



Outdoor Ornamental Plants Produced in The Province Of Yalova Of Turkey: Status, Problems and Solutions

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Abstract: The purpose of this study was to determine the current condition and structure of the nurseries that produce outdoor ornamental plants in Yalova to identify the problems that they face in the production and marketing, and to offer recommendations positively to contribute the development of the nursery owners. The data of the study was obtained from face to face interviews with the representatives of the 43 nursery owners that propagate outdoor ornamental plants-trees, shrubs, and bushes- and are registered in Yalova Provincial Directory of Agriculture and Forestry. The data obtained showed that the average age of the owners of the nurseries is 44. The rate of the owners who have an undergraduate degree is 30.2%. In Yalova the production area of the nurseries for the outdoor ornamental plants is 7.93 ha. Their average annual income is 1.108.000 ₺. 58.1% of the nurseries have agricultural insurance. 39.5% of the nurseries have suffered losses due to various reasons. Of the losses experienced by the nurseries, 37.2% of them were due to winds. 90.7% of the nurseries employ agricultural engineers or landscape architect. Only 7% of the nurseries cooperate with provincial directorate of agriculture. 14% of the business have planned how many saplings they are going to produce before they set up their plantations. With regard to the problems, 58.1% of the nurseries face maintenance problems while 37% of them experience problems related to the lack of work force. The plant type that is mostly preferred by the nurseries is *Euonymus* with a rate of 79.1% which is followed by *Photinia serratifolia* and blue *Cupressus arizonica* with rates 39.5 and 27.9%, respectively. 69.7% -the highest rate- of all the outdoor ornamental plants are sold in the Marmara region of Turkey.

Keywords: Outdoor ornamental plants, Sector analysis, Yalova,

Yalova İlinde Dış Mekan Süs Bitkilerinin Durumu, Sorunları ve Çözüm Önerileri

Öz: Bu çalışmanın amacı; Yalova ilinde faaliyet gösteren dış mekan süs bitkileri fidan üreticilerinin mevcut durumlarını, yapısını, üretim ve pazarlamada karşılaştıkları sorunlarını belirleyerek; sektörün gelişimini olumlu yönde etkileyecek öneriler sunabilmektedir. Çalışmanın verilerini, Yalova Tarım ve Orman İl Müdürlüğüne kayıtlı 43 adet dış mekan süs bitkisi üretimi (ağaç, ağaççık, çalı grubu) yapan işletmeci ile birebir görüşülerek yapılan anket çalışması oluşturmaktadır. Araştırma sonucunda, işletme sahiplerinin yaş ortalaması 44 olarak belirlenmiştir. Eğitim durumlarına bakıldığında lisans mezunu işletmeci oranı %30.2 olarak tespit edilmiştir. Yalova ilindeki işletmelerin dış mekan süs bitkisi üretim alanı ortalama 7.93 ha olarak bulunmuş ve yıllık ortalama gelirin 1.108.000 ₺ olduğu anlaşılmıştır. Tarımsal ürün sigortası yaptıran işletmeci oranı %58.1'dir. İşletmesi, herhangi bir zarardan etkilenmiş işletmeci oranının %39.5 olduğu, işletmelerde oluşan zararların ise %37.2 oranla rüzgar kaynaklı olduğu görülmüştür. İşletmecilerin %90.7'si ziraat mühendisi veya peyzaj mimarı çalıştırmaktadır. İşletmecilerin yalnızca %7'si tarım il müdürlüklerinden hizmet almaktadır. İşletmecilerin %14'ü fidanlık tesislerini kurmadan önce ne kadar fidan üreteceğini planlamaktadır. İşletmecilerin %86'ı tohumla üretim yapmamaktadır. Karşılaştıkları sorunlar içerisinde; işletmecilerin %58.1'i bakım sorunu, %37'si iş gücü yetersizliği sorunu ile karşılaşmaktadır. İşletmecilerin en çok tercih ettiği bitki türü %79.1 oranı ile taflan, %39.5 oranı ile *Photinia serratifolia*, %27.9 oranı ile *Cupressus arizonica*'dir. Üretilen dış mekan süs bitkileri en çok %69.7 oranla Marmara bölgesine pazarlanmaktadır.

Anahtar Kelimeler: Dış mekan süs bitkisi, Sektör analizi, Yalova

1. Introduction

Green areas are one of the most important factors that increase the quality of life and productivity of individuals. The main body of the green areas is the outdoor ornamental plants. Outdoor ornamental plants express the plant species used in outdoor landscape applications for aesthetic and functional purposes. The mentioned plants give an aesthetic appearance to their environment. Roads, intersections, refuges, squares are arranged by outdoor ornamental plants as well as the sharp lines of the structures are softened and, decorative and attractive forms are created (Zencirkiran, 2010). The outdoor ornamental plants production of Turkey was 3.74 ha in 2018 while the amount of production was 507.2 million plants. Marmara region of Turkey is the region with the highest production when looking at ornamental plant cultivation areas. Aegean is the second region for production area. The highest amount of outdoor ornamental plant production belongs to Yalova, İzmir and Sakarya provinces of Turkey (Anonymous, 2019).

The vegetation of Yalova is commonly composed of shrubs and forests. The steep slopes to the south of Yalova are covered with an intensive forest area. Coniferous trees are very

small in this part where deciduous trees dominate. These forests cover 58% of the areas of the province. In terms of climate characteristics, Yalova has transition climates between Mediterranean and Black Sea region. It also reflects the continental climate in some periods. Summers are dry and hot, winters are warm and rainy in the region. According to the average 30-year meteorological data, the annual temperature in Yalova is 14.6 °C. The average temperature of the coldest month is 6.6 °C and the warmest month is 23.7 °C (Anonymous, 2015). These ecological conditions make Yalova an important position in the ornamental plant sector. Thanks to Yalova's features such as geographical location, climate, use of space and marketing, outdoor ornamental plants make up a large part of the related sectors. The aim of this study was to determine the present condition and structure of the businesses that produce outdoor ornamental plants in Yalova to identify the problems that they face in the production and marketing, and to offer recommendations to positively contribute to the development of the sector.

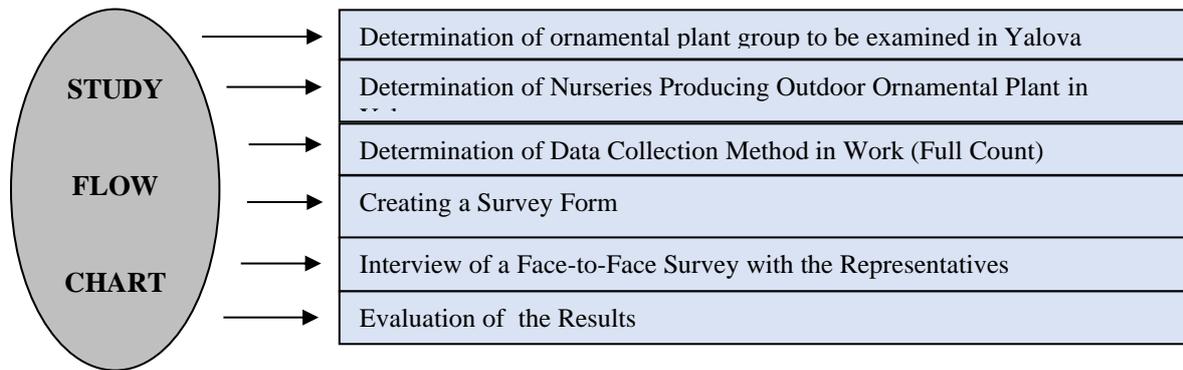


Figure 1. Flow chart of the study

Şekil 1. Çalışmanın akış şeması

2. Materials and Method

The research was carried out on 43 nursery companies producing outdoor ornamental plants in Yalova province of Turkey. Due to the differences in the production of seasonal flowers (seed storage, extra greenhouse conditions such as heating), nurseries concerned in the production of trees and shrubs, except the seasonal flower producers have been taken into consideration. The socio-economic structure, age, gender, experience in this field, educational status of nurseries, size of total area, situation of land use, average income from arboriculture, agricultural insurance, the number of persons working in the nursery, the institutions they have benefited from (expert-worker-consultant-manager) and the status of participation in the course related to the arboriculture were evaluated in the study.

Since the number of producers of outdoor ornamental plants is small, the full count was done instead of the sampling model. If a research aimed to reach all units belonging to a main body, it is called as 'full count' (Akin, 2015). The flow chart of the research realized according to the full counting method is presented in Figure 1. The obtained data were analyzed using SPSS 22 statistical program for Windows.

3. Results and Discussion

3.1. Age, gender, experience and educational status of the nursery owners

The average age of the nursery owners who produce outdoor ornamental plants was 44 in the Yalova province. 4.6% of nursery owners took part in the 26-35 age group, 55.8% in the 36-45 age group, 34.9% in the 46-55 age group and 4.6% in the 56 and above age group. 81.4% of the nursery owners were males and 18.6% females. When the nursery owner's arboriculture experience was examined; the number of nursery owners with experience between 1-5 years were 4.6%, while the number of nursery owners with experience between 6-15 years was the highest in this group with 39.5% experienced nursery owners. The number of nursery owners having experience between 16-20 years was 20.9%, the number of nursery having experience between 21-30 years was 27.9%, the number of nursery

owners having more than 30 years experience was 6.9%. In terms of education, 2.3% of the business owners graduated primary school, 4.7% attended middle school, 34.9% attended high school, 25.6% attended college, 30.2% graduated and 2.3% possess a master's degree. There was no non-literate nursery owner.

3.2. Land size of the nurseries, annual average income situation

In the survey conducted, it was seen that the average production area of the nurseries was 7.93 ha and the total area was 341 ha. It was determined that 89.6% of the arable land was leased and 13.48% of land belonged to the nursery owners. The rate of nursery owners that production area was between 1 and 3.5 ha was 32.55%, between 3.6 and 7 ha was 34.88%, between 7.1 and 13 ha was 18.60%, between 13.1 and 25 ha was 9.30%, between 25.1 and 45 ha was 2.32%, between 45.1 and 60 ha was 2.32%. According to the survey, the average annual income of the nursery owners producing outdoor ornamental plants was determined to be 1.108.000 ₺. When compared to annual income of nursery, the number of nursery having annual income between 55.000-200.000 ₺ was 16%, between 201.000-400.000 ₺ was 12%, between 401.000-700.000 ₺ was 30%, between 701.000-1.000.000 ₺ was 21%, between 2-3 million ₺ was 12%, between 4-5 million ₺ was 9%.

3.3. The situation of nurseries insuring products, getting engineers to work and getting services from the relevant provincial directorate.

It has been determined that 58.1% of the nursery owners have the agricultural products insurance, and the longest held insurance policies are with two nursery owners, each with 15-year policies. When it is examined whether there is any damage to the production of outdoor ornamental plants, the rate of the nursery which has been damaged before has been determined to be 39.5%. When the causes of the damage were examined, it was seen that 37.2% nurseries have damaged by wind, 2.3% of the nursery has damaged by hail and 2.3% of them has damaged by frost. 90.7% of the nursery employ landscape architect/agriculture engineer. The average

number of agricultural engineer working in nursery is only 2.3%. 14% of nursery owners apply to provincial directorates for their problems. 4.7% of the nursery owner producing outdoor ornamental plants has received services from provincial directorate of agriculture for disease and pest. 7.0% nurseries have received services from the Provincial Directorate of Agriculture and Forestry for the care of plants. There are no nurseries who received service from the provincial directorates of agriculture in other matters such as identification, budding/grafting and production. 96.8% of the nurseries owner believe that they do not need to receive services because of that their technical information being sufficient or better than provincial directorates of agriculture and forestry. 16.3% of nursery owners do not apply to provincial directorates of agriculture for support because of having their own experts.

3.4. Person characteristics who are employed in the nurseries and are joined to a related course

The percentage of permanent workers in nurseries were 41.9% and the percentage of temporary workers 9.30%. 30% of nursery employ consultant and 56% of nursery employ managers. The rate of nurseries which employ administrative staff was 7% except the manager

and the consultant. Only 7.0% nursery owners have participated in courses related to the arboriculture, 93.0% of the nursery owners did not participated in any course related to the arboriculture. Two nursery owner participated in ISO-9001 course and one nursery owner has participated in disease-pest course and they have received certificates after the training.

3.5. Production and marketing situation of the nurseries

14% of nurseries have planned how many saplings to produce before planting. 44.2% nurseries have made yearly sapling production plan, 55.8% nurseries (have not made annual sapling production plan. The names of plants most produced by the nurseries were presented in Table 1. The outdoor ornamental plants large produced were *Euonymus japonica* with 79.1%, *Photinia serratifolia* with 39.5%, *Cupressus arizonica* with 27.9%, *Thuja* spp., *Pittosporum* spp. and *Buxus* spp. with 25.6%. 65.1% of the nurseries according to the market, 39.5% of nurseries considering finance, 20.9% of nurseries considering land condition, 9.3% of nurseries considering work power, 4.7% nurseries considering rootstock and 2.3% of nurseries considering agricultural production decide the amount of production (Table 1).

Table 1. The most produced outdoor ornamental plants by the nurseries

Çizelge 1. Fidancılar tarafından en çok üretilen dış mekan süs bitkileri

Latin name of plant	Number of nursery	%*	Latin name of plant	Number of nursery	%*
<i>Euonymus japonica</i>	34	79.1	<i>Cedrus libani</i>	4	9.3
<i>Photinia serratifolia</i>	17	39.5	<i>Quercus</i> sp.	4	9.3
<i>Cupressus arizonica</i>	12	27.9	<i>Lavandula angustifolia</i>	3	7.0
<i>Thuja</i> sp.	11	25.6	<i>Cupressus</i> sp.	3	7.0
<i>Pittosporum</i> sp.	11	25.6	<i>Laurus nobilis</i>	3	7.0
<i>Buxus</i> sp.	11	25.6	<i>Jasminum officinale</i>	3	7.0
<i>Cupressus leylandi</i>	9	20.9	<i>Picea</i> sp.	3	7.0
<i>Nerium oleander</i>	4	9.3	<i>Carex</i> sp.	2	4.7
<i>Viburnum opulus</i>	7	16.3	<i>Cupressus marcocarpa</i>	2	4.7
<i>Prunus cerasifera</i>	6	14.0	<i>Euonymus japonica</i>	2	4.7
<i>Rosa</i> sp.	5	11.6	<i>Chamaerops humulis</i>	2	4.7
<i>Platanus orientalis</i>	5	11.6	<i>Juniperus</i> sp.	2	4.7
<i>Lagerstromia indica</i>	5	11.6	<i>Cupressus gold wilma</i>	2	4.7
<i>Abies</i> sp.	2	4.7	<i>Hydrangea macrophylla</i>	4	9.3

* Since more than one options were marked, the sum of the ratios exceeds 100%.

3.6. Use of seeds in plant production in the nurseries

The number of nurseries which produce plants by seeds was 14%. 2.3% nurseries used the moist storage technique in cold condition, and 4.7% nurseries used a dry storage technique in cold condition to maintain seeds. There was no nursery which maintain their seeds under natural conditions. In addition, there were 9.3% nurseries which pre-process the seeds to stimulate germination. 14.0% nurseries which produce seeds sow their seeds in the autumn. There was no nursery which sow seeds in the spring. When looking at the outdoor ornamental plants propagated by seeds, 7.0% nurseries are producing *Laurus*, 4.7% *Cotoneaster*, 4.7% *Ligustrum*, 4.7% palm, 2.3% *Dracena*, 2.3% *Agapanthus* and 2.3% *Nandina domestica*. 2.3% nursery seed check, 9.3% seed bed, 2.3% seedling production trays gave the answer to the question of where seed were planted. 14.0% nurseries sow the seeds manually, and there was no any nursery which use planting with the machine.

3.7. Production techniques, irrigation and other problems of the nurseries

58.1% of nurseries which produce outdoor ornamental plants have maintenance problems, 37.2% businesses had labor power inadequacy problem, 14.0% of the nurseries had rootstock procurement problem, 14.0% businesses have irrigation problem, 14.0% nurseries have problem due to a lack of technical knowledge, 11.1% nurseries have chemical control issues, 4.7% nurseries have a grafting or budding problem, 2.3% nurseries have a graft procurement problem. Percentage of nursery having trouble finding irrigation water was determined as 20.9%. 11.63% of the operators who have trouble finding the irrigation water, because of the lack of water in the irrigation canal, 9.30% of the water quality problem due to the poor water quality problem they are experiencing. 83.7% of the enterprises are watering with sprinkler method. The most common disease in the nurseries powdery mildew (62.8%). Root rot, black spot and fever blight diseases were followed. The most common

pest of the nurseries (76.7%) were red spider and followed by aphid, cotton lice, leaf drill, snail, caterpillar, rootworm and grasshopper, respectively.

3.8. The factors of determining the type and amount of fertilizer & chemicals applied by the business.

62.8 % of nursery owners have determined type and amount of fertilizer by their own experience, 32.6% have determined by their agriculture expert, 25.6 % have determined by soil analysis result, 9.3 % have determined it by soil fertility, 2.3 % have determined by fertilizer price, 2.3 % have determined according to the seller's recommendation. 60.5 % of nursery owners have determined type and amount of chemicals used by agriculture expert advice, 39.5 % have determined by their own experience, 18.6 % have determined by soil analysis result, 2.3 % have determined by have determined according to the seller's recommendation. As the answer of question of " Do you consult an expert about issue of use of chemical", 62.8 % of nursery owners have answered "I always get information from them", 27.9 % have answered "I consult if I have to ", 9.3 % have answered "our own experience is sufficient".

3.9. Packing, labeling and marketing of sapling of nurseries

69.7% outdoor ornamental plants producer of nurseries do not pack saplings. 27.9% of nursery owners apply semi-packaging, 9.3% apply full packaging and 9.3% apply open sales. 3 firms have tagged one out of each ten saplings, and 1 business have tagged one out of each 20 saplings. On the labels of the 2 nurseries, there is information that includes the name and logo of the certificate issuing organization, the variety name, the species name and the company name. On the label of other 2 business, there is information about the species name and the company name. On the label of just 1 business, there is the rootstock information. 67.4% of the firms producing outdoor ornamental plants are retailing their seedlings. In the province of Yalova, all 43 businesses which produce outdoor ornamental plants sell their seedlings in the nursery garden, 2 businesses (4.7%) at the market

place and 15 businesses (34.9%) through tender. 6% of the business sell their seedlings as futures, and 1% sale of cash. 36% of the business sell their seedlings both cash and futures.

3.10. Cities and regions where the outdoor ornamental plants marketing

69.8% of nurseries that producing outdoor ornamental plants in Yalova are marketing to the Marmara region, 27.9% to Central Anatolia region, and some of these nurseries sell saplings to all parts of the country depending on demand. On the basis of province, 25.6% nurseries sell to Istanbul, 20.9% sell to Ankara, 11.6% sell to Yalova, 7.0% sell to Bursa, 4.7% sell to Adapazarı and 4.7% sell to Eskisehir province of Turkey. The number of nurseries that market outdoor ornamental plants produced in Yalova province to abroad was 30.2%. The rate of which does not have the marketing problem was 76.7%.

3.11. Methods of determining the prices of saplings, and sales situation of saplings

51.1% of the businesses determine prices of saplings their own prices according to their costs, 39.5% of businesses according to the market conditions, 18.6% of businesses according to the seller-agreement and 4.7% of businesses according to the conditions of the tender. 65.1% of the enterprises are satisfied with the prices of 2014 outdoor ornamental plants. 30.2% of the businesses were able to sell the whole of their seedlings. The rate of business manager which receive marketing assistance is very low with 4.7% but the rate of businesses that receive marketing assistance is 95.3%. Businesses that receive marketing assistance are solely assisted by other producers; there were no business intermediaries, exporters, agricultural organizations and universities.

3.12. Sapling losses and major problems in business

74.4% of the nurseries have noticed that there was some loss in working place and 25.6% of them stated that there was no loss. 39.5% of the nurseries stated that there are losses in process of cuttings for 18.6% in process of grafting, for 16.3% in planting grafted parcels, for 7.0% in removing, for 2.3% in germination of seeds, and 2.3% of the businesses stated that there were

losses due to rooting. 67.4% of nurseries notice that they have problem of maintenance, 37.2% of nurseries staffing issue, 18.6% of nurseries have problem of marketing, 14.0% of them have problems with diseases, insects and production, 11.6% of them have problem of lack of technical knowledge, 7.0% of them have problem of soil conditions, 4.7% of businesses have water deficit problem, 2.3% of them state that they have problems of government support, instability in payments and climatic conditions.

3.13. Controls by the related authorities on nurseries

The Ministry of Agriculture and Forestry carries out inspections according to authorization and inspection regulations in the seed sector, which was published in the official newspaper numbered 27229 dated 15 May 2009. The aim of this regulation was to determine procedures about the authorization and supervision of the real or legal people who produce, distribute and sell seeds. According to the inspections carried out in the province of Yalova, the owner should have elements such as sufficient number of buildings, title deeds related to the land, certified copy of the lease contract by the provincial or provincial directorate, annual capacity declaration to be issued by the applicant, suitable storage capacity for production capacity, agricultural engineer/landscape architect working status, participation in training and meeting invited by the ministry, certified master copy of the tax levy and ministry supervision of the province, maintenance of sales records for 5 years (Anonymous, 2009). The Ministry of Agriculture and Forestry carries out the passport control of the businesses according to the regulation on the registration of plant passport system and operators published in the official newspaper dated 12 January 2011 numbered 27813. Purpose of our regulation; herbal products and other substances that may be the carriers of harmful organisms and to record them who produce, import and trade them and to take necessary precautions in case of encountering any harmful organism. According to the fifth division in the regulation, official controls are realized as registration control and land control. Documents of registered operators

are checked at least once a year. Firms producing, storing and stocking have to obtain the ornamental plant certificate from the authorized directorate (Anonymous, 2011).

According to this study, it was determined that 41.9% nurseries were audited once a year while the percentage of audited business was (25.6%. In Yalova province, only 2.3% of the businesses producing outdoor ornamental plants was not satisfied with the inspections. The reason for not being satisfied is that the technical information of the inspecting authorities is not sufficient.

3.14. Nurseries receiving agricultural support loans

The rate of business receiving agricultural support loans was determined as 62.8%. 23.25% nurseries received the agricultural support loan last in 2013, and 39.5% of nurseries received the agricultural support loan in 2014. When the number of agricultural support loans received by the nurseries was taken into consideration, it was seen that the highest loan received was 500.000 ₺ and the lowest loan was 50.000₺.

4. Conclusion

The ornamental plants sector has grown rapidly in developed countries and has a big share in commercial sense. Ornamental plant sector in Turkey has made significant progress in recent years. This progress has provided alternative employment in the ornamental plant sector (Karaguzel et al., 2010). Both the state and the private sector have contributed positively to sector development. From the end of the 90's, ornamental plants have begun to gain an important place in their production and marketing agriculture sector (Yazici, 2015).

According to the results of the survey conducted with 43 nurseries of outdoor ornamental plants (tree, shrub, and group producing) licensed by the provincial directorate of agriculture; the average age of the ornamental plants in Yalova province was 44. 55% of the owners are between the ages of 36-45. In Yalova province, there was no survey study conducted only on outdoor ornamental plants.

According to Aydoseli (2001), there were 28 nurseries who produce outdoor ornamental plants. Temel, (2011) conducted a study in Yalova, the firms that produce indoor, outdoor, cut flower production were surveyed and companies that produced 23 outdoor ornamental plants were taken into consideration. In the total ornamental plant production group, it was reported that the weighted activity rate of outdoor ornamental plants was 25.6% and the average age was 48. Ay (2009) conducted a questionnaire survey with 52 ornamental plant businesses operating in Yalova, and 31.1% of the operators reported that they did outdoor ornamental plant breeding. These results show that production of outdoor ornamental plants in Yalova province is increasing with time.

In our study, 81.4% of the nursery owners appeared to be male. According to the study of Temel (2011) nursery owners in Yalova province were 95.6% male and Ay (2009) was male of 82.7% of the nursery owners. Nursery owners have average 19 years of experience. The percentage of nursery owners with 20 years of experience is 34.9%. Also, the percentage of business owners who have been experimenting with ornamental plants for 20 years is 47.8%. According to the study of Ay (2009), 82.7% of the ornamental plants have been doing this business for at least 7 years. According to these values, it can be seen that the experience of the business owners producing ornamental plant is quite high.

When the education level of the business owners producing outdoor ornamental plants is examined, 34.9% are high school graduates, while the rate of undergraduate graduates is 30.2%. Ay (2009) reported that 55.8% of the business owners producing ornamental plants in Yalova were high school and 32.7% were university graduates. According to the survey conducted by Temel (2011), 32.2% of the business owners producing ornamental plants in Yalova are high school graduates and 34.4% are university graduates. According to these results, there is no increase in the level of education of the business owners, which is noticed according to years.

The annual average revenues of the operators producing outdoor ornamental plants were determined as 1 million 108 thousand ₺. The ratio of the enterprises that have earned over 800 thousand ₺ was determined as 41.9%.

In Yalova province, 58.1% of the nurseries producing outdoor ornamental plants have agricultural product insurance. According to Temel (2011) with the producers of ornamental plants in Yalova province, this ratio is only 1.2%. This shows that, in recent years, agricultural insurance has become increasingly widespread in nurseries producing ornamental plants. When the damage situation of the nurseries producing outdoor ornamental plant was examined, it was seen that the ratio of the nurseries which have been exposed to damage is 39.5%, and this loss was mostly caused by wind with a rate of 37.2%.

90.7% of the nurseries employ agricultural engineering / landscape architecture. According to the result of Temel (2011) study, this rate was only 23.3%. According to these values, although the increase in the technical staffing ratios has been experienced by the operators, when the production areas of the enterprises were taken into consideration, it was seen that the number of technical personnel was insufficient.

In Yalova province, 86% of the nurseries producing outdoor ornamental plants did not receive services from provincial directorates of agriculture. While 7% of businesses receive the most support about maintenance, 69.8% did not consider getting technical support because they think that technical information was better. Nursery owners' participation rates in a course related to maintenance were very low.

It was seen that the plants that the nurseries produce the most are *Euonymus japonica*, *Photinia serratifolia*, *Cupressus arizonica*, *Thuja occidentalis*, *Pittosporum* sp. and *Buxus* sp. The other mostly produced ornamental plants are *Cupressus leylandii*, *Viburnum opulus*, *Prunus cerasifera*, *Rosa* L., *Platanus orientalis*, *Lagerstroemia indica*, *Nerium oleander*, *Hydrangea macrophylla*, *Cedrus libani*, *Photinia fraseri* little red, *Quercus* sp., *Lavandula angustifolia*, *Cupressus* sp.. According to Aydoseli (2001), the most produced plants were

Codiaeum sp., *Dieffenbachia* sp., *Dracaena* sp. and *Yucca*. In the study of Temel (2011), the most produced outdoor ornamental plants; *Rosa* L., *Cupressus leylandii*, *Iridaceae*. *Dieffenbachia*, when these ratios are compared, it can be said that the production amount of plants varies according to years.

86% of nurseries did not produce seeds. When looking at the production of outdoor ornamental plants made with seeds, the highest percentage belong to *Laurus nobilis* and other plants seed production were *Cotoneaster*, *Ligustrum*, *Agapanthus*, *Nandina domestica*, *Dracena*, *Chamaerops excelsa*.

The problems of the production techniques of the producers of outdoor ornamental plants were taken into consideration, the rate of operators having problems irrigation water was 20.9%. 11.7% of the operators were having problems due to water shortage in the irrigation channel. Irrigation was done by sprinkling water method with a maximum rate of 83.7%.

60.5% of nursery owners decided on the type and amount of medicines they apply with agricultural specialist advice. It can be thought that the fact that most of the operators are agricultural engineers or landscape architects is causing this ratio to be high. The rate of operators having a market problem was 23.3%. According to Temel (2011) this rate was 46.7%. The rate of operators receiving marketing assistance was very low, at 4.7%. Nurseries with marketing assistance only receive assistance from other manufacturers. The rate of farmers receiving agricultural support loans was 62.8%. In the Temel study (2011), the rate of agricultural credit utilization was only 2.2%. Accordingly, it appears that the use of credit has been preferred in recent years.

While 72.1% of the nurseries were being audited in various forms, 27.9% of them were not audited. This was due to the deficiencies in the regulation of supervisory practices in the ornamental plant sector, and it was on the agenda of the state policy as of 2018 (Anonymous, 2019). Temel (2011) reported that the nurseries have a labor, irrigation water, credit, disease-pest and technical knowledge problems. According to

Aydoseli (2001), nurseries have mostly the supply of plant material and the inadequacy of production techniques. In recent years, it can be said that the problems related to technical issues have been reduced thanks to increase in businesses' technical staffing. However, even though most businesses employ technical staff, the number of technical staffs in businesses is inadequate, plant losses in nurseries and technical problems are not prevented.

According to the results obtained, the most important problem identified in the nurseries was the inadequacy of in the number of technical employees according to the consultation and production area. Especially for enterprises with a large production area, the number of technical employees was required to be higher. The biggest problem that this situation presents was financial losses.

The ornamental plant sector in Yalova province has an important position in terms of production and marketing since it is high due to the production climatic conditions. However, according to the results obtained;

- Elimination of lack of promotion in marketing
- Increasing control frequency
- Importance of export
- Improvement of varieties for Yalova province and Turkey
- Increasing participation in trainings organized by provincial directorates of agriculture
- Adequate advertising in the fairs organized in the surrounding areas
- Abandonment of traditional production methods by nursery owners
- Increasing the number of trained personnel in nurseries
- Ensuring that the manufacturer who wants to make production reaches the related consultant,
- Establishment of Faculty of Agriculture or similar Faculty in Yalova province,
- Increasing the training of producers given by Atatürk Horticultural Central Research Institute in the city.

- The provision of consultancy support to the enterprises regarding the annual production planning is an important issue to be made in terms of the development of the Yalova province outdoor ornamental plant industry.

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