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The profitability and characteristics of greenhouse capia pepper farmers: A case of Kaş district, Antalya, Turkey

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Abstract

In this study, the socio-economic structure and profitability of the farmers producing capia pepper in Kaş district of Antalya were investigated. In the district of Kaş, surveys were conducted with 77 farmers producing capia pepper with face to face via questionnaire. The data belongs to the 2016 production period. As a result of the research; in the production of capia pepper, the relative profit was calculated as 1.56. However, 22.08% of the farmers had a negative profit. The most important reason for this was the low productivity of the unit area and sales price.

Key words: Capia pepper, profit, farmer, cost, Kaş

Introduction

Red pepper produced in the world belongs to the Capsicum of the Solanaceae family and grown in temperate climates zone (Beis, 1990; Yemiş, 2001). Greenhouse activity is one of the important livelihoods in Kaş. Production units show a small family business. Greenhouse in the distinction is made of glass and plastic. Due to the geographic location of Kas district, the production of capia pepper became important. There is a long period of foggy weather on a bowl-shaped plain on four sides. It is stated that this situation provides quality and yield increase in pepper production undercover. The production of capia pepper in the greenhouse has increased significantly in the region in the last five years. Turkey was given 737177 hectares in the greenhouse to pepper production in 2017. The 46.36% of these greenhouse areas are plastic, 24.71% is a low tunnel, 14.50% is glass, and 14.43% is a high tunnel. In the same year, the vegetable production was approximately 7.38 million tons in the greenhouse. The 83926 decares of the vegetable fields created pepper areas in the greenhouse. Total pepper production was 704293 tons. Thus, pepper share is 11.38% in the greenhouse vegetable areas in Turkey, and 9.54% of the total production. The pepper capia subject to study in Turkey in 12282 decares area, totaled 128974 tonnes in the greenhouse. Capia pepper production areas accounted for 14.63% of total pepper production areas and 18.31% of production in the greenhouse. The distribution of the species in greenhouse pepper production in Turkey, green pepper comes in front with 56.05% share. This type is followed by capia pepper with 18.31%, bell pepper with 14.27%, and banana pepper with 11.37% (TURKSTAT, 2019). Kaş district of Antalya has a total of 25250 decares of vegetables in the greenhouse. In the same year, vegetable production in these areas was 385475 tons. The district realises 8.27% of the greenhouse vegetable areas and 10.68% of the vegetable production in Antalya. Pepper in the greenhouse areas in the district covers 6995 decares of total vegetable areas and constitute 27.70% of the total area. In this district, pepper production is 68863 tons, and it meets 17.86% of total vegetable production. With these cultivation areas, the district covers 18.90% of the pepper in the greenhouse areas of Antalya and 17.44% of its production.

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Capia pepper in the Kas district is 4194 decares. 41940 tons of capia pepper was obtained from this area (Table 1). Consequently, 16.61% of the greenhouse vegetable production areas in the district constitute capia pepper with these values. 10.88% of the vegetable production is covered by capia pepper.
In the district, 6995 decares of pepper in the greenhouse area are 59.96% of the capia pepper. Of the 25444 tons of pepper production, 60.90% of them were made with capia pepper (Table 1).
In the greenhouse, capia pepper production in Kaş district constitutes 53.05% of Antalya capia pepper production. In this respect, the research area of the capia pepper sample area was determined as the Kaş district.

Table 1. Pepper production in a greenhouse in Kaş district (2017 year)

Cover type	Peppers	Harvested area (decare)	Production (tonnes)	Harvested area (%)	Production (%)
Greenhouse (Glass)	**Banana**	295	2655	4.22	3.86
	Green	792	7128	11.32	10.35
Greenhouse (Plastic)	**Banana**	837	8370	11.97	12.15
	Bell	106	1060	1.52	1.54
	Capia	**4194**	**41940**	**59.96**	**60.90**
	Green	771	7710	11.02	11.20
Total		6995	68863	100.0	100.0

Source: TURKSTAT, 2019

Gül et al. (2009) investigated sixteen vegetable prices and their fluctuations using by the data from Antalya Wholesale Fruit and Vegetable Market Branch Directorate for the period of 1997-2006. Vegetable prices were analysed monthly by converting to real prices. They used simple, trends and active averages methods to estimate the seasonal price fluctuations. They found the price of pepper has fluctuated sharply.
Dagistan et al. (2015) determined red pepper production economics and pesticide usage in Hatay. They detected pepper production per hectare was 149.4 kg with a profit of 2040 $.
Aytop and Akbay (2018) determined the cost, profitability and physical production inputs of Maraş Pepper. They calculated the profit margin per kilogram obtained from pepper production was 0.32 TL, and the proportional profit in Maras Pepper production was 1.26.
Şirikçi and Gül (2019) analysed the production costs and profitability of red pepper in Kahramanmaraş province covers the period 2004-2018. They found that the production costs of 2018 increased by 21%, depending on 2004 and relative and absolute profit decreased compared to the beginning of the period.
In this study, it was aimed to determine the farmers' profitability and the characteristics of the farmers.

Materials and Methods

The data were obtained from 77 farmers who produced capia pepper in the greenhouse in Kaş, Antalya. Data gathered from farmers belonged to the 2016 production period.
The number of capia pepper growers and capia pepper fields was obtained from the District Directorate of the Ministry of Agriculture and Forestry of Kaş, Antalya. Stratified sampling was applied to this main population. The number of pepper producers to be interviewed was calculated as 77 with a 10% margin of error and a 90% confidence interval. The distribution of the surveyed producers, according to the greenhouse areas, was given in Table 2. Farmers with capia pepper area less than 2.50 decares were identified group I, the producers with 2.51-5.00 decares area was II. group, producers with an area over 5.0 decares was III. group (Table 2).

Table 2. Sample size

Groups	Greenhouse area (capia pepper, decares)	Number of farmers interviewed (person)	Percentage (%)
I	<2.50	23	29.87
II	2.51-5.00	20	38.96
III	5.00<	34	31.17
Total		77	100.00

The data were obtained from the capia pepper growers by the face-to-face survey method. The questionnaire included the following questions: (i) socio-economic characteristics of farmers, (ii) technical information about capia pepper production activity, (ii) economic information of farmers on capia pepper production activity.
A single budget method was used to calculate the cost items of farmers in the region. The costs of production activities were examined as variable and fixed costs.
Cost elements are divided into two in terms of their economic characteristics. These; (i) fixed costs (rent, insurance, depreciation, permanent employee wages, interest, etc.) and (ii)

that are not dependent on the capacity of production, decreasing and multiplying, i.e., variable, by production volume (Açıl, 1977).

The unit production cost was calculated by dividing the production costs into production. The relative profit was calculated by proportioning the gross production value to production costs (Kiral et al., 1999).

The primary data obtained from farmers were tabled and interpreted.

Results and Discussions

The average of the interviewed producers' age was 44.5. The experiences of agricultural activity were 11.3 years on average and 4.4 years on the production of capia pepper (Table 3).

Table 3. Farmer characteristics

Groups	Farmers' age (years)	Experience in the farm activity (years)	Experience in the capias pepper production activity (years)	Household size (person)
I	46.00	13.22	4.48	3.87
II	44.30	8.37	3.67	4.33
III	43.25	13.21	5.25	4.54
Average	44.48	11.32	4.40	4.26

When the population structure of the farmers was examined, it was found that 58.4% of the total population was concentrated in the 15-49 age group. 45.5% of the total population was female, and 54.5% were male. It was determined that the household size was 4.3 persons on farms.

It was determined that 11.7% of the pepper producers interviewed in the region were engaged in non-agricultural business. It was found that 11.7% had computers, 13.0% had internet, and 92.2% had automobiles. 55.8% of the capia pepper producers in the region were using credit cards, and 90% had social security.

When the indebtedness of the farmers in the last five years was examined; 28.57% stated that the indebtedness decreased, 20.78% had the same debt, and 50.65% had increased the indebtedness. The reasons for the increase in the indebtedness of the producers of the region can be attributed to the increase in production cost and the addition of new ones to the greenhouse areas in recent years. 69% of capia pepper producers used agricultural loans, and 87.0% were members of agricultural organisations.

About 51.95% of the farmers were only producing capia pepper. In addition to the capia pepper production, 44.16% of the farmers engaged in livestock production, capia pepper production as well as other plant production activities in the rate of 2.60%, pepper production, while other vegetative production and livestock activities in the rate of 1.30% (Table 4).

Table 4. Agricultural activity of farmers (%)

Groups	Only capia peppers	Capia peppers and livestock	Capia peppers and other crops	Capia peppers, livestock and other crops	Total
I	30.43	60.87	8.70	0.00	100.00
II	53.33	46.67	0.00	0.00	100.00
III	70.83	25.00	0.00	4.17	100.00
Total	51.95	44.16	2.60	1.30	100.00

It was determined that agrochemical dealers (4.9 points according to 5 points Likert scale) were very effective in deciding the inputs used by capia pepper producers in the region. Their information, buyer requests, and the agricultural organisation were determined to be moderately effective. It was determined that 43 (55.8%) of the capia pepper producers kept records in the enterprise.

Seedlings row spacing used by the producers interviewed in the region, varied between 110 cm and 160 cm. Farmers were mostly used 125-140 cm in-row spacing. The distance between seedlings ranged from 30 cm to 60 cm. Farmers preferred the most seedling distance of 40 cm.

Regional dealers were generally effective in a seedling supply channel.

It was determined that 27.3% of capia pepper farmers knew the integrated pest management, 64.9% knew good agricultural practices, 58.4% knew organic agriculture and 54.5% knew biological control.

In the decision-making on the product variety of farmers interviewed in the region, the most active role was the company recommendations. Consultant suggestions were also useful in these decisions.

Capia pepper yield in the study area was calculated as 7755.98 kg per decare. The harvest number of capia pepper was 23. Capia pepper area was determined as 4.79 decares. In pepper production, the irrigation system was realised by drip irrigation. The pepper production period in the region could exceed ten months, and the number of irrigation was 120. Farmers reported a 0.96% product loss in their production (Table 5).

Table 5. Capia pepper area, yield, product loss

Groups	Yield (kg per decares)	Number of Harvest (pcs)	Capia pepper field (decare)	Number of Irrigation (units)	Product loss (%)
I	7463.12	21	2.16	114.8	1
II	6965.10	23.5	4.09	117.7	0.9
III	8346.03	25.4	7.88	137.5	1
Average	7755.98	23.3	4.69	123.0	0.96

The average selling price of capia peppers was 1.99 TRY. As the greenhouse scale increased, the selling price of unit capia pepper increased. The average cost of capia pepper was 1.56 TRY. As the greenhouse scale increases, the unit capia pepper cost fell. The relative profit was found to be 1.56. As the greenhouse scale increased, the relative profit from pepper production increased. As a result, the greenhouse scale increases farmers' profitability (Table 6).

Table 6. Capia pepper cost and profitability

Groups	Sale price per kg (TL)	Production cost per kg (TL)	Relative profit
I	1.77	1.50	1.18
II	1.99	1.48	1.35
III	2.05	1.12	1.84
Average	1.99	1.28	1.56

The share of the factors that make up the capia pepper production cost of the farmers interviewed in the region was given in Table 7. The most crucial cost elements in Capia pepper production were seedling, fertiliser, pesticide, labour. The variable cost ranged from 69.27% to 79.24% in farmer groups. The fixed cost was calculated between 20.76% and 30.73%. As the greenhouse scale increases, the rate of variable cost increases and the fixed cost share decreases. Small-scale farmers benefited from more family workforce. The greenhouse facility interest rate and depreciation share were also high on a small-scale farm. As a result, the greenhouse scale increases, and fixed cost decreases (Table 7).

Table 7. Distribution of capia pepper production cost (%)

Cost items	I	II	III	Average
Seedling	17.71	19.51	20.73	19.83
Fertilisers	12.28	15.41	19.44	16.90
Pesticides	10.46	10.66	12.93	11.74
Labour temporary	10.24	9.01	9.98	9.68
Marketing	5.79	5.21	5.17	5.28
Irrigation	5.63	5.59	3.35	4.49
Machinery rent	2.81	2.94	1.83	2.37
Other variable cost	1.06	1.93	2.05	1.85
Revolving fund interest	3.30	3.51	3.77	3.61
Variable cost	**69.27**	**73.76**	**79.24**	**75.76**
Land tenure	6.51	8.10	8.43	8.02
Family labour	9.30	6.24	3.75	5.49
Greenhouse facility cost of interest	6.47	4.93	3.12	4.28
Greenhouse plant depreciation	6.36	4.75	3.09	4.18
General administrative expenses	2.08	2.21	2.38	2.27
Fixed cost	**30.73**	**26.24**	**20.76**	**24.24**
Production cost	**100.00**	**100.00**	**100.00**	**100.00**

With the positive findings in the economic indicators, it was determined that the farmers' tendency to continue the production of capia pepper and their satisfaction was high. In small-scale enterprises, these indicators were lower. The level of knowledge about the capia pepper cultivation was moderate. About 22.03% of the farmers lost in the capia pepper production in the investigated period. The greenhouse area, the number of households, the tendency to continue the production of capia pepper, and their satisfaction were lower (statistically significant at 10% between the two groups (the profitable farmer; the loser

farmer)). Capia pepper cultivation experience and knowledge levels were also low. Capia pepper is lower in yield per unit area (about 5000 kg). This was one of the reasons why unit production costs were higher than the other group (profitable).
68.83% of the farmers interviewed used agricultural credit for the production of pepper in the period examined. The productivity of the farmers who use credit to the unit area, the tendency to continue the production of capia pepper and their satisfaction were higher (statistically there is a significant difference between the two groups (the ones who use credits, the ones who do not use). Capia pepper cultivation has low experience but high levels of knowledge. The yield of capia pepper to the unit area was about 8007 kg and more than 1000 kg. This leads to lower production costs compared to the other group (non-user). Moreover, unit sales prices were 14% more than those who do not use loans.

Conclusions

In this study, the characteristics and profitability of greenhouse capia pepper producers were investigated. The Kaş district of Antalya was taken to the scope of the study. In this context, 77 farmers were interviewed face-to-face with the questionnaire method. The average age of the capia pepper producers in the region was 44.5 years, and the majority of them were primary school graduates. More than half of the farmers kept records in their production. The rate of non-agricultural work was low. More than half of the farmers were growing only capia pepper. A significant portion of the producers (about 70%) were using agricultural credit. Farmers' indebtedness in the last five years has also increased. More than half of the producers knew the concepts such as organic agriculture, biological control, and good agricultural practices.
The firm's recommendations were most effective in deciding the variety of products of the producers. Agrochemical dealer was also useful in deciding the inputs used of the farmers.
The essential cost items were fertiliser, seedlings, pesticide, and labour cost.
The farmers' satisfaction with the production of capia pepper was high. The relative profit was calculated as 1.56, and this is also effective on satisfaction.
The most critical factor for the farmers in the region to go to the production of capia pepper is to provide a good income. Also, the incentives for producers to be more informed about the benefits of cooperatives can increase the profit rates of small-scale farms. Useful information/guidance on input use is also vital to sustainability.

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References

Açıl, A.F., 1977. Calculation of Agricultural Product Costs and Developments in Agricultural Product Cost in Our Country (in Turkish). Ankara University Faculty of Agriculture Publications, 76p., Ankara.

Aytop, Y., Akbay, C., 2018. Economic Analysis of Spice Red Pepper (Maras Pepper) Production. Türk Tarım ve Doğa Bilimleri Dergisi 5(4), 455–464.

Beis, S.H., 1990. Food Coloring from Red Pepper (in Turkish). MSc. Thesis, Anadolu University Health Sciences Institute, 27p., Eskişehir.

Dağistan, E., Demirtas, B., Tapki, N., Üremis, I., Arslan, M., 2015. Economic analyses of pesticide usage on red peppers (Capsicum) in Hatay Province in Turkey and determination of production cost. Custos e@ gronegócio on line, 11(3), 56-65.

Gül, M., Dağıstan, E., Demirtaş, B., Yılmaz, H., Karataş, A., Yılmaz, Y. 2009. Developments and Seasonal Fluctuations in Some Vegetable Prices in Antalya Province (in Turkish). Mustafa Kemal Üniversitesi Ziraat Fakültesi Dergisi 14(2), 57-68.

Kıral, T., Kasnakoğlu, H., Tatlıdil, F.F., Fidan, H., Gündoğmuş, E., 1999. Cost Calculation Methodology and Database Guide for Agricultural Products (in Turkish). Agricultural Economics and Research Institute, TEPGE Report No: 1999-13, 143p., Ankara.

Şirikçi, B.S., Gül, M., 2019. Analysis of Red Pepper Cost and Profitability in Kahramanmaraş Province. 2. International Conference on "Agriculture, Forestry & Life Sciences", April 18-20, 2019, Prague, 75-82p., ISBN: 978-605-81152-2-4.

TURKSTAT, 2019. Turkish Statistical Institute, Agricultural Statistics data. Web page, (www.tuik.gov.tr), Access date: 15.03.2019.

Yemiş, O., 2001. Research on Oleoresin Capsicum Production from Red Peppers (in Turkish). MSc. Thesis, Ankara University Institute of Science and Technology, 71p., Ankara.