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Training needs assessment of Radish growers in peri-urban areas of the Punjab, Pakistan

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Abstract

By increasing consumption of fruits and vegetables, lives of about 2.7 million people could be saved each year. In Pakistan, to meet the demands, production of vegetables is not enough which results in high prices. There is double increase in the growth of urban population than those of total growth. In past decades, vegetable production has remained very low in Pakistan because the research institutes and researchers have not given due priority and it has been inadequately addressed. Therefore, the present study was designed in order to assess the training needs of radish growers in peri-urban areas of province Punjab. Due to limited financial resources, the research was limited to peri-urban areas of Faisalabad city (3rd populous city of Punjab). Data were collected with the help of validated and well-structured questionnaire from 208 respondents who were registered with Fruit and Vegetable Development Program (F&VDP). Findings of the present research indicate that vegetable growers were information deficient in different production practices i.e. fertilizer application, seed rate and insect/pest identification. It was therefore, suggested that effective extension work is required by the public sector extension department to enhance the practical knowledge of farmers regarding above mentioned vegetable production practices. Enhanced knowledge will definitely lead to adopt recommended practices and ultimately will result in increased vegetable production.

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Introduction

Having a geographical area of 796,096 square kilometers, Pakistan has always been known for its fertile land and this characteristic makes agriculture one of the four major drivers of growth. Out of total land area, Pakistan has 34.1% agricultural land. From the total agricultural land, arable land has a share of 26.1% for the production of different crops (Govt. of Pakistan, 2018). Distinctive geographical location and varying environment makes it favorable for successful cultivation of variant crops (Abbasi, 2012).

The Punjab province holds the largest share due to its favorable climatic conditions having both rain-fed and irrigated soils (Asian Development Bank, 2005). At present, the agriculture sector is encountering many problems, which are associated with sustainable agricultural development (Hani *et al.*, 2006). Now, it has become a challenge for agricultural producers to protect the production resources and meet the food requirements of the large population at the same time (Middelberg, 2013).

Being an essential component of human diet, vegetables are consumed all over the world to have a reduced risk of some chronic diseases (Rao and Rao, 2007). By increasing consumption of fruits and vegetables, lives of about 2.7 million people could be saved each year. In under-developed countries where the people are suffering from different chronic diseases (obesity, cancer, diabetes, heart diseases etc.) and are deficient in vitamins and minerals, the intake of minimum 400g of fruits and vegetables per day can be helpful to fulfill their nutritional requirements for a healthy existence (Knapton, 2014).

In Pakistan, government recommends an intake of 0.83kg of onion, 0.38kg of tomatoes, and 1.54kg of other vegetables per capita on monthly basis (Govt. of Pakistan, 2012).

Population of the country either living in urban areas or rural areas are dependent on vegetables for uptake of protein, minerals, vitamins, iron, calcium, mineral salts and phosphorous (Tunio and Majjedano, 2001).

In global context, vegetables are being grown intensively on per capita basis, which has increased 60% over the last 20 years. This accelerating trend looks strong particularly in developing countries (Emana and Gebremedhin, 2007). More than thirty-six varieties of vegetables are grown on large scale in Pakistan (Govt. of Pakistan, 2006). Among different provinces of Pakistan, Punjab holds the largest share of 63 and 74% in vegetables' area and production, respectively (Shaheen *et al.*, 2011).

The countries where farmers have small landholdings, vegetable production provides them opportunity for intensive production resulting to increased participation in the market (Adil *et al.*, 2007).

In Pakistan, to meet the demands, production of vegetables is not enough which results in high prices (Adil *et al.,* 2012). There is double increase in the growth of urban population than those of total growth. Due to their perishability, vegetable commodities have received greater attention and vegetable production has thus become concentrated in peri-urban zones in Asia (Midmore and Jansen, 2003). In Pakistan fruit and vegetable markets have been established by the cities and towns to utilize the supply from the nearby areas. Government of Pakistan has thus decided to establish fruit and vegetable zones in big cities like Karachi, Faisalabad, Multan, Swat and Quetta where more than thirty-six varieties of vegetables are grown (Govt. of Pakistan, 2006).

In past decades, vegetable production has remained very low in Pakistan because the research institutes and researchers have not given due priority and it has been inadequately addressed (Abedullah *et al.*, 2006). Urban and rural poor will have access to vegetables when the prices will be in the range of people and by increasing productivity we can keep the vegetables prices in limited range (Govt. of Pakistan, 2006). Research has indicated significant increase in production due to effective extension work around the world (William, 1999). Edeoghon *et al.* (2008)

documented a significant increase in production prior and after extension services in Nigeria. Akinbile and Odebode (2002) witnessed increased awareness of agricultural practices among farmers leading to increase in production. Generally, increase in production is significantly associated with effective role of extension and production of vegetables is of no exception. The aims of recent research were to identify the information level of Radish growers regarding latest recommended production technology of Radish and to explore different areas where Radish growers are deficient in information.

Methodology

Radish has been widely grown on an area of 700 acres with production of 5330 tonns in the peri-urban areas of Faisalabad (2nd most populous city of province Punjab). Food and Agriculture Organization (2000) has defined the peri-urban area as "it is neither entirely urban nor purely rural in the traditional sense; it is at most the partly urbanized rural area".

The Faisalabad Bypass which is around the city to let through traffic flow without interference from local traffic and is almost 15-20 km away from the main city was considered as the end point of peri-urban area, therefore, the areas falling between Faisalabad city and Bypass were selected for the study. Farmers growing vegetables in peri-urban areas of Faisalabad served as study population.

A complete list of registered vegetables growers (sampling frame) was obtained from the office of Fruit and Vegetable Development Project (F&VDP), Faisalabad. According to the Table developed by Fitz-Gibbon and Morris (1987) for determining the sample size, a sample size of 208 vegetable growers was drawn through random sampling technique. A well-structured, validated, reliable and pre-tested interview schedule was designed for data collection. Face to face interviews and focused group discussion were data collection techniques used in this study. Descriptive statistics such as percentages, weighted score and scoring techniques were used to get meaningful results.

Results and discussion

Radish is one of the prominent vegetables often consumed raw as salad. Respondents were asked to reveal their awareness about its production technology. Data presented in Table 1 indicate that "laalpari" was the prominent variety known to 88% respondents. During discussion respondents argued the over-extended value of "laalpari" variety in market. Green neck was second leading variety known to 71.6% respondents. An overwhelming majority (93.8%) was aware of land leveling followed by deep ploughing as land preparation practices. Majority (62%) of respondents was quite unaware of the recommended seed rate. However, the recommended sowing season was known to a vast majority (96.2%) of the respondents.

More than 80% respondents were familiar with the application of irrigation. Awareness regarding fertilizer application ranged between 26 to 33.2%. Early blight and later blight are common diseases of radish and awareness was seen among 57.7 and 64.4% farmers regarding these diseases, respectively. Awareness regarding army worm and cabbage butterfly was the highest among the other insect/pests.

The widely known insecticide Carbosulfan EC-500 (20ml/acre) was known to 68.8% followed by Emamectin EC-1.9 (200ml/acre) which was known to 62.0% respondents. Among different recommended fungicides Mencozeb was known to 85.1% of the farmers. Within the cultural control practices, sowing of resistant varieties and crop rotation were known to 59.1 and 47.6% respondents, respectively.

Similar findings were presented by Yasin*et al.* (2002) that awareness regarding pests control methods was very low among respondents. Akhtar *et al.* (2007) also reported very low awareness of insect/pests control methods among respondents. A large majority (77.9%) of the respondents was well aware of the harvesting of radish in case of early varieties while less than half of the respondents (43.8%) were familiar with the harvesting of late varieties.

Table 1. Distribution of respondents according to their awareness about recommended production technologies of radish.

Recommended technologies	Awareness			
	Yes		No	
	f	%	f	%
Varieties				
Green Neck	149	71.6	59	28.4
LaalPari	183	88.0	25	12.0
All Season	55	26.4	153	73.6
Land preparation				
Deep ploughing	142	68.3	66	31.7
Leveling	195	93.8	13	6.3
Seed rate				
3 Kg/acre	79	38.0	129	62.0
Sowing season				
September-November	200	96.2	8	3.8
Spacing				
Row-row distance (75cm)	133	63.9	75	36.1
Plant-plant distance (8cm)	100	48.1	108	51.9
Irrigation				
1st irrigation at the time of planting	171	82.2	37	17.8
Irrigation at time of requirement	170	81.7	38	18.3
Fertilizer application				
Application of FYM (10-12 tons/acre) during land preparation	65	31.3	143	68.8
Nitrogen (25 Kg/acre) 1/3 during land preparation, 1/3 before flowering stage, 1/3 after flowering stage	69	33.2	139	66.8
Phosphorous (20 Kg/acre) during land preparation	61	29.3	147	70.7
Potash (25 Kg/acre) 2/3 during land preparation and 1/3 after flowering stage	54	26.0	154	74.0
Diseases				
Early blight	120	57.7	88	42.3
Late blight	134	64.4	74	35.6
Insect/pests				
Army worm	173	83.2	35	16.8
Flea beetles	69	33.2	139	66.8
Cabbage butterfly	164	78.8	44	21.2
Diamond back moth	71	34.1	137	65.9
Mealy bug	62	29.8	146	70.2
Semilooper	34	16.3	174	83.7
Painted bug	101	48.6	107	51.4
Insect/pest management practices Chemical control:				
a. Insecticide				
Emamectin EC-1.9 (200ml/acre)	129	62.0	79	38.0
Indoxacarb EC-150 (175ml/acre)	51	24.5	157	75.5
Cypermethrin EC-10 (250ml/acre)	21	10.1	187	89.9
Carbosulfan EC-500 (20ml/acre)	143	68.8	65	31.3
b. Fungicide				
Mencozeb (2g/kg as seed treatment)	177	85.1	31	14.9
Mencozeb (2.5-3g/L of water and spray after every 10 days)	59	28.4	149	71.6
Cultural control				
Crop rotation	123	59.1	85	40.9
Insect resistant varieties	99	47.6	109	52.4
Cultivation of soil	75	36.1	133	63.9
Harvesting				
After 45-50 days for early sowing varieties (when leaves turn from dark green to light green)	162	77.9	46	22.1
After 70-80 days for late sowing varieties (when leaves turn from dark green to light green)	91	43.8	117	56.3

The data depicted in Table 2 reveal the areas in which respondents assume themselves deficient. According to the findings, information deficiency regarding fertilizer application appeared the leading deficiency

area with mean value of 4.38 heading towards very high. Information deficiency regarding seed rate to get proper plant population was ranked 2nd with mean value of 4.25 slightly heading towards very high level of deficiency but more closer to high level of deficiency. This deficiency is supposed to affect production significantly as if plant population is less in number then production will be on decline. Another deficiency revealed by the respondents was their inability to identify insect/pests and diseases and was 3rd ranked area with mean value of 4.01. These findings are in line with those of Schlosser (1999) who reported that a number of farmers were not able to differentiate many key pests in Jamaica. However, these findings are in contrast to Banjo *et al.* (2003) who revealed that farmers were quite aware of insect/pests of vegetables in Nigeria. During informal discussion respondents revealed that due to limited awareness they were not capable of effective management of insect/pests and diseases despite a significant production loss pertinent to inset/pests and diseases outbreak. Sharma (2014) revealed that growers required information regarding almost each step involved in production process i.e. seed, sowing, fertilizers application etc.

Table 2. Weighted score, mean, standard deviation and rank order of vegetable production practices based on information deficiency among respondents.

Vegetable production practices	Weighted score	Mean	Std. dev.	Rank Order
Fertilizer application	912	4.38	0.904	1
Seed rate	883	4.25	1.046	2
Insect/pests/disease identification	834	4.01	1.270	3
Varieties	804	3.87	1.267	4
Harvesting	753	3.62	1.492	5
Insect/pest management	735	3.53	1.072	6
Irrigation application	716	3.44	1.071	7
Maintenance of plant population	673	3.24	0.905	8
Land preparation	651	3.13	0.894	9
Seed selection	645	3.10	0.892	10
Transplanting	623	3.00	1.153	11
Sowing method	379	1.82	0.869	12
Nursery raising	312	1.50	0.811	13
Sowing time	279	1.34	0.505	14

Information deficiency regarding other aspects involved in production system i.e varieties selection, harvesting techniques, insect/pests management, application of irrigation, plant population maintenance, land preparation, seed selection and transplanting of nursery appeared with mean value ranging from 3.00 to 3.87 indicating deficiency of medium to high levels.

Other associated aspects like sowing methods, nursery raising and sowing time were the least deficient areas ranked 12th, 13th and 14th. During discussion farmers reveled that because of common practices and experience in vegetables cultivation sowing methods; nursery raising and sowing time were widely known to the farmers.

Conclusion

It is concluded from present research that a huge gap existed between recommended production practices and applied vegetable production practices. Particularly, vegetable growers responded that non-judicious use of fertilizer was the most prominent area where they had insufficient information. Therefore, on the basis of findings it is recommended that Extension Field Staff (EFS) should launch effective extension programs for enhanced awareness among Radish growers to familiarize them with latest

information about Radish production. In addition, EFS has to put special emphasis to bridge that gap among Radish growers and application of diversified extension approaches should be a better option for increased awareness.

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