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## A Study About Technical, Economical Situation, Problems and Improvement of Oil Rose (*Rosa damascena* Mill.) in Turkey

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**Abstract:** The purpose of this study was to state the present situations of rose oil (*Rosa damascena* Mill.) production, to evaluate the economical terms of the rose oil farms and make suggestions about sustainability. The data were obtained from 177 rose oil farms through survey research in study. The single budget analysis method was employed on determination of production cost in the 2008 production season. According to the results, the average rose garden size was 0.68 hectare, the rose oil experiences of farmers was 24 years, the ages of rose gardens were 18 years, the production output of rose was 5499.4 kg per hectare and production cost was calculated as US\$ 4489.8 per hectare on the average basis of the exercised enterprises. The relative profit was 1.36. The solution suggestions for the problems in rose sector; putting discount to the input prices, needs of state support, consideration about the prices and costs. One of the important solution suggestions was to produce more consciously. For sustainability of rose oil sector, the proposed solutions for the problems of rose and products commercially must be increased, new product design, marketing of products both international and national arena should be carried out publicity. More technical information and technical help must be provided to the farmers.

**Key words:** *Rosa damascena* Mill. Economical Situation, Turkey.

### Introduction

*Rosa damascena* Mill. belongs to the family Rosaceae and genus *Rosa*, which includes 200 different species and more than 18000 cultivars <sup>1</sup>. *R. damascena* is an important essential oil crop, with Bulgaria and Turkey being the main rose petal processing countries in the world. Rose oil is a highly prized product used in perfumery, cosmetics, food industry and pharmacy <sup>2,3</sup>.

Turkey is an important country in the world's rose oil production. Most of the oil rose production

carried out in Isparta. The other important cities for rose oil production are Afyonkarahisar, Burdur and Denizli. Although the allocated oil rose harvested areas in the total agricultural land are very limited, it is the most prominent agriculture product economically in Isparta <sup>4</sup>. The province, Isparta is famous for its rose oil, on the other hand it also has a privileged position due to profit per unit area, employment opportunities and exportation.

About 84 % of the rose production in Isparta is

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obtained from Gönen, Keçiborlu, and Centre districts. Gulbirlik (The Oil Rose and Oily Seeds Agriculture Sales Cooperatives) cooperative was established in 1954 and this cooperative has an important place in marketing channel. Gulbirlik is a Union of Cooperatives originally formed by nine founding members. Gulbirlik currently comprises six separate cooperatives including 8.000 producer partners, four rose oil plants at four different locations and two rose concrete plants. It processes 320 tons of rose flowers per day during the season (from the second half of May to the end of June) and produces rose oil and rose oil solid in conformity with world standards<sup>5</sup>. In the region there are about 20 factories in total and two of them have foreign funds.

There were various studies about this subject. Uçar<sup>6</sup> calculated the production cost and using inputs of rose oil in Isparta province. Özçelik *et al.*<sup>13</sup> stated in their studies that the plantation area of enterprises was 4.51 hectare and the parcel number was 3.50. The land of the farmers was 78.75 % individual land and out of this land 21.58 % was rose planted area, 4.10 % was orchard field, 2.29 % was vegetable field, 5.01 % was vineyard field. The population was 4.96 and the gross profit (86.58 %) was supplied from crop production and 13.42 % was from animal production. When the transaction volume of the enterprise increased, the gross profit increased accordingly. As an alternative to the rose growing in agricultural enterprises; vineyard, apple and wheat bring the most profit per hectare.

Gül<sup>4</sup> studied about the development of rose oil agriculture in Turkey which is the premier rose oil producer. Nearly all rose oil was exported to the EU and the USA, Japan, the Middle East countries. The importance of Isparta in Turkey rose oil plantation and production has decreased both proportionally and absolutely since 1979.

Demircan<sup>7</sup> studied using input and production cost of rose oil in Isparta. According to the research results, the manpower and machine power in the facility period was 60.27 and 3.62 hours respectively and in the production period it was 147.29 and 5.62 hours respectively. The proportional profit in the rose production was calculated as 1.61.

Giray and Ormeci Kart<sup>8</sup> conducted their study through interviews with Gulbirlik staff and producers as the main stakeholders, and academics and agricultural experts as they know the area and subject in Isparta in 2011. According to the authors, the most important challenge of the sector is to provide a sustainable production in quantity and quality in parallel with market demand. Production and marketing problems at internal and external markets come from organisational problems in processing, lack of farmers' interest in investment and establishing recording systems to keep data in production and processing.

Ormeci Kart *et al.*<sup>9</sup> tried to exhibit the progress of the growth, production and trade in oil rose, discussed the problems of the sector, put forth the solutions and determined the strong side, weakness, threats and opportunities by SWOT analysis. Isparta province holding 84.41 % of oil rose production in Turkey, has the potential to create a cosmetics valley to develop cosmetics and perfume industry in Turkey.

In this study, the present situation of oil rose production in Turkey was discussed, and suggestions were made in terms of sustainability and also evaluations of the enterprises which produce oil rose economically were discussed.

### Material and methods

In this study, the data which was obtained from oil rose farmers through face to face interview with the help of questionnaire. Data from similar corporations and statistics which were done by various organizations and various relative researchers also used. The data for 2008 production period was used in this study.

The corporations in the region were visited. Gönen, Keçiborlu, Centre, Egirdir district's villages where the oil rose is intensively produced were selected on purpose. 177 oil rose farms in the villages were identified with stratified sampling and based on the data obtained from these enterprises through survey. Enterprises were divided into three groups. The first group has 0.10-0.49 ha, the second group has 0.50-0.99 ha, and the third group has 1.00 ha and more oil rose planted area.

A single budget analysis method was used in the determination of oil rose production costs. According to this, income and expenses were not calculated for all of the products which are produced in agriculture enterprise, but only for oil rose. The 3 % of the total variable costs is considered as general administration expenses. The working capital interest is a variable cost and represents the opportunity cost of the capital which is invested to the production activity. Working capital interest was calculated by applying to the variable costs multiplied half of the (7 %) interest rate which T.C. Ziraat Bank applies to the agriculture credits. The interest of bare land value is found by taking 5 % of the bare land value in the research region. Establishment depreciation costs annual is obtained by dividing the total facility costs in the facility period to the economic life (10 years) of the rose garden. Establishment interest rate cost is calculated by applying 5 % interest to the half value of total facility costs. In the analysis of farms, general features of the economic and technical indicators for oil rose results were evaluated.

## Results and discussion

### *The size of rose plantations in the enterprises*

According to the data which were obtained from the region, the year of the rose plantation was 18 on average of enterprises. When it was analyzed based on age groups of the gardens, it was clearly seen that the rate of young gardens were 34 % while the rate of old gardens were 39.6 %.

In the survey, according to the data, enterprises have been carried out for 24 years for oil rose growing. When this situation was evaluated in terms of the experience of the enterprise, it seems that there were generally 21 years old or over rose growing experience in the enterprises (63 % of total oil rose farms).

Some indicators about the oil rose enterprises by the size were analyzed in Table 1. Number of the first group enterprise was 83, the second group enterprise was 29, and the third group enterprise was 65.

The average rose garden size was 0.68 hectare. When this situation was evaluated according to

the rose garden size groups, it was ascertained that the enterprises have rose gardens between 0.20 hectare and 1.34 hectare. The rate of enterprises which has big rose gardens is low (Table 1).

In the oil rose production, 99.4 % of the farmers operate tillage. While all the farmers which were included in the first and third group cultivate soil, the rate for second group enterprise is 96.6 %. Soil is generally cultivated in February, March and April (55 % of the enterprises). While the rate of the farmers operating tillage by a tractor was 56.5 %, while 33.5 % of them were operating by the help horse and the other methods (Table 1).

In the region, pruning was also available for nearly all of the enterprises (85.9 %). It varied between 79.3 % and 90.8 % based on the enterprise groups. Pruning was carried out in February, March and April seasonally (56.2 % of the enterprises).

In the region, 84.7 % of the enterprises use rejuvenational pruning. This rate changed between 79.3 % and 86.2 % in the enterprise groups. However, the height of the applying stage was a sign which shows the consciousness of the farmers about the rejuvenational pruning. It was observed that the rejuvenational pruning was used once in 7 years. This period was proper for growing technique (Table 1).

The production of high rose flower and obtaining good quality of oil rose per field in rose production depends on bringing up the necessity of inputs in a true way and therefore it depends on the proper fertilizing. It has been found out in the last years that the rose garden soils are rich in potassium and very poor in organic material. Although the soils are very rich in potassium, it is stated that the plant cannot take advantage of the potassium sufficiently. First of all it must be given to the gardens which will build new farming fertilizer together with plantation 3-4 tons burn manure per decars. On the other hand this amount of manure should be used once in two/three years in yielded garden in autumn or February and this must be mixed with the soil <sup>10</sup>.

Most of the farmers (74 %) do not perform soil analysis. It is possible to interpret that producers behave unconsciously about the implementation

**Table 1. Some indicator of oil rose farmer**

Indicator	I group	II group	III group	Average
Number of interviewed farms	83	29	65	177
Average oil rose harvested areas of the interviewed enterprises (ha)	0.20	0.59	1.34	0.68
Ploughing status (%)	100.0	96.6	100.0	99.4
Pruning status (%)	84.3	79.3	90.8	85.9
Pruning for rejuvenating status (%)	85.5	79.3	86.2	84.7
Knowledge of oil rose cultivation (%)	56.6	72.4	64.6	62.1
Knowledge of organic oil rose cultivation (%)	16.9	13.8	20.0	17.5
Importance of organic oil rose production for the sector depend on farmers opinions (%)	53.0	48.3	58.5	54.2
Change of production practiced from conventional to organic farming for coming years (%)	30.1	13.8	40.0	31.1
Possibility of continued oil rose production for coming years (mean)*	3.9	3.5	3.9	3.8
Oil rose production increase during 15 years (mean)**	3.1	2.8	2.9	3.0
Satisfaction of Gulbirlık (mean)***	2.8	2.4	2.5	2.6
Satisfaction of private firms (mean)***	3.0	3.0	2.8	3.0
Irrigation status (%)	50.6	44.8	40.0	45.8
Foliar fertilizer application (%)	83.1	65.5	75.4	77.4
Chemical fertilizer application (%)	88.0	93.1	92.3	90.4
Organic fertilizer application (%)	9.6	17.2	7.7	10.2
Manure application (%)	21.7	27.6	15.4	20.3
Soil analysis status (%)	22.9	24.1	30.8	26.0
Ploughing by tractor (%)	57.8	44.8	60.0	56.5
Use of N per hectare on oil rose production (kg)	198.4	212.0	172.2	191.0
Use of P <sub>2</sub> O <sub>5</sub> per hectare on oil rose production (kg)	200.9	166.9	168.2	183.3
Use of K <sub>2</sub> O per hectare on oil rose production (kg)	37.7	46.5	32.2	37.1

\* 1-Definitely not continue 2- Not continue 3- Undecided 4- Continue 5- Definitely not continue

\*\* 1- Decreased a lot 2- decreased 3- not changed 4- increased 5- increased a lot

\*\*\* 1- Definitely not satisfied 2- not satisfied 3- Undecided 4- satisfied 5- Definitely satisfied

of plant nutrition elements. In this respect, performing soil analysis should be encouraged and conscious fertilizer use should be increased.

All of the enterprises in the study used fertilizer. In addition to this, chemical fertilizer was used nearly in all the enterprises (90.4 %) (Table 1). It was found out that the fertilizing is usually common in the early spring months.

The rate of the farmers who use foliar fertilizer in the enterprises was 77.4 % in the average of enterprises. It was found out that the month when

foliar fertilizer was applied April and May (56.6 % of the enterprises) mostly. The rate of the farmers who use manure was 20.3 % in the average of enterprises and the rate of the enterprises that use organic fertilizer was 10.2% (Table 1).

The nitrogen amount which was used for the rose growing in the region was 191.0 kg and it changed between 172.2 kg to 212.0 kg depending on the enterprise groups. The phosphorus used per hectare was 183.3 kg in the average of enterprise and it changed between 166.9 kg to

200.9 kg in the enterprise groups. Potassium used per hectare was 37.1 kg and it changed between 32.2 kg to 46.5 kg depending on the enterprise groups (Table 1).

One of the most significant problems in the rose gardens of the region is that it is not attached great importance to the struggle against diseases and pests which directly affect the yield and quality of the rose. The most common diseases in the rose gardens of the regions could be listed as: “*Phragmidium mucronatum* and *Sphaerotheca pannosa* var. *rosae*” and the harmful ones are “*Parthenolecanium* spp., *Tetranychus urticae*, *Syrista parreyssi*, *Ardis brunniventris*, *Rhynchites hungaricus*, *Agrilus cuprescens*, *Lepidosaphes ulmi* and *Macrosiphum rosae*”.

In the study region; pesticide against various diseases and pests were used. For weed controls; farmers were taken cultural practices such as hoeing, ploughing, etc.

Isparta is one of the premier cities in Turkey with its irrigation possibilities. Oil rose is a plant which does not necessarily need irrigation in the region. However, when it is irrigated, it gives almost two times more production. For example, Uçar *et al.*<sup>11</sup> determined that increasing amount of irrigation water significantly increased the rose flower yield by 2.44, 2.35 and 2.17 times. About 45.8 % of the enterprises taken advantage of irrigation in the oil rose gardens. This rate changes between 40.0 % and 50.6 % in the enterprise groups (Table 1). The enterprises preferred mostly surface irrigation (75.4 %). However, drip irrigation system which is one of the important modern irrigation is being employed in the study area.

Organic rose production which is an important production branch about product differentiation increases with the development as it is observed in recent years. In the study area, 17.5 % of the oil rose farmers declared that there was information about organic oil rose production. This rate changes ranges between 13.8 % and 20.0 % in the enterprise groups (Table 1).

Also, the ideas of transferring to the organic rose production of the oil rose farmers were examined. Accordingly, 31.1 % of the enterprises thought about transferring to the organic oil rose production (Table 1). The first reason why the

enterprises did not think about transferring to the organic rose growing is that they tried this production but gave up because of the production decrease, plant died and the other reasons are inadequacy of the pesticides used and no price difference (20 % of the enterprises).

The opinions of the rose farmers about the importance of the organic rose production were asked for the development of the sector. About 54.2 % of the enterprises think that the organic production is important sector for improvements. The rate of the farmers who think that the organic production is important for sector improvements changed between 48.3 % and 58.5 % in the enterprise groups (Table 1).

The satisfaction level of the GULBIRLIK activity which has quite an important place in the oil rose market of the enterprises was examined. Accordingly, it was ascertained that most enterprises were undecided for cooperating with GULBIRLIK and also private firms. As a result, it was proved that the oil rose productions of the enterprises have not increased in the last 15 years and it was ascertained that they think to continue the oil rose producing as a general tendency (Table 1).

Machine rent, labour, material (irrigation, pesticides, fertilizer) and other variable costs, working capital interest constitute the variable cost elements in the oil rose production. The variable cost per hectare in the rose production in the enterprises was calculated to be US\$ 2885.2. This value changes ranges between US\$ 2559.5 to US\$ 4217.2 in the enterprise groups (Table 2).

In the study area, rate of variable costs in the total production costs was 64.3 %. The rate of variable costs changes between 61.4 % and 71.7 % in the enterprise groups. The most important cost element of the variable costs was labour (28.6 %) (Table 2). In the studies which were made in the region, the rate of variable costs of the production costs was observed to be 69.86 %<sup>7</sup> and 72.92 %<sup>12</sup>.

The establishment depreciation cost, establishment interest rate, land rent, the general economical expenses constitutes fixed costs in the rose production. The fixed cost per hectare was US\$ 1604.6 in the rose production within the study

**Table 2. Production cost of oil rose**

Production cost items	I	II	III	Average
	group	group	group	
	Per hectare (US\$)			
Material cost	1353.4	1021.9	855.2	946.9
Renting cost of machinery	687.3	468.2	345.8	409.8
Labour	1786.8	1476.2	1148.7	1282.3
Other variable cost	113.7	79.5	42.4	57.4
Interest of working capital	275.9	213.2	167.4	188.8
Variable cost	4217.2	3259.0	2559.5	2885.2
General administration expenses	126.5	97.8	76.8	86.6
Establishment interest rate	219.8	204.7	218.7	216.9
Establishment depreciation value	879.1	818.6	874.9	867.5
Land tenure	439.5	409.3	437.5	433.7
Fixed cost	1664.9	1530.3	1607.9	1604.6
Total production cost	5882.0	4789.3	4167.5	4489.8
	Percentage (%)			
Material cost	23.0	21.3	20.5	21.1
Renting cost of machinery	11.7	9.8	8.3	9.1
Labour	30.4	30.8	27.6	28.6
Other variable cost	1.9	1.7	1.0	1.3
Interest of working capital	4.7	4.5	4.0	4.2
Variable cost	71.7	68.0	61.4	64.3
General administration expenses	2.2	2.0	1.8	1.9
Establishment interest rate	3.7	4.3	5.2	4.8
Establishment depreciation value	14.9	17.1	21.0	19.3
Land tenure	7.5	8.5	10.5	9.7
Fixed cost	28.3	32.0	38.6	35.7
Total production cost	100.0	100.0	100.0	100.0

area and in the enterprise groups, it changes between US\$ 1530.3 to US\$ 1664.9. The portion of the fixed costs in the total production costs was 35.7 %. The fixed cost in the enterprise groups was about 28.3 % to 38.6 %. The most important element of the fixed costs is establishment depreciation cost (19.3 %) (Table 2). In the studies which were carried out in region on different dates, the portion of the fixed costs into the production costs was found to be 30.14 % <sup>7</sup> and 27.8 % <sup>12</sup>.

The production cost per hectare was US\$ 4489.8 in the rose production in the study area and it changed between US\$ 4167.5 and US\$ 5882.0 in the enterprise groups (Table 2).

When the enterprise size gets bigger; machine

rent, material, labour force, variable costs and production costs decrease. But there is not any statistics connection between the enterprise group and production costs items (Table 2).

According to the data which were obtained from the enterprises per kilogram production cost, selling price, gross production value (GPV), gross profit, absolute profit and relative profit were given in Table 3.

Per hectare flower yield was calculated as 5499.4 kg in the average of enterprises (Table 3). In the surveys which were conducted in the region on different dates, rose flower production were calculated to be 3450 kg Uçar <sup>6</sup>, 3836 kg Özçelik *et al.*<sup>13</sup>, 5041.9 kg Demircan <sup>7</sup>, 4166.3 kg İkiz and Demircan <sup>12</sup>.

**Table 3. Production profitability of oil rose farms**

Indicators	Groups of farms			Average
	I group	II group	III group	
Flower yield per hectare (kg)	6848.84	6054.31	5134.71	5499.41
Production cost per kilogram (\$)	0.86	0.79	0.81	0.82
Selling price per kilogram (\$)	1.08	1.07	1.12	1.11
Gross production value per hectare (GPV) (\$)	7410.72	6496.73	5760.10	6090.09
Gross margin per hectare (\$)	3193.53	3237.78	3200.58	3204.91
Absolute profit per hectare (\$)	1528.68	1707.47	1592.65	1600.27
Relative profit	1.26	1.36	1.38	1.36

In the region, 1 kg rose production cost was calculated as US\$ 0.82. This changes between US\$ 0.79 to US\$ 0.86 in the enterprise groups. Selling price of 1 kg rose in the enterprise was 1.11 US\$ and it changes between US\$ 1.07 to US\$ 1.12 in the enterprise groups (Table 3).

According to other data in the region; GPV which were supplied from rose production activity per hectare were calculated to be US\$ 6090.09. GPV changes between US\$ 5760.10 to US\$ 7410.72 in the enterprise groups (Table 3).

Gross profit was obtained by subtracting the variable costs from GPV. Accordingly, gross profit per hectare was amounted to US\$ 3204.91 in the enterprises during process periods and it ranges between US\$ 3193.53 to US\$ 3237.78 in the enterprise groups (Table 3).

Absolute profit per hectare which is supplied from rose production was calculated by taking the difference between the GPV and production costs. The average absolute profit was US\$ 1600.27 in the enterprises and it varies between US\$ 1528.68 to US\$ 1707.47 in the enterprise groups (Table 3). When the enterprises were taken into account individually, 20.3 % had negative net profit.

The relative profit, in this study, was calculated by dividing GPV to production costs. Relative profit was found to be 1.36 in the study. In other words with US\$ 1 cost oil rose farms get US\$ 1.36 GPV in rose production. The relative profit varies between 1.26 to 1.38 in the enterprise groups (Table 3). In other studies which were conducted on different dates in the region, relative

profit which was obtained from rose production was 1.61<sup>7</sup> and 1.05<sup>12</sup>.

When the rate of rejuvenating pruning with cost and profitability indicators of the enterprises in the regions were compared; the production costs, GPV, gross profit, absolute profit and relative profit per hectare were lower than the enterprises which do not make. But statistically there was not any difference.

The rate of using manure with some other indicators were examined, enterprises which use manure used more nitrogen, phosphoric and potassium. They sell 1 kg rose to the higher price and obtain more relative profit. There were differences statistically in terms of these indicators for enterprises using manure.

There are statistical differences in terms of enterprises' using organic fertilizer, amount of potassium use, production cost, and fertilizer costs. These values were higher in the enterprises which use organic fertilizer.

The connection between the situations of irrigation for the rose garden and some indicators were considered in the region; the amount of using nitrogen, the production costs per hectare were higher. The production cost, GPV, gross profit, absolute profit and relative profit were higher than the enterprises which did not make irrigation. These indicators were statistically different.

When the marketing channel which the enterprises, and economic indicators were compared, there were not statistical differences.

### Marketing Channels

The farmers who grow oil rose in the region sold 35.03 % of their products to the private companies, 46.33 % of them sold to GULBIRLIK, 18.64% sold to both of them (Table 4).

Rose oil industry has oligopolistic structure controlled by mainly GULBIRLIK and a few private companies. This is why “cost leadership” and/or “differentiation” which are main concerns of a value chain analysis for a competitive advantage are not paid enough attention by GULBIRLIK <sup>8</sup>.

In the Table 5, reasons for choosing oil rose marketing channels of farm enterprises were given.

The most important reason why the enterprises prefer this marketing channel was taking an advance and cooperative society and using advance in the enterprises was extremely common. It was stated that the researched enterprises

in the working region was not satisfied with the cooperative generally.

Averagely, 85 % of the farmers get their money for the product in the period of July-August. It was asked to the enterprises obtaining channels of the bolts in case of formation new rose garden. According to the information given, prior obtaining source of bolts of the enterprises was their own gardens. The other important obtaining channel was professional bolt production institutions.

### The opinions of the farmers about the future of the rose sector

The opinions of the enterprises which produce oil rose were asked about the future of the rose sector and results were shown in the Table 6. Accordingly, 22 % of enterprises engaged in the cultivation of roses has led to pessimistic beliefs such as “if such prices continue, there will be no oil rose production ten years later-after a few years

**Table 4. Marketing channel of oil rose growers**

Groups of farms	Marketing channel						Average	
	Private sector		Cooperative Gulbirlik		Cooperative-Gulbirlik + Private sector		N	%
	N	%	N	%	N	%		
I. group	33	18.64	32	18.08	18	10.17	83	46.89
II. group	6	3.39	19	10.73	4	2.26	29	16.38
III. group	23	12.99	31	17.51	11	6.21	65	36.72
Average	62	35.03	82	46.33	33	18.64	177	100.00

**Table 5. Reasons for choosing oil rose marketing channels of farm enterprises**

Reasons for choosing the sales channel	N	%
To give advance	46	26.0
Cooperative partner	39	22.0
Product price, ease-payment	25	14.1
Reliability-familiar	24	13.6
The absence of other purchaser	9	5.1
Proximity	9	5.1
Absence quota limit	7	4.0
To sell both in order to improve market	7	4.0
The interest shown by buyers/ to meet the needs	6	3.4
Lack of cooperative partners	5	2.8

**Table 6. Farmers' opinions on regarding the future of the oil rose industry**

	N	%
Conditional opinions: uncertain- due to price	33	18.6
Abstentions opinion: I do not know	12	6.8
Rather pessimistic view: Very bad-If such prices there would be no oil rose production ten years later-after a few years enterprises will not produce oil-bearing rose	36	20.3
Pessimistic view: Bad-does not look good	39	22.0
Quite optimistic: Great-Very good seeing	6	3.4
The optimistic view: Good	34	19.2
Hard opinions: Normal	17	9.6
Total	177	100.0

enterprises will not produce oil-bearing rose” “does not look good”.

#### **The problems of rose farmers**

The problems which the enterprises encounter in the rose growing were given in the Table 7. According to the data, the most important problem the farmers faced was lack of labour for harvest and diseases & pests control. The other problems which were stated as an important rate were weather conditions, yield losses, labours' request is very much difficult, irrigation, transportation and soil analysis. The important economical problems which were encountered in rose producing were; high input prices and high production costs. Premier problems which were encountered about marketing in rose producing in the study area are the low price of roses. Uncertainty of the rose price and late declaration of the prices are also important. The enterprises see the lack of state support and absence of minimum purchase prices for oil rose as a problem, too. Some of the farmers stated also the limitation of the market. The farmers also encountered with the problems in sale of product (for example: purchases were deducted over the tare and early closing). The other important problem in oil rose producing was lack of information of the farmers.

The important problems which the farmers encounter in the rose growing can be categorized into 4 titles; technical (lack of workers in the harvest, diseases-pests, bad weather conditions, production decrease, difficulty in plant care,

irrigation, transportation and soil analysis), economic (high input prices and high costs), marketing (low rose price, uncertain prices and late declaration of the prices, absence of the base price, limited market, lack of variety, deducting of purchase over the tare) and information (lack of information of the farmers).

#### **Solution suggestions for the problems of oil rose growers**

In Table 8 the solution suggestions of the enterprises to the problems which encountered in rose sector were given. As seen in the Table, the farmers provide firstly solution suggestion in price point (for example: reasonable prices, early announcement of the prices etc.). Second point was reduction of input prices. The other important point was state support. Government should determine a price as it happens in some other products, costs should be taken into account in pricing are only a few of the suggestions.

One of the important solution suggestions was producing of the farmers more consciously. In fact, with the regular seminars about rose, the increase of the farmers could be ensured and it was stated that the country agriculture offices could contribute to this sector with the engineers who specialized on rose. Also, being in good communication of these engineers with the farmers is important for forwarding the developments to the farmers in the sector.

The other suggestions which developed by farmers were the adoption of drip system,

**Table 7. Problems of oil rose sector**

<b>Problem</b>	<b>N*</b>	<b>%</b>
No idea	23	13.0
Lower the price of roses	95	53.7
To find the problem at harvest workers	61	34.5
Rose diseases pests	61	34.5
Production cost is high	57	32.2
Input prices are high	35	19.8
Uncertainty of the rose price/Price is not disclosed on harvesting season	30	16.9
Labours' request is very much/care difficult	25	14.1
Weather conditions-drought	22	12.4
technical knowledge is insufficient	20	11.3
The lack of state support/the absence of minimum purchase prices	19	10.7
Irrigation	19	10.7
Problems of logistic	15	8.5
Unconscious production	12	6.8
Not given advance	9	5.1
Yield losses	9	5.1
Lack/ limitation of market	8	4.5
Purchases are deducted over the tare	7	4.0
Inability to organize	7	4.0
In the early closing intake rose	6	3.4
Drip irrigation should be adopted	6	3.4
Not given importance to quality	5	2.8
Quota application	5	2.8
Excessive production	4	2.3
No service	3	1.7
Libra is not enough	1	0.6
Organic production	1	0.6
Soil analysis	1	0.6

\*Some farmers reported more than one option, the total exceeds 177 and the ratio exceeds 100%

**Table 8. Oil rose growers' solution for the problems**

<b>Suggestions*</b>	<b>N</b>	<b>%</b>
No idea	54	30.5
Purchase of rose should be at reasonable price	80	45.2
Prices should be announced early	33	18.6
Reductions in input prices	32	18.1
State support on rose production	30	16.9
Seminars should be on a regular basis subject rose/ farmers should be educated	25	14.1
Government should give base price as hazelnuts	20	11.3
County agriculture officials must deal with rose harvested area/	19	10.7

table 8. (continued)

Suggestions*	N	%
agricultural engineers specialized on rose should be work on		
agriculture officials/technical staff should be aware of farmer		
Market opportunities should be developed/differentiated	13	7.3
Price should be based on the amount oil quality	9	5.1
Gulbirlık should distribute the advance	6	3.4
Planting areas should be narrowed/rose production	5	2.8
reduce the level of demand		
Costs should be taken into account in pricing	5	2.8
Rose not be grown/spread in different regions/planting restrictions	5	2.8
The adoption of drip irrigation system	3	1.7
Organic production should be adopted	3	1.7
Producer organizations should be ensured	3	1.7
Quotas should not be placed	3	1.7
The institution's officials should seek the views of its partners	2	1.1
Technical and economical study should be done about the rose	2	1.1
Promotional activities should be done about roses and related products	2	1.1
Adsorbents that retain water in the soil, should be introduced to	2	1.1
farmer and encouraged to use		
Gulbirlık should establish laboratory for rose disease and pest	1	0.6

Some farmers reported more than one option, the total exceeds 177 and the ratio exceeds 100 %

regulation in planting areas, taking the demand in account, differentiation and development of the market, production should be differenced, promotional activities should be done according to the oil quantity which will be supplied from rose. Most of the farmers assumed themselves sufficiently informed about oil rose producing (57.3 %), accordingly the rate of the farmers who assume themselves insufficient was extremely high (35.2 %). In parallel with the producers' opinions about assuming themselves sufficiently, training activities about rose production and what they need to know are also included in the questionnaires of the survey. According to the data, most of the farmers stated that they need training about rose production (57.3 %). Priority subjects which the farmers need training were fight against diseases and pests, how to use pesticides (35.2 %), gardens' care (12.3 %), fertilization (8.3 %).

#### Priority research topics which farmers want from Suleyman Demirel University (SDU)

#### GULAR (Research and application central office for rose and rose products)

GULAR (Rose and Rose Products Research and Application Centre) founded in 2005 within the structure of Suleyman Demirel University (SDU) conducts research and development activities about rose and rose products which have an important role in the region. Thus priority research topics of SDU GULAR demanded by enterprises are listed in Table 9.

Producers request studies about struggle against pests and diseases specifically against *Parthenolecanium spp.*, *Capnodis spp.*, *Agrilus chryso-deris*, and *Aurigena chlorana*. Additionally in vineyards of some producers, plant died was observed. Producers have solution demands for these problems.

Studies about the price of rose oil and the demand of rose oil on a world scale are requested. Researching about new markets, improving marketing opportunities, developing alternative use opportunities and improving cosmetic industry are among the demands. Working structure of the

**Table 9. Priority research topics which farmers request from SDU GULAR**

Priority research topics from GULAR	N*	%
No idea	54	30.5
Diseases and pests	60	33.9
The development of efficient and high-quality varieties of oil roses	32	18.1
Oil rose price both world and Turkey	30	16.9
Reduce the production cost of oil-bearing rose	28	15.8
Farmer informed about new technology and technique	26	14.7
More incentives to be built facing of soil analysis	21	11.9
Improving marketing opportunities - improving cosmetic industry	20	11.3
Fertilizer	20	11.3
States provide support oil rose - provide support oriented rejuvenation of oil rose area	16	9.0
Improvement of the structure marketing channels	16	9.0
Rose planting area is limited. European countries should be promoted to oil roses	13	7.3
Irrigation technique	10	5.6
Advances to give farmers more	10	5.6
Technical staff should check oil rose planted area	8	4.5
Pricing depend on oil quality	8	4.5
Organic production technique	6	3.4
Gulbirlık should provide more information about the work and pricing policy	6	3.4
Seminars should be organized in the oil rose production	5	2.8
The influence of climate change on oil rose production	4	2.3
Identification of alternative products where oil rose yield low areas	3	1.7
To investigate the issue of inability to organize	3	1.7
Natural ways of pest and disease eradication	2	1.1
Encouraging the planting of oil roses in areas with high yields and quality	2	1.1
Diversification of uses of oil roses	2	1.1
Establishment of stock market of oil rose	2	1.1
More importance to the cosmetics industry	2	1.1
Production quota	2	1.1
Possibilities of harvesting mechanization of oil rose	1	0.6

\*Some farmers reported more than one option, the total exceeds 177 and the ratio exceeds 100 %

enterprises which are in the marketing channel of the rose, calculating the production costs and reducing the production cost are also among the demands of the producers.

They have other requests such as raising awareness about rose production, giving information on field, preparing reference books and booklets and distributing them to the producers. Producers should also be informed about

performing soil analyses. Becoming informed about the activities of SDU Rose Research Centre, organizing seminars periodically about growing rose oil, geographical regions from which rose oil could be obtained are the topics collected under the same title.

### Conclusion

In this study, present situation of the oil rose

growing was stated and suggestions were made for sustainability. In the study, the data were obtained through survey from the oil rose enterprises.

According to the data, most of the farmers stated that they need training about rose growing. Priority subjects which the farmers need about education activity/information were precautions about how to fight against diseases and pests, using pesticides, maintenance, and fertilization. Organic rose production which was an important production field for product differentiation increases with the developments in the recent years. Thoughts of the oil rose farmers who are thinking about transferring to organic rose production were asked and 31 % of the enterprises stated that they can make organic production. The reasons why the enterprises don't think to pass to the organic rose production were asked. They stated that they tried this production but they gave up because of production decrease and drought, absence of price difference, encountering with the problems such as diseases in the gardens which pesticides are used. The enterprises believe that organic rose production was important for the development of rose sector. But they don't have enough information about rose growing in the important part of the enterprises.

These suggestions can be given for the

sustainability of the rose sector with the following findings:

- \* Stable pricing policy is needed for the sustainability of the oil rose production.
- \* To solve the problems of the farmers in the growing; brochure about diseases and pests; maintenance procedures; informative booklets should be published and these books should be distributed to the farmers.
- \* Organizing seminars about the subject is important for the consciously agriculture applying of the farmers.
- \* The problem of manpower especially in picking up has important dimension in rose agriculture. In this respect, studies for solving this problem should be made with cutting-edge technology.
- \* When the problems are discussed, high costs is extremely important for farmers. So that calculating the production costs regularly, observing the international situation of the sector and informing the farmers about this subject is extremely important for sector.
- \* Marketing of rose and products should be in detail focused. Designs of new products, marketing of products both in the national and international dimensions should be performed.
- \* More technical information and technological support should be given to the farmers.

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