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CLIMATE CHARACTERISTICS OF SAFRANBOLU (KARABÜK) AND SAFFRON CULTIVATION

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ABSTRACT

Saffron (Crocus sativus) has been one of the most important spices in the world since ancient times. Though there is a variety of information about its origin, it is believed to have emerged in Iran, Turkey, or Greece and have spread across the world. Saffron, which is commonly produced in the Mediterranean and Southwest Asian countries, is used in many different fields such as painting, medicine, perfumery, and food. Climate and soil conditions also play an important role in saffron production. Saffron, which shows a flexible characteristic in terms of temperature demand, shows resistance to cold temperatures down to -18 degrees and to summer temperatures up to 45 degrees. The type of soil suggested for the development of the plant is clay loam soil. Although saffron growing in Turkey has lost its former significance today, it is still carried out on a small scale in Safranbolu city. This study intends to show the positive effects of climatic elements prevailing in the region on the production of saffron, the world's most expensive plant, and to reestablish its former importance in the region. The climate data used in the present study were taken from the General Directorate of Meteorology of Turkey. The climatic conditions required by the Thornthwaite climate classification method. Systematic approach was used as a research method. The maps used in the study were prepared on ArcGIS 10.3 GIS (Geography Information System) package. According to the Thornthwaite method, Safranbolu is arid-low humidity in terms of rainfall activity, has a 2nd level mesothermal climate, has no water excess, and is closed to sea effect. Considering the climate demands of saffron, it can be said that the climate of Safranbolu city is suitable for saffron growing. In Safranbolu, saffron plants are currently cultivated only in few villages. However, more effort should be made to enhance the production of saffron, which is as precious as gold.

Contribution/ Originality: This study describes the historical growth, present status and future prospect of Saffron in Turkey that has already been grown for years in different countries of world. This research evaluates production, ecology and farming of Saffron in Turkey and world thus making it different from other related researches.

1. INTRODUCTION

Saffron is an alliaceous plant and its cultivation is based on human force and requires much effort and patience. The price of this spice is almost equal to gold. It is the most expensive product in the whole world when compared to its weight. Because of this property, it has many fake products in the markets. This spice has been used by mankind since very ancient times as back as A.D. and its name is derived from the Arabic word "*za'feran*", which means "yellow" in the Arabic language. It is considered that it had its name because of the color it gives to the substances to which it is mixed. It is named as "*Crocus sativus*" in botanic and as "Saffron" in Turkish. Many properties of Saffron have been the topic of poems in the literature and it has attracted attention in history, geography and similar areas. The word "Za'feran" was first used by Turks in the book of Yusuf Has Hacib named "Kutadgu Bilig". In this work, the word "Saffron" has been used in three sections, and is used to describe the Sun in two sections and to describe the human face in one section.

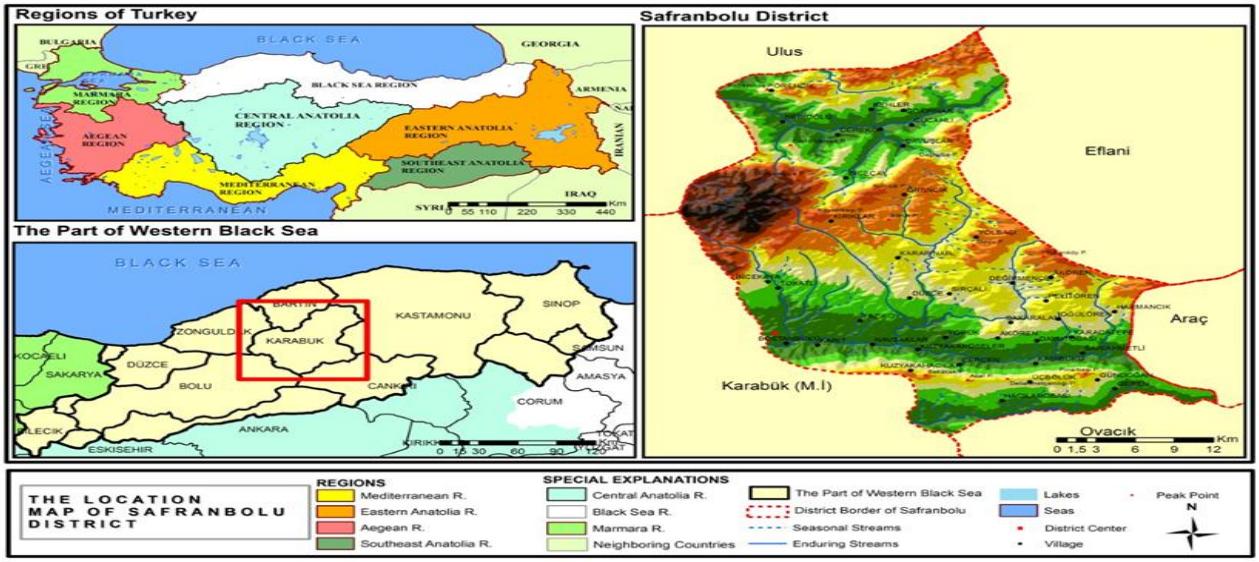
Although there are not exact data on the motherland of Saffron, there are many different viewpoints. There are some viewpoints claiming that the motherland is Anatolia, Eastern Mediterranean Region and its surroundings, and was brought from the Middle Asia by the Turks who migrated to Anatolia, and were cultivated in India and Horasan region of Iran for centuries. It is also claimed that it was cultivated in Egypt and Middle East 3500 years ago. When the root of the word "Saffron", its common usage, and climatic properties are considered, the claim that its motherland is the area neighboring Mediterranean basin in the Middle East becomes to the forefront. Fernandez (2004) claimed that Saffron started to spread in Europe during Medieval Ages, and reached Great Britain in 14th Century.

Saffron has been used as a spice in food and desserts for centuries with its smell and taste. It is among the important spices in the Turkish cuisine. Turkish Delight with Saffron, ashoura, saffron and rice dessert, baklava with Saffron are common examples for desserts, and rice with Saffron, *keşkek* (*a dish of mutton or chicken and ground wheat*), Saffron soup, which are the outcome of being rich, are some of the food made with Saffron. The usage areas of Saffron are wide from paint industry to medication industry and medicine. Ceylan (2005) conducted a study and stated that Saffron was mentioned in the sources to regulate sleep and give the feeling of being fit and comfort, soothed and stimulated the neural system, exhilarated people, had a myorelaxant property, facilitated digestion, treated asthma and cough, killed the pain in the ears, and was used as kohl.

The purpose of the study is to show the positive effects of the climate in the area on Saffron in Safranbolu, which was called as *Za'feranborlu* in the past, which has become Safranbolu today after the Saffron. The city has become to the forefront with the Saffron cultivation during the Ottoman Period. It is also the aim of the study to compare the climatic conditions with the ecological demands of Saffron. The recommendations on making the importance of Saffron grow even greater like in the old times and the suggestions on increasing the cultivation areas make the study become important. Some studies conducted from Turkey and World are; Özdemir (2001); Ceylan (2005); Ünaldı (2007); Allahvediev *et al.* (1997); Davis *et al.* (1988); Davis *et al.* (2000); Mathew (1982); Sampathu *et al.* (1984); Negbi *et al.* (1989); McGimpsey *et al.* (1997).

2. THE STUDY AREA

Safranbolu is a county of the city of Karabük located in the Western Anatolia in the Black Sea Region in the northern part of Turkey (Map 1). Since the county was located on the important commercial routes during the Ottoman Period, it attracts the attention in terms of historical geography. It was included in the World Heritage Cities in 1994 by UNESCO, and has a great importance in terms of history and tourism. Safranbolu has the cultural heritage with its historical mosques, houses, inns, public baths, aqueduct, and also has a natural heritage with its bio-variety, canyons and carstic caves.



Map-1. The Location of Safranbolu

Source: DEM were generated from data/ Downloaded from:www.viewfinder.panoramas.org

3. MATERIAL AND METHOD

After the literature review, the climatic characteristics of Safranbolu have been determined in the study in the light of the data received form the General Management of Meteorology. The study was supported by using the Thornthwaite Climate Classification Method. In preparing the cartographic materials of the study, the ArcGIS 10.3 GIS (Geography Information System) Package Program was used.

The descriptive review method was made use of in the study. In this method, a situation on a topic is investigated and interpreted. These kinds of research are conducted by collecting systematic and regular information on the study topic. In a descriptive study, the aim is to reveal the existence or inexistence of a certain situation. The results of descriptive studies, the tables, graphics are interpreted, and the issue of whether there is a correlation between the variables or not is investigated (Arseven, 2001).

4. FINDINGS AND DISCUSSION

4.1. Saffron Plant

Saffron flower is a perennial plant and contains three different stigmas in it and has a geophyte structure. According to the estimations, 1 kg Saffron is produced from 75.000-125.000 Saffron stigma. The production of Saffron requires immense human force and intense efforts. After a meticulous preparation stage, Saffron onions are generally planted in August and September (in Turkey), and require regular care. Saffron starts to give yield as of the first years after it is planted though it is very low in the very first year. The yield increases after the second year, and reaches the highest yield in the fourth or fifth year. After this period, the yield start to decrease; however, the yield continues for six or seven years in total.

The harvest of Saffron must be made before dawn, which is a little before it blooms. In order to obtain quality Saffron, it must be harvested with quick and expert employees within the short time period before the Sun rises. Saffron starts to lose its quality after the Sun rises with the radiation coming from the Sun. The duration between the ripening and harvest of Saffron is nearly two days. In addition, after it is harvested, the collection of the stigmas and the preservation conditions of them has important effects on the quality of Saffron. Collecting Saffron one by one with hands and separating the white areas in their roots requires a specific expertise, because the aroma, bitterness and staining quality of Saffron, which give it the value, are important. Performing these stages without due care causes that Saffron loses its all commercial value, which means serious losses in its values. It is interesting

that Saffron is the most expensive plant in the world, and one gram of it is almost equal to gold. For this reason, Saffron is also called as "the golden plant".

4.2. Saffron Cultivation in the World

Saffron cultivation is performed in varying amounts in different countries of the world. Iran has a production rate, which has extremely higher benefits when compared with other countries. Aside from Iran, India, Greece, Spain, Turkey, France, Switzerland, Israel, Pakistan, Azerbaijan, China, Egypt, Japan, Afghanistan, Iraq and Australia also cultivate Saffron. It is estimated that the amount of Saffron cultivated in these countries is around 205 tons Iran alone ranks the first with its cultivation of 160 tons from 47.000 hectares. India and Greece are also among the countries that are important in terms of Saffron cultivation. Iran has allocated 46.000 hectares of land in Horasan city for Saffron cultivation and received a yield of 137 tons from this area (Parviz *et al.* (2004) transporter (Jan *et al.*, 2014)) The areas allocated for Saffron cultivation in the world and the amounts received from these areas (in kg) are given in Table 1.

Table-1. The Distribution of Saffron Cultivation in the World

Country	Area (ha)	Production (Kg)
Iran	47 000	160 000
India	-	8,000-10,000
Greece	860	4,000-6,000
Azerbaijan	675	-
Morocco	500	1000
Spain	200	300-500
İtaly	35	120
France	1	4
Turkey	-	10
Switzerland	-	0,4

Source: Gresta *et al.* (2008) Transporter (Jan *et al.*, 2014)

4.3. Saffron Cultivation in Turkey

Saffron has been in Anatolia and has been made use of as medicine since the Hittites. In early 14th century, Saffron was cultivated in huge amounts in some areas in Anatolia. In his travel book, Ibni Batuta said "there are no gardens or vineyards here, nothing is grown except for Saffron" for Göynük Area (Ünaldı, 2007).

Saffron was one of the important export goods during Ottoman Period. It is understood that this spice was an important commodity in the past because its name was given to several historical places. The examples for this are the Big and Small Saffron Inns, and Zaferan Han in Ankara. On the other hand, the Zaferan Monastery of Assyrians in Mardin also attracts attention and shows that this plant was important in the area.

It is considered that Saffron was cultivated in Izmir during the Byzantine Period. In the Ottoman Period, Saffron was cultivated in İstanbul, İzmir, Tokat, Adana and Urfa as well as in Safranbolu. Aside from these regions, Saffron cultivation was also performed in various regions of Anatolia. The Saffron cultivation is decreasing each year in our country due to difficulties in its production, the labor force, and similar requirements. The Saffron cultivation regressed to 500 kg in the latest period of the Ottoman State. Today, Saffron cultivation is tried again in various areas of our country especially in cities like Tokat (Centrum and Zile County), Şanlıurfa (Hilvan), Bursa (İnegöl). The Saffron cultivation works were confirmed by the officials of the Provincial Agricultural Managements in Tokat and Şanlıurfa in the interviews made with them; however, it has been stated that the cultivation has not gained a commercial value yet. For this reason, there are no data on Saffron cultivation in the registers of Statistical Institution of Turkey (TUIK). There are no scientific data for today on any other places where Saffron cultivation is made in Turkey.

4.4. Saffron Cultivation in Safranbolu

Safranbolu has been an important center for Saffron cultivation since the Ottoman Period. Although Saffron cultivation is performed in several areas in Anatolia, Safranbolu has always been an attractive area in Saffron cultivation. Although there was Saffron cultivation previously in Şanlıurfa, Tokat and İzmir, the cultivations have not had any continuance in these areas. Saffron was cultivated in nearly 40 villages in 18th century; however, today, only a few villages deal with Saffron cultivation in Safranbolu, which is considered to have been named after the Saffron plant (*Za'firânborlu*). The annual Saffron cultivation amount varies between 7 and 12 kg.

Safranbolu has attracted attention not only with the Saffron cultivation, which is a strategic product, but also with its characteristics as being one of the world culture heritage cities. Safranbolu is also a touristic area with its traditional houses, caves, and canyons. For these reasons, it was included in the World Culture Heritage (WCH) in 1994 by UNESCO. Because of these characteristics, Safranbolu hosts tourists from almost every country in the world. In certain periods, especially the tourists coming from Far Eastern countries visit the area and purchase local products and Saffron spice.

Many different products are also produced in the area other than Saffron. Safranbolu Delight with Saffron, Saffron tea, Saffron soap, Saffron cologne and similar products are the examples for this group. Today, Saffron is added to the desserts like saffron and rice dessert and ashoura in Safranbolu houses because it gives a nice flavor and taste to the rice. The reasons for Saffron cultivation being continued in the Safranbolu may be due to its contribution to tourism and its existence in the cuisine. However, in recent period, the Saffron cultivation decreased even in Safranbolu due to the decreasing number of people dealing with this job with migrations. Today, Saffron cultivation is performed in the villages of Safranbolu County of the city of Karabük in Turkey. These villages that are known to perform Saffron cultivation are Davutobası, Aşağıgüney, Geren, Yazıköy, Değirmencik and Yörük.

4.5. The Demands of Saffron for Climatic Conditions and Soil

Saffron is grown in warm areas where summer droughts are observed, which fits the Mediterranean Climate Type. The minimum temperature that can be tolerated by Saffron, which exists with its onions under the soil during winter, is minimum -18C°. It is cultivated with irrigation methods in Greece, which receives 500 mm precipitation in annual scale, and in Spain where the annual precipitation rate is 400 mm. As well as the annual precipitation rates, the months and seasons that receive precipitation are also important for Saffron cultivation. The demands of Saffron for water increases in areas where there are summer droughts at extreme levels. The dry period in summer after a rainy period spring are the optimal conditions which ensure that saffron is cultivated well. Saffron likes direct and influential sunlight during ripening period. For this reason, the slopes that receive direct sunlight are the most proper areas for planting Saffron. Saffron spends the summer by sleeping and starts bud in early autumn, and in mid-autumn it starts to bloom.

The cool and humid weather in vegetation period influence the growth of it in a negative way. During blooming period, Saffron demands dry and hot climatic conditions. The precipitation during these period decreases the quality of Saffron at an important level. In studies conducted previously, it has been shown that Saffron may grow in various climatic conditions, in various elevations, and in very different temperature and humidity ranges. In addition, the areas where Saffron is cultivated must be protected from the winds, and must be located in areas that are closed to cold weather conditions, which are all important for the yield of saffron. The Saffron flowers start to bloom during dawn and start to decay in furthering hours; for this reason, the harvest of the flowers must be performed quickly.

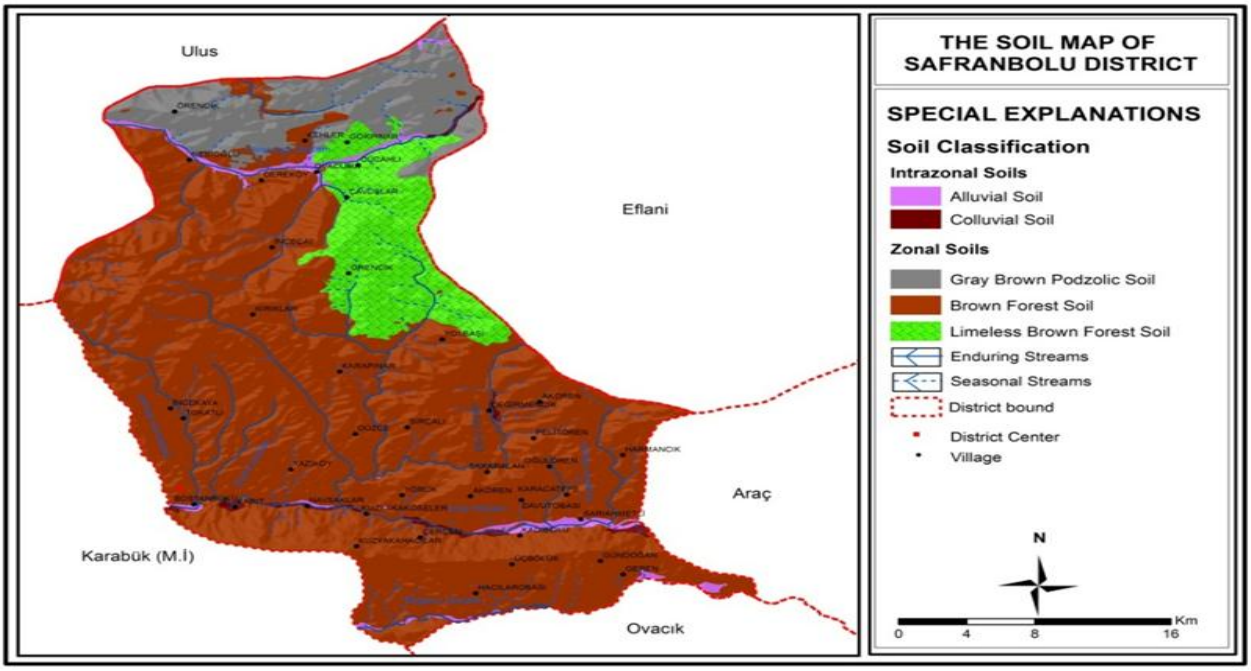
Serious preparations are necessary in the area where Saffron will be planted. The soil must be aired, and the field must be plough several times. Burnt animal manure, which is an organic fertilizer, is preferred much. Since Saffron is a geophyte plant, it is perennial. Although the planting period of Saffron is generally flexible, it is usually planted between August 15 and September 15. It starts to bloom in the same year between October 15 and

November 15. The yield is low in the first year. Different planting methods are preferred in cultivating Saffron. It may be cultivated in wide areas and in different soil types. According to Skrubis (1990) the best soil types that are suitable for Saffron cultivation are loamy-limy deep soils that have calcium. (Sampathu *et al*., 1984; Gresta *et al*., 2008) on the other hand, recommends using well-ploughed sandy-loamy or well-drained limy soil types. The best pH value for Saffron is 7-7,5 (Map 2).

When the climatic characteristics of the world for Saffron are examined it is observed that it is cultivated in Navelli (Italy) up to 650-1100 meters and with an annual precipitation of 700 mm in average. In Sardinia, Govino and Monrcole, it is cultivated in 50-140 meters and with annual 300-600 mm precipitation. In Greece, near Kozani and Macedonian border, it is cultivated in 650-700 meters and with annual 550 mm precipitation in Spain, it is cultivated in La Moncha and Castille regions. In these regions the cultivation is performed under 250-500 mm annual precipitation. It is cultivated in India in sub-tropical climatic conditions. In Azerbaijan, Saffron is cultivated in areas where the temperatures drop below -5,9C° in autumn. In summer months, on the other hand, it may tolerate 30-40 C°

(Tammaro (1990) transporter (Gresta *et al*., 2008)).

In the light of these experiences and studies, the elevation range for Saffron cultivation has been determined as 0-1300 meters. According to the same evaluation results, the precipitation demand of Saffron requires values over 300 mm. The inclination of the area must be between 0-15%. The areas that are suitable for Saffron cultivation are explained in the table above.



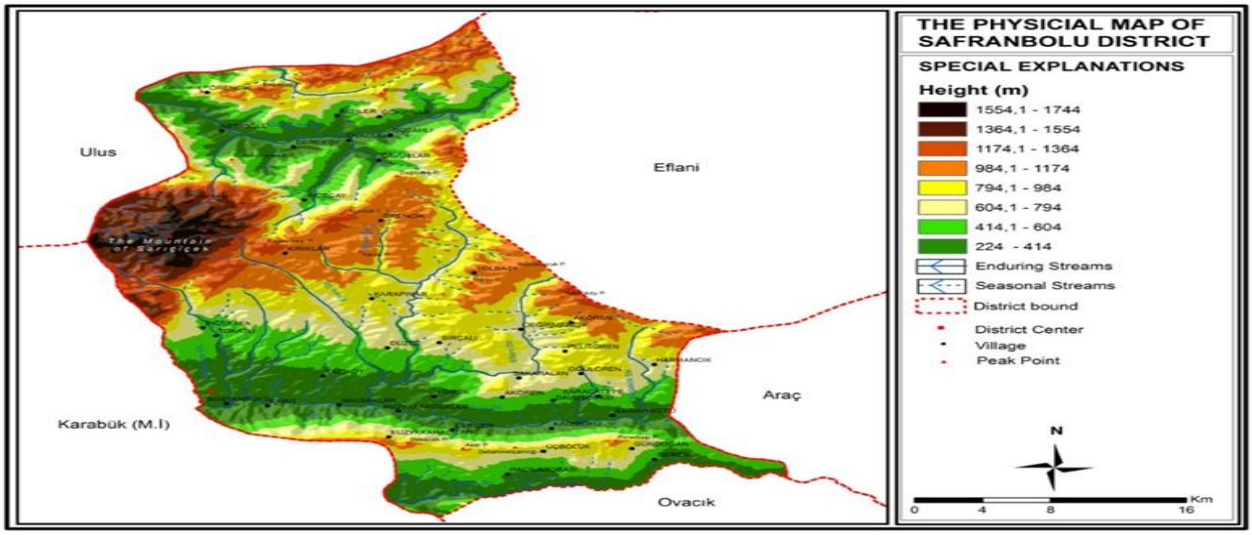
Map-2. The Soil Map of Safranbolu District

Source: Republic of Turkey Ministry of Food, Agriculture and Livestock/ http://www.tarim.gov.tr/Sayfalar/EN/AnaSayfa.aspx

4.6. The Climatic Characteristics of Safranbolu

When the climatic data between 1960 and 2005 for Safranbolu, which is located in the Western Black Sea Part of the Black Sea Region, are evaluated, it is observed that the average annual temperature value is 12,3 C°. The average temperature in January is measured as 2,6 C°, and the average temperature in July is 22 C°. The annual average maximum temperature in the fields is 18,7C°. When the average of the highest temperatures during winter months is examined it is observed that these values vary between 6-8 C°. When summer months are considered, the maximum temperatures in Safranbolu are over 25C°. The average precipitation between the years 1960 and 2005

has been calculated as 440,3 mm (Map 3). According to these values, it must be cared that the temperatures in Saffron cultivation areas must not drop below 0 C°, and must not be excessive. These values are recommended for the ecological conditions for production yield and quality. Saffron has tolerance against much lower temperatures and precipitation values.



Map-3. The Physical Map of Safranbolu

Source: DEM were generated from data/ Downloaded from:www.viewfinder.panoramas.org

Saffron is a perennial plant, and the planted Saffron onion may give yields for long years. Since the onion wait under the soil during winter months, it is not influenced by cold weather.

Table-2. Safranbolu Climatic Data (1960-2005)

	Jan.	Feb.	Mar.	Apr.	May.	June	Jul.	Aug.	Sep.	Nov.	Dec.	Dec.	Year.Ort
Ave. Temp.	2,6	3,9	7,2	11,8	15,9	19,4	22	21,5	18,2	13,7	7,8	4	12.3
Ave Max. Temp.	6,8	8,8	13,2	18,5	23,1	26,9	29,8	29,7	26,1	20,4	13,2	8	18,7
Ave. Min. Temp.	-0,7	-0,1	2,3	6,4	10,2	13,3	15,6	15,3	12	8,5	3,8	0,9	7,2
Ave. Pre.	47,2	33,4	34,2	43,3	48,1	39,3	25,6	21,5	21,8	35,4	41,2	49,3	440,3
Ave. Rainy Days	9,9	8,4	8,2	8,8	8,4	6,7	4	3,4	4,2	6	7,5	10	85,5

Source: The General Directorate of Meteorology/ http://www.mgm.gov.tr.

Cold is risky for Saffron especially during blooming period. Early autumn (September-November) frost events in blooming period (September-November) are the most harmful meteorological events for Saffron. In areas where early frost is experienced during autumn, it is not recommended to deal with Saffron cultivation, because the frost during blooming period causes that there are no or very low yield in that year.

By considering the climatic data between 1960-2005, the climatic classification was made for Safranbolu County. Erinç (1996) says that many methods are used in classification of climates. One of these methods is the Thornthwaite Climate Classification Method. According to Thornthwaite, in order to determine the climate of an area, the water that collects in the soil in one year, monthly change of this water, annual potential evaporation values, real evaporation values, water shortage, excessive water, flow and humidity values are determined by making use of monthly average temperature, monthly average precipitation and monthly evaporation values. By

using these values the climatic classification of the study area is made. In this context: the climatic classification of Thornthwaite is based on the precipitation-evaporation and temperature-evaporation relation. According to Thornthwaite, in areas where evaporation is more, the soil is saturated and there is excessive water in such areas, and therefore, the climate of this area is humid. Unlike this, in areas where evaporation is low, the soil cannot accumulate water and cannot provide the water that is needed by the plants. There is a shortage of water in such areas. The climate of such areas is dry. The climatic classification of Thornthwaite changes between these two extreme values.

Table-3. The Water Balance of Safranbolu/Karabük According to Thornthwaite Method (1960-2005)

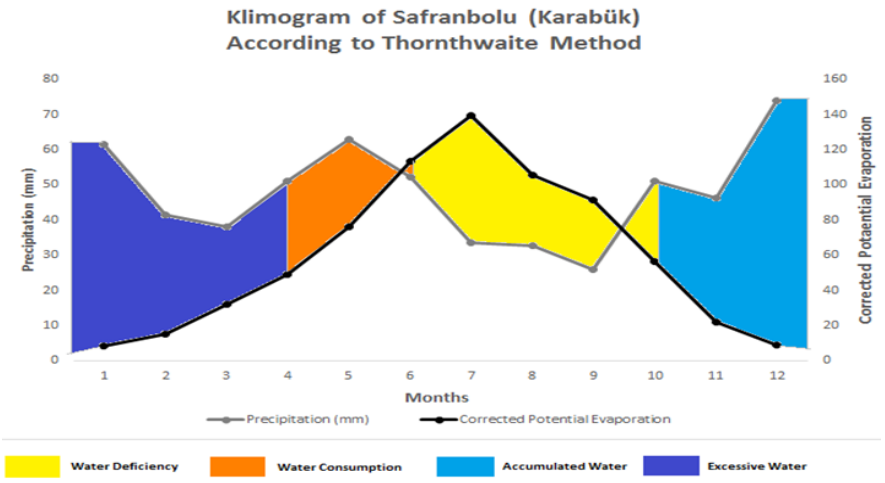
Elements of the balance	Months												
	1	2	3	4	5	6	7	8	9	10	11	12	Annual Total
Air Temperature (°C)	2,6	3,9	7,2	11,8	15,9	19,4	22	21,5	18,2	13,7	7,8	4	12,3
Temperature İndex	0,37	0,69	1,74	3,67	5,76	7,79	9,42	9,10	7,07	4,60	1,96	0,71	52,88
Uncorrected Potential Evaporation	5,5	10	22,5	44	68	93	130	115	85	55	25	10	
Corrected Potential Evaporation	4,56	8,3	23,1	48,8	85	117,1	165,1	136,8	88,4	52,8	20,5	8	758,46
Precipitation (mm)	47,2	33,4	34,2	43,3	48,1	39,3	25,6	21,5	21,8	35,4	41,2	49,3	440,3
Storage Change	38	0	0	-5,5	-36,9	-57,6	0	0	0	0	20,7	41,3	
Storage	100	100	100	94,5	57,6	0	0	0	0	0	20,7	62	534,8
Real Evapotranspiration	4,56	8,3	23,1	48,8	85	96,9	25,6	21,5	21,8	35,4	20,5	8	399,46
Water Deficiency	0	0	0	0	0	20,2	139,5	115,3	66,6	17,4	0	0	359
Excessive Water	4,64	25,1	11,1	0	0	0	0	0	0	0	0	0	40,8
Runoff	2,32	13,71	12,40	6,20	3,10	1,55	0,775	0,387	0,193	0,096	0,048	0,024	40,8
Moisture Ratio	9,35	3,02	0,48	0,11	-0,43	-0,66	-0,84	-0,84	-0,75	-0,32	1	5,16	

Source: Erinç (1996). **Prepared:** Mücahit Coşkun.

Table-4. Safranbolu County Thornthwaite Water Amounts (1960-2005)

Climate Types of Safranbolu/Karabük According to Thornthwaite Climate Classification	
Rainfall Efficiency Index:	**D:** Semi Arid
Temperature Efficiency Index:	**B'2 (Humid):** Mesothermal (Middle Hot Climates)
According to Rainfall Regime:	**d:** No More Water or Less Secondary Climate
Evaporation rate of the summer:	**a':** Evaporation rate of the summer < 48

Source: Erinç (1996). **Prepared:** Mücahit Coşkun.



Graphic-1. Climate Classification of Safranbolu County according to Thornthwaite (1960-2005)

Source: Erinç (1996). **Prepared:** Mücahit Coşkun.

Safranbolu has a semi-dry climate with little humidity properties according to the Thornthwaite Classification. When these properties are considered, it is observed that the area has the properties that are necessary for Saffron, which is sensitive to excessive cold in winter, and which requires cool weather in winter and drought in summer. When the water existence in the area is examined according to Thornthwaite Climate Classification results, it is observed that there is water shortage in July, August and September. The reason for this situation may be explained with the fact that the evaporation is more than the precipitation in the area in these months.

When the water demand of Saffron is considered, it is possible to cultivate it in areas which receive precipitation at an average of 300 mm annually. When the precipitation values of Safranbolu are examined it is observed that there is a difference at a rate of 440,3 mm between the years 1960 and 2005, which is suitable for the ecological demands of Saffron.

5. RESULT AND RECOMMENDATIONS

Saffron is observed more in countries that are located in various parts of the world especially in the Mediterranean Basin. Saffron may be cultivated in different countries in different soil types easily, and shows a flexible characteristic in terms of climate and soil demands. It does not have excessive demands in terms of temperature and precipitation. In general sense, it adopts itself easily to the climatic and temperature demands in Turkey. In Turkey, it is possible to cultivate it mainly in areas where the Mediterranean Climate is influential, and in Southeastern Anatolian Region and Central Anatolian Region.

When all these characteristics are considered, it is determined that Saffron has been cultivated at a high rate in all over Anatolia especially in those times when urbanization phenomenon was not on the agenda and agriculture was the most important economic activity. Only a few centuries ago from our present day, it is understood that Saffron was exported in tons. However today, although Saffron was tried to be cultivated in some regions, there are no official records except for Safranbolu. The urbanization phenomenon and urban cultural concept, which emerged

in 1980s, were influential in this situation. The difficulties in village life, the inadequate healthcare and social opportunities, and the desire to have a better life triggered the migration to the cities from villages. Although the population that migrated from villages influenced the whole social structure, there appeared important changes in agricultural areas as well. The agricultural activities that were once performed by villagers disappeared slowly. When investigating the reasons for the decrease in Saffron cultivation, this situation must not be ignored.

In addition, the difficult labor, short harvest times, collection, drying, and difficult storage conditions and the drawbacks in finding markets may be considered as the reasons for the decrease in the Saffron cultivation. Aside from these difficulties, Saffron is a perennial plant, the yield is very low in the first year, in a field where there is Saffron cultivation, no cultivation can be performed again between 5-7 years are all influential in the decrease in cultivation. Özdemir (2001) stated that although Saffron was an important agricultural product in the past, today, especially with the emergence of the food coloring products, it lost its importance.

Despite these negative conditions, Saffron is the most important and the most expensive plant in the world. When the usage areas are considered, it may be used in various fields such as food products, paints, industry, medical field, and in perfume industry. It is cared much in the world markets because it competes with gold. It is not sold on shelves in markets in Europe. It awaits its customers in steel cases and in velvet clothes. The cultivation of such a plant, which is cared much in the world, is decreasing with each passing year in Turkey.

The Safranbolu County, which is located in the Western Black Sea Region, has always been an important center in Saffron cultivation since the early times of history. The soil demand, the ecological conditions and climatic conditions (temperature and precipitation) for Saffron to grow and develop exist in this area.

The results of Thornthwaite Climate Classification, which was determined by making use of the data of Safranbolu, provides us with encouraging data on the climate that will encourage the production of Saffron in Safranbolu. Safranbolu has been an important place for Saffron cultivation for centuries, and it still continues to be suitable for natural cultivation. The temperature demand of Saffron for growth and ripening exists in Safranbolu. In addition to this, the precipitation demand and the distribution of it among months are extremely suitable for the cultivation. As a matter of fact, Saffron is cultivated in a comfortable manner in areas which receive annual precipitation that is over 300 mm and where there is summer drought. These conditions exist in Safranbolu. The annual precipitation is around 440.3 mm and the periods when the precipitation is intense are suitable for the demands of Saffron. The ecological conditions in Safranbolu are in favor of Saffron cultivation, and in addition to this, the tradition for using Saffron is continuing, and the city is accepted as the World Heritage, which makes tourism become a major activity, Turkish Delight with Saffron, soap with Saffron, Saffron tea, Saffron cologne and similar products find buyers in the market, which makes it nearly compulsory to cultivate Saffron. For this purpose, the requirements of internal consumption are ensured in this area.

The farmers who are interested in Saffron production must be supported with various agricultural incentives, and these activities must be encouraged. Saffron may be used in various areas. for this reason, the worries of farmers to find a market for their products must be eliminated by the state with various encouragements. The unit price is high, and when the cultivation of Saffron is developed for export purposes, this will bring positive results for the future of our country and for the farmers. In order for the quality of Saffron to be high, the flowers must be harvested in the right time, the collection and drying techniques must be selected in a correct manner. The farmers who perform the Saffron cultivation must be trained. When Saffron is re-acquired in the economy of Turkey, it will be an important start in forming the competition power of Turkey in the world. Ünaldı (2007) stated that the use of Saffron in cancer research is attractive, and if the production was increased, it would contribute greatly to our country.

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