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Research Article

Adoption of good agricultural practices (GAP) in chillies cultivation by farmers in southern districts of Tamil Nadu

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SUMMARY : A study was conducted on adoption of good agricultural practices (GAP) among chillies farmers in three districts of southern Tamil Nadu. By following simple random sampling, a sample size of 160 respondents was selected from eight villages. The findings revealed that 43.75 per cent of the contract farmers had high level of adoption followed by medium adoption level (38.75 %). In the case of non-contract farmer 37.50 per cent had high adoption while 30.00 per cent had medium adoption level.

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BACKGROUND AND OBJECTIVES

India is the largest producer and consumer of chillies in the world. Andhra Pradesh is the largest producer of chillies in India and contributed 26 per cent to the total area under chillies, followed by Maharashtra (15 %), Karnataka (11 %), Orissa (11 %) and Madhya Pradesh (7 %). The remaining states contributed 22 per cent of the total area under chillies. India has immense potential to export different types of chillies required by various markets around the world. The export of chillies accounts for 48 per cent in terms of quantity and 28 per cent in terms of value of the total export of spices from India. Indian chillies are considered to be world famous for two important commercial qualities *viz.,* colour and pungency levels.

It is the leader in chillies exports, with 25 per cent share in world trade, followed by China with 24 per cent share in total global exports. Clearly, China is a potential competitor to India in the international markets, penetrating all major markets like Indonesia and USA. Indian chilli exports are mainly affected by domestic demand, food safety measures and uneven production, which is interrupted by erratic monsoon and drought, and yield factor. The Spices Board of Government of India introduced sampling and mandatory quality testing of chilli and chilli product consignments before shipment for the presence of Sudan I to IV dyes and aflatoxin. This has boosted the confidence of overseas buyers and helped India's exports.

The concept of GAP evolved recently as a result of the big concern about food safety and quality. GAP offers benefits to farmers and consumers to meet specific objectives of food security, food quality, production efficiency, livelihood and environmental protection.

Microbial contamination in spices is of major concern and has been the driving force behind the establishment of the USA good agricultural practices (GAP) policies and surveillance systems. Currently, there are numerous systems that growers can adopt to ensure safe food production, which include amongst others good agricultural practices

(GAP), good manufacturing practices (GMP), hazard analysis critical control points (HACCP), good hygiene practices etc.

Spice production in India, like much of the agriculture in the country, is undertaken in millions of tiny holdings and determines the livelihood of a large portion of the rural population (Spices Board, 2011). Variations in technology adoption by farmers could results in production of chillies which may not meet the food safety and quality standards.

In the study area, the chilli processing firms had direct contract with farmers. They procured the dried chillies from farmers. These firms trained the contract farmers about the GAP practices by their field staffs in order to get the best quality of chillies. So with this background, the present study was undertaken to measure the adoption level of GAP technologies in chilli among the contract and non-contract farmers.

RESOURCES AND METHODS

The study was conducted in Ramanathapuram, Thoothukudi and Virudhunagar districts. Four blocks from three districts were selected to compare the contract and non contract farmers. The contract farmers were selected from the list obtained from processing industries and the non contract farmers were selected at random at the rate of 10 from each selected village. Thus, a random sampling technique was used to select 160 sample farmers.

Adoption index:

The adoption index of good agricultural practices developed by (Sharma, 2002) was used. Adoption was measured on three point continuum *viz.*, full, partial and nil with numerical scores of 3, 2 and 1, respectively. The average score for a given technology was obtained using the adoption index. The score was calculated by dividing the average score with maximum obtainable score on a given practice multiplied by hundred.

$$\text{Adoption index} = \frac{\text{Respondent's score}}{\text{Total possible score}} \times 100$$

OBSERVATIONS AND ANALYSIS

The adoption level of GAP technologies are presented and discussed in Table 1.

Table 1: Adoption level of GAP technologies among contract and non - contract farmers

Adoption level	Categories	Contract (n=80)			Categories	Non - contract (n=80)		
		Nos.	Percentage	Mean score		Nos.	Percentage	Mean score
Low	<57.86	14	17.50	53.33	<43.47	26	32.50	47.62
Medium	57.86 - 64.71	31	38.75	61.79	43.47-52.44	24	30.00	37.53
High	>64.71	35	43.75	70.79	>52.44	30	37.50	57.33
		80	100.00	61.97		80	100.00	47.49
	F value=0.008					't'value = 0.000		

Table 2: Practice wise adoption of GAP technologies in chillies cultivation

Sr. No.	Good agricultural practices	Contract farmers (n=80)	Non-contract farmers (n=80)
1.	Certified seeds from authorized source	65.00	26.87
2.	Seed treatment method	38.13	12.50
3.	Following nursery cultivation	67.50	26.25
4.	Incorporating manure into soil at least two weeks before planting	75.63	38.75
5.	Do not using untreated waste as fertilizer	69.38	63.75
6.	Use properly composted manure	86.88	33.12
7.	Avoiding applying chemicals after flowering to pod formation period	67.50	37.50
8.	Picking the pod upwards while harvesting	76.88	58.12
9.	Restricting animals, including livestock, poultry or pets, to roam in crop areas, especially near harvest time	84.38	46.25
10.	Excluding rodents, insects and other pests from growing areas	87.50	56.25
11.	Providing appropriate hand-washing instructions and clean toilet facilities for field workers	86.25	40.00
12.	Cleaning and sanitizing harvest containers before use	84.63	60.62
13.	Avoiding harvest of chillies within 120 days of chemical application	78.75	65.00
14.	Drying of harvested materials on clean, elevated racks, concrete floors, or mats and not on the bare ground.	79.38	62.50
15.	Excluding field debris from packing and storage facilities by cleaning the outsides of harvest bins and requiring workers to wear clean clothes in these areas	75.63	71.87
16.	Using new and unused bags to pack products for further transport and sale	85.00	46.87

Table 3: Constraints faced by farmers in adopting good agricultural practices

Sr. No.	Constraints	Non-adopters	
		Mean score	Rank
1.	Lack of knowledge	70.00	I
2.	Increase in production costs	64.33	II
3.	Less land holding	45.26	III

It could be inferred (Table 1) that the 43.75 per cent of the contract farmers had high adoption followed by medium adoption (38.75 % of farmers) about the chillies cultivation practices with mean adoption index scores of 70.79 and 61.79, respectively. While, 17.50 per cent of them possessed low overall adoption level with mean technological score of 53.33. In the case of non contract farmers, 37.50 per cent had high adoption while 32.50 per cent of them had low adoption level. F test value (0.008***) was significant and 't' test for two sample assuming unequal variances also revealed that the adoption index was statistically different between contract and non-contract farmers.

Knowledge limits the action of the individual; hence, probable reason for majority of the respondents to fall under medium adoption category might be due to the medium to high knowledge possessed by majority of the respondents. The finding is in conformity with the results of Ranish *et al.* (2001).

Following are the GAP in chillies cultivation, which are approved by the American Spice Trade Association that have also been recommended by Spice Board of India (*www.asta.com*). The firms provide trainings to contract farmers in all these components of GAP for chillies. Practisewise adoption of GAP technologies in chilies is presented in Table 2.

Among the various GAP technologies, more contract farmers, adopted field sanitation practices.The field sanitation practices were restricting animals in crop areas, excluding rodents(84.38 %), insects, and other pests from growing areas(87.50 %), providing appropriate hand-washing instructions to field workers (86.25 %), cleaning and sanitizing harvest containers before use (84.63 %) and using new and unused bags to pack products(85.00 %). Field sanitation is an important practice which decides the quality of pods hence, farmers were educated about the recommended clean cultivation practices by the field staffs of the processing firms. Most of the contract farmers (86.88 %) used properly composted manure, compare to non- contract farmers (33.12 %). There was less adoption in use of seed treatment among contract (38.12 %) and non- contract (12.50 %) due to lack of knowledge.

Constraints faced by farmers in adopting good agricultural practices (GAP):

Farmers were asked to rank the reasons for non-adoption of good agricultural practices (GAP). The response was analyzed by using Garrett's ranking technique and the results are presented in Table 3. Inadequate knowledge about the good agricultural practices was the most important reason for non- adoption. The other reasons ranked by the non-adopters were increase in production costs and less land holding.

Conclusion:

It could be concluded that the contract farmers (43.75 %) had high level of adoption followed by medium level (38.75 %). The study further observed that more adoption level was observed in contract farmers. Less adoption has been observed in the use of seed treatment among contract (38.13 %) and non-contract (12.50 %) farmers. The major reason for non adoption was lack of knowledge. In order to increase the quality of chillies, there is a need to intensify transfer of technology efforts to popularize the GAP practices by the concerned extension agencies on top priority.

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