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Knowledge level of vegetable growing farmers on organic production in Diyarbakır province

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Abstract

As was the case in the World, intensive input use was seen the only remedy to increase agricultural productivity so that to meet the needs for food and raw material in the second half of the last century in Turkey. Accordingly, chemical fertilizer and pesticide use were supported and encouraged. Unconscious chemical use increased the plant production but resulted in poor quality products and human health disorders. As a result of foodborn and environmental health problems, a new type of agricultural production was urged and encouraged by the conscious customers all over the World. This is called organic or ecologic farming which aims to restore the unwanted outcomes of intensive or conventional agriculture and produce healthy food to satisfy customer demands. In achieving the goals of organic production and increasing organic food production it is of great importance to unveil the knowledge level, problems and requests of the producers since culture, customs, social environment and the knowledge accumulated over years shape the agricultural production. In this study, it is aimed to reveal the knowledge level and production customs of the organic vegetable producers in Diyarbakır province. Study data was collected from the vegetable growing farmers with structured questionnaires through face to face interviews. Sample size was determined using simple randomized sampling method. In analysis of the data descriptive statistics method and Chi-Square test was employed. Study results revealed that about 61% of the respondents did not have their soils tested. It was also determined that of all respondents 81% act according to their own knowledge when covering the plant nutrient requirements of the soils as 7,5% consult their friends or neighbours and only about 2% followed the recommendations of agricultural experts. The most striking result, on the other hand, was that only about 27% of the respondents accepted that they had adequate knowledge on organic farming while the rest not.

Introduction

Conventional Agriculture based on the fulfilling the food demand of increasing World population resulted in intensive chemical use and one step further was the use of genetically modified seed. After figuring out that a number of diseases were foodborne, customer demands for organic agricultural products have emerged. Also, enhancement in income levels of the people parallel to the economic developments of the nations brought about changes in eating habits and patterns.

Having previously paying attention only to hygiene and freshness on the products to purchase, consumers have started to care about the quality of the products in recent years (Başak et al., 2015). Today, environmental awareness and the demand for healthy foods and other necessary consumer goods has rapidly been increasing all over the world. Gaining worldwide popularity organic Agriculture has been practicing in a number of countries with an increase in acreage and number of producers day by day.

Organic Agriculture refers to the agricultural activities towards producing healthy and high quality food and other necessary consumer goods by taking into account the ecological conditions ensuring sustainable soil fertility, preventing erosion of genetic resources and restoring the unwanted outcomes of intensive or conventional agriculture (Demir and Gül, 2004; Ak, 2002).

Although World organic agricultural product market has been growing up, US and EU member countries have still made up almost all of the market. They only import the non-grown or inadequate products from the developing countries which already challenge to take share from that rapidly growing organic food and product market (Demiryürek, 2004).

After the 1980s small scale and subsistence nature of organic farming has shifted to more commercial and market-driven production due to increasing customer demand (Turhan, 2005).

Crisis in conventional Agriculture, increasing demand for organic products, food safety concerns, encouraging government regulations, increasing environmental awareness and higher revenue are reported to be the principal reasons for the rapid growth in acreage under the organic farming (Midmore et al. 2001).

In Turkey, organic farming was firstly started with raisins and dried fig, the most important traditional export products, in 1984-85 production season and later reached up to 214 product in raw material basis according to the latest statistics (TUIK, 2018).

Although organic agricultural production is practiced as contract farming especially for foreign markets, interest and

demand for organic products in domestic markets have increased in recent years with the supportive policies of the governments and the efforts of NGOs (Kantar et al., 2011).

The first attempt for organic production in Diyarbakır was started by one producer in wheat and cotton prodcution in a total acreage of 180 hectare in 2006 (TUIK, 2016). By the year 2016, number of producers and production acreage have reached up to 944 farmers and 523 hectares respectively (DTIM, 2016). Wheat, lentils, grape, chickpeas, pomogranate and almond are the leading organically grown agricultural products in Diyarbakır. Organic vegetable farming was firstly supported by GAP Administration within the context of "Improvement of organic farming in Lice district of Diyarbakır" Project with a budget of 288.751 ₺ (GAP, 2016). In this study it was aimed to unveil the opinions and attitudes of the vegetable growers on organic farming.

Material and Methods

The primary data was obtained from the questionnaires through face to face farmer interviews while official records of the Diyarbakır provincial directorate of Agriculture were the secondary data of the study. Study area covers the Ergani, Çınar and central districts of Diyarbakır province where organic production has been practiced. Since it was not possible to visit all producers dispersed in these districts and villages regarding the time and budget limitations, using the organic producers' records of Diyarbakır provincial directorate of Agriculture the population of the organic producers was sampled. Sample size was determined according to simple randomized sampling method, which allows all individuals in the population to be sampled equally (Newbold, 1995; Miran, 2002), and calculated according to the formula given and explained below.

$$n = \frac{N \, z^2 \, p \, (1-p)}{N \, d^2 + z^2 \, p \, (1-p)}$$

where,

n = Sample size
N = Total number of organic vegetable growers
σ^2_p = Variance
r = Margin of error (%7),
$Z_{\alpha/2}$ = The z-score for 95% confidence (1,96)
p = Likelihood of selecting an individual organic vegetable grower from the population (assumed to be 0,50 to obtain a big enough sample size for precision)

The sample size was calculated to be 156 growers but it was rounded up to 160 against the possibility of some incomplete, non-eligible questionnaires. In analysis of the data descriptive statistical methods and Chi-Square test were employed for the qualitative variables, or the originally quantitative but converted to qualitative variables (Püskülcü and İkiz, 1986).

The sample size was calculated to be 156 growers but it was rounded up to 160 against the possibility of some incomplete, non-eligible questionnaires. In analysis of the data descriptive statistical methods and Chi-Square test were employed for the qualitative variables, or the originally quantitative but converted to qualitative variables (Püskülcü and İkiz, 1986).

Results and Discussion

Of all age groups 31-40 (27,5%) and 41-50 (28,8%) were the most conglomerated making 56,3% of all respondents (Çizelge1). It was determined that 56,9%, 28,8% and 3,8%

had primary school, secondary school and bachelor degrees respectively while 5,6% had no any degree. Also, 94,4% of the respondents stated that there was no cooperative in their villages. Only 12,5% of them had a membership to producer organizations. Whereas, farmer organizations has an important role in achieving an ecoomic and socially sustainable Agricultural production (Şahin et al., 2013).

In a similar study was it reported that 85,7%, 20,2% and 76,2% of the respondents were the members of Agricultural Credit cooperatives, Agricultural Development Cooperatives and Agricultural Sales Cooperatives respectively (Doğan, 2011).

In our study, 70% of the respondents stated that they engaged vegetable production both for family consumptions and commercial purposes as 29% were solely for family consumption and commercial respectively (Table 2).

In a study conducted in Erzurum it was noted that commercial growers adopted the organic farming more easily (Kaya ve Atsan, 2013).

The primary objective of the organic Agriculture is to prevent the use of harmful chemicals. There is a positive relationship between the level of awareness on the harmful effects of these chemicals and the adoption of oganic Agriculture by the farmers. Almost half of the respondents (49%) in the study area accepted the possibility of harmful effects of the chemicals they used in Agriculture as about 26% did not agree with these chemicals' detrimental effects. Again, 23% stated that these chemicals might be partially harmful for the environment (Table 3).

In a study conducted in Artova district of Tokat province, it was reported that 93.1% and 56,5% of the respondents admitted the harmful effects of pesticides and chemical fertilizers respectively (Kızılaslan and Kızılaslan, 2005).

It is a well known fact that unconscious, excessive and long years of chemical fertilizer use brings about salination and heavy metal accumulation, unbalanced and heterogenous plant nutrient content and poor microorgansim activity in soils, along with negative environmental impacts such as nitrogen and sulphure emission, thin ozone layer and greenhouse effects (Sönmez et al., 2008). In challenging these problems it is of vital importance to use fertilizers according to soil test results. In fact this can be accepted as an indication showing the higher level of consciousness not only in organic production but also in conventional agriculture as well. In present study, about 60% of the respondents stated that they did not have their soils tested as about one third (39%) of them employed regular soil tests (Table 4). In a study executed in Manisa province a meaningful relationship was reported between previous engagement in oganic farming and regular soil test employment (Başak et al., 2015). Moreover, in another study conducted in Kazova district of Tokat province it was dtermined that most of the agicultural producers admitted the necessity of soil testing eventhough they did not have their soils tested regularly (Olgun, 2010).

When asked how they determine the nutrient requirements of their soils, around 81% of the respondents replied that they did according to their own experiences, advices of neighbour or friends and suggestions of the Agricultural experts in respective order. Only about 7.5% of them stated that they determined according to soil test results (Table 5). This result suggests that the producers have a conventional way of thinking on Agricultural production in the study area.

The priority tool in adoption and dissemination of the organic farming among the farmers, which is a new production technique for them, is the knowledge. Although organic Agriculture is not new for Turkey, knowledge of the farmers on this production technique is limited and depends on some specific sources of information (Akın, 2008). As technology and science progress rapidly in all fields, in parallel to this progress farmer needs for knowledge and skills increase day by day. For that reason, it is of great importance to research on the information sources effective on the adoption and dissemination of the organic farming as an innovation (Kaya and Atsan, 2013).

About 76% of the respondents stated that they did not have adequate information on organic farming. Only around 23% pointed out that they had sufficient information. It is obvious from Table 6 that respondents from Ergani and Çınar districts were considerably more confident on their capability on organic farming compared to those from central district (Table 6).

Organik farming producers needs more information on the subjects of technical, marketing and regulation issues compared to conventional producers (Akın, 2008). Information sources of the farmers varies from region to region and subject to subject. Identifying the sources of information is important regarding the reliability and diffusion of the information. According to respondents their information sources were television %18. In previous studies it was reported that producers benefited from TV at the stage of awareness of innovations (Olgun, 2010). In another study conducted in KOP region it was determined that producers lacked of information and consciousness about organic farming (Üstüntaş et al., 2015).

Among the factors of primary importance is the profit expectation ranking first in making production decisions. It is directly related to crop yields and price. Of the respondents around 86 % and 13% stated that they were aware, partially aware and not aware of the lower yield but higher product prices in organic farming in respective order (Table 8). In a previous study conducted in Manisa province, 37% of the respondents pointed out that low yield in organic farming was unavoidable (Başak et al., 2015).

Conclusion

The research results show that a significant number of producers engaged with vegetable production both for domestic consumption and commercial purposes. This result has been interpreted as an advantage in adopting organic agriculture by the producers. This is because the consumption of the product produced by the producers is interpreted as an auxiliary factor in the adoption of organic farming and at the same time increasing the income from unit production. This is because producers' consumption of their own products with a peace of mind and getting higher revenue per unit product may facilitate the adoption of organic farming.

Results revealed that a significant number of producers have lacked of sufficient knowledge on organic Agriculture. The most important thing in Agricultural extension is to enhance the success of extension work through training the producers on the subjects on which they admit their incompetence. Nevertheless, farmers' low level of organization is seen as an obstacle for the adoption of organic farming. For that reason, it necessary to raise awareness and encourage the producers on starting producer unions and cooperatives.

It was revealed that respondents mostly rely on their own experiences in determination of nutrient requirements of the plants. This may be interpreted that they have a conventional way of thinking and in elimination of it extension agents working in the region should necessarily focus on the extension work on the relavant subjects when needed.

According to the results, it was found that the leading source of information on organic farming is TV, which shows the importance of using TV in Agricultural extension. Nevertheless, we interpret that it is effective in raising awareness rather than dissemination of innovations.

Table 1. Demographic characteristics of the respondents

Age of the Respondents			Education Level of the Respondents		
Age Groups	N	%	Degree Obtained	N	%
18-20	7	4.4	Illiterate	9	5.6
21-30	23	14.3	Literate	7	4.4
31-40	44	27.5	Primary	91	56.8
41-50	46	28.8	Secondary	46	28.8
51-60	19	11.9	High	6	3.8
61 <	21	13.1	University	1	0.6
Total	160	100.0	Total	160	100.0
Cooperative existence in village of Respondents			Membership to Producer Organizations		
Response	N	%	Response	N	%
Yes	9	5.6	Yes	20	12.5
No	151	94.4	No	140	87.5
Total	160	100.0	Total	160	100.0

Table 2. Distribution of the respondents by the purposes of production

Purpose	Cinar		Ergani		Merkez		Total	
	N	%	N	%	N	%	N	%
Family consumption	11	21.2	27	31.0	9	42.9	47	29,4
Family consumption and Commercial	41	78.8	60	68.9	12	57.1	113	70.6
Total	52	100.0	87	100.0	21	100.0	160	100.0

χ^2=3,649, sd=2, p=0.161 (non-significant). Respondents from different districts did not significantly differ regarding the vegetable growing purposes.

Table 3. Opinions of the respondents on the harmfulness of the agricultural products to human health due to the chemicals they use in agricultural production

Respondent opinions	Çınar		Ergani		Central		Total	
	N	%	N	%	N	%	N	%
Harmful	30	57.7	43	49.4	6	28.6	79	49.4
Not harmful	10	19.2	26	29.9	7	33.3	43	26.9
Partially harmful	12	23.1	18	20.7	8	38.1	38	23.8
Total	52	100.0	87	100.0	21	100.0	160	100.0

χ^2=6,492, df=6, p=0.165 (non-significant). Respondents from different districts did not differ significantly regarding their opinions on the harmfulness of the chemicals they used in agricultural production.

Table 4. Distribution of the respondents according to their soil testing status

Farmers' Soil Testing Status	Çınar		Ergani		Central		Total	
	N	%	N	%	N	%	N	%
Tested their soils	32	61.5	25	28.7	6	28.6	63	39,4
Never tested their soils	20	38.5	62	71.3	15	71.4	97	60.6
Total	52	100.0	87	100.0	21	100.0	160	100.0

χ^2=15.83 df=2, p=0.000 (significant). Respondents from different districts differed significantly regarding their soil testing status.

Table 5. Breakdown of the respondents by the ways of determining soil nutrient requirements

The ways of determining soil nutrient requirements	Ergani		Çınar and Central Districs		Total	
	N	%	N	%	N	%
According to my friends and neighbours	7	8.0	11	15.1	18	11.2
According to result of soil analysis	7	8.0	5	6.8	12	7.5
According to my experience	73	84.0	57	78.1	130	81.3
Total	87	100.0	73	100.0	160	100.0

χ^2=1.982, df=2, p=0.371 (non-significant). Respondents from different districts did not differed significantly regarding making decision on nutrient requirement of the soils.

Table 6. Knowledge levels of the respondents on organic agriculture

Adequacy of the respondents' knowledge on organic agriculture	Ergani		Çınar and Central districts		Total	
	Freq.	(%)	Freq.	(%)	Freq.	(%)
Adequate	23	26.4	15	20.6	38	23.8
Inadequate	64	73.6	58	79.4	122	76.2
Total	87	100.0	73	100.0	160	100.0

χ^2=0.760. df=1 p=0.457 (non-significant). Respondents from different districts did not differed regarding the adequacy of their knowledge on organic agriculture.

Table 7. Information sources of the respondents on organic farming

Sources of information	Ergani		Çınar and Central District		Total	
	N	%	N	%	N	%
I have no knowledge	59	67.8	50	68.5	109	68.1
TV	19	21.8	10	13.7	29	18.1
Others (directorates of agr., friends, etc)	9	10.4	13	17.8	22	13.8
Total	87	100.0	73	100.0	160	100.0

χ^2=3,062. df=2. p=0.213 (non-significant). Respondents from different districts did not differ significantly regarding sources of information on organic agriculture.

Table 8. Awareness status of the respondents on low yields but higher product prices in organic farming

Awareness status of the respondents	Ergani		Çınar and Central Districts		Total	
	N	%	N	%	N	%
Aware	76	87.4	62	84.9	138	86.2
Unaware	11	12.6	11	15.1	22	13.8
Total	87	100.0	73	100.0	160	100.0

χ^2=0.197. df=1. p=0.818 (non-significant). Respondents from different districts did not differ significantly regarding their awareness status on low yields but higher product prices in organic farming.

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