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INVESTIGATING THE EFFECTIVENESS OF LEADER HORTICULTURAL PRODUCERS IN KERMAN PROVINCE FROM GARDENERS' PERSPECTIVE

Mahdiyeh SAEI, Hossein MORADI SHARE BABAK

Kerman Agricultural and Natural Resources Research and Education Center, AREEO, Economic, Social and Extension Research Department, Kerman, Iran, Emails: m_saeey@yahoo.com, moradi_1346@yahoo.com

Corresponding author: m_saeey@yahoo.com

Abstract

The use of local leaders and leader farmers in extension programs has been common in most countries. Through the analysis of a case study, this paper aims to evaluate the effectiveness of leader horticultural producers in increasing the quantitative and qualitative efficiency of horticultural products in Iran from the gardeners' perspective. The statistical population of the study was composed of horticultural producers in Kerman province in 2015-2016 (=310). Sixty gardeners were picked up by Cochran formula and random cluster sampling. The research instrument was a questionnaire and the research used a descriptive-correlational design. More than half of the gardeners had no knowledge about the leader producers in their area, and had never visited any sample farm. The leader producers were the fifth source of information, with only 11.1% of gardeners had received information from them. Overall, more than 60 percent of gardeners cited the effectiveness of leader producers as average. Gardeners who had less experience, higher education, more area under cultivation, and a high number of visits to agricultural departments, and were more satisfied with agricultural profession found leader producers to be more effective. The findings confirm the weak position of the leader producers among gardeners.

Key words**:** *effectiveness, extension programs, horticultural producers, increase production, Iran, leader gardeners*

INTRODUCTION

Effectiveness refers to the degree to which objectives are accomplished and the extent to which targeted problems are tackled. In contrast to efficiency, effectiveness is determined without reference to costs [4]. The results of the surveys show that there is, in many cases, a significant gap between the average yield and that of the leader producers. Much of this difference is due to their work experience as well as use of technical and extensional findings and recommendations. The use of local leaders and leader farmers in extension programs, with goals such as modelling for other farmers and producers and using them to disseminate useful innovations as well as extensional notifications, has been common in most countries, and there has always been a place for them to play an extensional role in extension programs. Perhaps the most important goal of selecting leader agricultural producers is to increase the quantitative and qualitative and sustainable production of agricultural products by transferring the technical knowledge and applied research findings, relevant and appropriate technologies and scientific experiences of sample producers to other producers. The success of leader farmers is because they have combined knowledge with experience and they have been able to achieve much more than the national average with better management. One of the reasons for the gap between leader farmers and others, is in the utilization of agricultural research results. Since in our country, leader producers aimed at conducting extension activities, have been selected and introduced as an extensional strategy in various specialized fields of agriculture and natural resources, this question has been raised by the relevant authorities to what extent the leader selected farmers are able to carry out extension activities; in other words, what are the extension functions of a leader farmer and do the leader farmers have the necessary and

sufficient effectiveness in carrying out the extension activities?

The effectiveness of agricultural extension activities has been subject to limited research in Iran and other countries, of which the followings can be mentioned.

The results for the impacts of educational extension delivery in agricultural cooperatives in Iran (Tehran and Alborz Provinces), showed a significant correlation between awareness of cooperation sector, motivation of membership in cooperatives, and literacy with the variable of using educational extension services. In addition, applying Mann–Whitney test showed that participation in agricultural educational extension course had a statistically significant effect on awareness of the cooperation sector and motivation of membership in cooperatives [6].

The effectiveness of in-service training courses for agriculture-Jihad staff in Iran (Qom province) has been investigated based on Kirkpatrick model using JAM software. The results showed that these courses were effective at three levels of Kirkpatrick model, namely, reaction, learning and behaviour, but were not effective at the results level [9].

In another research, the effectiveness of agricultural television programs from the Fars province perspective was examined using Percy's model. Findings revealed that low percent of farmers were as the programs audiences. From the viewpoint of the audience, the effects of agricultural television programs were moderate regarding direct, conditional and overall effects and below average in terms of cumulative and cognitive effects. Satisfaction toward provincial television network; audiences' goals to pay attention to programs and trust in provincial programs had the most important roles in predicting the effectiveness of the programs. Also, among the audiences' agricultural information resources, television had the forth rank [10].

The role of paddy rice farmers' education under the project of Attendant with Farmer (AWF) has been evaluated based on Kirkpatrick's model in the Amol Township in Iran. The Results showed that AWF project had influenced in much level on learning and behavioural characteristics of the farmers. In addition, most of paddy rice farmers had good reaction toward the project. Also, the AWF project was effective in improving knowledge of paddy rice farmers and increasing rice production [11].

The perceived effectiveness of agricultural extension techniques used to promote the adoption of improved technologies by rice growers in Kogi state of Nigeria has been assessed. The results indicated that 99.1% of the growers were informed of the presence of extension workers in their area and 87.7% visited every two weeks. Also, extension workers were perceived to be more capable in performing field demonstration activities and the individual contact method was perceived as the most effective extension teaching method in the study area [1].

Another study dealt with the effectiveness of agricultural extension education methods as perceived by vegetable growers in Jordan was evaluated. The most preferred extension methods by farmers were farm visit, meeting groups of farmers, result demonstrations and farm tours. Low rated methods included information and communications technologies [2].

A study on assessing the effectiveness of different agricultural technology transfer methods in the Northern and Upper East regions of Ghanait reported that farmer-to-farmer approach, technology demonstration fields, household promotion, and radio constituted the main agricultural promotion methods employed in the study area. There was a significantly low support of the Information and Communication Technology (ICT) and mass media mechanisms such as mobile phone, video, posters, newspapers, and drama. Demonstration, farmer-to-farmer, and household promotion methods were regarded as the most effective agricultural promotion methods [3].

The results of the study on the effectiveness of agricultural promotion methods employed in the adoption of recommended rice production technologies by growers in Nigeria, showed that majority of the

respondents had their major source of farm information from radio programs. The major problems encountered by the farmers were: irregular visits by extension agents, lateness of information flows, lack of adequate trained extension agents, and their localities outside network coverage among others [5].

The effectiveness of extension delivery methods was graded on a five-point Likert scale in the Central region of Vietnam, showing that extension methods including training, farmer-to-farmer extension, farmers' group meetings, and farm/home visits were the most effective. However, extension methods including the use of radio programs, posters, and booklets were found to be ineffective [7].

The effectiveness of the demonstration alone, the meeting alone, and the pamphlet alone and all methods together on the knowledge and skills levels of poultry farmers in Egypt was surveyed.

The sample was classified into four equal groups in terms of providing extension recommendations by various extension methods with help from extension poultry experts in the studied districts. The major findings of the study revealed poultry farmers' exposure level to the studied information sources to be, on average, moderate at 59.8%. Furthermore, the all methods group had received the maximum knowledge and skills (55.8% and 48.3%, respectively) followed by the demonstration method, the meeting method, and the pamphlet method [8].

Given the role of the leader producers in the transmission of agricultural information and lack of study in this area, this study was aimed to shed light on the effectiveness of leader horticultural producers in Iran (a case study: Kerman province). Other objectives of this study were:

-Investigation of demographic characteristics of the studied gardeners,

-Identification and classification of gardeners based on the studied parameters,

-Investigation the impact of leader horticultural producers on the yield and production of other gardeners,

-Investigation the impact of leader horticultural producers on the application of new technologies at the farm level.

MATERIALS AND METHODS

The research used a descriptive-correlational design and was a survey type. Given the variety and expanding fields of activity in the agricultural sector and, therefore, the diversity of leader agricultural producers, as well as the fact that about 23% of the area under cultivation is located in Kerman province, the horticultural sector and related producers, were the target of the present survey. The statistical population of the study was composed of horticultural products in Kerman province in 2015-2016 (=310). Sixty gardeners were picked up by Cochran formula and random cluster sampling. The research instrument was a questionnaire. Data were analyzed using SPSS software. Descriptive statistics (mean, contingency table, percentage, frequency, standard deviation, median and mode) and inferential statistics (Pearson and Phi correlation coefficients, t-test and regression analysis) were used.

RESULTS AND DISCUSSIONS

The demographic characteristics of the studied gardeners are listed in Table 1.

Table 1. Demographic characteristics of the studied gardeners

Characteristic	Groups	Percent	Other statistical indicators
Gender	Man	96.2	
	Female	3.8	
	Total	100	
Age (years)	≤30	11.5	
	31-40	19	
	41-50	30.5	
	51-60	35.2	Mean=45.9
	≥61	3.8	Standard Deviation=11.2
	Total	100	Median=45
Level of education	Illiterate	7.7	Mode=52
	Reading and writing literacy	19.2	Minimum=20
	Under the diploma	23.1	Maximum=68
	diploma	30.8	
	Higher than diploma	19.2	
	Total	100	

Source: Own calculation.

According to this table, gardeners were predominantly male (96.2%), mostly in the age group of 51-60 years (35.2%) and had a high school diploma (30.8%). The youngest and oldest were aged 20 and 68 years, respectively, and their average age was 45.9 years. Also, about 7.7% of them were illiterate and 19.2% had higher diploma education.

Based on the business characteristics presented in Table 2, gardeners had an average of 20 years of gardening experience. The highest belonged to the age group of 11-20 years (30.7%) and the lowest (11.5%) belonged to those with 6-10 years of experience.

Table 2. Business characteristics of the studied gardeners

Characteristic	Groups	Percent	Other statistical indicators
Experience (years)	5≤	19.3	Mean=20.1 Standard Deviation=13.2 Median=20 Mode=20 Minimum=1 Maximum=50
	6-10	11.5	
	11-20	30.7	
	21-30	23.2	
	31≥	15.3	
	Total	100	
Activities in organizations	City and village councils	11.5	
	Production cooperatives	7.7	
	board of trustees of the mosques	26.9	
	Other organizations	38.5	
	Non-membership	15.4	
	Total	100	
Total area under crop and horticulture (ha)	5≤	15.4	Mean=17.4 Standard Deviation=18.7 Minimum=2 Maximum=100
	5.1-10	34.6	
	10.1-20	27	
	61≥	23	
	Total	100	
Area under horticulture (ha)	1≤	27	Mean=8.25 Standard Deviation=15.4 Minimum=0 Maximum=80 The average number of garden pieces is 3 and the maximum is 12
	1.1-5	30.9	
	5.1-10	23	
	10≥	19.1	
	Total	100	
Area under crop (ha)	5≤	42.4	Mean=8.9 Standard Deviation=7.6 Minimum=0 Maximum=30 The average number of the garden pieces is 4.5 and the maximum is 20
	5.1-10	34.5	
	10.1-20	15.3	
	20≥	7.8	
	Total	100	

Source: Own calculation.

Meanwhile, about 19.3% of gardeners had less than 5 years of experience. Survey of activity status in organizations also showed that about 85 percent of gardeners were members of social institutions including the city and village councils, the production cooperatives, the board of trustees of the mosques, and 15.4 percent were not members of any organization. The average area under crop and horticulture was 17.4 hectares with minimum and maximum, 2 and 100 hectares, respectively, and the highest frequency (34.6%) belonged to gardeners with areas ranging from 5.1 to 10 hectares. The average area under horticulture and crop were 8.25 and 8.90 ha, and the maximum were 80 and 30 ha, respectively.

All of the studied gardeners had at least two jobs (horticulture, agriculture, animal husbandry, non-agricultural self-employment, and government jobs). The most important source of income was ‘gardening’ (57.7%) and the least important source belonged to the two groups of ‘non-agricultural self-employment’, and ‘government jobs’ (3.8% each) (Table 3). In terms of income status, 23.1% of those survived described themselves as above average, 42.3% on average and the rest (34.6%) rated themselves below the average.

Table 3. Income characteristics of the studied gardeners

Characteristic	Groups	Percent
The most important source of income	horticulture	57.7
	agriculture	26.9
	animal husbandry	7.7
	non-agricultural self-employment	3.8
	government jobs	3.8
	Total	100
Comparison of income status with other people	Very desirable	7.7
	desirable	15.4
	In Average	42.3
	Inappropriate	26.9
	Very inappropriate	7.7
	Total	100

Source: Own calculation.

According to the results of Table 4, more than 30% of the gardeners were unaware of their area experts/extension workers and more than 34% did not participate in any extension program. The average participation in extension programs was 2.4 times a year, and about 11.4% of producers participated in

extension activities more than five times a year.

Table 4. Education-Extension characteristics of the studied gardeners

Characteristic	Groups	Percent	Other statistical indicators
Recognition of regional agricultural Expert/extension worker	Yes	69.2	
	No	30.8	
Participation in extension programs (number per year)	None	34.6	Mean=2.4 Standard Deviation=2.8 Minimum=0 Maximum=10
	Once	15.4	
	Twice	19.2	
	Three to five times	19.2	
	More than five times	11.4	
	Total	100	
Visits of Agriculture-Jihad organization (number per year)	None	3.8	Mean=7.4 Standard Deviation=6.5 Minimum=0 Maximum=30
	1-3	23	
	4-10	57.6	
	>10	15.2	
	Total	100	
Consultation with experts of the Agriculture-Jihad Bureau (number per year)	None	34.6	Mean=3.8 Standard Deviation=4.7 Minimum=0 Maximum=20
	1-3	30.8	
	4-10	26.9	
	>10	7.6	
	Total	100	
Recognition of regional leader gardener	Yes	46.2	
	No	53.8	
Sample farm visits (number)	None	53.3	Mean=1.7 Standard Deviation=2.3 Minimum=0 Maximum=7
	1-4	30.4	
	>4	16.3	
	Total	100	
Adoption of leader gardener as a model	Yes	69.2	
	No	30.8	
Adoption of leader gardener as Agriculture-Jihad representative/extension worker	Yes	26.9	
	No	73.1	

Source: Own calculation.

The findings of Table 4 also show that the average visit to the Agriculture-Jihad organization was 7.4, with minimum and maximum zero and 30 times per year, respectively. The purpose of these gardeners from visiting Agriculture-Jihad organization was different, and it is noteworthy that about 34.6% of the gardeners had not visited Agriculture-Jihad organization for expert advice and guidance. More than half (53.8%) of the gardeners were unaware of their area leader producers, and more than 53.3% of those surveyed had never visited any sample farm. Average number of visits was 1.7 times a year. At the same time, nearly 70 percent of gardeners stated that they see 'leader producers' as their role models, but only 26.9 percent of respondents tended to adopt them as Agriculture-Jihad representative/extension worker. Taken together, these findings confirm the weak position of the 'leader producers' among gardeners.

The findings in Table 5, illustrate the gardeners' perspective on scientific validity and influential characteristics of leader producers. The average of these ten items in the range of 1–5, indicated an average view of the gardeners. In this ranking, ‘gardeners' trust in the recommendations of leader producers’ had the highest score ($\bar{x} = 3.46, \text{sd.} = 0.86$) and ‘rate of knowledge transfer from experts to gardeners by leader producers’ had the lowest score ($\bar{x} = 2.8, \text{sd.} = 0.80$).

Table 5. Gardeners' perspective on scientific validity and influential characteristics of leader producers

Rank	Item	Very Little	Little	Average	Much	Very Much	Mean*	Sd.
1	Gardeners' trust in the recommendations of leader producers	3.8	0	53.8	30.8	11.5	3.46	0.86
2	Skill level of leader gardeners	0	7.7	61.5	19.2	11.5	3.35	0.80
3	Impact of leader producers on the use of machinery and equipment	0	11.5	50	30.8	7.7	3.35	0.80
4	Compatibility of leader producers 'actions with other farms	0	7.7	57.7	30.8	3.8	3.31	0.68
5	Effect of leader producers on use of appropriate seeds and seedlings	0	11.5	61.5	19.2	7.7	3.23	0.74
6	Effect of leader producers on use of new irrigation methods	0	19.2	46.2	26.9	7.7	3.23	0.87
7	Impact of leader producers on increasing production	0	7.7	73.1	15.4	3.8	3.15	0.61
8	Accuracy of information and knowledge from leader producers	0	11.5	69.5	15.4	3.8	3.10	0.65
9	Up-to-date knowledge of leader producers	0	11.5	73.1	11.5	3.8	3.07	0.63
10	Rate of knowledge transfer from experts to gardeners by leader producers	7.7	19.2	57.7	15.4	00	2.8	0.80
Mean		1.2	10.8	60.4	21.5	6.1	3.2	0.74

* In the range (1-5)
Source: Own calculation.

Overall, more than 60 percent of gardeners, mentioned the effectiveness of leader producers as average.

The results of gardeners' job satisfaction rate (Table 6) show that their satisfaction rate was slightly above average ($\bar{x} = 3.13, \text{sd} = 1.04$). Over 34.6% (19.2+15.4) had a little desire to continue farming with their children, and 38.4% (19.2 + 19.2) had a low tendency to stay in this job.

Table 6. Gardeners' job satisfaction rate

Rank	Item	Very Little	Little	Average	Much	Very Much	Mean*	Sd.
1	No fatigue from agriculture	3.8	3.8	38.5	38.5	15.4	3.58	0.93
2	Interest in (agriculture, horticulture, animal husbandry, etc.)	0	23.1	34.6	26.9	15.4	3.35	1.02
3	Willingness to continue farming with their children	15.4	19.2	30.8	34.6	0	2.85	1.08
4	Willingness to stay in farming	19.2	19.2	34.6	23.1	3.8	2.73	1.13
Mean		9.6	16.3	34.6	30.8	8.7	3.13	1.04

* In the range (1-5)
Source: Own calculation.

Studying the information and knowledge sources of producers can help to understand the position and role of the leader producers among gardeners. Table 7 shows that, in total, gardeners had relied heavily on input sellers (25.5%) and government experts (20.7%) for information on the four areas of 'pesticides, agricultural fertilizers, livestock medicines and animal nutrition'. In this ranking, the leader gardeners were the fifth source of information, with only 11.1% of gardeners had received information from them. Separate results of information sources in the above four areas showed that in the field of agricultural pesticides, 'input sellers' (34.6%), in the fields of fertilizers and livestock medicines, 'input sellers' and 'government experts' (23% each), and in the field of animal nutrition, 'farmers and local friends' (26.9%) were the most important sources of information. The results show that in none of these areas, the leader producers had a high status as a source of information and the highest information related to agricultural pesticides was only 11.6%.

Table 7. Sources of information for the studied gardeners (%)

	Information field	Input sellers	Consulting companies	Government experts	Leader producers	Farmers and local friends	Farmers in other areas	Radio and TV	Magazine and newspaper	Virtual electronics	Others
1	Agricultural pesticides	34.6	19.3	17.3	11.6	5.8	3.8	1.9	1.9	0	3.8
2	Fertilizers	23	13.5	23	11.5	13.5	5.8	4	3.8	1.9	0
3	Livestock medicines	23	13.5	17.3	15.5	23	5.8	0	0	0	1.9
4	Animal nutrition	21.3	7.6	25	5.8	26.9	7.7	3.8	0	0	1.9
Mean		25.5	13.5	20.7	11.1	17.3	5.7	2.4	1.4	0.5	1.9
Rank		1	4	2	5	3	6	7	8	9	–

Source: Own calculation.

Pearson correlation coefficient and t-test were used to examine the relationships between the research variables and the variables 'influence of leader producers', 'scientific validity of leader producers', 'Job satisfaction' and 'effectiveness of leader producers'. It is recalled that the variable 'Influence of leader producers' was derived from the combination of five items with the Likert scale (in the range of 1-5), the variable 'Scientific validity of leader producers' from the combination of five items with the Likert scale (in the range of 1-5), the variable 'Effectiveness of the leader Producers' from the combination of ten items with the Likert scale (range 1-5) and the 'Job satisfaction' was derived from the combination of the four items with the Likert scale (range 1-5) and were measured from the point of view of gardeners.

Based on Table 8, gardeners' perceptions of 'influence of leader producers' had negative and significant relationships with age (r= -

0.304, Sig.= 0.000) and experience (r= -0.275, Sig.= 0.002) and positive and significant relationships with education (r= 0.314, Sig.= 0.000), participation in extension classes (r=0.316, Sig.= 0.000), number of visits to agricultural offices (r= 0.411, Sig.= 0.000), and job satisfaction in agriculture (r= 0.520, Sig= 0.000). In other words, gardeners who had less age and experience, more education, and more participation in extension classes and visits to agricultural departments, as well as more job satisfaction, found the leader producers to be more influential. Also, the gardeners' perspective on 'scientific validity of leader producers' show positive and significant relationships with the garden area (r= 0.325, Sig= 0.000) and expert consultation (r= 0.339, Sig= 0.000).

Gardeners' perspective on 'effectiveness of leader producers' also had a negative and significant relationship with producer's experience (r= -0.243, Sig. = 0.005) and positive and significant relationships with education (r= 0.206, Sig. = 0.019), garden area (r= 0.272), number of visits to agriculture-Jihad organization (r= 0.238, Sig. = 0.006), consultations with experts (r= 0.287, Sig. = 0.001), and job satisfaction (r= 0.410, Sig. = 0.000). In other words, farmers who had less experience, higher education, more land, more visits to agricultural departments, and further consultation with experts and were more satisfied with their job have found the 'leader producers' to be more effective. Satisfaction with occupation was negatively and significantly correlated with age, experience and garden area, and was positively and significantly correlated with variables of education level, participation in extension classes, and number of visits to Agriculture-Jihad organization.

Table 8. Relationships between individual, educational and economic variables of the leader producers and dependent variables

Independent variables	Job satisfaction		Effectiveness of leader producers		Scientific validity of leader producers		Influence of leader producers	
	Correlation coefficient	Significance level	Correlation coefficient	Significance level	Correlation coefficient	Significance level	Correlation coefficient	Significance level
Age	-0.253	0.004	-0.095	0.280	0.162	0.065	-0.304	0.000
Education level	0.396	0.000	0.206	0.019	0.022	0.800	0.314	0.000
Experience	-0.232	0.008	-0.243	0.005	-0.129	0.142	-0.275	0.002
Garden area	-0.190	0.031	0.272	0.002	0.325	0.000	0.143	0.105
Participation in extension classes	0.307	0.000	0.119	0.178	-0.135	0.127	0.316	0.000
Number of visits to agricultural offices	0.446	0.000	0.238	0.006	0.026	0.765	0.411	0.000
Consultation with experts	-0.149	0.092	0.287	0.001	0.339	0.000	0.156	0.077
Visits to leader producer farms	0.040	0.654	-0.082	0.354	0.040	0.649	-0.179	0.053
Job satisfaction	-	-	0.410	0.000	0.158	0.072	0.520	0.000

Source: Own calculation.

As mentioned earlier, there were two positive and negative views among gardeners as to whether the leader producers could be models. According to the results of Table 9 from T-test, there was no significant difference between the two groups of gardeners regarding the leader producers influence (t= 0.068, Sig. =0.946). But gardeners who were willing to adopt the leader producers as extension workers ($\bar{x} = 3.49$, sd. =0.73) compared to the other group ($\bar{x} = 3.03$, sd. = 0.44), had a significant difference in their belief that the leader producers were influential (t= 3.472, Sig. =0.001). The difference between the gardener groups was different about the scientific validity of the

leader producers. Those who considered the leader producers as models also provided more scientific validity for them ($\bar{x}$ =3.37, sd. =0.57), and the difference was statistically significant (t= 4.807, Sig. =0.000); however, adoption ($\bar{x}$ = 3.29) or non-adoption ($\bar{x}$ =3.25) of leader producers as extension workers by the gardeners did not differ significantly in their view of scientific validity of leader producers (t= 0.321, Sig. =0.748) (Table 9).

The findings in Table 9 also indicate that the gardeners who considered the leader producers as models also found the leader producers to be more effective ($\bar{x}$ = 3.26, sd. = 0.52), and in this respect with another group that did not considered them as models ($\bar{x}$ = 3.09, sd. =0.25) had a statistically significant difference (t= 2.573, Sig. = 0.011). There was also a statistically significant difference (t =2.413, Sig. =0.020) between the two groups of gardeners (those who adopted the leader producers as extension workers ($\bar{x}$ = 3.39, sd. =0.54) and those who did not adopt them ($\bar{x}$ = 3.14, sd. =0.41). The first group considered the leader producers to be more effective and rated their effectiveness at 3.39 (Table 9).

Table 9. Influence, scientific validity, and effectiveness of leader producers from the viewpoints of different gardener groups

Variable	Gardener groups	Mean*	Sd.	Equality of variances (Levene's Test)		t	Sig.	df
				f	Sig.			
Leader producers influence	recognition Leader producers as models	3.16	0.66	43.923	0.000	0.068	0.0946	1,277.931
	Non-recognition Leader producers as models	3.15	0.28					
Leader producers influence	Adoption leader producers as extension workers	3.49	0.73	28.985	0.000	3.472	0.001	43.474
	Non-adoption leader producers as extension workers	3.03	0.44					
Scientific validity of Leader producers	recognition Leader producers as models	3.37	0.57	21.183	0.000	4.807	0.000	127.504
	Non-recognition Leader producers as models	3.02	0.23					
Scientific validity of Leader producers	Adoption leader producers as extension workers	3.29	0.42	0.090	0.765	0.321	0.748	128
	Non-adoption leader producers as extension workers	3.25	0.55					
Effectiveness of Leader producers	recognition Leader producers as models	3.26	0.52	22.242	0.000	2.573	0.011	127.067
	Non-recognition Leader producers as models	3.09	0.25					
Effectiveness of Leader producers	Adoption leader producers as extension workers	3.39	0.54	10.289	0.002	2.413	0.020	48.807
	Non-adoption leader producers as extension workers	3.14	0.41					

* In the range (1-5)
Source: Own calculation.

CONCLUSIONS

The results of the present study showed that more than half of the studied gardeners (53.8%) had no knowledge about the leader producers in their area, and more than 53.3% of those surveyed had never visited any sample farm. At the same time, nearly 70 percent of gardeners stated that in their view, the 'leader producer' could be their agricultural model; however, only 26.9 percent stated that they preferred the 'leader

producer' as representative of Agriculture-Jihad or extension worker. The leader producers were the fifth source of information and only 11.1% of the gardeners received information from them. Therefore, they do not have a high status as a source of information. Taken together, these findings confirm the weak position of the 'leader producers' among the gardeners. Overall, more than 60 percent of gardeners cited the effectiveness of leader producers as average. Gardeners who had less experience, higher education, more area under cultivation, and a high number of visits to agricultural departments and consultations with experts and were more interested in the agricultural profession also found the 'leader producers' to be more effective. According to the results of the research the following suggestions can be made:

- Using 'leader Producers' as representative of the Agriculture-Jihad or extension worker in areas covered by agricultural activities
- Planned visits from the 'leader Producers' farms in the application of new technologies, including modern irrigation, monthly, seasonally, etc.
- Organizing extension and training classes on the optimal use of inputs and marketing of agricultural products with the presence of 'leader producers'.

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