Short communication

Adoption behaviour of organic pepper farmers in Idukki district

R. Sreejith and Binoo P. Bonny*

College of Horticulture, KAU P.O., Kerala Agricultural University, Thrissur 680656, Kerala, India.

Received 11 November 2016; received in revised form 06 May 2017; accepted 05 June 2017

Abstract

Black pepper is the most important spice crop of India with high export potential especially organic pepper. Idukki district is the major pepper producing district in Kerala with highest area and production of pepper. Pepper is cultivated as an organic crop by default by majority of farmers in the district. The paper discussed the adoption of organic practices by pepper farmers, which was analyzed on selected five dimensions of soil fertility management, organic pest management, extent of use of organic inputs, use of innovative weed management practices and extent of farm diversification. It was found that innovative weed management was the practice most widely adopted and use of organic inputs was the lowest adopted practice. The results clearly indicated that organic farmers in pepper were less inclined towards scientific organic management practices and mostly followed organic by default utilizing the rich forest soils.

Keywords: Adoption Index (AI), Certified organic farmers, Non-certified organic farmers, Organic practices

Black pepper (*Piper nigrum*), popularly known as the king of spices, is a crop with high geo-political significance in India. It was the lure of this exotic spice, which was grown exclusively in Malabar coasts of Western Ghats that brought foreign traders to the Indian shores as early as 15th century (Joy et al., 2002). Kerala has the maximum area under organic pepper with a share of about 50 per cent of total area (Spices Board, 2016). However, the productivity of the crop is lower than that of other pepper producing states. One of the major reasons for this status is due to the casual approach of the farmers towards pepper cultivation. Highly volatile market prices are also a concern for farmers in pepper cultivation. In this context organic pepper assume significance in ensuring sustainable income to the farmers. It is more important considering the fact that the adoption of organic farming practices provided an opportunity for small and medium farmers of the state to participate in international trade and realize better prices (Parvathy and Weibel, 2015). Therefore, an attempt was made to analyze the adoption behaviour of organic pepper farmers in Kerala with respect to its various cultivation practices.

Idukki one of the leading districts in pepper production in the state was purposively selected for the study. Two blocks in Idukki district, Nedumkandam and Azhutha which had maximum area under organic pepper were selected as the study area. Fifty organic farmers from each block were randomly selected making the total sample size to 100. The sample consisted of 45 Certified Organic Farmers (COF) and 55 Non-certified Organic Farmers (NcOF) based on the possession of a valid organic certificate issued by an authorized certification agency. For calculating the adoption score the method used by Guthman (2000) was used. Five dimensions selected for calculating the

*Author for correspondences: Phone: 9447406793, Email: binoobonny@gmail.com

adoption score were degree of soil fertility management, degree of organic pest management, extent of use of organic inputs, use of innovative weed management practices and extent of farm diversification.

Adoption score was calculated for each of the dimensions with the maximum possible score 25 and minimum possible score 7 as explained in Table 2. Double weightage was provided to soil fertility management and degree of organic pest management in computation of score as these dimensions included higher importance in organic farming. Then the weighted total score was calculated and adjusted to a five point scale making the total adoption score range between 1-5. Based on the adoption score the adoption index is computed as:

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

Certified Organic Farmers (COF) and Non-certified Organic Farmers (NcOF) based on the possession of a valid organic certificate issued by an authorized certification agency were again classified into scientific and natural farmers based on the extent of organic practices adopted as given by the mean adoption score. The mean score was calculated at 3.49 and the farmers who secured score above the mean are classified as scientific organic farmer and below the mean score were classified as natural organic farmers as presented in Table 1.

Peerumede Development Society (PDS) and Eco-development society (EDS) were the agencies involved in supporting the farmers to get organic certification in the area. The results indicated that expect certified farmers under Peerumede Development Society (PDS) most of the respondents relied mostly on natural form of organic farming. This indicated that the organic input use at the prescribed form or rate was not common among these farmers. Results showed that more than 54 per cent of the non certified farmers relied on organic sources of inputs while all of the certified farmers under Eco-development Society (EDS) were relying on zero input use natural farming. It should also be considered that farmers certified under EDS were doing organic farming in forest land and were not allowed use of any external inputs in these lands. Thus the results suggested that the pepper farmers in the area mostly follow organic farming by default and not by design. They rely mostly on the rich forest soil, climate and other geographical advantages in raising pepper organically rather than scientific organic recommendations.

The results of the practice wise adoption of organic practices by the farmers revealed that adoption index on soil fertility management was 62 for COF as compared to 52 for NcOF.Soil fertility management was analyzed in three different components i.e., organic nutrient management and recycling, activities to enhance soil fertility management and measures to control soil erosion. The results are provided in Table 3 which showed that erosion control measures got the maximum adoption score for both COF and NcOF with scores of 4.55 and 3.92 respectively. The practice with lowest adoption score was organic nutrient management which was

Table 1. Distribution of organic pepper farmers on adoption score

Category	Mean Adoption score	Certified Farmers		Non certified farmers
		PDS*	EDS**	
		(Frequency (%)		(Frequency (%)
Scientific organic farmers	>3.49	17 (56.66%)	0 (45.45%)	25
Natural organic farmers	<3.49	13 (43.33%)	15 (100%)	30 (54.54%)
Total		30	15	55

* Peermedu Development society, ** Eco-development Society

Table 2. Dimensions and parameters used in scoring of organic practices adopted by Pepper growers

Dimension of Practice	Parameters of measurement	Practices considered	Scoring adopted	Maximum score	Minimum score
Soil fertility management	1.Intensity of organic manure use	Schedule & type of organic manures/ ameliorants used	Regular >2 times = 3 Regular 2 times= 2 Sporadic use <2 times=1	8	2
	2.Sourcing of organic manures	Extent of *in situ* production of soil management inputs	Complete *in situ* production=3 Partially outsourced =2 Completely outsourced =1		
	3. soil conservation	On-farm measures (Contours/ terraces/ other measures) mulching and no conservation	Additional score of 2, 1 and 0 respectively		
Pest management	1.Intensity of pest management	Schedule of pest management	Regular Prophylactic practices =3 Contingent based management =2 Natural management =1	6	2
	2.Sourcing of inputs	Dependency on external inputs in pest management	Complete *in situ* management=3 Partially dependent on external inputs =2 Completely dependent on natural processes =1		
Organic input use	Method of sourcing of bio-inputs	Extent of dependence	Complete internal sourcing of bio-inputs=3 Partial dependence on external bio-input=2 Complete dependence on external inputs=1	3	1
Weed management and recycling	1.Management strategy	Type of practices followed	Slashing/cover cropping+ mulching=3 Slashing+ Burning=2 No weeding=1	5**	1
	2. water conservation	Intensive water conservation measures, moderate water conservation measures and no conservation	Additional score of 2, 1 and 0 respectively		
Crop diversification	Diversity in variety and farm components	Varieties, crops and livestock components Use of on-farm seed and planting materials	2 or more varieties) + developed on farm (partially /fully)+livestock =3 < 2 varieties/crops with livestock=2<2 varieties/ crops without livestock=1	3	1
			Total score	25	07
			Adjusted score	05	01

indicative of the dependence of farmers on the high nutrient fertility of forest soils. Results clearly indicated that the certified farmers are carrying out more scientific soil management practices than the Non-certified farmers.

Organic pest management practices were analyzed within the context of measures to build pest and parasite population, exclusion of chemicals from the pest management practices and use of prophylactic measures in pest control (Table 4). It

Table 3. Adoption of soil management practices by organic pepper farmers

Components of soil fertility management	Adoption score	
	Certified organic farmer	Non-certified organic farmer
Organic nutrient management and recycling	2.26	2.16
Enhancing soil micro-organism activities	2.53	2.34
Soil erosion control measures	4.55	3.92
Average total score	3.11	2.81
Adoption index	62.34	52.36
Total adoption index of organic pepper farmers (AI)	56.85	

Table 4. Adoption scores of organic pepper farmers in pest management

Organic pest management Practices	Adoption score	
	Certified organic farmer	Non-certified organic farmer
Build up predator and parasite population	2.42	2.21
No use of chemical pesticides or fungicides except Bordeaux mixture	4.59	5
Prophylactic measures to avoid incidence of disease and pest	2.51	2.68
Average total score	3.31	3.16
Adoption index	66.29	63.23
Total adoption index (AI)	64.60	

Table 5. Adoption scores of organic pepper farmers on extent of use of organic inputs

Organic pest management Practices	Adoption score	
	Certified organic farmer	Non-certified organic farmer
Composting	2.48	2.18
Use of bio pesticides	2.40	2.15
Use of bio fertilizers	2.18	2.12
Use of Bordeaux mixture	2.07	2.45
Average total score	2.22	2.28
Adoption index	45.74	44.54
Total adoption index (AI)	45.08	

Table 6. Adoption scores of organic pepper farmers on organic weed management

Organic weed management Practices	Adoption score	
	Certified organic farmer	Non-certified organic farmer
Use of slashed material as such	3.66	3.12
Weeding limited to slashing as far as possible and burning used as the last resort	4.81	4.87
Intensive cropping	1.81	3.87
Average total score	3.43	3.73
Adoption Index	68.64	74.74
Total adoption index (AI)	71.99	

was found that COF had a higher adoption score for first two parameters while NcOF had a substantially high adoption score than COF in use of prophylactic measures. The major reason for this was many of the COF were unaware that use of inputs like Bordeaux mixture was permitted in organic farming.

The results on the extent of adoption of organic inputs by the two major groups of organic pepper

Table 7. Adoption scores of organic pepper farmers on farm diversification

Farm diversification components	Adoption score	
	Certified farmer	Non-certified farmer
Planting high yielding varieties	1.70	1.87
Integrated farming	3.37	3.54
Use of traditional disease and pest resistant varieties	3.48	3.33
Average total score	2.85	2.91
Adoption index	57.37	58.38
Total adoption index of organic pepper farmers (AI)	57.92	

farmers are presented in Table 5. Except for the use of Bordeaux mixture, certified farmers had adopted more organic inputs than noncertified organic farmers. Composting was the practice adopted maximum by certified farmers while use of Bordeaux mixture was the practice adopted maximum by Non-certified farmers. It also reflected that the farmers are not inclined to adopt organic inputs as per the scientific practices.

It can be observed from the results of Table 6 that certified farmers concentrated more on slashing for weed management in organic pepper cultivation. This also reflected the help provided by the respective NGOs in educating the farmers in organic certification procedures. While most of the farmers did not resort to burning of the weeds some farmers who adopted zero input use strategy used burning of the weed plants in the field.

It can be inferred from the results in Table 7 that the share of other crops in the total area was very low for certified farmers compared to noncertified farmers. It suggested that certified farmers were more interested in monoculture of pepper and not very keen on diversifying the farm. Moreover, certified farmers mostly used proven disease resistant local varieties than high yielding varieties (HYV). Adoption rate of integrated farming was more among the non-certified farmers. But it can be attributed to the fact that some of the certified farmers used leased forest land in farming and as such could not undertake livestock farming or any other forms of farm diversification.

It can be inferred from the results that the organic pepper farming in the area is based on the geographical advantages of rich forest soils, climate and certification promoted by the NGOs involved. Despite these the farmers are not adopting any of the organic practices to the maximum potential. Although certified farmers have a higher adoption score than the Non-certified farmers, the score for key elements like use of organic inputs is very low for both the categories. Hence there is immense potential for interventions by public sector extension agencies that promote training and awareness programmes about advantages of adopting scientific organic practices and certification fr farmers. This can definitely bring the market advantages of organic pepper directly to the farmers.

References

Guthman, J. 2000. Raising organic: An agro-ecological assessment of grower practices in California. Agr. and Human Values., 17: 257-266.

Joy, C.M., Pittappillil, G.P. and Jose, K.P. 2002. Drying of black pepper (*Piper nigrum* L.) using solar tunnel dryer. J. Trop. Agric. Sci., 25(1): 39-45.

Parvathy, P. and Weibel, H. 2015. Adoption and impact of black pepper certification in India. Quarterly J. Int. Agr., 54 (2): 133-161.

Spices Board. 2016. Spices catalogue. Available: http://www.indianspices com/spices-development/spice-catalogue., 20 May 2016.