

Banana - A Very Profitable Crop for Subtropical Conditions

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Abstract: Bananas have been cultivated economically for a long time in subtropical regions of Turkey where production and productivity per hectare have significantly increased due to the adoption of protected cultivation. Protected cultivation of banana began in the 1980's in Anamur and Bozyazi, Mersin. In the 1990s this system became more popular. Today, a similar trend is underway in Mediterranean coastal strip. Approximately 4300 ha of banana are grown in Turkey, of which over 2500 ha is grown under protected cultivation. The average yield per ha is about 20-30 tonnes under open-field and 60-70 tonnes under protected cultivation. In 2008, the total banana production of Turkey was 210.115 tonnes but domestic consumption of bananas in Turkey exceeds supply and hence bananas are imported. Local importers pay very high custom duties (over 100%) for imported bananas and because of that, banana retail prices remain high which makes local banana production a very profitable enterprise.

Introduction

Banana growing areas of the world are mainly situated between the Equator and latitudes 20°N and 20°S. Climatic conditions in these areas are mainly tropical, with relatively small temperature fluctuations from day to night and from summer to winter (Robinson, 1996). On the other hand, banana can also be grown in subtropical areas. We may show that Western Australia, South Queensland, South Africa, Israel, Taiwan, Spain (The Canary Islands), Egypt, Morocco and parts of Brazil and Turkey for subtropical condition (Galan Sauco et al., 2004). Banana plantations are situated between the latitudes 20° and 30° many of subtropical area. But in Turkey, banana plantations are situated at 36° latitude. Nevertheless banana has been grown economically in Turkey for over a century. At present, the total banana growing area of Turkey has reached up 4300 ha (Anonymous, 2009) of which more than 2500 ha are under protected cultivation. In 2008, the total banana production of Turkey was 210.115 tons (Anonymous, 2009). As local demand (domestic consumption) for bananas are nearly 400.000 tons. Therefore, Turkey has to import nearly 200.000 tonnes bananas from overseas. Local importers pay very high custom duties (over 100%) for imported bananas, as such banana retail prices remain high, which makes local banana production a very profitable enterprise.

The main climatic constrain in Turkey like other subtropical regions are wide temperature fluctuations between day and night, low and high temperature extremes in winter and summer respectively and also rainfall is not sufficient in some months. Due to the low temperature, protected (greenhouse) cultivation has gained popularity in recent years in Turkey. In Turkey, protected cultivation of banana began in the 1980's in Anamur and Bozyazi, Mersin and in the 1990s this cultivation type gained popularity. Presently a similar trend is underway in Erdemli, Mersin; Alanya, Gazipasa (flat region), Finike, Kumluca, Antalya and Iskenderun, Hatay.

The objective of this study was to evaluate the cultivation and constrain constrains of banana in Turkey.

Banana Growing under Open-Field and Protected Conditions

Banana growing areas in Turkey are located in the Mediterranean coastal strip. Planting occurs in the North part of the mountain to protect from wind damage. Bananas have been grown in Turkey in both open-field and protected cultivation (plastic greenhouse). Anamur and Bozyazi in Mersin are the main protected cultivation areas. On the other hand, banana has grown in Alanya and Gazipasa, Antalya both open-field and protected cultivation. Average mean yearly minimum/maximum temperatures in the open-field cultivation and under the protected cultivation are 10/30 °C and 11/35 °C, respectively. Yearly average relative humidity for both conditions is over 60%. Shading powder was applied during the summer season to protect plants and fruits from sunburn damage under protected cultivation.

Growing Conditions and Cultural Practices

In Turkey, the greenhouse structure is made of round iron poles and 6.5 – 7 meters high at the top and 5-6 meters below the gutter and covered with plastic. Generally, the greenhouse is not heated in all locations. The greenhouse cost approximately 10-15 Euros/m² (without a plastic cover). However, banana plants bear fruits the same year after planting and the production costs outlays are recovered within a few years.

‘Dwarf Cavendish’ is the most common cultivar for open-field. But ‘Grande Nain’ and ‘Azman’ (local cultivar) are the most widely planted cultivars for greenhouse conditions. Plants are planted in March for open-field condition. However, there are two planting time for protected cultivation (February and September). When the plants are planted under open-field, the first ratoon crop is not so productive. But the plants produce very good bunch in the first ratoon crop under protected cultivation. While suckers are used for open-field cultivation, tissue culture plants are used for protected cultivation. Plant spacing is 2.5 x 2m (2000 plant per ha) in open-field conditions, and 3 x 1.8 m (1850 plant per ha) in protected cultivation (Gubbuk and Pekmezci, 2004). Single line is preferred than double line. But after the second ratoon crop, the plants are increased 2100 or 2200 plant per ha both cultivation systems. The soil pH was slightly alkaline, lime content was medium, texture was loam, and organic matter content was between low and medium (Köseoğlu et al., 1985). Organic manure is applied at about 50 to 60 kg per plant. Fertilizers are applied either by hand around the plant or via irrigation. The main fertilizers are NPK, which are applied at rate of 300, 400, and 1000 g/plant per cycle. Drip irrigation system are used in both cultivation system. Nematodes are the most important pests of banana. There is no Sigatoka and common virus disease in Turkey. Postharvest Technologies including handling and ripening are improve day by day.

Differences between Cultivation Systems

The main differences between both cultivation systems is days from shooting to harvest and yield. Only one crop is produced per year in field conditions, but sometimes two crops are obtained per year under protected cultivation. Days from shooting to harvest were shorter (between 90-120 days) in protected cultivation. Bunch was harvested earlier in protected cultivation than in open-field cultivation. The shorter interval is a great advantage in the subtropical region, especially in the case of frost damage. After mid November, the temperature begins to drop in the cool subtropical climate. Frost damage occurs not only in plants, but also in the fruit. Frost damage can rarely be seen in sucker and fruit in protected cultivation, but not in open-field cultivation.

Average yield per ha is between 25-30 tons in open-field and 50-70 tons under protected cultivation. The harvest time for protected cultivation is between October and January and between December and March for open-field condition. The farmer and retail prices are different in Turkey. The farmer price is between 0.7 and 0.8 Euro per kg. However, the retail price is about 1.5 Euro per kg. Therefore, the income is higher in protected cultivation.

Advantages of Protected Cultivation

There are many advantages in protected cultivation compared to open-field cultivation in subtropical conditions e.g. (a) Reduction of life cycle from planting to harvest (b) Reduction in water consumption (c) Extended duration of temperatures above 20°C (d) Higher rate of photosynthesis (e) Protection against wind and other weather conditions (e.g. sunburn and hail) (f) Increased bunch and finger weight (Galan Sauco et al., 1998). Furthermore, in protected cultivation, chilling injury and low temperature differences do not negatively affect the plants and fruits, as compared to open-field cultivation.

Disadvantages of Open-Field Cultivation

The main constrain of banana growing in Turkey like the cooler subtropics are the greater diurnal temperature fluctuations, and lower night temperatures, insufficient rainfall and wind damage. Furthermore, winter leaf sunburn, underpeel discolouration and growth cessations are typical physiological problems associated with banana production in the subtropics (Robinson, 1996).

Conclusion

The advantage of growing banana under protected cultivation under cool subtropical conditions is that the yield and the quality are higher, compared with open-field cultivation. Therefore, higher yields increase the economic prospects of banana cultivation in the subtropical regions.

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