57.00
	Total	120	100

Practice wise knowledge level of tomato growers

It could be observed from table 2 that cent per cent of respondents (100.00%) possessed knowledge about tomato variety, season, seed rate and number of irrigations under drip method. It was also observed that an overwhelming majority of the respondents possessed knowledge on time of harvesting (98.00 %), fungicide for leaf curl (96.00 %), recommended biofertilizer (96.00 %), recommended quantity of fertilizer (94.00 %), time of gap filling (92.00 %) and insecticide for fruit borer (92.00 %). Further, majority of the respondents had knowledge on fungicide for damping off and quantity of micro nutrient mixture (89.00 %), quantity of farm yard manure (84.00 %), quantity of fertilizer for seed treatment (83.00 %), spacing (83.00 %), , insecticide for aphids (82.00 %), growth hormone (81.00 %) and time of staking (63.00 %). The low level of knowledge was found with 21.00 per cent of the respondents on recommended pre-emergence herbicide. It might be due to their lack of interest in acquiring knowledge on herbicide application. In general it could be concluded that as all these practices are important for obtaining better yield, which inturn would have enabled them to acquire adequate knowledge.

Table 3.2; Distribution of respondents according to their practice wise knowledge level (n=120)

S.No.	Statements	Number	Percentage
1	Variety	120	100
2	Season	120	100
3	Seed rate	120	100
4	Recommended by of fertilizer	115	96
5	Quantity of biofertilizer for seed treatment	99	83
6	Recommended spacing	100	83
7	Time of gap filling	113	94
8	Recommended Herbicide	25	21
9	Time of staking	75	63
10	Growth hormone	97	81
11	Quantity of fertilizers	113	94
12	Quantity of farmyard manure	101	84
13	Quantity of micronutrient mixture	107	89
14	Number of drip irrigation	120	100
15	Insecticide for fruit borer	110	92
16	Insects insecticide for aphids	98	82
17	Fungicide for damping off	107	89
18	Fungicide for lift spot	110	92
19	Fungicide for leaf curl	115	96
20	Time of harvesting	118	98

Constraints in adoption of precision farming practices

It could be observed from table 3 that cent percent of the respondent reported high cost of labour and irregular power supply as the major constraints. High cost of labour was a constraint as expressed by all the tomato growers. Generally vegetable cultivation required more number of labourers from sowing to harvesting operations at farm Level. Most of the respondents expressed that now-a-days, the agricultural labourers are demanding higher wages due to scarcity of labour. Hence, it leads to high cost of production. This finding is in accordance with the findings of Rakesh (2010). Irregular power supply was expressed as constraint by the cent percent of the tomato growers. As this crop requires more water for the entire period, the growers need to irrigate the crop with regular intervals. Non - availability of credit was expressed by 86.00 percent of the tomato growers. This may be due to the fact that tomato respondents always dependent on private money lenders, fertilizer shop owners and cooperative societies to borrow money for cultivation. They do not have adequate savings. The respondents could not avail of the credit facilities from banks because of the tedious and time consuming procedure. The available non-institutional sources in the study area and also high interest rates for their loan are expressed as reason for this constraint. This finding drives support from the findings of Maheshwari (2007).

Table 3.3; Constraints expressed by tomato growers in adoption of precision farming practices (n=120)

S.No.	Statements	Number	Percentage
1	High Court of labour	120	100
2	Irregular power supply	120	100
3	Non-availability of credit	103	86
4	Damage students irrigation system	98	82
5	Delay in getting subsidy	93	78
6	Difficulty in taking intercultural operations	91	76
7	High cost of input	90	75
8	High cost for installation of drip irrigation	86	72
9	Intervention of Middleman	83	69
10	Chocking of drippers	73	61
11	Price fluctuation	72	60
12	Difficulty in transporting produce to distance market	59	49

Damage to the drip irrigation system was reported by 83.00 percent of the respondents. The drip materials are damaged by rodents and it makes the maintenance cost high every year. Delay in getting subsidy was reported by 78.00 percent of the respondents. The reason for this problem might be due to delay occurs in line department in sanctioning the subsidy. These findings are in line with the findings of Sudha (2008).

Difficulty in taking intercultural operation was reported by 73% of the respondents. This might be due to labour scarcity in the study area as already reported by Sangeetha(2009).

High cost of input was expressed by 75% of the respondents. This might be due to the fact that they get the inputs from the private agencies. They only fix the price and get the maximum price for given inputs like fertilizers pesticides, etc. This finding is in agreement with the findings of Vasanthakumar (2012). High investment for installation of drip system was reported by 68% of the respondents do they get subsidy from government the cost of installation and maintenance are becoming higher due to increased labour cost. This is in agreement with the findings of Sathyasundaram (2006). Intervention of middleman (69%), chocking of drippers (63%) and price fluctuation (60%) are also expressed as major constraints by the tomato grace. These constrains are also expressed by Sivajiganesan (2011) and VasanthaKumar (2012). Difficulty in transporting produce to distance market was reported as constraint by 49% of the tomato growers. Most of the local vegetable markets where constructed at places outside the village or town limit they were not easily accessible. Besides the availability of transport facility the height charges for transportation and non availability of vehicles at times of need are expressed as the reason for transportation difficulty. This finding is line with the findings of Rajesh Khana et al. (2005).

From the above results it is suggested that,

- The knowledge level of the tomato growers may be enhanced by conducting training programmes, group discussions and campaign.

- The local extension functionaries and scientist should take appropriate promotional strategies so as to ensure maximum adoption.
- The authorities concerned should take necessary action to ensure regular power supply.
- The field bunds should be cleaned regularly by farmers to control rodent damage to the drip materials.
- Regular acid washing to drippers should be done to avoid choking of drippers and
- The subsidy for drip irrigation components should be increased to reduce high investment cost involved in precision farming.

These findings will be of use for the officials of state department of Horticulture, researchers and policy makers to modify the extension programmes so as to eliminate the constraints of tomato growers in order to achieve increased production at farm level by adopting precision farming practices.

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