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YIELD AND FIBER QUALITY CHARACTERISTICS OF SOME COTTON (*Gossypium hirsutum* L.) CULTIVARS GROWN IN THE SOUTHEASTERN ANATOLIAN CONDITIONS

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ABSTRACT

The aim of this study was to determine cotton cultivars for high yield and fiber technological characters in Southeastern Anatolian ecological conditions. For this purpose, the study was carried out with 11 cotton (*Gossypium hirsutum* L.) cultivars in 2019 and 2020. Field experiment was designed based on randomized complete block design with four replications. The results of combined analysis indicated that there were significant differences between cultivars in terms of yield and quality parameters except for the number of monopodia, fiber strength and fiber fineness. It was determined that cv. Edessa and cv. PG 2018 were superior to other cultivars for seed cotton yield, in respectively 4006.25 kg ha^{-1}, 3971.42 kg ha^{-1}. While these cultivars had higher fiber yield than all others, they were the least affected by the year difference. Cv. PG 2018 also had the highest plant height and ginning turnout. It was concluded that cv. Edessa and cv. PG 2018 are more suitable for cultivation in Batman ecological conditions.

Keywords: Cotton, cultivar, fiber yield, lint quality, seed cotton yield

INTRODUCTION

Cotton is one of the most important industrial plant for Turkey as well as all over the world. It creates significant added value to the economy by providing raw materials to the cotton textile industry. Cotton production in Turkey is concentrated in the Aegean, Antalya, Cukurova and Southeastern Anatolian regions. The Southeastern Anatolian Region has become the most important cotton production region of Turkey in recent years. Although it shows some fluctuation year by year, 57% of the cotton produced in Turkey is produced in the Southeast Anatolian region, 21% in the Aegean Region, 21% in the Cukurova region and 1% in the Antalya region. In parallel with the increase in the irrigated areas with the Southeastern Anatolian Project (GAP), it is estimated that the cotton cultivation areas in the Southeastern Anatolian Region will increase even more. In 2019, there is 288,914 ha cultivation area in the Southeastern Anatolia region, while it is 421 ha in Batman province. This represents only 0.15% of the region. Cotton production amounts, cultivation areas and yield data of Turkey and Batman Province are given in the Table 1. In Turkey, in the provinces of Adiyaman, Batman, Diyarbakir, Gaziantep, Kilis, Mardin, Siirt, Sanliurfa and Sirnak, which cover the (GAP), cotton farming has some problems waiting to be solved. One of these problems is the selection of varieties and the provision of seeds of this variety. In general, the variety to be grown in a region should be high yielding, superior in fiber technology, earliness, resistant to diseases and pests, and suitable for the mechanical harvesting (Mert, 2011).

Variety selection is seen as a big problem in Turkey and especially in the Southeastern Anatolian Region. Farmers have difficulties in deciding which variety is suitable for their region (Ertekin et al., 2017; Ertekin et al., 2018), and this can cause serious yield losses. Especially in the regions opened to new irrigation areas, there are serious decreases in yields due to the mistakes of the farmers in the selection of varieties. Although the genetic potential of the cultivars has been revealed with cultural practices in the existing agricultural areas, new cultivars are being sought in order to increase the yield. Yield reductions can be prevented by cultivars with high adaptability. Cultivars that can maintain their stability in different environmental conditions and do not show high differences in their yield and quality parameters from year to year are preferred for more reliable production.

Suitable climatic conditions are also one of the most important factors to reach the desired yield (Ertekin et al., 2019; Ertekin et al., 2022) and fiber quality in cultivars (Van Esbroeck and Bowman, 1998). Although there is a very strong cotton production structure in our country, there are many problems that can negatively affect this strong structure. These problems, which can negatively affect cotton production, are about cultivars, seeds and production techniques. All of the cotton cultivated in Turkey are belong to *Gossypium hirsutum* L. species. Due to the differences in the cotton production techniques applied as well as the ecological differences, cultivars with very different genetic structures are used in our cotton production regions. As a matter of fact, the results obtained from the yield trials in different cotton production regions show that the seed yield, yield components and fiber technological characters vary significantly according to the varieties and/or lines (Copur, 2006; Foulk et al., 2009; Gureli and Mert, 2016; Durkal and Mert, 2017).

Table 1. Cotton production statistics of Batman province and Turkey for last years

Years	Turkey			Batman Province		
	Cultivation area (ha)	**Yield (t ha^{-1})**	**Production amount (t)**	**Cultivation area (ha)**	**Yield (t ha^{-1})**	**Production amount (t)**
2010	480,650	4.48	2,150,000	1,319	4.45	5,873
2011	542,000	4.76	2,580,000	1,502	4.50	6,757
2012	488,496	4.75	2,320,000	1,150	4.45	5,118
2013	450,890	4.99	2,250,000	592	4.70	2,783
2014	468,143	5.03	2,350,000	350	5.01	1,755
2015	434,013	4.72	2,050,000	80	4.01	321
2016	416,010	5.05	2,100,000	-	-	-
2017	501,853	4.89	2,450,000	252	5.21	1,314
2018	518,634	4.96	2,570,000	530	5.63	2,982
2019	477,868	4.60	2,200,000	421	5.25	2,210

Defining the suitability of existing cultivars for different ecological conditions is almost as important as developing new ones for high yield and quality. Therefore, yield and quality parameters of 11 different cotton (*G. hirsutum* L.) cultivars were investigated in Batman ecological conditions in 2019 and 2020.

MATERIALS AND METHODS

In this study, a total of 11 cotton cultivars (May 344, May 455, St 468, St 498, Lima, BA 119, BA 440, PG 2018, Edessa, Flash and Carisma) belonging to *G. hirsutum* L. were used as plant material to determined suitable cultivar for Batman Province of Southeastern Anatolian Region. These varieties were provided from companies operating in nearby provinces during the years the study was conducted. In addition, these are varieties that have not had any problems in seed supply recently. Field experiment was designed based on randomized complete block design with four replications. Each plot consisted of 4 rows of 12 m and each row was 0.7 m apart. This study was carried out under the control of Batman Provincial Directorate of Agriculture and Forestry, on the farmer's land in Diktepe Village of the Center, within the scope of 10 plots determined every year within the scope of Integrated Pest Management. The experiment field in Diktepe Village (Batman) consists of deep and medium deep soils with low organic matter and not much salinity problem. Some soil properties were determined by taking soil samples from 0-30 cm depth from the field before planting. Soil properties were determined in Technology and Research & Development Center, Hatay Mustafa Kemal University. Soil properties were indicated in the Table 2.

Table 2. Soil properties of the experimental area

Saturation (%)	60.2	Clay-loam
pH	7.29	Slightly alkaline
EC (dS cm^{-1})	1.84	Low
Lime $CaCO_3$ (%)	19.23	High limy
Phosphorus (kg ha^{-1})	112.4	High
Potassium (kg ha^{-1})	558.0	High
Organic matter (%)	2.84	Moderate

Batman Province is affected by the continental climate. Dry and hot summers, mild and rainy winters are the characteristic features of this region. One of the most distinctive characteristics of the local climate is that the summer season is unconditionally arid and very hot. During to growing season, total precipitation was 98.1 mm at the long-term, it was 76.3 mm for 2019 and 86.8 mm for 2020 (Table 3). The climate data of the experimental area for 2019-2020 and the long-term average were obtained from the Batman Meteorology Station Directorate and given in Table 3.

The experiment was conducted with four replications according to the Randomized Complete Block Design in

2019 and 2020. Delinted seeds were used throughout the experiment. Sowing was done with a pneumatic seeder to have about 71.4 thousand plants per hectare. The field was ploughed deeply with a plow in the autumn and as a shallow with a cultivator in the spring. Half of the nitrogen and all of the phosphorus needed during planting, and the second half of the remaining nitrogen before the first irrigation and second irrigation was applied with a fertilizer seeder (a total of 200 kg ha^{-1} of N, 80 kg ha^{-1} of P). Triplesuperphosphate and urea were used as fertilizer sources. From sowing to harvest, irrigation was applied 5 times at the field capacity in 2019, 6 times in 2020. When 60% of the bolls have opened defoliant applied. Harvesting of seed cotton were made by hand with two weeks after the defoliant applications.

Table 3. Meteorological data of experiment area in the studied years and long-term (1959-2020)

	Temperature			Precipitation		
Months	2019	2020	LTA	2019	2020	LTA
1	4,5	3,5	2,5	70,6	53,1	61,3
2	5,5	4	4,5	79,9	111,9	66,2
3	8,5	10,9	9,2	116,1	159,1	76,3
4	12	13,7	14,3	160,7	95,1	75,5
5	**20,2**	**18,9**	**19,4**	**32,4**	**85,9**	**47,1**
6	**28,1**	**25,1**	**25,9**	**1,2**	**0**	**8,6**
7	**29,3**	**30**	**30,2**	**0**	**0,5**	**1,7**
8	**29,8**	**28,6**	**29,5**	**0,3**	**0**	**1,8**
9	**24,7**	**26,5**	**24,2**	**0,3**	**0,4**	**4,9**
10	**19,5**	**19**	**17,3**	**42,1**	**0**	**34**
11	9,3	10,4	9,6	18,2	30,4	53,8
12	7,2	4,6	4,3	81,8	44,5	64

Yield components were measured from 10 plant each plot. subsequently, seed cotton samples picked up from 50 bolls for fiber quality during harvest. The fibers were separated from the seeds by rollergin machine. Seed cotton samples and fibers were weighed. The ginning percentage was calculated with the data obtained. Before examining the fiber technological properties, fiber samples were kept at 21±2 °C temperature and 65±2% humidity conditions for 2 days. Fiber technological properties were investigated by USTER HVI 1000 in ProGen Seed INC. The data were subjected to analysis of variance with the IBM SPSS Statistics 24 and the means were compared by using the LSD test (Steel and Torrie, 1980).

RESULTS AND DISCUSSION

According to the results of variance analysis, cultivars, years and cultivar x year interaction were significant for plant height. (Table 4). The plant height was 101.91 cm in the first year and 107.95 cm in the second year. When the two-year averages of the cultivars were examined in terms of plant height, the highest value was 112.54 cm for cv. PG 2018, and the lowest value was 99.41 cm for cv. May 344. cv. PG 2018 gave higher results than other cultivars during both years of the experiment (Figure 1). The variation in plant height, which is one of the main yield parameters in cotton (Ali and Hameed, 2011), can be based on the differences in the genetic structure of the cultivars (Ehsan et al., 2008). Significant differences between cotton cultivars for plant height have also been reported in previous studies (Copur, 2006; Anwar et al., 2002). In this respect, the results of this study are in agreement with previous studies.

The differences among cultivars and years for the number of monopodia were statistically non-significant (Table 4). However, mean values ranging from 0.98 to 1.45 per plant were recorded among the cultivars. The number of monopodia can be affected by factors such as soil moisture, disease and pest density, lodging, mechanical injuries and plant density (Mert, 2020). Increasing nitrogen doses can also increase the number of monopodia in cotton, but this effect of nitrogen may vary according to plant genetics, environmental conditions and cultural practices applied (Durkal and Mert, 2017). However, it has been reported that this trait is genetically controlled (Arshad et al., 2007).

The differences in the number of sympodia as a result of cultivars, years and interaction of both factors were significantly different (Table 4). The number of sympodia, which was 10.70 units' $plant^{-1}$ in the first year and 10.10 units' $plant^{-1}$ in the second year, indicated higher variation among the cultivars. Based on the average of both years the highest value was observed in May 455 cultivar with 11.52 units' $plant^{-1}$, and the lowest value was in cv. Edessa with 9.32 units' $plant^{-1}$. Although, according to the interactions, the highest value was in the cv. Carisma in 2020, the cv. May 455 remained stable for the number of sympodia in both years (Figure 1). According to Arshad et al. (2007), who stated that the number of sympodia in cotton is an indicator for high yields, the sympodia numbers of cotton cultivars are significantly different. The reason for the differences in the number of sympodia is due to the genetic structure of the cultivars (Ehsan et al., 2008).

The number of bolls, together with the seed cotton weight, is one of the most important yield factors that make up the seed cotton yield. Cultivars, years and cultivar x year interaction were significant for number of bolls. The highest value for the number of bolls was in cv. Edessa with 16.79 units' plant^{-1}. This cultivar also had the lowest number of sympodia. This indicates that this cultivar was not prone to boll abscission in this study. Carisma and Lima cultivars shared the lowest value (11.10 units' plant^{-1}). Carisma also had a large number of sympodia despite the lowest number of boll. The difference between the boll number mean, which was 14.44 units' plant^{-1} in 2019 and 12.00 units' plant^{-1} in 2020, is due to the superiority of Edessa, PG 2018 and May 455 cultivars for the number of boll in the first year (Figure 1). The boll numbers decreased in the second year of all cultivars except Flash. It was one of the most resistant cultivars to boll-abscission, as reported by the breeder company. This gives an idea that it may be more stable against different weather conditions in the second year. Although boll abscission depends on the potential of the cultivar (Ehsan et al., 2008; Ali and Hameed 2011), the most important factors are cultural practices (Mert, 2011). Among the factors affecting the number of bolls, the cultural practices and the plant density should be within the optimum limits (Aygun and Mert, 2020). In this study, where such factors are the same for all cultivars, the differences in the number of boll may be of genetic origin. However, to be more detailed, factors such as plant density, temperature, disease-pests, fertilization and irrigation can be mentioned (Kerby and Hake, 1996). The differences of the cultivars for the number of boll are similar to the previous studies (Anwar et al., 2002; Copur, 2006; Arshad et al., 2007; Ehsan et al., 2008).

Table 4. Yield and some yield component of cultivars

	PH	MN	SN	BN	SCW	SCY
Years						
2019	101.91**b**	1.22	10.70**a**	14.44**a**	4.62	3181.39**b**
2020	107.95**a**	1.16	10.10**b**	12.00**b**	4.78	4213.63**a**
Cultivars						
Carisma	106.68**b**	1.08	11.42**a**	12.10**d**	4.36**bc**	3343.75**f**
BA 440	102.69**c**	1.05	9.59**fg**	12.28**d**	4.20**c**	3593.75**d**
Flash	107.51**b**	1.34	10.04**def**	13.06**cd**	4.13**c**	3406.25**ef**
BA 119	99.43**d**	1.23	9.91**ef**	13.03**cd**	4.59**abc**	3737.50**c**
Lima	100.69**d**	1.00	10.20**de**	12.10**d**	5.19**ab**	3456.25**e**
Edessa	107.05**b**	0.98	9.32**g**	16.79**a**	4.39**abc**	4006.25**a**
PG 2018	112.54**a**	1.34	10.73**bc**	13.96**bc**	4.71**abc**	3971.42**a**
St 468	107.64**b**	1.45	10.06**def**	12.55**d**	5.27**a**	3712.50**c**
May 455	107.28**b**	1.15	11.52**a**	14.51**b**	4.43**abc**	3862.50**b**
St 498	104.61**c**	1.29	10.45**cd**	12.16**d**	5.24**ab**	3850.00**b**
May 344	99.41**d**	1.23	11.11**ab**	12.83**d**	5.19**ab**	3831.25**b**
F Value $_{Year}$	194.33***	0.65ns	36.10***	144.27***	1.99ns	4984.78***
F Value $_{Cultivar}$	31.72***	1.82ns	18.58***	17.45***	5.31***	82.18***
F Value $_{Interaction}$	8.10***	0.20ns	5.85***	13.22***	0.01ns	6.10***
CV	5.22	27.87	9.24	18.48	13.66	15.27
SEM	0.58	0.04	0.10	0.26	0.07	60.20

PH*: Plant height (cm),* ***MN****: Monopodia number (unit plant^{-1}),* ***SN****: Sympodia number (unit plant^{-1}),* ***BN****: Boll number (unit plant^{-1}),* ***SCW****: Seed cotton weight boll^{-1} (g),* ***SCY****: Seed cotton yield (kg ha^{-1}),* ***CV****: Coefficient of variation,* ***SEM****: Standard error of mean,* ***ns****: is not significant,* *******: is significant at $P \leq 0.001$.*

While years and cultivar x year interaction were not significant for seed cotton weight. However, the differences between the cultivars were found to be statistically significant (Table 4). The highest value (5.27 g boll^{-1}) was in cv. St 468, and the lowest value (4.13 g boll^{-1}) was in cv. Flash. It is one of the most important yield components that make up the yield, together with the number of bolls. In terms of seed cotton weight, the findings were similar to previous studies (Ozdemir, 2007; Ozkan and Kaynak, 2009).

The effect of years, cultivars and their interactions on seed cotton yield were significant. The seed cotton yield, which was 3181.39 kg ha^{-1} in 2019, increased to 4213.63 kg ha^{-1} in 2020 (Table 4). One more time irrigation in 2020, although not statistically significant, caused a slight increase in seed cotton weight and ginning turnout, which are yield elements. A significant increase was observed in the 100 seeds weight. These may explain the higher seed cotton yield in 2020. When the interactions are examined, the highest seed cotton yield was obtained from cv. May 455 in 2020, but it could not indicate superiority in 2019. Subsequently, Edessa and PG 2018 cultivars maintained their high yield stability in both years (Figure 1). Seed cotton yield is a quantitative character and can be significantly affected by environmental conditions. In many studies, it has been stated that genotype-environment interactions related to seed cotton yield were important (Killi and Gencer, 1995). This means that cotton genotypes may have different yields in different environments, however according to Yuka (2014), cotton yield is affected by genotype.

While cultivars and cultivar x year interaction were significant for ginning turnout, years was non-significant. PG 2018 cultivar had the highest ginning turnout with

41.98%, and cv. May 344 had the lowest with 36.60%. Ginning turnout is one of the most important yield parameters in cotton. When the results of both years of the experiment were evaluated, the highest ginning turnout was obtained in 2019 from the BA 440 cultivar. However, it could not indicate this superiority in 2020 (Figure 2). BA 119 and Carisma cultivars were the least affected cultivars by years. There is a linear relationship between ginning turnout and yield (Ehsan et al., 2008). The results were similar to previous studies in which the differences in ginning turnout of the cultivars were significant. (Khan et al., 1989; Ehsan et al., 2008: Ali and Hameed, 2011).

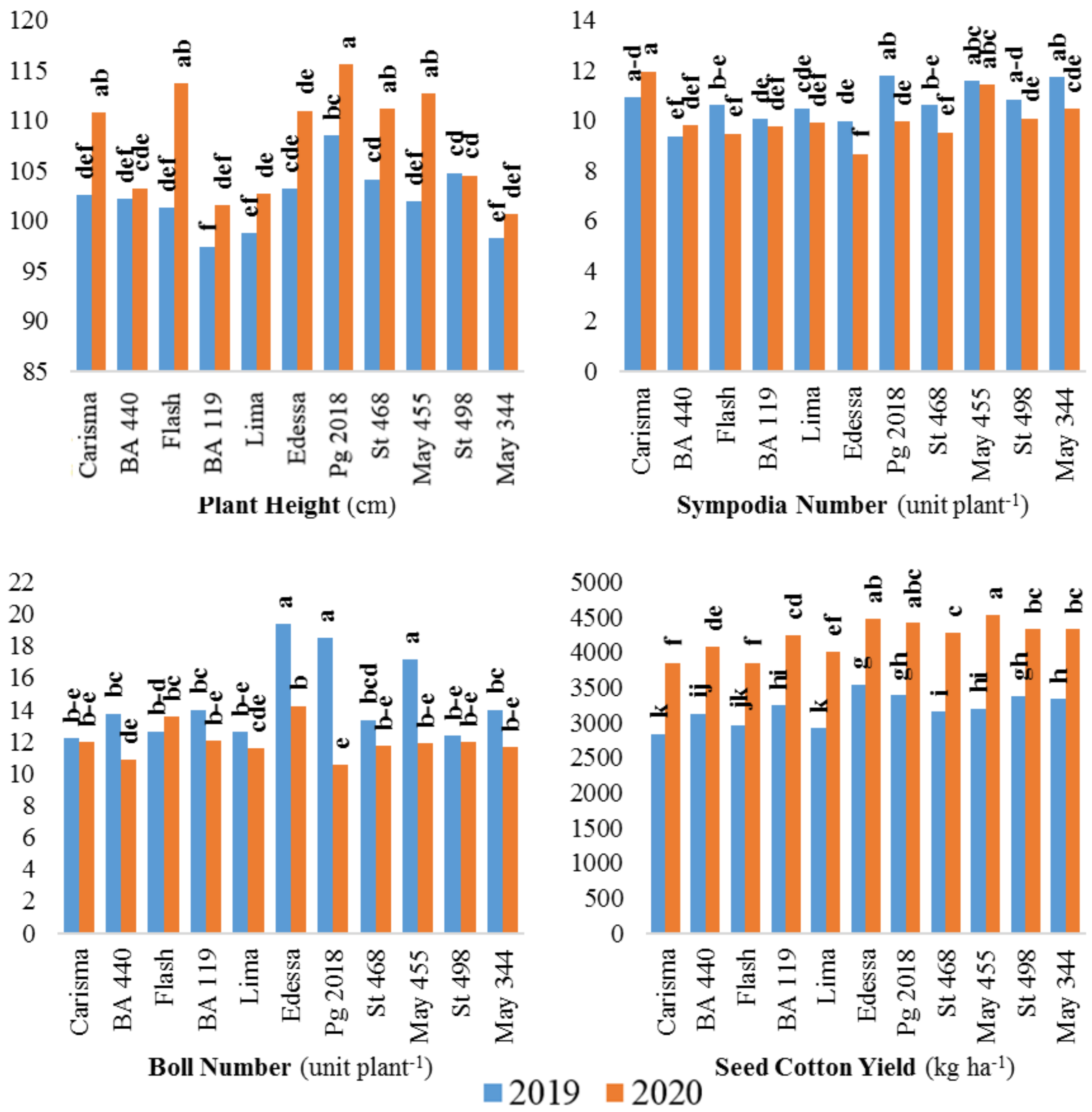

Figure 1. Interactions of cultivar x year for plant height, sympodia number, boll number and seed cotton yield

While cultivars and years were significant for fiber length, interaction was not significant. Fiber length means were 28.54 mm in 2019 and 29.18 mm in 2020. The top of the range was cv. Lima with 30.51 mm. The shortest fiber length was 28.12 mm in BA 440 cultivar. The fiber lengths in this study can be classified as medium long and long according to Bradow and Davidonis (2000). Fiber length is a genotype-dependent characteristic (Ramey, 1986), and previous studies also reported significant differences among fiber lengths of cultivars (Khan et al., 1989; Copur, 2006; Ehsan et al., 2008; Ali and Hameed, 2011).

While years and cultivar x year interaction were significant for fiber strength, cultivars were not significant. Year averages for fiber strength were 28.21 g tex^{-1} in 2019 and 32.41 g tex^{-1} in 2020. There was an increase in the fiber strength values of all cultivars in the second year of the study, except for the cv. Lima (Figure 2). When the mean values of fiber strength of the cultivars were examined, there was variation between 28.93 (cv. Carisma) and 31.42 g tex^{-1} (cv. May 455) (Table 5). Similarly, Gureli and Mert (2016) pointed out that there was no difference in fiber strength between genotypes and drew attention to the importance of genotype x year interaction.

While years and cultivar x year interaction were significant for fiber fineness, effects of years and cultivars were non-significant. While the mean value of fiber fineness was 4.42 micronaire in 2019, it was 4.63 micronaire in 2020. The average fiber fineness of the cultivars varied between 4.33 (cv. Carisma) and 4.69 micronaire (cv. St 498) (Table 5). The fibers were thinner in 2019 than in 2020. When the interaction was examined, the highest and lowest values were found in 2020 in cv. PG 2018 and in 2019 in cv. May 455, respectively. Fiber fineness is one of the most important quality characteristics for cotton fiber, especially for textile use (Ehsan et al., 2008). Fiber fineness is more affected by environmental factors than fiber length and fiber strength (Mert, 2020). Micronaire, which represents a combined measure of cotton's fineness and maturity (Bechere et al., 2016), is ideally between 3.5-4.9 micronaire for Upland cottons (Culp, 1992; John, 1997). Fabrics obtained from fibers with this fineness show superiority for softness and shine (Cagirgan and Barut, 2000). According to the results of this study, mean values of fiber fineness were within the ideal limits.

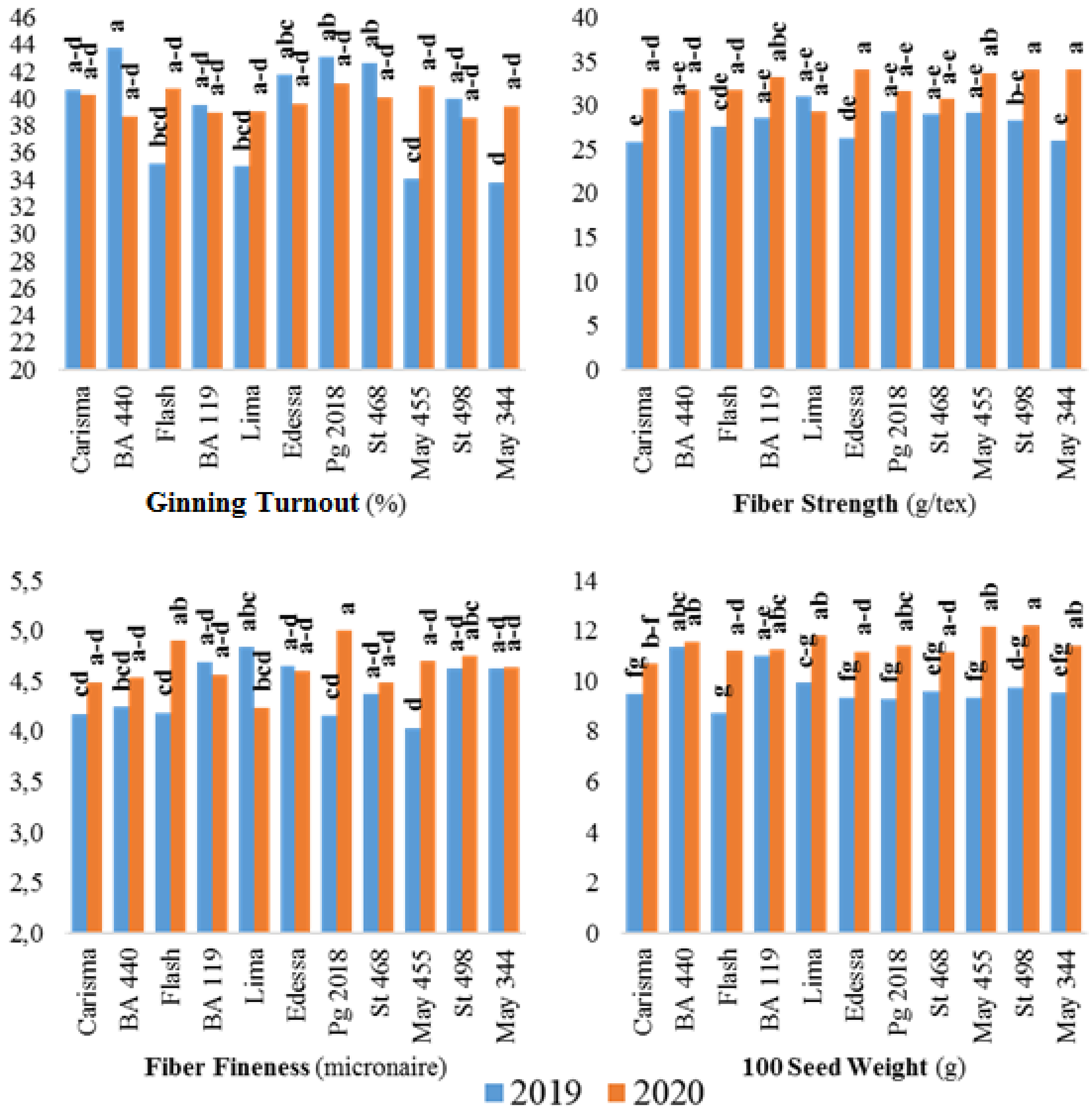

Figure 2. Interactions of cultivar x year for ginning turnout, fiber strength, fiber fineness and 100 seed weight

Cultivars, years and cultivar x year interaction were significant for 100 seed weight (Table 5). They were 9.77 g in 2019 and 11.46 g in 2020 as annual averages. Among the cultivars, the highest value was 11.46 g in cv. BA 440. Flash cultivar had the lightest seeds. In cultivars, the highest 100 seed weight was obtained from cv. St 498 in 2020, but this cultivar had a much lower seed weight value in 2019. However, it has a substantial value for the averages of both years. BA 440 and BA 119 cultivars were less affected by the year difference than other cultivars and preserved their stability. These results regarding the fact that the weight of 100 seeds varies according to the cultivars were similar to the findings of previous studies (Yuka, 2014; Gureli and Mert, 2016).

Cultivars, years and cultivar x year interaction were significant for fiber yield. Fiber yields were quite low in 2019 compared to second year, 1244.87-1676.30 kg ha^{-1}, respectively. The cultivar with the highest fiber yield was

PG 2018 with 1629.81 kg ha^{-1}. Edessa, which was in the same statistical group, had a fiber yield of 1626.10 kg ha^{-1}. Lima and Flash cultivars shared the lowest statistical group and had a fiber yield of 1291.20 and 1307.60 kg ha^{-1}, respectively. When the cultivar x year interaction was examined, the highest value was in cv. May 455 in 2020. However, this cultivar had very low fiber yield in 2019. PG 2018 and Edessa cultivars showed their preferability by maintaining more stable fiber yield in both years. BA 440 cultivar was the least affected by the year difference (Figure 3).

Table 5. Yield, yield component and fiber technological properties of cultivars

	GT	FL	FS	FF	SW	FY
Years						
2019	38.96	28.54**b**	28.21**b**	4.42**b**	9.77**b**	1244.87**b**
2020	39.78	29.18**a**	32.41**a**	4.63**a**	11.46**a**	1676.30**a**
Cultivars						
Carisma	40.47**ab**	28.33**b**	28.93	4.33	10.1**f**	1352.12**de**
BA 440	41.22**a**	28.12**b**	30.62	4.39	11.46**a**	1468.94**bc**
Flash	37.98**bc**	29.46**ab**	29.65	4.55	9.97**f**	1307.60**e**
BA 119	39.28**abc**	29.17**ab**	30.92	4.63	11.16**ab**	1466.73**bc**
Lima	37.06**c**	30.51**a**	30.2	4.54	10.87**bcd**	1291.20**e**
Edessa	40.72**ab**	28.22**b**	30.23	4.63	10.26**ef**	1626.10**a**
PG 2018	41.98**a**	29.05**ab**	30.62	4.64	10.34**c-f**	1629.81**a**
St 468	41.37**a**	28.65**ab**	29.89	4.43	10.38**def**	1528.64**b**
May 455	37.49**c**	28.92**ab**	31.42	4.37	10.76**b-e**	1470.57**bc**
St 498	39.28**abc**	28.87**ab**	31.14	4.69	10.99**abc**	1509.00**bc**
May 344	36.60**c**	28.25**b**	30.07	4.63	10.51**c-f**	1415.74**cd**
F Value $_{Year}$	1.24ns	6.65*	81.02***	13.52***	202.45***	456.19***
F Value $_{Cultivar}$	3.31**	2.76**	0.86ns	1.68ns	5.66***	11.51***
F Value $_{Interaction}$	3.73***	1.01ns	3.48**	4.83***	4.65***	5.36***
CV	9.36	4.59	10.55	7.78	10.85	18.26
SEM	0.39	0.14	0.34	0.04	0.12	28.44

***GT**: Ginning turnout (%), **FL**: Fiber length (mm), **FS**: Fiber strength (g tex^{-1}), **FF**: Fiber fineness (micronaire), **SW**: 100 seed weight (g), **FY**: Fiber yield (kg ha^{-1}), **CV**: Coefficient of variation, **SEM**: Standard error of mean, **ns**: is not significant, *: is significant at P ≤ 0.05, **: is significant at P ≤ 0.01, ***: is significant at P ≤ 0.001.*

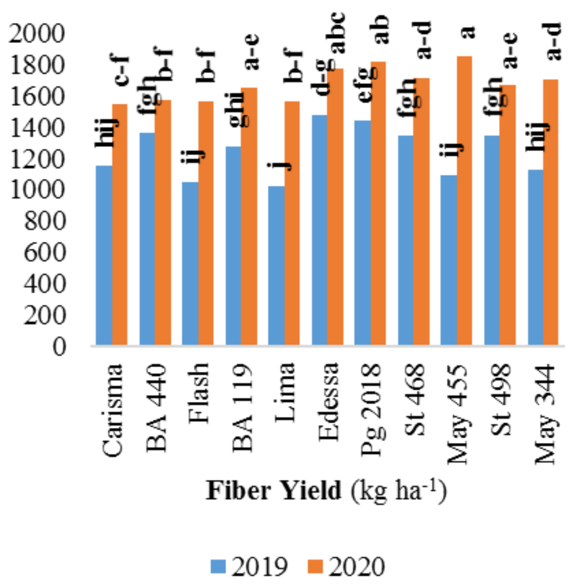

Figure 3. Interaction of cultivar x year for fiber yield

CONCLUSION

Edessa and PG 2018 were the cultivars with the highest yield. They showed their superiority not only in seed cotton yield and fiber yield but also in many other parameters. However, for many yield and quality parameters, the cultivars were affected by the year. Despite this fact, Edessa and PG 2018 were superior cultivars for seed cotton yield and fiber yield in both years. Also, cv. PG 2018 had the highest plant height and ginning turnout.

Selection of cultivar in cotton production is the assurance of yield and quality (Mert, 2020). In the selection of cultivar, it is expected that the yield and quality of the cultivars should be high. Still, other points to be considered are resistance to diseases and pests, wind resistance of seed cotton, suitability for machine harvesting, resistance to stress conditions, high ginning turnout and response to day length, and especially earliness (Mert, 2020). As a result, Edessa and PG 2018 cultivars were found to be suitable for cultivation in Batman ecological conditions of Southeastern Anatolian Region and gave higher results than the others.

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master's thesis titled "Determination of Yield and Fiber Technological Properties of Different Cotton Cultivars in Batman Ecological Conditions" completed in 2021.

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