



KNOWLEDGE LEVEL OF TOMATO GROWERS ON RECOMMENDED PRECISION FARMING PRACTICES

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Abstract

Agriculture, being one of the most important sectors, is the largest livelihood provider along with its allied sectors especially in the rural areas. Precision Farming is generally defined as information and technology based farm management system to identify, analyze and manage spatial and temporal variability within fields for optimum productivity and profitability, sustainability and protection of the land resource by minimizing the production costs. Most parts of the Dharmapuri district are semi-arid tracts with low rainfall. Taking these factors into consideration, this district was chosen to be the study location to analyze the adoption of precision farming by the farmers growing tomatoes in the Dharmapuri district. This district comprises of 8 blocks. Out of which from 2 blocks namely Morapur and Harur, 3 villages each were taken for study. Utilizing appropriate tools and techniques, the knowledge level of the precision farming practices among the tomato growers was measured. Farmers have maximum knowledge on variety, season of sowing and seed rate. The high level of knowledge might be due to their better education coupled with high level of extension agency contact and economic motivation of the respondents. As the respondents are beneficiaries of Tamil Nadu precision farming project, the extension officials of state department of the horticulture often contact the farmers and disseminate the technical aspects of precision farming among them.

Keywords: Precision Farming, Tomato, knowledge level.

Introduction

Agriculture, being one of the most important sectors, is the largest livelihood provider along with its allied sectors especially in the rural areas. With the advent of technology, it is only fitting to use it for the benefit of the farmers by applying them to obtain improved quality and quantity of agricultural products also with lesser economic expenditure, proficient use of natural resources, controlled use of chemicals and hence preventing soil degradation. Following the Green revolution in the 1960s our country has been able to increase the food production in multiple fold due to the high input application which includes pesticides, fertilizers, etc., and accelerating mechanization of agricultural work. However, this has consequences of negative impact on the environment, though not as alarming as developed countries, which includes land degradation and loss of nutrients. Thus, in order to yield high produce from the available land and resources, with minimal disturbance to the ecosystem, precision farming is proposed since it is a tailor made management technique which will lead to sustainable agriculture and sustainable development. Precision farming highlights on the application of farming inputs taking in to account the infield diversity which should be assessed priory by various technological methods. These differences have to be first identified, measured, and documented. By practicing such a spatially variable crop production, there is scope for increasing the production and quality of agricultural produce and also decreasing the usage of chemicals to certain extent and as a sequel diminish environmental degradation.

Tomato is found in every kitchen world-wide in different forms irrespective of the cuisine. This berry type fruit is the largest vegetable crop grown worldwide after potato and sweet potato. India is the second largest producer of tomato after China. Tomato cultivation and marketing is one of the most profitable agricultural businesses. It is an excellent choice for harvesting a commercially important crop four times a year. Tomato needs a diverse set of climate

for its growth – it cannot withstand frost nor high intensity light, its ideal temperature for growth being 21^o to 23^oC. It is sensitive to both excess and very little water. Keeping in mind these factors of effective and productive ways of cultivation of tomato, the TNAU (Tamil Nadu Agricultural University) implemented the Tamil Nadu Precision Farming Project (TNPFP) in Dharmapuri and Krishnagiri districts on about 400 ha of land with a total budget of 720 lakhs for a period of three years.

Dharmapuri being the major horticulture belt in the state contributes for 12% of the area under fruits in the state. The total number of farmers in the district is 2, 10,300 out of which 1, 90,000 are small and marginal farmers. Agriculture is the most predominant sector of the District economy, as 70 % population involved in agriculture and allied activities for livelihood. Most parts of the Dharmapuri district are semi-arid tracts with low rainfall. Taking these factors into consideration, this district was chosen to be the study location to analyze the knowledge level of tomato growers on precision farming practices in the Dharmapuri district.

Materials and Methods

This study was conducted in the Dharmapuri district of Tamil Nadu. This district comprises of 8 blocks namely, Pennagaram, Nallampalli, Dharmapuri, Morappur, Harur, Pappireddipatti, Palacode, and Karimangalam. Within the 8 blocks, two blocks namely Morappur, Harur were considered for this study. Out of 36 villages belonging to these two blocks, 6 villages (3 villages from each block) were selected. The villages are as follows, Vagurappampatti, Kettureddipatti and Bannikulam from Morappur and Naripalli, Theerthamalai and Chellmpatti from Harur block. By means of random sampling technique, a sample size of 120 tomato growing farmers was chosen for this study. For the collection of required data a personal interview schedule was planned and outlined which includes cautiously opted fifteen socio-economic and psychological variables, considering the knowledge level of tomato growers as dependent variable.

Utilizing appropriate tools and techniques the knowledge level of the precision farming practices among the tomato growers was measured.

Research Design of the Study: This study aims at knowing the retrospective actions by employing the ex-post facto research design as the approach of exploration to obtain response to the research questions.

Statistical Tools Used: Various statistical tools were used for examination and interpretation of data. They were mean, percentage analysis, cumulative frequency analysis, zero-order correlation, linear multiple regression analysis method.

Results and Discussions

Distribution of Respondents According To Their Knowledge Level on Precision Farming Practices in Tomato

S.No.	Category	Number of respondents	Per cent
1.	Low	22	18.33
2.	Medium	36	30
3.	High	62	51.66
	Total	120	100.00

Knowledge Level of Recommended Precision Farming Practices among Tomato Growers

(n = 120)

S.NO.	Techniques	NUMBER OF RESPONDENTS	PER CENT
1.	Variety		
	Recommended tomato variety	120	100
2.	Season of sowing		
	Recommended season of sowing	120	100
3.	Seed rate		
	Recommended seed rate acre	120	100
4.	Seed Treatment		
	a. Recommended bio-fertilizer for seed treatment	85	70.83
	b. Recommended quantity of bio-fertilizer	84	70
	Mean percentage		70.42
5.	Main field preparation		
	a. Recommended NPK fertilizer	109	90.83
	b. Recommended quantity of FYM	115	95.83
	c. Recommended pre emergence herbicide	80	66.66
	d. Recommended quantity of pre emergence herbicide	75	62.5
	Mean percentage		78.96
6.	Planting		
	a. Age of seedling	111	92.5
	b. Recommended spacing	106	88.33
	c. Gap filling	112	93.33
	Mean percentage		91.38
7.	Drip irrigation		
	a. Recommended Number of irrigation	110	91.66
8.	Fertigation		
	a. Recommended method of application of fertilizer	110	91.66
9.	Inter cultivation		
	a. Recommended growth hormone	67	55.83
	b. Recommended dose of growth hormone	55	45.83
	c. Recommended quantity of micro nutrient mixture	48	40.00
	d. Recommended time for application of micro nutrient mixture	50	41.66
	e. Recommended time of staking	114	95
	f. Recommended time of weeding	110	91.66
	Mean percentage		61.66
10,	Plant protection		
	Pest management		
	1.fruit borer		
	a. Recommended insecticide	104	86.66
	b. Recommended quantity of insecticide	83	69.16
	2.Aphids		
	a. Recommended insecticide	110	91.66
	b. Recommended quantity of insecticide	76	63.33
	Mean percentage		77.70
11.	Disease management		
	1. Leaf curl		
	a. Recommended fungicide	100	83.33
	b. Recommended quantity of fungicide	76	63.33

	c. Recommended time of application of fungicide	79	65.83
	2.Fusarium wilt		
	a. Recommended fungicide	102	85
	b. Recommended quantity of fungicide	77	64.16
	c. Recommended time of application of fungicide	80	66.66
	Mean percentage		71.63
12`	Harvesting		
	a. Recommended time of harvest	120	100

Practice Wise Knowledge Level Of Farmers About The Recommend Precision Farming Technologies In Tomato.

In order to have an in depth idea about knowledge level of the respondents, a practice wise knowledge level of respondents was also worked out and the results are given in table.

Variety

From the above table, it could be observed that all the respondents had knowledge on recommended varieties for precision farming. For obtaining higher yield under precision farming, variety is a very important decisive factor which might have interested the farmers to seek information on new variety, which would probably have lead to better knowledge about it.

Season of Sowing

All the respondents were found to have knowledge on recommended season for sowing tomato crop. Traditional agricultural practices must have equipped the farmers with the knowledge about the appropriate season of sowing . This finding is in agreement with the finding of Sivaperumal (2013).

Seed Rate

It could be observed from the table that cent percent knowledge score was observed against seed rate. The recommended seed rate insignificant for having optimum plant population and higher yield, and hence the farmers might have gained ample information about proper seed rate. This finding is in agreement with the finding of Rogers, E.M. 1983.

Seed Treatment

Around 70 per cent of the respondents had knowledge on recommended bio fertilizer for seed treatment (70.83%) and recommended quantity of bio fertilizer (70%). The mean knowledge score was 70.42 per cent. The high level of extension contact and medium level of mass media exposure of the respondents might have helped them to acquire knowledge on bio fertilizer seed treatment.

Main Field Preparation

The mean knowledge score for main filed preparation was found to be 78.96 per cent. High knowledge was observed for the practices namely recommend quantity of FYM per acre (95.83 per cent) and recommended quantity of NPK Fertilizer per acre (90.83 per cent). The strong conviction of farmers about the result of application of FYM and NPK fertilizers might have enabled them to seek complete information about these practices which in turn would have resulted in high knowledge. The knowledge level was found to be comparatively low for the remaining practice viz., recommended pre emergence herbicide (66.66 per cent) and recommended quantity of pre emergence herbicide (62.5

per cent). This might be due to their lack of awareness about herbicide application.

Planting

Under planting, all the three practices namely age of seedling (92.5 percent), recommended spacing (88.33 percent) and the time of gap filling (93.33 percent) where having high knowledge score. The mean knowledge score was found to be 91.38 per cent. As these practices are important for maintaining optimum population and enhanced crop growth, the farmers might have gained adequate information on these practices which would have enabled them to acquire more knowledge.

Drip Irrigation

Majority of the respondents (91.66per cent) had knowledge on recommend number of irrigation under drip method to tomato crop. The state department of horticulture alludes drip irrigation as method of choice for tomato crop under precision farming and provides subsidy for installation of drip irrigation system in the field. The familiarity of the farmers about drip irrigation might have enabled them to obtain more knowledge in this regard.

Fertigation

From the table, it is found that91.66per cent knowledge score was spotted against“ fertigation”. People might be cognizant of applying fertilizer through irrigation water, they might have come by adequate details on this practice. This finding is in agreement with the finding of Vasanthakumar, 2012.

Inter Cultivation

The mean knowledge score for inter cultivation was found to be 61.66per cent. Among the inter cultivation practices, high knowledge was observed for the practices namely recommend time of staking (95 percent) and recommended time of weeding (91.66 percent) the knowledge level was found to be low for the remaining practices viz., recommended growth hormones (53.83 percent), recommended dose of growth hormones (45.83 percent) and the recommended quantity of micro nutrient mixture (35.83 %) and the recommended time of application of micro nutrient mixture (95 percent). This might be due their lack of awareness about growth hormone and the micro nutrient application.

Pest Management

The mean knowledge score for pest management was found to be 77.70 percent. More than 90 percent of the respondents had knowledge on recommend insecticide for aphids (91.66 percent). Whereas less than 70 per cent had knowledge on recommend quantity of insecticide for fruit borer (69.16 percent) aphids (63.33 percent) this might be due to the lack of complete information from the official of

state department of horticulture about pest management. This finding is in agreement with the finding of Kannan, J.2013.

Disease Management

It could be noted from the table that more than 80 percent of the respondents had knowledge on recommend fungicide for *Fusarium* Wilt (85 percent) and recommended fungicide for leaf curl (81.67 percent). Around 60 percent of respondents had knowledge on recommend dose of fungicide for *Fusarium* Wilt (64.16 percent) leaf curl (63.33 percent). This might be again due to lack of complete information regarding disease management.

Harvesting

All the respondents had knowledge on accurate time of harvesting tomato fruit. The high knowledge level might be due to their rich skill in tomato cultivation. This finding is in agreement with the finding of Prabu, R. 2004.

It could be perceived from the table that slightly more than fifty per cent of the respondents (51.66 per cent) had high level of knowledge on precision farming practices in tomato crop followed by 30 percent of the respondents who had medium level of knowledge. Only 18.33 per cent of respondents had low knowledge level. As the respondents are

beneficiaries of Tamil Nadu precision farming project, the extension officials of state department of the horticulture often contact the farmers and disseminate the technical aspects of precision farming among them. This in turn would have enabled them to acquire more knowledge on precision farming.

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