

Review Article

Fig Production in Türkiye: Varieties, Cultivation, Orchard Management and Processing

Atila AYTEKİN POLAT¹*¹ Hatay Mustafa Kemal University, Agriculture Faculty, Department of Horticulture, Hatay, Türkiye

*Corresponding author e-mail: aapolat@mku.edu.tr

ABSTRACT

ARTICLE
INFO

In the present compilation the current scientific information on Türkiye fig production: varieties cultivation, horticultural requirements, fresh and dry handling; postharvest physiology and storage, fig processing and its processed products was evaluated. Türkiye led fig-producing countries with 356,000 t, accounting for 27.3% of total world production in 2023. Türkiye has a share of about 50-55% in dried fig production and 52-60% in fig exports. Although the number of countries importing Turkish figs is increasing, more than 70% is sent to the EU markets. In Türkiye, the main cultivar for drying is “Sarılop” in which is favored in all fig producing countries for its quality. ‘Bursa Siyahı’ which is also is the most preferred and high quality for fresh fig in the world market with increasing export demand. Fig plants are usually propagated by cuttings. The fig plantations are established by rooted hardwood cuttings with a between and on row spacing ranging from 7x7 or 8x8 m in older low-land orchards to 5x6 or 6 x 6 m on the slopes. Generally, fig trees are trained in “open-centre” system. Table fig varieties are consumed fresh while dried fig varieties are consumed as dried fruit. In addition, some fruits are consumed as processed products such as jam, marmalade or delight etc. Owing to the extreme perishability of fresh fig fruit, the most important fig product offered to consumers is dried fig fruit. For drying of figs, the production protocol is programmed according to the demand, pass through aflatoxin control after storage stage. Figs control at least two times to sort out aflatoxin contaminated dried figs under UV lamps. During this control, other mouldy figs are also removed. Dried fig is processed in different types according to customer request (Lerida, Layer, Chocolate, Premium, Makaroni). After the stem and eye of the best quality figs are cut, they are wrapped individually and presented to customer in its special packaging. Dried figs are packed in various types according to customer’s request. All packed products pass through metal detector control.

Keywords: *Ficus carica* L., cultivars, cultivation, handling, processing

Received:
19.04.2025
Accepted:
25.11.2025

Türkiye’de İncir Üretimi: Çeşitler, Yetiştiricilik, Bahçe Yönetimi ve İşleme

ÖZET

MAKALE
BİLGİSİ

Mevcut derlemede, Türkiye incir üretimi hakkında güncel bilimsel bilgiler: yetiştiricilik, yıllık bakım işlemleri, taze ve kuru tüketim; hasat sonrası fizyolojisi ve depolama, incir işleme ve işlenmiş ürünleri hakkında bilgi verilmiştir. Türkiye, 2023 yılında toplam dünya üretiminin %27,3’ünü karşılayarak 356.000 ton incir üreten ülkeler arasında başı çekmektedir. Türkiye, kuru incir üretiminde yaklaşık %50-55, incir ihracatında ise %52-60 paya sahiptir. Türk incirini ithal eden ülke sayısı artmakla birlikte, %70’ten fazlası AB pazarlarına gönderilmektedir. Türkiye’de kurutma için kullanılan ana çeşit, kalitesi nedeniyle tüm incir üreten ülkelerde tercih edilen, “Sarılop” çeşididir. Dünya pazarında artan ihracat talebiyle taze incir için en çok tercih edilen ve kaliteli olan ‘Bursa Siyahı’dır. İncir bitkileri genellikle çeliklerle çoğaltılır. İncir bahçeleri, taban arazilerde 7x7 veya 8x8 m’den yamaçlarda 5x6 veya 6 x 6 m’ye kadar değişen sıra arası ve sıra üzeri mesafelerde köklenmiş odunsu çeliklerle tesis edilir. İncir ağaçlarına genellikle “goble” terbiye sistemi verilir. Sofralık incir çeşitleri taze olarak tüketilirken, kuru incir çeşitleri kurutulmuş meyve olarak tüketilir. Ayrıca bazı meyveler reçel, marmelat veya lokum gibi işlenmiş ürün olarak tüketilir. Taze incir meyvesinin son derece çabuk bozulabilmesi nedeniyle tüketiciye sunulan en önemli incir ürünü kuru incir meyvesidir. İncirlerin kurutulması için üretim protokolü talebe göre programlanmakta, depolama aşamasından sonra aflatoksin kontrolünden geçirilmektedir. İncirler, en az iki kez UV lamba altında aflatoksin bulaşmış kuru incirleri ayıklamak için kontrol edilmektedir. Bu kontrol sırasında diğer küflü incirler de ayıklanmaktadır. Kuru incir müşteri talebine göre farklı tiplerde (Lerida, Layer, Chocolate, Premium, Makaroni) işlenmektedir. En kaliteli incirlerin sapı ve gözü kesildikten sonra tek tek sarılarak özel ambalajında müşteriye sunulmaktadır. Kuru incirler müşteri talebine göre çeşitli tiplerde paketlenmektedir. Paketlenen tüm ürünler metal dedektör kontrolünden geçmektedir.

Anahtar Kelimeler: *Ficus carica* L., çeşitler, yetiştiricilik, derim ve sonrası işlemler, işleme

Geliş:
19.04.2025
Kabul:
25.11.2025

Cite this article as: Polat, A. A. (2025). Fig Production in Türkiye: Varieties, Cultivation, Orchard Management and Processing. *Manas Journal of Agriculture Veterinary and Life Sciences*, 15(2), 271-281. <https://doi.org/10.53518/mjavl.1679749>

INTRODUCTION

The fig (*Ficus carica*), one of the first cultivated trees in the world, is grown in most of the of the world's moderate climates (Crisosto et al., 2017). It is well adapted to the Mediterranean conditions and can be found dispersed in natural flora. As its nutritional and pharmaceutical properties are unfolded by research work, the demand is growing. The fig tree with its diverse horticultural properties offers fresh fruit in the spring and summer and dried fruit or processed products throughout the year (Aksoy, 2017).

Fig is an important fruit crop of Mediterranean Basin. It is cultivated mainly for its sun-dried fruits. In the Mediterranean countries fig cultivation ranks top in the world for dried fig production and trade (Aksoy, 2021). Among the total world production of more than 1.3 million tonnes in 2023, Türkiye is the leading country producing 356,000t (27.3% of the world fig production in 2023) (FAOSTAT, 2025). (Table 1).

Table 1. Top-ten fresh fig production countries(2023)(FAOSTAT, 2025)

Countries	Area (ha)	Production (tone)	Percentage
Türkiye	57459	356000	27.28
Egypt	28667	193058	14.79
Morocco	69737	119167	9.13
Algeria	38374	116183	8.90
Iran	12206	73483	5.63
Afghanistan	10228	60651	4.65
Syrian Arab Rebulic	9645	40760	3.12
Spain	16860	39650	3.04
Saudi Arabia	1435	28675	2.2
United States of America	2665	27744	2.13
Uzbekistan	1324	27673	2.12
World	299768	1304849	

Türkiye contributes almost half of the whole world dried fig production and has the first place in production and in trade. Türkiye's exports of both fresh and dried figs have increased significantly in the last 20 years. Türkiye is the world's largest fresh and dried figs exporter country. The world dried fig export was 153,113 t in 2021 with 91,122 t exported from Türkiye. This constitutes the greatest amount of Turkish dried fig production and 59.5% of the world's exports in 2021 (FAOSTAT, 2023)(Polat, 2024).

Although the number of countries importing Turkish figs is increasing, more than 70% is sent to the EU markets. France, Germany, United States, Italy, and China were the top five dried fig-importing countries while Germany, France, Holland, Russian and United States were the top five fresh fig-importing countries.

Fig trees are widely distributed throughout Türkiye near the Black Sea, the Marmara region, the Aegean and Mediterranean coastal regions, southern Anatolia, and the interior valleys of central Anatolia (Polat and Caliskan 2008; Polat, 2017). Fig production is concentrated in the coastal belt of Türkiye facing the Mediterranean Sea and often fig trees are interplanted with other fruit species such as olive. In particular, the most important areas are the large and small Menderes valleys, where dried fig production is a common and traditional activity (Özbek, 1978; Isin et al., 2003). The Marmara, Mediterranean, Black Sea and Southeast Anatolia regions produce fresh figs (Yilmaz et al., 2017). In particular, fig cultivation is located in Aydin, Bursa, İzmir, Mersin, Hatay, Balikesir and Gaziantep provinces. 60-70% of the harvested area is located in Aydin province with 62% and 75% production of fresh and dried figs, respectively (Uzundumlu et al., 2018; Ferrara et al, 2022). Dried figs are mainly produced in the Aegean region, especially in Aydin and Izmir provinces, while fresh figs are mainly farmed in the Southern Marmara region, especially in Bursa province (Polat, 2017; Ferrara et al., 2022).

Because of health benefits, the consumption of dried figs in traditional markets has not only increased but also created new markets. There are new producer countries because of the increasing world market demand, and presently demand is more than its production. Although its health benefits increase the consumption of dried figs, the most important issue in world trade is the quality and safety of the product (Aksoy, 2021).

Fresh figs are highly perishable and are susceptible to postharvest losses due to infections. Preharvest orchard sanitation and postharvest value-chain conditions are important for improving fruit quality and postharvest shelf life. To reduce postharvest losses and improve global fresh fig marketing, plant breeders, physiologists and postharvest researchers need to work together (Crisosto et al., 2017). The aim of this study is to outline the current scientific information on Türkiye fig production: varieties cultivation, horticultural requirements, fresh and dry handling; postharvest physiology and storage, fig processing and its processed products.

CULTIVARS

The Türkiye fig industry is essentially based on six cultivars: ‘Sarilop,’ ‘Bursa Siyahı,’ ‘Göklop,’ ‘Morgüz,’ ‘Yediveren,’ ‘Sarı Zeybek,’ and ‘Yeşilgüz’ (Polat and Çalışkan, 2008) (Figure 1 and 2). The most important commercial fig cultivars are ‘Sarilop’ as dried, ‘Bursa Siyahı’ as fresh fig in Türkiye and also in the world. Both the ‘Sarilop’ and ‘Bursa Siyahı’ are valued worldwide for their premiere quality and large size of fruit (Figure 3 and 4). Ninety percent of Türkiye's dried fig production is made from ‘Sarilop’ cultivar, which has unique qualities such as soft texture, natural color, honey flavor and pleasant smell. Due to these features, Turkish figs continue to be the leader in the world markets (Arpacı et al., 2018).

‘Bursa Siyahı’ has amazing taste, hard flesh structure, dark purple or blackish skin color, long storage life as well as its alluring shape and size. It is one of the best quality fresh fig cultivar grown in Türkiye which shows increasing trade (Polat, 2017). Based on the recent breeding efforts, ‘Yediveren,’ ‘Goklop,’ and ‘31-IN-16’ could be alternatives to ‘Bursa Siyahı,’ currently the most favored fresh table fig cultivar. These new cultivars have a potential for both domestic and foreign markets (Çalışkan and Polat, 2008). Moreover, ‘31-IN-01,’ ‘31-IN-08,’ ‘31-IN-10,’ ‘31-IN-12,’ ‘31-IM-13’ fig types have also been found promising (Polat and Ozkaya 2005). Differences in fruit quality parameters such as ripening period and sugar/acid ratio among the new entries could help fill different market niches. ‘Bursa Siyahı,’ ‘Yediveren,’ ‘Göklop,’ ‘01-IM-02,’ and ‘31-IN-16’ have been recommended when planting new fresh fig orchards in the Mediterranean region (Polat and Çalışkan 2008; Çalışkan and Polat 2008).

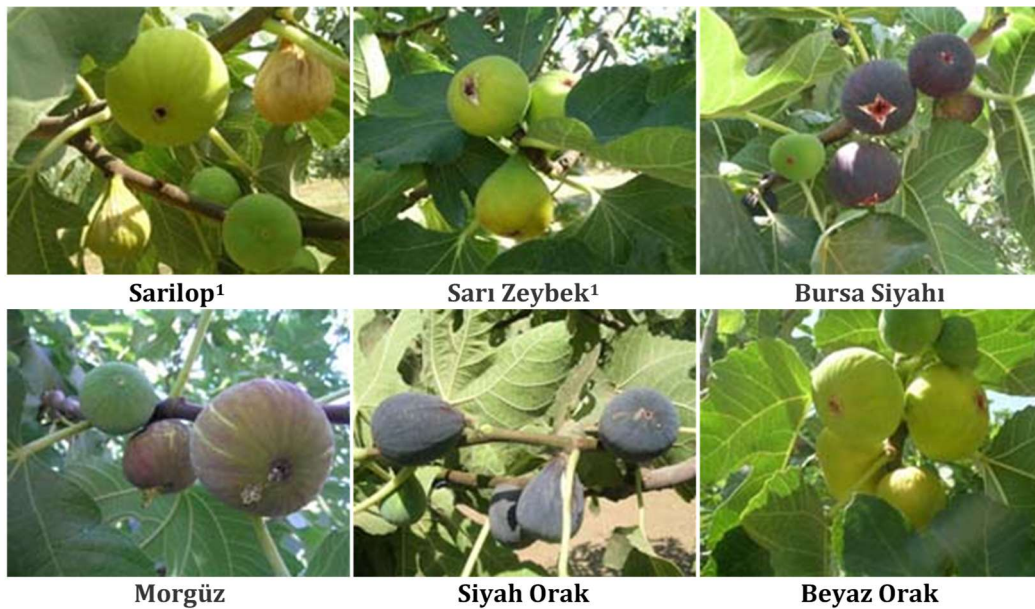


Figure 1. Figs on tree selected cultivars grown in Türkiye (¹intended for drying) (Polat and Siddig, 2012).

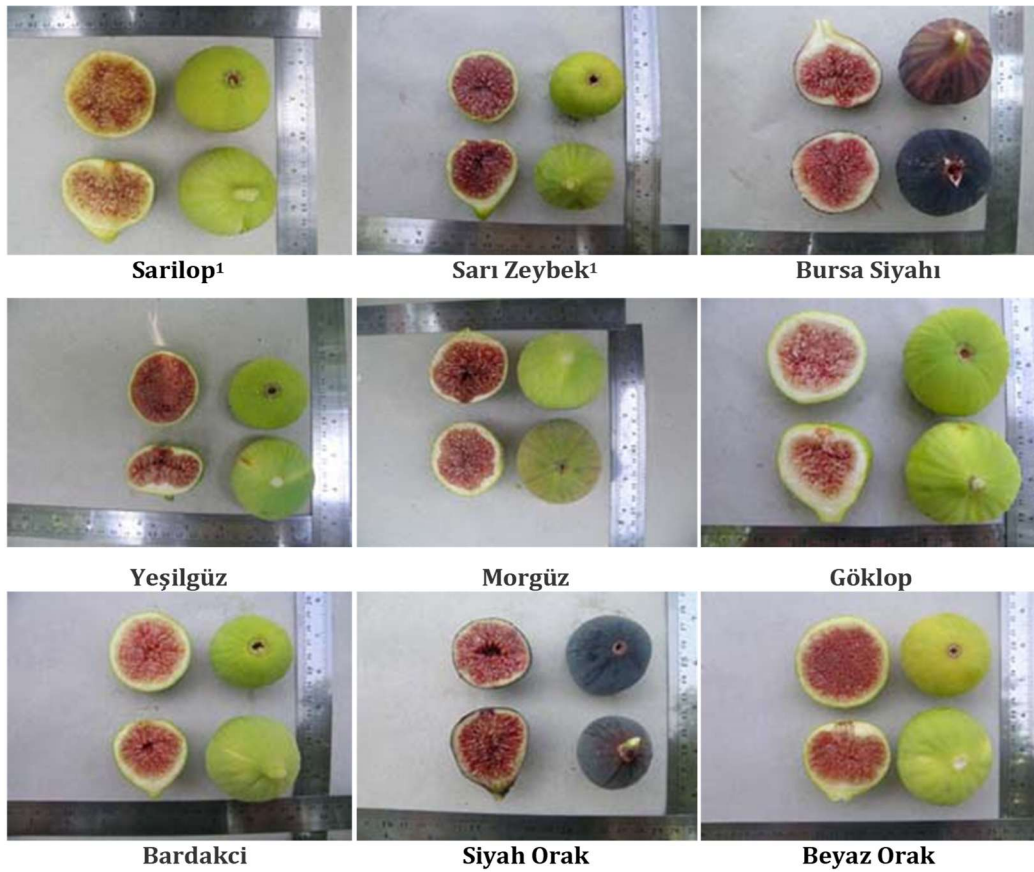


Figure 2. Figs fruit selected cultivars grown in Türkiye (¹intended for drying) (Polat and Siddig, 2012).

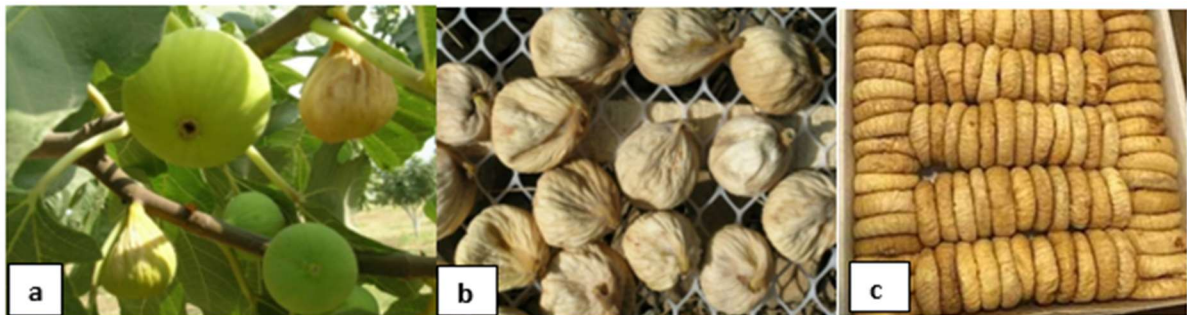


Figure 3. Fresh (a) dried (b) and packed (c) fruits of 'Sarılop'.



Figure 4. Ripe fruit of 'Bursa Siyahı'

ORCHARD ESTABLISHMENT

Fig orchards in Türkiye are traditionally developed with saplings propagated by hard or softwood cuttings. Orchard plantations are established on flat lands. Usually, the cultivars for drying are planted at 7×7 or 8×8 m, and for fresh fruit at 6×4 m spacings. On sloping and highland regions, trees are usually planted at 6×6 m spacings because they form smaller canopies. The time of planting depends on whether the saplings are bare root or container. Saplings are planted usually in November-December in warm regions and in February-March in cold regions (Polat, 2017).

ORCHARD MANAGEMENT

Irrigation

Fig is a hardy tree and does not require much irrigation, mostly grown as rain fed, optimum rainfall claim of 625 mm is enough for its cultivation. For growing dried figs, it is better if the rainfall occurs in between November and June, and dry and cloudless between July and September.

When the annual rainfall is insufficient or irregular (below 550 mm per year), it is suggested to provide irrigation especially in the most sensitive plant growth period which is at the beginning of spring (March-April) when the new leaves are emerging. However, nursery trees should be irrigated until it reach up to 4-5 years. The saplings are irrigated from May to mid of September at 7-10 day intervals depending on climate and soil conditions, then these young fig trees don't need additional irrigation in the following years. For the irrigation of a mature fig trees in the orchard the most common methods followed are basin, furrow and drip irrigations. The orchards should be irrigated after the end of the rainy season and should continue until spring and the start of the rainy season in fall. It is recommended to prefer underground irrigation systems to reduce evaporation in dried fig production.

Fertilization

Fig trees require correct nutrition management to produce high production with quality fruits. The types of fertilizer used and application rates are related to plant age and soil nutrient status.

The majority of fig cultivation in Türkiye is in soils with low nutrient content. In some production areas it is grown in sandy soils that contain low nutrients and in some other soils it contain high lime. Soil analysis is therefore needed to understand the soil health and fertilizer programme should be carried out accordingly. Production of dried figs in the Aydın region the, main fig production area of Türkiye, is generally carried out mostly with manures without inorganic fertilization (Arpacı et al., 2018).

Balanced nutrition of the tree is very important. Excessive nitrogen fertilization increases the risk of aflatoxin by prolonging the drying time of fig fruits. Similarly, very low nitrogen levels can trigger stress and increase aflatoxin formation. Cracking and sunburn in fig fruits are closely related to the potassium (K), calcium (Ca) and magnesium (Mg) content of the fruit. A low potassium/calcium (K/Ca) ratio increases fruit cracking, while a high potassium/calcium (K/Ca) ratio increases sunburn of fruit.

Soil tillage

In order to benefit from winter rains, and to reduce the competition of weeds for water and nutrients, it is suggested to create a smooth ground floor before harvest. The soil should be plowed but not too deeply while it is still soft. In dried fig cultivation, soil tillage is done 3-4 times a year, preferably in November, March and June. In order to prevent erosion on slopy lands, soil plowing should be done very carefully and by following the contours of the slope. Hoeing is done to clean the weeds at the base of the trees and a pool is opened at the base of the trees to capture rain water. Before harvest, tilling that causes excessive dust in the orchard should be avoided especially in windy days. Because this process triggers the formation and spread of aflatoxin in the product by spreading mold spores.

Pruning

If remain unpruned, fig trees, inner canopy of the trees will be too dense and the fruit will be produced only near the outside of the canopy. The fruits in the outer canopy will be easily sunburned and the yield will be low. Therefore, pruning should not be neglected.

Pruning is applied regularly in intensive orchards but not always for scattered trees. Pruning is done for 3 different purposes: formative, production and rejuvenation.

Formative, production, and rejuvenation pruning are performed at different growth stages to regulate canopy structure, maintain high productivity, and restore the vigor of aging trees, respectively. Pruning intensity and timing were determined according to the tree age, growth habit, and overall orchard management objectives.

1. Formative Pruning: Fig trees may be trained to a modified central leader or open centre configuration. In Türkiye, generally, fig trees are trained in “open-centre” systems (Polat, 2017). To train fig trees to open centre, after planting, the top of the sapling is cut at 60-80 cm from ground level. At the end of the first year after planting, 3-4 of the shoots sprouting up the main trunk of the young trees are selected as scaffold branches. It is best to choose three or four branches that are evenly spaced around the tree, have wide angles, and are not directly opposite another branch. The selected branches on the tree are pruned to 30-40 cm, and other waste branches are removed. During the second year, the tipping process is carried out so that the strong shoots coming out of the scaffolds branches do not grow any more. At the end of the second year, 2-3 shoots are selected close to the tip of each scaffolds branch as lateral branches and are pruned from 25-30 cm. The same applications are done in the third and fourth years. Thus, at the end of the fourth year, a young and strong tree canopy with 3-4 scaffold branches and 6-12 lateral branches is obtained.

2. Production Pruning: In production pruning, the branches that are creating congestion, gluttonous, weak, drooping, broken, dried or diseased branches and leaves are removed. Production pruning should be done every year to control the excessive growth of the tree and to obtain sufficiently developed annual shoots.

3. Rejuvenation Pruning: Rejuvenation pruning is severe pruning done to neglected, damaged, poorly yielding or very large trees that can no longer be efficiently farmed. The tree is topped about 0.5 m from the ground during the dormant season. Pruning compound with fungicide is often applied. New scaffolds will be selected from the shoots on the trunk and trained for 3-4 years. Rejuvenation pruning takes advantage of the existing root system's ability to produce a new tree rapidly (Jafari et al., 2022). In Türkiye, it is applied to old and unproductive trees but with healthy main trunks. In this type of pruning, main old branches are cut and removed from the trunk and new main branches are formed from the newly formed shoots and the tree is given a new shape. In this way, the tree is rejuvenated.

Pest and Disease

There are various root, leaf and fruit diseases and some pests frequently affecting fig trees in Türkiye. The most common root diseases are White root rot caused by *Rosellinia necatrix* Prill fungus and Armillaria root rot caused by *Armillaria mellea* fungus.

The most important and widespread leaf disease is Fig Mosaic Virus. Its symptoms are similar to potassium deficiency. The leaves are smaller than normal and may be deformed. It causes premature defoliation and fruit drop often occur. Spreading of the virus are occurred by planting materials that are developed by cuttings, graftings, and vectors [*Aceria ficus* (Cotte)].

Endosepsis (internal rot) caused by *Fusarium moniliforme* is a fungal disease and is the leading fruit disease. Especially sickened profichi fruits would play major role in spreading of the disease.

Another important fruit disease is sourness that is caused by fermentation of the fruit. Fermentation caused several bacteria and fungus infection. Spreading of this souring is performed by Mitadulid and Carpophilus dried fruit beetles. The most important pests that cause problems in fig cultivation are root knot nematodes, *Ceroplastes rusci* (red spider), *Drosophyla melanogaster* (vinegar fly), *Tetranychus urticae* and *Aceria ficus*. In Türkiye, fig cultivation is practiced almost without use of chemicals for pests and diseases. In some years, the widespread dried fruit beetle (*Carpophilus hemipterus*) and fruit flies (*Drosophila* spp.) are controlled by using natural traps rather than chemicals.

Caprification

Fig pollination, known as caprification, is customary practice in all fig-growing regions where 'Smyrna' type figs are produced (Gaaliche et al., 2011b; Trad et al., 2012). Common and important Turkish fig cultivars such as ‘Sarilop’, ‘Bursa Siyahı’, ‘Yeşilgüz’, ‘Morgüz’ and ‘Göklop’ are require cross-pollination and caprification for fruit set. In order to pollinate female figs that requires cross-pollination for fruit set, the process of transferring caprifig fruit pollen to the edible fig syconia by the fig wasp is the common practice, *Blastophaga psenes* which lives in the fruit of male trees is called caprification (Figure 5). Caprification is done when the edible female fig fruits, which are the main product of female figs, are the size of a hazelnut. In the Izmir-Aydın region, which is an important production center of Türkiye, caprification is done in the first two weeks

of June in normal conditions (Özen et al., 2007; Şahin et al., 2012). This time can be shifted earlier or later considering the other effect of ecological factors. Caprification is repeated two or three times at 5-7 day intervals depending on the number of fruits on the tree due to the intermittent ripening of the fruits in female fig trees (Gaaliche et al., 2011b; Başpınar et al., 2019).

The caprification process is generally done by stringing the fig fruits from the neck to the stalks of the *Typha latifolia* plant (*Cyperaceae* spp) and hanging these strings on the female fig tree. This process can also be done by placing the fig fruits in small nets and hanging the nets on the tree (Figure 5). The number of caprifigs fruit to be hung each time varies depending on the size of the tree. Under normal conditions, it is sufficient to place 3-4 fruits inside nets in three different places on the tree which should be repeated twice with a week interval. When the caprification process is complete, the caprifigs fruit hung on the trees are collected and destroyed outside the orchard.

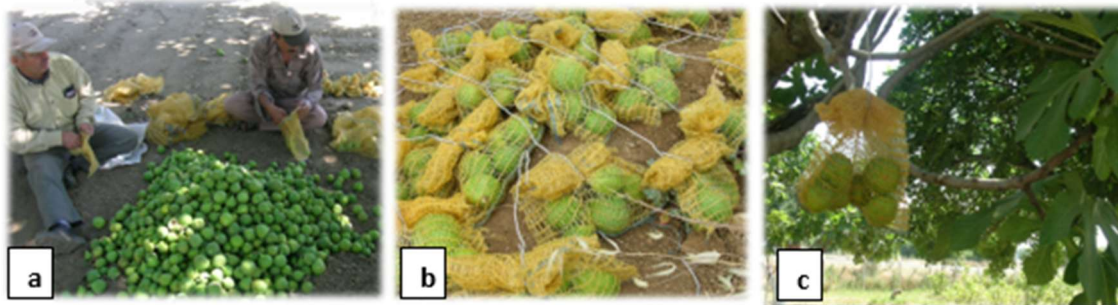


Figure 5. Caprification: Preparing of profichi fruit (a and b), profichi fruits which are hanged on the fig tree within the net (c).

Harvesting

Fresh Fig

Figs are climacteric fruit but they do not continue ripening after harvest (Crisosto et al., 2010, 2011), they are picked when they are fully ripe. The best index of fruit ripeness is the color of the fruit's skin and the characteristics specific to the variety formed on the skin. Since the fruits on the tree ripen irregularly, the fruit is picked daily for the next 4-6 weeks. The selective harvesting of suitable fruit needs experienced and trained pickers. Fruit harvesting is done by hand. The fruit is picked from the branch with its stalk and its skin untearing. The fruits are picked in the early morning when the weather is cool and are not exposed to the sun and heat. The picked fruits are packed and transported to the market as soon as possible. Packaging is done in shaded and cool places in field, or in packing house.

Wooden or plastic crates and cardboard trays are used as packaging containers. The packaging container must be sturdy, stylish and appropriately labeled. Fruits are sorted according to maturity by color, also by size (weight) and packed in one layer 30x40 cm trays, 25, 22, 20, 18, 16 or 14 pieces per box or 4 pieces in a punnet (160-180 g). It is also packaged in 30x20 cm mini carton box for retail. Depending on customer requirements, it is pack 2, 6 or 8 pieces or 500 g, 1000 gr punnet or package, any size or weight of fruit as demanded. The most suitable transportation vehicle for fig export is the airplane. Since fresh fig fruit is perishable very quickly, the product must be collected in the morning and transported to the importing country by air on the same day. Where transportation by air is not possible, alternatively refrigerated vehicles can be used. Products that are not collected and sent to the market immediately must be placed in cold storage.

Dried Fig

The figs which are not collected as fresh are partially dehydrate on the tree and fall on the ground due to forming suberification. Fruits that do not drop on their own are dropped by shaking the tree with the help of a pole. The fruits are collected from the ground, to prevent mold and pest damage. Dried fig harvesting is done regularly. In recent times, harvesting nets are used to prevent fruits from falling to the ground. Nets are placed under each tree at a height that will not contact the soil. Dropping figs are collected regularly from the net and brought to a suitable area for drying.

POSTHARVEST PHYSIOLOGY AND STORAGE

Fully ripe fresh figs are soft, prone to bruising and are extremely perishable. Therefore, after picking, fruits that can not sent immediately to market should be stored in cold storage. Postharvest temperatures are critical

for fresh figs. Low temperatures during postharvest storage of fresh figs slow the fruit's metabolism, delaying fruit ripening, quality loss and controlling spoilage. The optimal storage conditions for fresh figs are temperatures of approximately -1 to 0°C with a relative humidity of 90-95% (Ramezani et al., 2022). Fresh figs can be stored for two weeks in 0°C and 85-90% relative humidity (Başpınar et al., 2019).

Fresh fig shelf life is extremely short, lasting 1-2 days at 20°C after storage at 4-6°C and 75% relative humidity (Morton, 1987). Forced-air cooling to 0°C is recommended (Chessa, 1997; Crisosto and Kader, 2009). It has been shown that the storage of fresh-cut fig fruit at low temperatures (5 or 0°C) was more effective than controlled atmosphere storage (Hong et al., 2016).

Among the Turkish fig varieties, 'Bursa Siyahı' is one of the most preferable and the excellent quality for fresh fig in Türkiye and has a great demand in the world market. Pre-cooling helps to extend the storage period. Pre-cooling process can extend the storage period from 2 weeks to 4-5 weeks in "Bursa Siyahı" fig fruits. Also, harvesting 'Bursa Siyahı' figs before full ripeness (firmness of 3.7 N/cm² vs 1.5 N/cm² in a ripe fruit) extended their storage potential from 4 to 6 weeks, but did not allow the fruit to achieve optimum quality (Türk 1989; Celikel and Karacalı 1998). Nonetheless, the quality attained was somewhat higher than that of many cultivars available in the market. Dried figs can be stored under ambient conditions if the relative humidity does not exceed 65%. However, recommended storage conditions are 0-4°C and 55-65% RH. Under these conditions dried figs can be stored for more than 12 months.

FIG PROCESSING AND PROCESSED PRODUCTS

Owing to the extreme perishability of fresh fig fruit, for centuries, the most important fig product offered to consumers is dried fig fruit. In addition, some other processed products like jam, marmalade or delight etc., are available in the market and only a small portion of production is canned. The process steps employed in the fig enterprises are fumigation, sizing, selecting and removing aflatoxinous under UV light, washing, drying, packaging, storage and delivery.

Harvesting and preparation for drying

Figs fruits to be used for drying are allowed to fully ripen and partially dry on the tree. Subsequently, fruits drop to the ground where they continue to dry. The orchard surface below the tree is appropriately prepared by weeding and sometimes it maybe covered with cloth or plastic canvas (Ozen et al. 2009). The acid figs collected from under the tree contain around 30-50% water (Aksoy, 1997). However, it is desired that the figs to be stored have around 18-20% water. The aim of drying is to reduce the water content from around 30-50% to 18-20%. Many different tools are used to dry the fruits. The drying process is mostly carried out on plastic or wooden drying trays called "kerevet" (Figure 6) under the full sun under natural conditions.

These trays are positioned in a special area in the orchard called the drying yard, usually located in a sun exposed open area. Fruits in the trays are periodically turned from one side to other side until they reach 18% to 20% water content. Drying process takes 3 to 7 days, depending on the weather. In the sun drying method, there is a risk of invasion by pests and pathogens due to the fruits prolonged exposure to open environment. Therefore, in recent years, drying the fruits under a plastic tunnel in which two sides are covered by a net (Figure 7) has become widespread in order to make the drying process faster and healthier.

The drying trays are placed 10 cm above the ground constitute the most suitable drying environment in terms of both pollution and drying time. Tunnels and 'kerevet' provide protection from sudden rainfalls in addition to their benefits such as shortening the drying time, reducing pollution, and preventing aflatoxin infection. In addition, they prevent the entry of butterflies of dried fruit beetle (*Carpophilus hemipterus*) and fruit flies (*Drosophila* spp.), protect them from the risk of laying eggs, and from dew. After drying, the fruits are transported to wholesaler or growers' warehouses immediately.



Figure 6. Fig drying in wooden or plastic trays



Figure 7. Drying figs under tunnels

Admission of Dried Fig by Cooperatives

Taris Dried Fig Processing and Storing Facilities are situated in Germencik, which is one of the provinces where fig production is most intensive and as this province having the advantage of being the closest to the area of raw material, product arrives at the factory within the shortest period. After the products, which are brought in plastic boxes by the producers who are registered at 15 Fig Agriculture Sales Cooperatives in Aegean Region, are checked and issued by the experts, they are sent to Taris Fig Processing and Storing Facilities in Germencik within 24 hours.

Fumigation and Aflatoxin Control

The dried figs which are sent to the factory after the expertise of the Union are fumigated. Every kind of contamination, which can be brought from the areas of field, is prevented through fumigation. The dried fruit industry in Türkiye generally uses approved chemicals or physical methods, such as shock treatment at -40°C , for fumigation (Arpacı et al., 2018). Products are sorted and stored after fumigation.

Dried figs, the production of which is programmed according to the demand, pass through aflatoxin control after storage stage. Besides the official control system, a monitoring system is established by the Aegean Exporters Union.

Figs control at least two times to sort out aflatoxin contaminated dried figs under UV lamps (Figures 8). During this control process, aflatoxin-contaminated fruits and other mouldy fruits are removed. All products are then washed and cleaned from foreign objects and thus become suitable for processing (Figures 9). Washed figs are nested for a while. They are kept in drying stores where required. The contaminated figs are collected in a warehouse and then destroyed as hazardous waste.



Figure 8. Separating aflatoxin-containing figs under UV light enterprises



Figure 9. Selecting and sorting in fig enterprises

Fig Processing, Premium Fig Production and Packaging

Dried fig is processed in different types according to customer's request [Lerida, Layer, Chocolate (Premium), Makaroni]. After the stem and eye of the best quality figs are cut, they are wrapped individually and presented to customer in its special packaging. Dried figs are packed in various types according to customer's request. All packed products pass through metal detector control.

CONCLUSION

The main variety for drying is “Sarılop” in Türkiye. Fig cultivars in the world markets do not have quality cultivars such as “Bursa Siyahı” for fresh fig, "Sarılop" for dry fig. This provides competitive advantage over European producing countries to Türkiye.

Orchard management plays a key role in the economic success of fig cultivation. Orchard management includes caprification, training and pruning, irrigation, fertilization, pest and disease control. All these components, if practiced scientifically at the right time will result in productive orchard that will produce good yields and better fruit quality for a longer span.

With the understanding of the benefits of fig fruit for human health, the consumption of dried figs in traditional markets has not only increased but also created new markets. Although its health benefits increase the consumption of dried figs, the most important issue in world trade is the quality and safety of the product (Aksoy, 2021). Pest damage of fruits and mycotoxins are the major challenges. Mycotoxins, which are mostly formed while fig fruit begins to ripen on the tree, are the major threat in all producing countries. In order to prevent or reduce contamination, in addition to good agricultural practices, contaminated fruits must be removed during the postharvest chain.

Due to the high perishability of fresh figs, high losses occur during marketing. Pre-harvest orchard conditions and post-harvest conditions are of great importance in improving fruit quality and post-harvest shelf life. In particular, to reduce post-harvest losses and improve global fresh fig marketing, plant breeders, physiologists and postharvest scientists need to work together. In addition, necessary studies need to be carried out to improve production and solve problems in dried fig farming.

ETHICAL APPROVAL

The study, entitled " Fig Production in Türkiye: Varieties, Cultivation, Orchard Management and Processing ", was conducted in accordance with the relevant scientific, ethical and citation rules. No falsification was made of the collected data, and this study has not been sent to any other academic media for evaluation. As it does not require ethics committee approval, it can be considered to be in accordance with the relevant ethical standards.

REFERENCES

- Aksoy, U. (2017). The dried fig management and the potential for new products. *Acta Hort.* 1173, 377-382. DOI:10.17660/ActaHortic.2017.1173.65.
- Aksoy, U. (2021). Dried fig industry: progress and challenges. *Acta Hort.* 1310, 157-164. DOI:https://doi.org/10.17660/ActaHortic.2021.1310.24
- Arpacı, S., Konak, R., & Çiçek, E. (2018). A national value: Turkish figs. *Chronica Horticulturae*, 58(2), 15-22.
- Chessa, I. (1997) Fig. In, Mitra, S. (ed.) *Postharvest Physiology and Storage of Tropical and Subtropical Fruits*(pp: 245–268), CAB International, Wallingford, UK.
- Crisosto, C.H. and Kader, A.A. (2009) Figs. In: *Postharvest Information for Fruits and Fruits. Postharvest Quality Maintenance Guidelines*, www.ucanr.edu/sites/kac/files/123822.pdf (accessed 30 October, 2025).
- Crisosto, C. H., Bremer, V., Ferguson, L., & Crisosto, G. M. (2010). Evaluating Quality Attributes of Four Fresh Fig (*Ficus carica* L.) Cultivars Harvested at Two Maturity Stages. *HortScience*, 45(4), 707–710. https://doi.org/10.21273/HORTSCI.45.4.707
- Crisosto, C.H., Bremer, V. & Stover, E. (2011) Fig (*Ficus carica* L.). In: Yahia, E.E. (Ed.) *Postharvest Biology and Technology of Tropical and Subtropical Fruits*, (pp: 134-158), Vol 3: Cocona to Mango. Woodhead Publishing Ltd., Cambridge, UK.
- Crisosto, C.H., Ferguson, L., Preece, J.E., Michailides, T.J., Haug, M.T., López Corrales, M. & Crisosto, G.M. (2017). Developing the California fresh fig industry. *Acta Hort.* 1173, 285-292. DOI: 10.17660/ActaHortic.2017.1173.49
- Çalışkan, O. & Polat, A. A., (2008). Fruit characteristics of fig cultivars and genotypes grown in Türkiye. *Scientia Horticulturae* 115, 360–367.
- Çelikel, F.G. & Karaçalı, I. (1998). Effects of harvest maturity and precooling on fruit quality and longevity of "Bursa Siyah" figs (*Ficus carica* L.). *Acta Hort* 480, 283-288. DOI: 10.17660/ActaHortic.1998.480.55
- FAOSTAT, (2025). Food and Agriculture Organization of United Nations, Statistical Data www.faostat.fao. org/ (accessed 29 October 2025).
- Ferrara, G., Mazzeo, A., Colasuonno, P., and Marcotull, I. (2022). Production and Growing Region. In, Sarkhosh A., Yavari A. and Ferguson L.(Eds). *The Fig: Botany, Production and Uses* (pp: 47-92), CABI International, UK. DOI: 10.1079/9781789242881.0003.



- Gaaliche, B., Trad, M. & Mars, M. (2011b). Effect of pollination intensity, frequency and pollen source on fig (*Ficus carica* L.) productivity and fruit quality. *Scientia Horticulturae* 130, 737-742. DOI: 10.1016/j.scienta.2011.08.032
- Hong, G., Crisosto, C. & Cantwell, M.I. (2016). Quality and physiology of two cultivars of fresh-cut figs in relation to ripeness, storage temperature and controlled atmosphere. *Acta Horticulturae*, 1141, 213–220.
- Işin, F., Çukur, T. & Armağan, G. (2003). An evaluation of dried fig production and marketing in Türkiye from dried fig exportation standpoint. *Acta Hort.* 605, 183-189. DOI:10.17660/ActaHortic.2003.605.27
- Jafari, M., López-Corrales, M., Galán, A.J., Galván, A.I., Hosomi, A., Nogata, H., Ikegami, H., Balas, F., Serradilla, M.J., Garza-Alonso, C.A., Yavari, A., Ferguson, L. & Sarkhosh, A. (2022). Orchard Establishment and Management. In, Sarkhosh A., Yavari A. and Ferguson L.(Eds). *The Fig: Botany, Production and Uses* (pp: 184-230), CABI International, UK. DOI: 10.1079/9781789242881.0008.
- Morton, J. 1987. Fig. In, Julia F. Morton(Ed) *Fruits of warm climates*(pp: 47–50), Miami, FL. <https://www.hort.purdue.edu/newcrop/morton/fig.html>(accessed 30 October, 2025)
- Özbek, S. (1978). Özel Meyvecilik. Çukurova Üniversitesi Ziraat Fakültesi. Yayınları:128 Ders Kitabı:11. Ankara Üniversitesi Basımevi. Ankara. 486 s.
- Özen, M., Çobanoğlu, F., Özkan, R., Kocataş, H., Tan, N., Ertan, B., Şahin, B., Konak, R., Dogan, O., Tutmuş, E., & Şahin, N. (2007). Fig cultivation (Türkiye: Ministry of Food, Agriculture and Livestock) (in Turkish).
- Özen, M., Çobanoğlu, F., Özkan, R., Konak, R. & Tutmuş, E. (2009). Effect of drying in tunnel and different harvest methods on some quality parameters and aflatoxin in storage, in sarilop fig cultivar. Paper presented at Fourth International Symposium on Fig, Meknes-Morocco, September 29-October 3, Abstract Book, p.116.
- Polat, A.A. and Özkaya, M. (2005). Selection studies on fig in the Mediterranean region of Türkiye. *Pak J Bot* 37, 567-74.
- Polat A. A., Çalışkan O. (2008). Fruit characteristics of table fig cultivars in subtropical climate conditions of Mediterranean region. *New Zealand Journal of Crop and Horticultural Science*, 36, 107-15. DOI: 10.1080/01140670809510226
- Polat A. A. and Siddiq, M. (2012). Fig. In, Siddiq M (Ed), *Tropical and Subtropical Fruits, Postharvest Physiology, Processing and Packaging*(pp:455-477). John-Wiley Punishing Co., Ames, Iowa, USA,
- Polat, A. A. (2017) Fig production in Turkey. *Journal of Pomology* 51, 197–198.
- Polat, A.A. (2024). Fig industry in Türkiye: production and marketing. *Acta Hortic.*, 1405, 201-208
Dio: 10.17660/ActaHortic.2024.1405.20
- Ramezani, A., Amiri, A. & Crisosto, C.H. (2022). Postharvest Physiology and Physiological Disorders of Fresh Fig Fruits. In, Sarkhosh A., Yavari A. and Ferguson L.(Eds). *The Fig: Botany, Production and Uses* (pp: 384-397), CABI International, UK. DOI: 10.1079/9781789242881.0016.
- Trad, M., Ginies, C., Gaaliche, B., Renard, C.M.G.C. & Mars, M. (2012). Does pollination affect aroma development in ripened fig [*Ficus carica* L.] fruit? *Scientia Horticulturae* 134, 93-99. DOI: 10.1016/j.scienta.2011.11.004
- Türk, R. (1989). Effects of harvest time and precooling on fruit quality and cold storage of figs (*F. carica* L. cv. "Bursa Siyahi"). *Acta Hort.* 258, 279-286. DOI: 10.17660/ActaHortic.1989.258.31
- Uzundumlu, A. S., Oksuz, M. E. & Kurtoglu, S. (2018). Future of fig production in Türkiye. *Journal of Tekirdag Agricultural Faculty*, 15, 138-146.
- Yılmaz, S., Gozlekçi, S. & Ersoy, N. (2017). A review of fig sector in Türkiye. *Acta Hortic.* 1173, 409-414. Doi: <https://doi.org/10.17660/ActaHortic.2017.1173.70>