Comparison of Conventional and Organic Farmers on Their Socioeconomic Characteristics and Communication Behaviors

Ayse Gul Tuncer , Ismet Boz

Department of Agricultural Economics, Ondokuz Mayis University, Samsun, Turkey
Correspondence : Ismet Boz, PhD
Ondokuz Mayis University
Faculty of Agriculture, Department of Agricultural Economics
Samsun Turkey
Email: ismetboz@yahoo.com

Abstract

The primary purpose of this study was to compare the conventional and organic hazelnut producers for their socioeconomic characteristics, communication behavior, and their mutual relationships with other people and organizations. Two stratified samples of 56 conventional and 42 organic hazelnut farmers from Terme district of Samsun Province were recruited as the study participants. The results showed that the organic farmers have a greater tendency to become the members offarmers' organizations such as cooperatives and unions, carry social security mostly given to government workers and medium level state officers, and use fewer loans for the farming investments as compared to the conventional farmers. In addition, the organic farmers were more aware of the Internet and they participated in different events such as conferences, congresses, and workshops. The study concludes that in order to shorten the adoption process, farmers' organization must be contacted first and awareness raising campaigns and adoption programs must be designed accordingly.

Keywords: Organic Farming, Organic Hazelnut, Diffusion and Adoption, Extension Education, Farmers' associations

Introduction:

Turkey is a major hazelnut producer country in the world. The area under hazelnut cultivation in Turkey is 740.141 hectares, which is 77% of thetotal hazelnut cultivation area in the world. The average hazelnut production in Turkey was 525 thousand tons in 2009–2014 period, which was approximately 68% of total globalhazelnut production. In the same period,Turkey's total export of hazelnuts was505 thousand tons, which is72.2% of total globalexports. The main hazelnuts importing countries are Italy, German, France, Belgium, Russia, Switzerland, the Netherlands, China, Poland, Canada, Vietnam, Spain, and Canada (Chamber of Agricultural Engineers, 2016). Although Italy, Spain, the United States, Georgia, and Azerbaijan seem to be the competitorsofTurkey as producers, their total area under hazelnut production, total yield,and exports are far less than Turkey.

Hazelnut cultivation has many benefits for producers and consumers. Although the majority of production isconsumed directly, the remaining is used for hazelnut butter, hazelnut oil, cakes, and chocolate industry. Hazelnut also has many byproducts. The leaves and shells can be used for making compost,which can be used in the farm itself. In agroindustry,poorquality hazelnuts can be used as ingredients for different foods and animal fodder. The wood part is used for furniture, home equipment, and basket making. Branches and harder shells can be used for heating purposes, which makes possible for rural families to use their own fuel during the winter seasons.

Owing to the importance and benefits of hazelnuts for human nutrition, its demand in thechocolate industry has considerably increased in recent years;thus many countries, such as Chile, China, Argentina, Australia,

Bulgaria, and Poland, have started to establish hazelnut orchards and become producers. For this reason, Turkey must implement proper policies to maintain and even further develop the present hazelnut value chain starting from pre-production period and ending todomestic and foreign consumption.

Organic hazelnut production must be considered as one of the key strategies that can increase the competition power of ahazelnut producingcountry, as many international companies are showing increased interest in organic hazelnuts. For this reason, the organic hazelnut production in Turkey was started on a contract basisbetween the farmers in Turkey and the processing companies in Europe. In order to claim the organic nature of thehazelnuts produce, it is necessary to go through the inspection and certification by a company, which is qualified by relevant market authorities inthe EU, US, or Turkey. In the entire production process of the product, until it reaches the consumer, only the allowed preparationsand methods can be used (Thimm and Aksoy, 2011; Boz et al., 2011).

There have been several studies in Turkey dealing with the sustainable use of natural and rural resources in asocial and economic manner (Boz, 2016; Ceyhan, 2010; Tatlidil et al., 2009; Boz et al., 2005). The earlier studies emphasized, to some extent, that organic and ecological agricultural production are the methods that can contributeto the sustainable use of agricultural land and other natural resources. Demiryurek (2010) developed information systems and communication networks for the organic and conventional hazelnut producers in the Samsun province. Another study conducted in the same province provided an economic comparison of the organic and conventional hazelnut production (Demiryurek and Ceyhan, 2008). According to this study,although organic hazelnut producers hire more labor, their production costs are considerably lower thanthat of theconventional hazelnut producers. Another socioeconomic difference found in this study was that the organic producers have higher educational levels as compared to the conventional producers.

Although there have been some studies in Turkey comparingadopters and non-adopters of innovations in agriculture and determining the factors that influencetheir adoptions (Oz and Boz, 2014; Kaynak and Boz, 2014; Boz et al., 2011; and Boz and Akbay 2005), there have been a lack of studies focusing on organic hazelnut farmers. With the advent of organic hazelnut production in Terme district of Samsun Province, this study aimed to compare the conventional and organic farmers in terms of their socioeconomic characteristics, communication behaviors, and their relationships with other people and organizations. The determination of certain patterns in this sector will probably facilitate the agricultural institutions and extension organizations to develop and deliver efficient programs and employ strategies for this clientele.

Materials and Methods

The data for the study were generated by administering a questionnaire to two stratified samples of conventional (n=56)and organic hazelnut (n=42)producing farmers operating in Terme district of Samsun Province Turkey. Initially, the conventional and organic hazelnut producing villages and the lists of hazelnut farmers in these villages were obtained from the DistrictDirectorate of Food Agriculture and Livestock. There were 4399 conventional and 243 organic hazelnut farmers constituting to the accessible population of the study. Considering the frequency distribution of hazelnut cultivation area for both samples, the accessible population was divided into three strata. Using Yamane's (2001) stratified sample determination formula, 56 conventional and 42 organic farmers were selectedas the final sampleof this study. These numbers were proportionally divided to each of the three strata determined from the accessible population.

A questionnaire to collect the data was developed considering earlier work conducted in the field andthe socioeconomic characteristics of the region. It technically included both the closed-ended and open-ended questions. In order to preventmisunderstanding and ensure the trust between the farmers and the researchers, the personnel who are familiar to farmers and have close relationships with them (these were personnel from the DistrictDirectorate of Food Agriculture and Livestock and personnel from farmers' unions) accompanied to the researchers. The data were collected in January–March 2017 period.

Descriptive statistics and cross tabulations were used to analyze the data on the socioeconomic characteristics, communication behavior, and therelationships of the farmers with other people and organizations. Chi-square test of independence and Fisher's Exact Test were used to determine whether significant differences exist between the conventional and organic farmers in terms of the above variables.

Findings

The socioeconomic characteristics of the respondents are presented in Table 1. Thirteen socioeconomic characteristic features, believed to influence the adoption of innovations among farmers, were considered. Most of these variables were selected from Rogers (2010) and other related studies conducted earlier. These were age of farmers, education level of farmers, farming experience, status of cooperative partnership, status of farmers' union membership, taking part in village administration, farm size, tractor ownership, type of social security, credit use for inputs, use of long term loans for farm investments, income level, and whether or not farmers think that they can change their future with their own effort. Only statistically significant test results are interpreted here. Of the 13socioeconomic variables, five were statistically significant at an alpha level of 0.05 or higher. The first significant variable was the status of cooperative partnership for which 33.9% of the conventional farmers were the partners of cooperatives and 66.1% were not. The same figures for organic farmers were 71.4% and 28.6%, respectively. Chi-square test performed between these two variables indicated a statistically significant association between the production type of hazelnut and cooperative partnership. Nature of this association can be interpreted as the organic farmers tend to take part in cooperatives more than conventional farmers.

Table 1. Socioeconomic Characteristics

Socioeconomic Characteristics	Conventional Farmers		Organic Farmers	
Age of farmers	N	%	N	%
35>	1	2.4	3	5.4
35–50	6	14.3	15	26.8
50 <	35	83.3	38	67.4
TOTAL	42	100.0	56	100.0
X^2= 3.043, P=0.218				
Mean Age (years), Standard Deviation	57.95	11.58	57.95	12.71
Education level				
Illiterate	8	14.3	1	2.1
Elementary school graduate	28	50.0	16	38.1
Secondary school graduate	8	14.3	11	26.2
High school graduate	8	14.3	8	19.0
University graduate	4	7.1	6	14.3
TOTAL	56	100	42	100
X^2= 7.749, P=0.101				
Farming experience				
20 years or less	10	17.9	7	16.7
21–40	25	44.6	22	52.3
40 years or more	21	37.5	13	31.0
TOPLAM	56	100.0	42	100.0
X^2= 0.616, P=0.735				
Mean farming experience (years), Standard Deviation	37.70	14.50	35.88	15.21
Status of cooperative partnership				
Yes	19	33.9	30	71.4
No	37	66.1	12	28.6
TOTAL	56	100	42	100
X^2= 13.500, P≤0.01				

Status of farmers' union membership

Yes	7	13.0	37	88.1
No	47	87.0	5	11.9
TOTAL	54	100	42	100

X^2= 53.717, p≤0.01

Participation in village administration

Yes	23	41.8	23	54.8
No	32	58.2	19	45.2
TOTAL	55	100	42	100

X^2= 1.600, P=0.145

Farm size

15 decare or less	20	37.0	8	19.0
16–30 decare	16	29.7	20	47.6
More than 30 decares	18	33.3	14	33.3
TOTAL	54	100.0	42	100.0

X^2= 4.660, P=0.097

Mean farm size, Standard Deviation	28.11	24.40	29.12	15.74

Tractor ownership

Yes	18	32.1	9	21.4
No	38	67.9	33	78.6
TOTAL	56	100	42	100

X^2= 1.380, P=0.172

Type of social security

Nosocial security	2	3.6	3	7.1
Bag Kur	39	70.9	10	23.8
Emekli Sandigi	4	7.3	8	19.0
SSK	10	18.2	21	50.0
TOTAL	55	100	42	100

X^2= 21.239, P≤01

Credit usefor inputs

Yes	17	30.4	15	35.7
No	39	69.6	27	64.3
TOTAL	56	100	42	100

$X^2= 0.313$, P=0.365

Long term loan use for farm investments				
Yes	15	26.8	3	7.1
No	41	73.2	39	92.9
TOTAL	56	100	42	100

$X^2= 6.176$, P=0.011

Income level[1]				
Low	6	10.7	3	7.1
Medium	40	71.4	33	78.6
High	10	17.9	6	14.3
TOTAL	56	100	42	100

$X^2= 0.685$, P=0.101

Can you change your future with your own effort?				
Yes	15	26.8	20	48.8
Somewhat	17	30.4	5	12.2
No	24	42.4	16	39.0
TOTAL	56	100.0	41	100.0

$X^2= 6.700$, P=0.035

[1]For this variable income level of farmers was asked as "If farmers of your village were divided into three categories as low, medium, and low-income levels, which category you would likely fall in?"

The second significant variable was the status of membership of farmers' unions for which 13% of conventional farmers were the members of farmers' unions and 87% were not. The same figures for organic farmers were 88.1 and 11.9%, respectively. Chi-square test performed between these two variables yieldeda statistically significant association indicatingthat the production type of hazelnut and membership of farmers' union are dependentoneach other. The nature of this association can be interpreted as the membership of farmers' unions is more common among the organic farmers as compared to the conventional ones.

The third significant socioeconomic variable was the type of social security, for this, 3.5% of the conventional farmers had no social security, while 70.9% weresecured by Bag-Kur (Farmers' Social Security System), 7.4% by Emekli Sandigi (Government Officers'Security System), and 18.2% by SSK (Workers Social Security System). The same figures for the organic farmers were 71.0%, 23.8%, 19.0%, and 50.0%, respectively. The chi-square test performed between these two variables yielded astatistically significant association indicating that the type of hazelnut production is statistically associated with the type of social security held by thefarmers. This association can be exemplifiedas organic farmers tend to be socially secured by SSK while conventional farmers by Bag-Kur.

The fourth significant socioeconomic variable was the use of long-termloans for the farm investments. In this case, 26.8% conventional farmers answered "yes" and 73.2% answered "no". The same figures for the organic farmers were 71%and 92.8%, respectively. These two variables showedstatistically significant association confirmingthat using long-term loans for farm investments is statistically associated with the type of hazelnut production, as the nature of this association verifiesthat the conventional farmers usemore loans for farm investments as compared to the organic farmers.

The last significant socioeconomic characteristic was that whether or not farmers perceived that they can change their future with their own effort, of which, 26.8% of the conventional farmers answered "yes", 30.5% answered "somewhat", and 42.4% answered "no". The same figuresfor the organic farmers were 48.8%, 12.2%, and 39.0% respectively. The chi-square test performed between these two variables showed that the type of hazelnut farming and the perception of whether or not farmers can change their future by their own effort are statistically associated witheach other. This association verified that this perception is quite higher among the organic farmers than the conventional ones.

The communication behaviors of farmers arepresented in Table 2. The communication behaviors,selected forthis study, were the frequency of reading newspapers, thefrequency of listening to

radio, thefrequency of watching television, awareness of the Internet, and the frequency of using the Internet. Of these five selected communication variables, only one was statistically significant at an alpha level of 0.05 or higher. This variable was awareness of the Internet, for which 44.6% of the conventional farmers were aware of the Internet while55.4% were unaware. The same figures for the organic farmers were 59.5% and 41.5%, respectively. The chi-square test carried outbetween the type of hazelnut farming and the awareness of the Internet revealed a significant association indicatingthat the awareness of internet among the organic farmers is considerably higher than the conventional farmers.

Table 2. Communication Behaviors

Communication Behaviors	Conventional Farmers		Organic Farmers	
Frequency of reading newspapers	**N**	**%**	**n**	**%**
Daily	14	25.0	17	40.5
Several times a week	11	11.6	9	21.4
Once a month	8	14.3	8	19.0
Almost newer	23	41.1	8	19.0
TOTAL	56	100	42	100
X^2= 5.868, p=0.118				
Frequency of listening to radio				
Several hours a day	11	19.6	8	19.5
Approximately one hour a day	3	5.4	6	14.6
Almost never	42	75.0	27	65.9
TOTAL	56	100	41	100
X^2= 2.474, p=0.290				
Frequency of watching television				
Several hours a day	49	87.5	37	88.1
Several hours a week	7	12.5	5	11.9
TOTAL	56	100	42	100
X^2= 0.008, p=0.929				
Awareness of the Internet				
Yes	25	44.6	25	59.5
No	31	55.4	17	40.5
TOTAL	56	100	42	100
X^2= 2.127, p=00.11				
Frequency of using the Internet				
Several hours a week	14	48.3	12	41.4
Several hours a week	5	17.2	6	20.7
Almost never	10	34.5	11	37.9
TOTAL	29	100	29	100
X^2= 0.292, p=0.864				

The relationships with other people and organizations are presented in Table 2. The selected variables under this criterion were the frequency of traveling to district center, the frequency of traveling to Samsun province, the frequency of meeting with extension personnel, the frequency of seeking advice about agricultural subjects, and the frequency of attending agricultural events such as conferences, symposiums, and workshops. Of these five selected variables,two were statistically significant at analpha level of 0.05 or higher. The first significant variable was seeking advice about farming practices, for which,35.7% of theconventional farmers answered every time, 33.9% sometimes, and 30.4% almost never, while the same figures for organic farmers were 59.5%, 33.3%, and 7.1%, respectively. The chi-square test performed forthe type of hazelnut farming and the awareness of the Internet revealed a significant association

indicating thatorganic farmers are activeto search farming information as compared withthe conventional farmers.

The second significant variable was the participation in the farming events such as conferences, symposiums, and workshops, for which, 21.4% of the conventional farmers answered many times, 12.5% several times, and 66.1% almost never, while the answers for the same variable by the organic farmers were 57.1%, 31.0%, and 11.9%, respectively. The chi-square test performed between the type of hazelnut farming and the participation to the farming events revealed a significant association indicating that the organic farmers' participation to this kind of activities is relatively higher than the conventional farmers.

Table 3. Relationships with Other People and Organizations

Relationships with Other People and Organizations	Conventional Farmers		Organic Farmers	
Frequency of traveling to district center	N	%	n	%
Daily	19	33.9	11	26.2
Once a week	21	37.5	20	47.6
Several times a week	11	19.6	3	7.1
More seldom	5	8.9	8	19.0
TOTAL	56	100	42	100
X^2= 5.534, p=0.137				
Frequency of traveling to Samsun province				
Once a week	6	10.7	3	7.1
Several times a year	50	89.3	39	92.9
TOPLAM	56	100	42	100
X^2= 0.367, p=0.545				
Frequency of meeting with extension personnel				
Once a week	3	5.4	5	11.9
Almost never	53	91.1	37	85.7
TOTAL	56	100	42	100
Fisher's Exact Test, p=0.282				
Seeking advice about farming practices				
Regularly	20	35.7	25	59.5
Occasionally	19	33.9	14	33.3
Almost never	17	30.4	3	7.1
TOTAL	56	100	42	100
X^2= 9.303 p≤0.01				
Participation in conferences, symposiums, workshops etc.				
Regularly	12	21.4	24	57.1
Occasionally	7	12.5	13	31.0
Almost never	37	66.1	5	11.9
TOTAL	56	100	42	100
X^2= 28.768, p≤0.01				

Conclusions and Recommendations

The findings of this study showed that organic hazelnut farmers have more positive tendency to participate in the farmers' organization such as cooperatives and farmers' union. Since these organizations enable farmers to obtain theinputs, up to some extent,at a lower cost and sell their products at higher prices,the organic farmers may benefit from this situation. Another finding showed that the organic hazelnut farmers

have social security with SSK, an institution that mainly providessocial security to workers and medium level government officers, while the conventional farmers had social security with Bag-Kur, an institution thatmainly providessocial security tofarmers. Since SSK provides more benefits and higher retirement salary as compared to Bag-Kur, the organic hazelnut producers have better opportunities than the conventional producers. However, in order to qualify for SSK, the farmers need to be employed by the government. Therefore, the organic hazelnut farmers tend to have jobs besides mere farming.Finally, the last significant socioeconomic variable was that the conventional farmers used more loans for long-term farming investments such as buying land, farm animals, or farming equipment. As they mostly did not have employment other than farming, their long-term purpose seems to be investing in the farm and earning more income.

The organic farmers were more aware of the Internet but the frequency of its use between the two groups did not show any significant difference. However, organic farmers were more activein knowingthe new farming practices and took part in different farming events such as conferences, seminars, and workshops. These characteristics may lead them to acquire information about the new ideas and technologies, which may ultimately help them accept the change easilyand become less stubbornto it.

Overall, the findings of this study showed that in order to convince the farmers to adopt organic hazelnut production, awareness raising campaigns must begin with the farmers' organizations. Conducting different events within these organizations will probably shorten the adoption process and more farmers will convert to organic hazelnut production.

Acknowledgments:

References

1. Boz, I., & Akbay, C. (2005). Factors influencing the adoption of maize in Kahramanmaras province of Turkey. *Agricultural Economics*, *33*(s3), 431–440.
2. Boz, I., Akbay, C., Bas, S., & Budak, D. B. (2011). Adoption of innovations and best management practices among dairy farmers in the Eastern Mediterranean region of Turkey. *Journal of Animal and Veterinary Advances*, *10*(2), 251–261.
3. Boz, I, Aksoy, U, Ozcatalbas, O. (2011). Enhancing Organic Farming in Turkey UTF/TR/052,Workshops and Training Programmes. Ministry of Agriculture and Rural Affairs, Ankara Turkey.
4. Boz, I. (2016). Effects of environmentally friendly agricultural land protection programs: Evidence from the Lake Seyfe area of Turkey. *Journal of Integrative Agriculture*, *15*(8), 1903–1914.
5. Boz, I., Akbay, C., Jordan, G., & Kamalak, A. (2005). Measuring livestock farmers' effect on sustainable agricultural and rural development. *Livestock Research for Rural Development*, *17*(8). Online available: http://lrrd.cipav.org.co/lrrd17/8/boz17088.htm. Accessed May 6, 2017)
6. Ceyhan, V. (2010). Assessing the agricultural sustainability of conventional farming systems in Samsun province of Turkey." *African Journal of Agricultural Research* 5(13): 1572–1583.
7. Chamber of Agricultural Engineers (TMMOB Ziraat Mühendisleri Odası). (2017). Hazelnut Report 2016 (Fındık Raporu 2016). Online available:
8. http://www.zmo.org.tr/genel/bizden_detay.php?kod=26370&tipi=17&sube=0. Accessed: May 6 2017.

9. Demiryurek, K. (2010). Analysis of information systems and communication networks for organic and conventional hazelnut producers in the Samsun province of Turkey. *Agricultural systems*, *103*(7), 444–452.
10. Demiryurek, K., & Ceyhan, V. (2008). Economics of organic and conventional hazelnut production in the Terme district of Samsun, Turkey. In *VII International Congress on Hazelnut 845* (pp. 739–744).

11. Kaynak, O., & Boz, I. (2014). Doğu Akdeniz Geçit Kuşağı Tarımsal Araştırma Enstitüsü Tarafından Geliştirilen Bazı Pamuk Çeşitlerinin Benimsenmesi ve Yayılması.
12. Oz, G., Boz, I. (2014).Isparta İli Eğirdir İlçesi Kovada Kanal Bölgesi'nde Çevre Amaçlı Tarım Arazilerinin Korunması (ÇATAK) Programının Benimsenmesi ve Yayılması G. Öz, İ. Boz
13. Rogers, E. M. (2010). *Diffusion of innovations*. Simon and Schuster.
14. Tatlıdil, F. F., Boz, I., & Tatlidil, H. (2009). Farmers' perception of sustainable agriculture and its determinants: a case study in Kahramanmaras province of Turkey. *Environment, Development and Sustainability*, *11*(6), 1091–1106.
15. Thimm, C., Aksoy, U. (2011). Enhancing Organic Farming in Turkey UTF/TR/052, Final Project Report. Ministry of Agriculture and Rural Affairs, Ankara Turkey.
16. Yamane, T. (2001). Temel Ornekleme Yontemleri. Cevirenler: Alptekin Esin, Celal Aydın, M. Akif Bakir, Esen Gurbuzsel. Literatur Yayincilik, Istanbul.