

REVIEW ARTICLE

FIGS (*FICUS CARICA L.*): CULTIVATION METHOD AND PRODUCTION BASED IN MALAYSIA

Kamaruddin Shamin-Shazwan, Rozilawati Shahari*, Che Nurul Aini Che Amri and Nur Shuhada Mohd Tajuddin

Department of Plant Science, Kulliyah of Science, International Islamic University Malaysia, 25200 Kuantan, Pahang, Malaysia.

*Corresponding author email: Firdawila@iiu.edu.my

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ARTICLE DETAILS**ABSTRACT****Article History:**

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Ficus (Moraceae) is a tree or shrub natively originated from East Asia countries such as Middle East and Turkey. However, determination of the most suitable cultivation method in Malaysia has becoming one of the major concerns in figs industry. This is because figs can be easily found in cold and temperate regions compared to the equator regions. Therefore, this paper will discuss on the method of figs cultivation and its production based on the market demands in Malaysia. Simple propagation methods such as cutting, and layering are the most recommended method used for cultivating the fig trees. As for the production, figs are mainly processed as food such as jam, tea, dipping sauce, spaghetti sauce and dried processed food or available fresh. It is also used in traditional medicine as it is claimed to be good remedies in treating severe health problem such reducing blood sugar level and gastrointestinal problem.

KEYWORDS

Fig, Cultivation, Production.

1. INTRODUCTION

Ficus commonly known as fig is a tree or shrub; belongs to the Moraceae family. This genus has almost 900 species around the world which originated in cold and temperate tropical regions such as Middle East, Turkey, Africa and India. *Ficus* genus is an important genetic resource due to its high economic and nutritional values and also an important part of the biodiversity in the rainforest ecosystem. This genus is also a good source of food for fruit-eating animals in tropical areas [1]. *Ficus carica L.* is known as common fig abundantly distributed in southwest Asia and eastern Mediterranean and is also the first figs species that has been cultivated by humans. This common fig has pear-shaped fruit, hollow and fleshy receptacle; can be consumed either in fresh or dry fruit [2]. In addition, a group researchers reported fig's fruits, leaves and roots traditionally used to treat several disorders such as colic, indigestion, loss of appetite and diarrhea, sore throats, coughs and bronchial problems, inflammatory and cardiovascular disorders. Researchers have discovered the enormous resource of medicinal plants like figs to be incorporated in modern pharmaceutical for medicine development for treating severe diseases like cardiovascular, anti-inflammatory and antispasmodic remedy [3, 4].

Figs mentioned in Quran in Surah At-Tin, verse 1: "[I swear] by the fig and the olive." From this ayah, Quran is the most perfect evident where Allah the Almighty swears by the name of fig together with olive. Fig being mentioned in the first ayah of the surah shows the wisest way of Allah in telling human the benefits imparted [5]. In addition, Prophet Muhammad the Messenger of Allah also mentioned figs in his hadith as narrated by Abu Darda RA: "Eat figs! If I would say a certain type of fruit was sent down to us from the heavens I would say it's a fig because it has no seeds. It ends the piles and is useful for rheumatism." Thus, Islam truly recommends human to consume figs as part of daily life because of its superiority compared to other fruits [6]. *F. carica* has been cultivated from a long time ago in many places all around the world. Currently, Turkey takes record as the largest producer in figs worldwide industry and Malaysia is not far behind in the world's development in figs industry as reported by Jay and Yusof (2018). Thus, the purpose of this study is to discuss on the current development of figs industry in term of its suitable method of cultivation and production based on the market demands in Malaysia.

2. CULTIVATION OF FIGS IN MALAYSIA

The common fig, *F. carica* is one of the early cultivated fruit species and becoming an important crop worldwide [1]. Like other countries, Malaysia cultivates figs by a few simple propagation methods such as through stem cutting and air layering. For stem cuttings, fig tree is usually propagated from the basal and median portions of the branches. Air layering is also can be applied for a few cultivars of *F. carica* like 'Brunswick', 'Nazareth' and 'Montes' reported. This method is an alternative way for cultivating the fig trees that have low capability in rooting from cutting [6] and also helps in maintaining the desirable traits of the cultivar of the figs and also being used in selecting material for planting [7, 8].

Fig production in greenhouse enables the growers to control the environmental conditions and other risks from pests and diseases for good crop development, increase of productivity in quantity and commercial opportunity. In addition, the hydroponic system applied help to control the nutrient supplement to the plant in consistent amount without having influence from the environment factors like soil system and weather [9,10]. The disadvantage in the production of figs under greenhouse is the cost for building the greenhouse. The average cost offered by the suppliers in Malaysia is around RM 10,000 – RM 30,000 for the small growers to start the business. However, there are many fig growers in Malaysia started their business by building the greenhouse worth up to RM 100,000 [11,12].

Based on the documentary, fig can also be produced in open field either in a big scale or small production scale. Unlike the greenhouse, fig cultivated in the open field need to have more neat and proper management because its growth might easily affect by the environmental factors especially the factors that can reduce the fig growth or production of the yield. Examples of environmental factors are weather, sunlight, soil condition, rain distribution, pests and pathogens attack and many more. Open field cultivation gives opportunity for small grower to plant the fig in small production scale just enough to harvest the fig for their own needs without planning to market their yield.

However, the open field production shows some challenges in production such as fruit decay during in rainy season, high risk in pests and pathogen

infection, mishandling of plantation due to few things need to be done manually and damage to the plant caused by frost [13]. In Malaysia, the main typical problem in growing fig is due to Malaysia condition with its dry and rainy season throughout the year unlike the Middle East which has four different seasons in a year. According to the Climate Change Knowledge Portal, the average rain distribution in Middle East is only 12.97mm while Malaysia has an average at 254.80mm [14]. Fig is very sensitive to the rain which easily caused the fruit rot, necrosis on the leaves and increase the risk of pests or pathogens attack that will reduce the yield production. In addition, the most common disease attack faced by fig when open planting is fig mosaic disease (FMD) that caused chlorotic mottling and blotching, banding, clearing and feathering of veins, chlorotic and necrotic ring spots and line patterns and malformation of leaves [15, 16]. FMD might causes many disorders in fig growth leading to poor fruit quality, low yield production, shortening the tree life and its growth as commercial crops.

Open field plantation need to have good planning in crops management to get higher yield such as implementation of fertigation techniques, high-planting densities plantation, managing productive branches and macro-tunnels and management in handling different types of pruning of leaves, buds and stems [13]. Thus, greenhouse plantation is a good production alternative in order to grow fig in Malaysia environment due to many considerations stated above compared to open field plantation.

3. PRODUCTION BASED IN MALAYSIA

In terms of production Malaysia is still growing to produce its own products. Fig fruit can be consumed fresh, dried, preserved, canned and candied [16]. In food industry in Malaysia, fig fruit is processed into jam, tea, dipping sauce, spaghetti sauce, cake, ice cream, biscuits, chocolate, marmalade, wine and other several types of beverages [17, 18]. The fig fruit demand is increasing due to the consumers' interest in the fruit content because of the micronutrient such as anthocyanin pigment, flavonoids and another phenolic compound with antioxidant activity [1, 19]. Figs are rich in fiber, trace minerals, antioxidant polyphenols, proteins, sugars, organic acids, cholesterol-free and contain high number of amino acids [20-23]. In order to keep fig production performance in high demand, breeding programme is necessary for selecting the new fig cultivars with favorable traits for fresh fruit consumption such as intense fruity flavors, an adequate balance of sweetness and sourness and good postharvest performance [24].

However, fig has a short post-harvest life if they are consumed fresh because of fig is highly sensitive to microbial activity. Therefore, fig is processed by sun drying in order to prolong their long-life storage [18]. Drying the fruit will decrease the water activity of the content, reduce microbiological activity and minimizes physical and chemical changes during its storage period [25-26]. Sun drying method is the most common method used for drying the fig fruit and applied by many countries due to its simplicity and low operating cost [19].

Ages fig is used as traditional medicine as it is claimed to be good remedies in treating severe health problem such as to reduce the blood sugar level and gastrointestinal and seems to have lower side effects [27]. There is a claim from consumers that fig can be used as part of medicine development for treating severe diseases like cardiovascular, anti-inflammatory and antispasmodic remedy [28]. Fig industry in Malaysia is growing in producing more products for commercial purposes rather than investing on modern pharmaceutical for medicine development.

4. CONCLUSION

In conclusion, fig can be cultivated either in greenhouse or open field condition based on the type of the growers want to be. However, there are also growers that chose to cultivate fig under open field condition with intensive care to monitor the production. For the production of fig, Malaysia is improving to produce own product based on customer's demand and focuses more on the use of fig in food industry rather than pharmaceutical industry. It is suggested for Malaysia to shift their focus in developing own product in medical treatment by using fig as main ingredient.

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