

RESEARCH ARTICLE :

Knowledge and extent of adoption of recommended cultivation practices among the vegetable growers in Tamil Nadu

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SUMMARY : The study was conducted in Chellampatti block of Madurai district in Tamil Nadu among 90 vegetable growers to assess the knowledge and extent of adoption of recommended vegetable cultivation practices. Interview schedule was constructed, pre-tested and finalized and used for collecting data. From the findings of the study it could be found that the average knowledge of vegetable farmers on recommended technologies was 74.72 per cent. Method of transplanting, recommended variety and HYV, fertilizer application, weed management, mulching and seed treatment practices were known to the farmers ranging from 75 to 90 per cent. Overall adoption level of farmers on technologies was 55.27 per cent. Soil testing, SHC recommendations, growth regulators, mulching, foliar spray, plant protection measures were having low adoption ranging from 40-48 per cent. Rise in fertilizer and pesticide prices, unavailability of timely and quality inputs, lack of knowledge to identify pest and diseases, lack of communication and training cum demonstrations on improved practices were felt by 35-45 per cent of the farmers as constraints for yield gap. The extension system have to popularize the recommended technological packages in fields through effective training, demonstrations, field visits, monitoring, etc. which helps to reduce yield gaps and thereby increasing the productivity of crops.

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BACKGROUND AND OBJECTIVES

Vegetables play a significant role in nutritional and food security. Recently, farmers of Tamil Nadu have shifted the traditional cereal crops to vegetable farming due to high yield, short duration, intensive cropping system, high income and employment generation. Vegetable production is increasing faster and consequently increasing the market

surplus and more pressure on post-harvest technologies for vegetables. The vegetable production in Tamil Nadu is largely produced by small and marginal farmers from small scale subsistence level farming systems. Even though the area is higher, the farmers who produce vegetable crops, struggle a lot to bring them up. Even at the time of producing the crops and at the time of selling them, they

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face a lot of hurdles and obstacles such as the interference of brokers and middlemen, lack of insurance facility, lack of finance, high cost of inputs, problems related to storage of the produce and transportation problems. Singla and Kaur (2016) indicated that lack of knowledge about IPM technologies (81.66%) followed by seed treatment (80.83%) and training on scientific vegetable production technology (79.17%), lesser knowledge regarding critical stage of irrigation (69.17%) and non-availability of facilities for soil testing (66.67%) were the gaps exist among the farmers. Further Sahu *et al.* (2009) found that lack of knowledge about improved varieties, seed rate, sowing time and IPM technologies, unavailability of improved seeds, lack of irrigation facilities, no remunerative price, lack of trainings on scientific production technology and lack of subsidies and high costs of pesticides were the problems.

The Department of Horticulture and Tamil Nadu Agricultural University, KVK and other development departments taking initiatives to increase the vegetable area through protected cultivation structures, integrated pest, disease and nutrient management and micro irrigation for increasing the productivity in order to ensure continuous supply of fresh vegetables to the urban markets and to meet the needs of growing population. But still farmers are facing difficulties in vegetable cultivation. Keeping the above situations in mind, an attempt has been made to identify the real knowledge and adoption on recommended vegetable cultivation technologies in order to identify the major bottlenecks in adoption of recommended vegetable growing techniques and to identify suitable measures to increase the productivity.

RESOURCES AND METHODS

The study area for this project was Madurai district of Tamil Nadu. In this district, Usilampatti taluk was selected purposively based on the maximum area under vegetable cultivation. In that taluk Chellampatti block was selected based on the highest area under vegetable cultivation. From the block @ 30 tomato, brinjal and ladies finger farmers were selected randomly to constitute study of 90 respondents. Interview schedule was constructed, pre-tested and finalized and used for collecting data. Relevant data collected pertaining to the study was analyzed, interpreted and meaningful conclusions were drawn using percentage analysis.

OBSERVATIONS AND ANALYSIS

Knowledge and extent of adoption of vegetable growers on recommended cultivation practices.

The data collected on the knowledge and adoption of recommended vegetable cultivation practices are given in Table 1.

Knowledge of farmers on recommended vegetable cultivation technologies:

From the Table 1 it could be inferred that 88.89 per cent of the respondents had knowledge on the method of transplanting. The instructions from department of Horticulture and nearby nursery unit motivated to have raised bed method of planting might be the reasons to have more knowledge on it.

86.67 per cent of the respondents had knowledge on recommended variety and HYV. For tomato the variety and hybrid varieties recommended by Tamil Nadu Agricultural University are PKM 1, CO.1, CO.2, CO.3, COTH.1, COTH 2 and TNAU Tomato Hybrid CO 3 and for Brinjal CO 1, CO 2, MDU 1, PKM 1, VRM 1, Annamalai COBH.1 COBH.2 and okra CO 3, CO BhH 1 are the hybrid varieties. With regard to vegetable variety, the department of agriculture and horticulture and Horticulture College involved in demonstrations on HYV in farmer's field which makes the farmers to have good knowledge on high yielding varieties and the private seed sector establishes good linkages with input dealers and farmers also playing role in varietal selection for vegetable cultivation.

Seed rate and seed priming were known by 78.89 per cent of the farmers. Fertilizers are playing an important role in the growth stages of vegetable crops and majority (77.78%) had knowledge on the importance of fertilizer application. 75.56 per cent of the respondents had knowledge on weed management practices. The respondents known about the ill effects of weeds and its damage in vegetable crops and hence, they know the weed management practices to be done immediately after the transplanting.

Nearly 75.00 per cent of the respondents had knowledge on mulching and seed treatment practices. The awareness created by the State Department of Agriculture and Horticulture might be the reasons. 72.22 per cent of the respondents had knowledge with regard to soil testing and SHC recommendations and top dressing of fertilizers. Split doses of fertilizers which is essential for flower initiation to fruit set. Nowadays, many of the

farmers are getting awareness on soil testing and SHC recommendations through Dept.of Agriculture and KVK might be the reasons.

66.67 per cent of the respondents had knowledge on application of foliar spray or micronutrient spray and 64.44 per cent of the farmer's had knowledge on growth regulators which has to be applied at full bloom stage to increase the yield and the same per cent of farmers had knowledge on plant protection measures.

They know the importance and advantages of each above practices by having discussion with agricultural, horticultural officers, nearby Periyakulum Horticulture College, friends, relatives, fertilizer and pesticide shops. Hence, the overall, average knowledge on technologies was 74.72 per cent. Still, interventions have to be given on the foliar spray or micronutrient spray, growth regulators and recommended IPM and IDM practices.

Adoption behaviour of farmers on recommended vegetable cultivation technologies:

Majority of the respondents had good knowledge

about the method of transplanting which reflects in the adoption also. 74.44 per cent of the respondents going for transplanting in raised bed method and the rest of them adopted flat bed method of transplanting. They are getting portrait nursery seedlings from nearby nursery unit which insisted to go for raised bed method might be the reasons.

Majority of the farmers (67.78%) had adopted weed management practices. Regularly they are doing hand weeding and in addition applying weedicides with the help of nearby input shop in order to control weeds and improve the crop growth in important stages. Hence, majority had adopted this practice.

The respondents had good knowledge on HYV which is visibly seen in the adoption of majority of the respondents (64.44 %). Further 63.34 per cent of the respondents had adopted recommended fertilizer application. Their experience towards plant growth and good yield in vegetable cultivation which depends on the type of fertilizer and amount of usage. Hence, they felt the importance of recommended fertilizer application. The rest of the farmers were not applying the correct dose

Table 1: Knowledge and adoption of farmers on recommended vegetable cultivation technologies			(n=90)
Crop operations	Recommended package of practices	Knowledge	Adoption
Variety /HYV	High yielding varieties Tomato: COTH.1,COTH 2 and TNAU Tomato Hybrid CO 3 Brinjal: TNAU Brinjal VRM 1,COBH.1 COBH.2 Bhendi: CO 3, CO BhH 1	86.67	64.44
Soil testing and SHC recommendations	Have to be done in all locations	72.22	40.00
Seed rate and seed priming	Seed priming was performed for better germination. Seeds were soaked during night for 8-10 hours with natural water, drained out excess water and dried in shade before sowing.	78.89	55.55
Seed treatment	Seed was treated with Captan @ 2-3g /kg seeds or carbendazim @1g /kg seed and with Imidacloprid @ 2.0 g /kg seed. With bio fertilizers/ bio agents and field application	74.44	61.11
Transplanting method	Transplanting in raised bed and distance row to row 120 cm and plant to plant 90 cm	88.89	74.44
Fertilizer dose	Recommended NPK fertilizer application transplanting to plant establishment stage	77.78	63.34
Top dressing	NPK fertilizers (Flower initiation to flowering and flowering to fruit set)	72.22	55.55
Mulching	with crop residues and plastic mulches	74.44	44.44
Growth regulators	15 days after transplanting and at full bloom stage to increase the yield.	64.44	42.22
Weed management	Pendimethaline @ 1.0 kg/ ha was applied immediately after transplanting.	75.56	67.78
WSF spray	Foliar spray of 2% N:P:K 19:19:20,40,60 DAT	66.67	46.66
Plant protection	Need based in case of severe infestations and IPM and IDM Packages	64.44	47.78

and time of application.

The seed/seedling treatment with bio-fertilizers and fungicides and field application were adopted by 61.11 per cent of the farmers. Lack of awareness on the dose and method of application might be the reasons for medium adoption.

With regard to seed rate, 55.55 per cent of the farmers were adopting recommended seed rate. The other respondents using over dose of seeds than the recommended seed rate with the motive to get higher yield. Seed priming was performed for better germination. Seeds were soaked during night for 8-10 hours with natural water, drained out excess water and dried in shade before sowing. But due to lack of interest in priming the respondents were not following properly and getting seedlings. This finding is in line with the findings of Singh *et al.* (2018).

The main objectives of top dressing of the fertilizers are splitting the whole fertilizer dose into small portions for application during crop growth period so that the nutrients are taken up by the roots and crop develop well. 55.55 per cent of the farmers known the importance and adopted split application.

Nearly 48.00 per cent of the farmers had adopted plant protection measures and rest of them partly adopting IPM and IDM practices. In the study area the farmers are applying chemicals and pesticides very frequently from flowering to harvest of crops. They doesn't know the impact of pesticides, their types, time of application etc.,. Hence, IPM and IDM practices may be popularized to create awareness and to control the level of pesticide application.

With regard to foliar spray only 46.66 per cent of the respondents had adopted the technology. Mulching is one of the techniques which prevents water evaporation and protect soil moisture. But only 44.44 were adopting this technique due to lack of awareness. Vegetable growers also not aware of growth regulators which increase the crop yield. Hence, 42.22 per cent of the farmers had adopted.

The farmers didn't have the awareness and knowledge on the importance of SHC recommendations in the optimum utilization of fertilizers. They felt that soil testing is a tedious process and not interested in testing

might be the reasons. Hence, only 40.00 per cent had adopted.

Overall adoption on technologies is 55.27 per cent. Hence, importance has to be given for the popularization of soil testing and SHC recommendations, growth regulators, mulching, foliar spray, plant protection measures through various trainings, field visits, personal contacts, group meetings, campaigns etc., in order to increase the adoption and yield.

Conclusion:

Overall the adoption behaviour of farmers on recommended technologies was 55.27 per cent. Yield gaps in vegetable crops between potential and farmers' yields are still substantially high due to non-adoption of recommended practices and other factors. Hence, research and extension support is necessary for narrowing adoption gap by properly addressing the problems. The researcher should understand farmers' constraints to high productivity and accordingly modify or develop integrated technological package (appropriate variety, timely planting, fertilizer, irrigation and pest management) for farmers for specific locations to bridge up the gaps. The extension system have to popularize the recommended technological packages and has to concentrate the less adopted technologies in fields through effective training, demonstrations, field visits, group meetings, group discussions, monitoring, etc. which helps to reduce yield gaps and thereby increasing productivity of crops in Tamil Nadu.

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