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ARAŞTIRMA MAKALESI

Yield and Some Morphological Properties of Lines Selected From Populations of Landraces Topbaş Wheat (*Triticum compactum*)

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Anahtar kelimeler: Topbaş buğday (*Triticum compactum)*, morfolojik özellikler, verim, sarıpas, karapas

Abstract

This study was carried out with 140 Topbaş wheat genotypes (*Triticum compactum*) belonging to wheat genotypes selected from landrace wheats collected from different cities in Turkey. Trial material consisted of 49 red and 91 white grain genotypes. In order to determine the genotypes that can be used as parent in biscuit breeding studies, the experiment was conducted in Konya central location during the 2015-2016 and 2016-2017 growing periods. Yields of *Triticum compactum* wheat genotypes were between 26.7-192.9 kg.da^{-1} and CV(coefficient of variation) was 34.69% in the 2015-2016 cultivation period in 239.5 mm rain. Yields were between 277-528.4 kg da-1 CV was 11.81% in 2017-2018 in 337.5 mm rain. In the 2015-2016 cultivation period, yields of *Triticum compactum* wheat genotypes ranged between 26.7-192.9 kg.da-1 in 239.5 mm rain and CV was 34.69%. It ranged between 277-528.4 kg da-1 in 337.5 mm rain in 2017-2018, CV was %11.81. When the results of two years are evaluated together, it was found that thousand kernel weight ranged between 24.0-65.1 g, CV ranged between 9.06-10.13%, number of spikelet per spike ranged between 10.2-18.7, CV ranged between 8.78-8.80%, number of grain per spike ranged between 13.5-41.1, CV ranged between 15.5-15.90%, grain weight per spike ranged between 0.39 -1.68 g, CV ranged between 17.57-18.39%, plant height ranged between 33.1-105.4 cm, CV ranged between 9.76-9.24%. Genotypes was determined that the yellow rust and stem rust infection coefficients of the ranged between (0-100). There are lines with better than the standard varieties in terms of the examined characteristics. This situation will create an important genetic resource for biscuit wheat breeding studies, and as a result of the selection studies to be made, it will allow to obtain new varieties with high yield and good biscuit quality. As a result of this study, 15 Topbaş wheat genotypes were selected as parents to be used in biscuit wheat breeding studies. Araştırma sonucunda geçmiş yıllara göre yeni piyasaya girmiş çok sayıda hibrit mısır çeşitlerinin fizyolojik olum sonrası nem kaybetme hızlarının çok fazla değişkenlik gösterdiği, bu durumun bazen çeşitlerin olgunlaşma grubu ile doğrudan ilişkili olamayacağı sonucuna varılmıştır.

Yerel Topbaş Buğday Popülasyonlarından (*Triticum compactum*) Hatların Verim ve Bazı Morfolojik Özellikleri

Öz

Bu çalışma, Türkiye'nin farklı illerinden toplanan yerel buğdaylardan seçilen 140 Topbaş buğday genotipi (*Triticum compactum*) ile yürütülmüştür. Deneme materyali 49 adet kırmızı, 91 adet beyaz taneli genotipten oluşmuştur. Bisküvilik ıslah çalışmalarında ebevyn olarak kullanılabilecek genotipleri belirlemek amacıyla, deneme Konya merkez arazisinde 2015-2016 ve 2016-2017 yetiştirme dönemlerinde yürütülmüştür. 2015-2016 yılı yetiştirme döneminde 239.5 mm yağışta Topbaş buğday genotiplerin verimleri 26.7-192.9 kg.da-1 arasında DK (Değişim Katsayısı) %34.69 olmuştur. Verimler 2017-2018 yılında 337.5 mm yağışta 277-528.4 kg da^{-1} aralığında, DK %11.81 olmuştur. İki yıl sonuçları birlikte değerlendirildiği durumda bin tane ağırlığı 24.0-65.1 g, DK %9.06-10.13, başakcık sayısı 10.2-18.7, DK %8.78-8.80, başakta tane sayısı 13,5-41.1, DK %15.5-15.90, başakta tane ağırlığı 0.39 -1.68 g, DK %17.57-18.39, bitki boyu 33.1-

105.4 cm, DK %9.76-9.24 aralığında değiştiği tespit edilmiştir. Genotiplerin sarı pas ve kara pas enfeksiyon katsayılarının da 0-100 aralığında değiştiği belirlenmiştir. İncelenen özellikler açısından standart çeşitlerden daha üstün özeliklere sahip hatlar bulunmaktadır. Bu durum bisküvilik buğday ıslah çalışmaları için önemli bir genetik kaynak oluşturacak, yapılacak seleksiyon çalışmaları sonucunda yüksek verimli ve bisküvilik kalitesi iyi yeni çeşitlerin elde edilmesine olanak sağlayacaktır. Bu çalışma sonucunda 15 adet Topbaş buğday genotipi bisküvilik buğday ıslah çalışmalarında kullanılmak üzere ebevyn olarak seçilmiştir.

Introduction

The rich biodiversity of the fact that Turkey is an important gene center is due to the homeland and to many plant and animal species (Kan et al., 2017). Wheat, with its 6.92 million hectares of cultivation area in Turkey, is an important crop species with about 17.7 million tons of annual wheat production (TÜİK, 2021). Our country is one of the gene centers where wheat was first cultivated (Gökgöl, 1939). Some part of the productive crescent which is accepted as gene center is found in our country (Akçura, 2006; Aktaş et al., 2018; Kılıç et al., 2016). Thanks to the past civilizations established in Anatolia, it is home to the cultivation and use of these plants and the culture and knowledge of interest (Atak, 2017).

Local varieties that met the variety needs of the country until 1950, they are generally tall, prone to bowing, poor responses to fertilizers, sensitive to leaf diseases and limited yield. The grain qualities and adaptability of these populations are generally satisfactory. In the 1950s, the variety model sought changed with the widespread use of machine agriculture, the use of fertilizers and the increase of irrigation opportunities. The semi-dwarf varieties, expressed as the green revolution between 1960-70, have become popular in our country as well as in the world local x local hybrids left it to modern varieties x local varieties hybrid (Özberk and Özberk, 2016). In recent years, as in many fields, very rapid developments have been made in genetic studies. Many researchers, both in the world and in our country, try to improve the wheat's grain yield, quality, resistance to diseases and pests, drought, cold and toxic substances, using the latest techniques developed (Akçura, 2009).

In our country, studies on development of wheat species for biscuit is not enough. Even more, so many breeding programs don't have such an aim. There may be several reasons for this, but the most important reason is that wheat species for biscuits are included in the lower purchasing scale and are priced poorly. Standard raw materials have been needed for the development of the international biscuit trade and for the Turkish biscuit industrialist to take place in international markets. It is difficult to always obtain raw materials of the same quality and standard from low quality bread wheat which is obtained from the market. Recently, the biscuit industrialists have been in talks with the breeding program executives for the development of wheat for biscuits and it is understood from the mutual interviews that they have been looking for different variety for biscuit. In line with these demands, wheat studies for biscuits have become a necessity and need in the targets of our wheat breeding programs. Wheat genotypes that have the feature of being used in biscuit production, with low gluten quality and protein ratio are preferred. It is thought that the Topbaş (*Triticum compactum*) type landrace wheat genotypes will be preferred by the biscuit industrialists because they are soft, and their gluten quality is low.

This study was carried out using genotypes selected from local wheats collected within the scope of the project titled "National Research, Collection and Storage of Turkish Wheat Local Varieties" supported by FAO and IWWIP and coordinated by Konya Bahri Dağdaş International Agricultural Research Institute between 2009-2014.

Material and Method

Under the project titled "National Survey, Collection and Storage of Turkish Wheat Landraces", 140 topbaş wheat (*Triticum compactum*) genotypes selected from the genotypes that have been characterized from local wheat have been used as material in augmented trial design with using 5 standard varieties (Artico, Carisma, Bayraktar 2000 Karahan 99, Gerek 79). In the trial pattern, it has been tried for 2 years in 2015-2016 and 2016-2017 cultivation periods. The regions where the material was collected and their numbers are shown (Figure 1). The test material consisted of 49 red and 91 white genotypes. A total of 7 blocks were planted, with 1 block of 25 plots. 140 genotypes, 5 standard species were used, 5 standard species were repeated in each block and the total number of parcels planted was 175. Trial material seed colors consisted of 49 red and 91 white genotypes. The study was carried out in the arid conditions of Bahri Dağdaş International Agricultural Research Institute Konya central land. Regions where sample material was collected and sample numbers are given in Figure 1. In 2015-2016, the experiment was sown on 22.10.2016 and on 31.10.2016 in 2016-2017. The parcel size of the trials was planted in 6 rows with a size of 1.2 m x 7 m = 8.4 m^2, with a seed density of 550 seeds per

Grain yield: The grain yield obtained from the parcel with a size of six square meters is converted to decare and calculated in (kg da^{-1}). Heading time: heading dates are noted in April-June (Zadoks 55-57 periods). (Zadoks et al., 1974; Tavella, 1978; Bohn et al., 1998). Measurements were determined according to observation by the same person.

Plant height (cm): The measurement was done in (cm) by recording the distance from the soil surface to the upper point of the last spike (Torres and Pietragalla, 2012).

Spike length (cm): Determined by measuring 10 spike samples in each plot. Number of grains per spike: The grains in each of the spike samples taken from each parcel were counted harvest by hand and the number of grain in the spike was determined as the number.

Number of spikelets in spike: The number of spikelets per spike was determined by counting 10 spikes per parcel.

The number of grain in the spike: The grains in each of the spike were counted.

Spike grain weight (g): Total grains in spike were weighed with 0.001 g sensitive scales.

Thousand kernel weight (g): It was determined according to AACC Method No: 55-31 (Anonymous, 2000).

Disease readings: Assessment of naturally occurring diseases in trials was carried out. Some years, rust diseases were seen naturally. Disease readings were made according to the disease severity (1, 5, 10, 20, 30, 40, 50, 60, 70, 80, 90, 100) and reaction type in the flag leaves of the plants for each type of rust using the modified Cobb scale (Peterson et al. 1948). Disease readings: Naturally occurring diseases were evaluated.

Disease readings were made with using the modified Cobb Scale according to the disease severity (1, 5, 10, 20, 30, 40, 50, 60, 70, 80, 90, 100) and reaction type in the flag leaves of the plants for each type of rust (Peterson et al. 1948). Then, the coefficient determined for the severity and reaction type was multiplied and the coefficient of infection (CI) was found. In these calculations, the following coefficients were used for the type of infection: S: 1 (sensitive), MS: 0.8 (Medium sensitive), MS: 0.6 (Medium sensitive-Medium resistant), MR: 0.4 (Medium resistant), R: 0.2 (resistant). In general, the CI values below 10 are durable, and the EK values above 60 are handled precisely. Between 10-60 were considered as medium sensitive or medium-resistant. 0 values show that no disease occur.

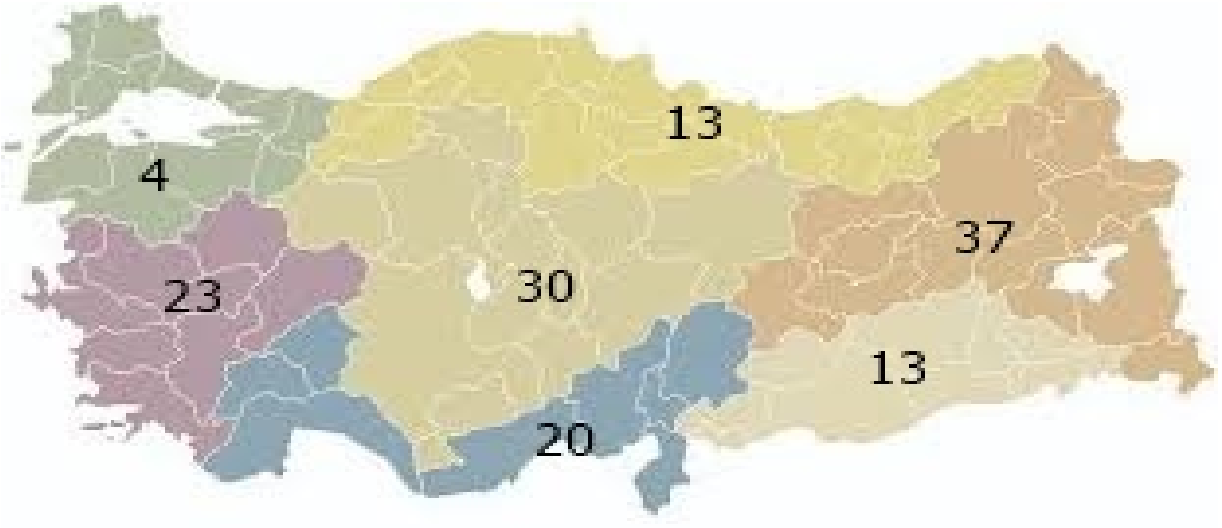

Figure 1. The regions where the trial material was collected and number of materials

Results and Discussion

After 2015-2016 sowing, germinations of the plants happened normally. However, winter rains were recorded as irregular and insufficient. Especially in the wheat stalk period, 12.4 mm rain was insufficient in April. 36 mm of rain was recorded in the last two days of May (Table 1). After the plants started to dry due to drought, there was precipitation, so the yields were low because the plants could not fully develop.

With the rains in November in 2016-2017, the plants germinated and entered the winter in germinated state. With the snowfall on the plant in December, the plants remained under the snow cover for about 45 days. During the plant growth period of 2016-2017, there was 337.7 mm of precipitation, and the plants did not undergo drought stress during this growing period.

Table 1. Climate data during the years of trials

	Rainfall (mm)			Minimum Temperature (°C)		Maximum Temperature (°C)	
Months	**2015-2016**	**2016-2017**	**Mean values of long years**	**2015-2016**	**2016-2017**	**2015-2016**	**2016-2017**
October	33.0	0.0	30.1	4.5	2.0	27.4	28.0
November	3.2	16.0	32.6	0.6	-8.0	19.2	22.0
December	0.2	81.3	42.0	-6.8	-18.0	12.2	9.0
January	37.6	35.8	35.9	-11.3	-18.0	15.5	6.0
February	6.4	0.0	28.0	-4.6	-19.0	21.5	13.0
March	55.3	71.0	27.5	-1.6	-4.0	26.0	20.0
April	12.4	39.0	32.3	4.9	0.0	28.6	25.0
May	36.0	59.6	43.3	6.6	3.0	30.8	31.0
June	46.3	26.4	24.8	10.2	8.0	34.6	34.0
July	9.1	8.6	5.5	17.6	20.7	29.9	27.8
Total	**239.5**	**337.7**					

Table 2. Values of the properties determined in pure landraces Topbaş wheat genotypes

G. NO	plht		hdtm		mtrt		spkl		nsps		ngps		gwps		yield		tkw	
	I yrs	II yrs	I yrs	II yrs	I yrs	II yrs	I yrs	II yrs	I yrs	II yrs	I yrs	II yrs	I yrs	II yrs	I yrs	II yrs	I yrs	II yrs
6	60.2	77.4	196	219	254	264	7.9	5.0	12	14.8	20	24.6	0.7	0.92	171.0	310	28	33.2
24	36.1	81.5	207	216	263	263	5.2	5.5	11	17.2	20	25.4	0.7	1.69	26.8	319	29	37.1
25	33.2	89.9	207	217	263	264	5.3	5.3	11	14.4	20	33.8	0.6	1.43	30.5	365	28	38.4
26	36.2	91.4	200	216	265	262	3.8	4.4	11	14.9	14	25.2	0.4	1.04	43.0	430	25	36.7
28	53.2	92.9	202	216	260	262	4.1	4.3	11	14.7	16	26.6	0.5	1.07	64.5	437	30	39.0
31	59.2	105	206	218	275	262	6.0	5.9	13	15.9	20	27.4	0.5	0.99	86.4	458	24	36.2
34	56.2	90.9	200	215	270	262	6.0	5.3	14	15.9	23	30.8	0.6	1.00	109.0	427	24	31.2
37	50.7	79.4	199	215	256	262	4.4	4.4	13	14.9	17	25.0	0.5	0.98	94.0	417	31	36.9
38	49.0	78.8	201	216	259	263	4.3	4.0	12	14.2	20	19.7	0.5	0.68	58.4	528	27	30.6
39	54.2	87.2	200	214	255	264	5.5	5.7	13	15.8	20	30.1	0.7	1.21	91.2	355	30	36.0
41	54.7	83.2	193	213	255	259	5.1	6.0	10	14.4	15	29.3	0.5	1.24	78.0	429	35	40.1
54	60.7	89.9	200	215	265	257	5.2	5.0	14	14.7	22	24.2	0.8	1.03	128.0	405	31	37.4
57	61.7	92.4	194	215	265	262	5.3	5.6	14	14.9	20	27.4	0.7	1.06	95.7	369	31	37.5
62	55.7	90.9	200	215	265	263	5.5	6.0	13	13.5	20	28.6	0.8	1.25	87.7	440	34	42.1
67	65.7	81.9	197	213	270	262	5.8	8.0	12	13.7	18	24.0	1.0	1.27	127.0	316	41	49.8
68	55.7	92.4	198	216	270	257	6.0	5.0	13	13.5	23	30.0	0.8	1.29	193.0	465	33	37.0
74	46.7	81.9	199	213	265	262	5.5	4.6	13	13.7	18	25.4	0.6	1.09	93.9	423	29	39.3
78	60.7	97.4	197	213	260	263	5.0	5.6	11	13.9	16	25.6	0.6	1.25	105.0	434	34	45.0
79	58.7	94.4	197	214	256	261	8.3	8.9	13	13.9	17	23.8	0.6	1.16	79.0	459	34	42.8
82	60.2	92.4	198	214	260	260	5.8	5.5	13	15.1	22	29.4	0.8	1.35	128.0	445	34	43.1
86	57.2	81.9	203	214	265	262	5.0	5.0	11	14.1	16	28.2	0.6	1.33	110.0	478	34	41.8
88	57.7	77.4	204	214	275	267	5.3	5.4	12	14.9	21	25.4	0.7	1.11	80.7	277	32	40.3
92	56.2	87.9	202	213	265	262	4.2	4.2	11	13.5	15	21.8	0.5	0.94	79.5	401	31	36.5
97	61.7	89.4	196	212	260	262	4.9	5.0	12	13.3	17	23.8	0.6	1.08	86.9	379	34	41.6
98	53.2	78.9	197	210	256	261	4.8	4.5	13	13.3	18	23.8	0.7	1.02	83.2	433	34	41.6
99	48.7	78.4	203	215	265	262	5.0	4.9	12	14.5	18	22.2	0.6	1.03	88.0	387	30	40.6
101	59.0	88.8	198	214	264	263	5.8	5.4	13	13.6	22	27.5	1.0	1.51	149.0	438	40	45.5
102	61.5	86.3	199	214	264	263	6.1	5.2	14	14.4	23	25.1	0.8	1.20	88.2	383	32	40.5
103	54.0	89.3	198	212	264	262	6.2	5.4	14	13.2	23	22.1	0.9	1.09	83.7	364	32	41.3
104	53.0	86.3	199	213	264	264	5.8	5.1	14	14.8	25	22.7	0.8	0.93	73.9	332	31	37.5
106	52.5	88.3	198	212	264	263	5.7	5.0	14	13.8	25	24.1	0.9	1.12	64.4	421	31	40.1
108	51.0	79.3	195	211	264	263	5.3	5.3	14	12.8	22	20.1	0.7	0.53	52.4	322	30	37.6
109	58.5	82.3	198	211	264	263	5.6	4.5	14	13.0	24	19.9	0.8	0.86	74.1	361	33	39.2
111	48.5	83.3	200	212	264	258	5.2	4.8	13	14.6	27	30.7	0.9	1.27	57.4	405	31	38.5
112	45.0	88.3	200	212	264	258	4.8	4.5	13	13.6	26	22.5	0.8	0.95	40.9	410	31	40.7
113	49.5	79.3	199	212	259	259	5.0	4.4	14	14.0	29	24.1	1.0	1.09	90.2	426	32	40.5
114	59.5	88.3	199	212	259	263	5.0	4.7	15	15.4	27	28.1	0.9	1.17	84.2	425	32	37.7
116	51.5	86.8	195	213	264	263	4.9	4.9	14	15.6	24	29.1	0.8	1.31	101.0	425	30	36.3
117	53.0	85.3	204	215	269	263	5.9	4.8	14	14.6	27	23.9	0.8	0.93	30.4	352	28	36.6
118	55.5	88.3	198	209	264	263	5.4	4.4	15	15.0	29	25.9	0.8	1.04	74.7	392	29	37.1
119	47.5	76.8	205	214	264	258	4.4	3.9	12	12.8	20	17.7	0.6	0.69	43.9	429	30	36.7
121	61.5	82.3	200	214	264	259	5.2	4.5	13	13.2	21	21.5	0.7	0.99	130.0	423	31	37.2
122	64.5	91.3	201	215	259	258	5.2	4.8	12	15.0	22	32.7	0.8	1.53	129.0	406	34	41.5
123	61.5	91.8	199	212	259	259	5.3	5.4	12	15.2	18	22.9	0.6	0.95	116.0	396	34	41.4
124	59.5	88.8	202	215	264	258	4.9	4.6	13	13.8	24	24.7	0.6	0.99	113.0	462	25	35.6
127	52.6	93.8	197	215	265	262	5.6	4.9	14	16.3	26	28.5	0.9	1.14	154.0	390	31	37.9
128	61.6	93.8	200	214	265	263	4.9	5.0	14	17.5	25	30.3	0.8	1.20	78.5	307	32	36.3
129	62.6	93.8	199	213	260	264	5.4	5.2	12	14.1	22	24.3	0.9	1.20	155.0	433	36	45.3
131	57.1	91.8	198	213	256	261	5.5	5.7	13	15.5	23	27.7	0.9	1.22	137.0	466	34	44.4

Table 2. Continue

G. NO	Plht		Hdtm		Mtrt		Spkl		Nsps		Ngps		Gwps		Yield		Tkw	
	I	II	I	II	I	II	I	II	I	II	I	II	I	II	I	II	I	II
	yrs	yrs	yrs	yrs	yrs	yrs	yrs	yrs	yrs	yrs	yrs	yrs	yrs	yrs	yrs	yrs	yrs	yrs
141	54.6	88.8	203	214	265	262	4.5	4.3	13	14.9	23	25.7	0.7	1.01	93.8	456	28	34.6
142	53.6	86.3	203	213	265	262	5.2	5.0	14	15.3	24	33.3	0.9	1.29	106.0	441	27	36.5
143	56.6	77.3	205	213	265	261	5.3	4.8	13	13.9	21	25.1	0.7	1.01	75.0	396	32	36.7
144	55.1	79.3	205	214	260	261	5.4	4.9	12	14.3	21	27.5	0.7	1.25	76.0	427	32	37.7
146	51.6	87.3	199	213	260	262	5.0	5.0	13	14.9	22	29.9	0.7	1.21	124.0	428	31	37.3
147	58.6	85.8	200	214	265	261	5.3	5.4	14	15.9	24	27.1	0.9	1.22	124.0	444	31	37.7
148	59.1	79.8	205	215	265	260	5.8	5.1	15	14.9	30	31.1	0.9	1.17	104.0	387	30	35.3
149	58.1	75.8	205	215	265	262	4.9	4.1	13	14.3	24	26.9	0.7	0.92	161.0	397	29	31.7
150	52.6	74.3	199	213	260	261	5.6	5.8	13	14.9	25	32.3	0.9	1.31	165.0	450	31	39.0
152	60.3	90.5	204	214	264	264	5.4	5.3	15	15.5	24	26.7	0.8	1.33	78.3	437	32	39.0
153	54.8	83.0	205	214	264	263	5.4	5.2	13	14.3	24	29.3	0.8	1.25	77.8	443	35	39.3
154	57.8	88.0	204	215	264	264	5.4	5.1	13	13.9	21	22.9	0.7	1.03	58.2	438	34	39.9
156	49.8	86.0	202	213	264	264	4.8	5.2	13	14.7	19	25.5	0.6	1.13	61.3	423	33	38.1
157	58.3	88.0	202	212	264	263	5.0	5.1	13	15.1	22	27.1	0.8	1.08	55.2	381	31	36.0
158	47.8	74.0	200	213	264	264	4.5	3.9	12	12.1	21	20.5	0.7	0.82	106.0	409	32	38.7
159	56.3	85.5	200	214	259	264	4.7	4.0	11	11.5	20	21.1	0.7	0.82	85.5	423	32	39.2
161	61.8	87.0	197	212	264	264	4.8	4.6	11	11.9	18	23.3	0.7	1.01	103.0	438	34	41.2
162	50.8	74.0	199	212	264	264	4.7	4.3	14	15.3	26	34.3	0.8	1.11	155.0	417	27	32.9
163	52.3	74.5	204	211	259	264	4.3	3.8	12	14.1	22	25.5	0.7	0.87	144.0	394	27	36.7
164	57.8	88.5	204	212	269	264	4.5	4.1	14	14.1	23	28.3	0.6	1.08	143.0	440	29	35.0
166	53.3	76.5	206	212	259	264	4.1	5.0	12	13.7	19	28.9	0.6	1.09	105.0	454	28	36.5
167	59.3	94.5	197	211	264	264	5.3	4.8	12	13.1	19	20.5	0.8	0.82	122.0	420	36	41.8
168	55.3	89.0	198	211	264	269	5.0	4.6	12	12.3	19	22.3	0.7	1.03	85.8	438	36	41.7
169	56.3	90.5	204	209	269	264	4.2	4.8	11	14.5	20	23.7	0.7	1.04	71.7	422	32	38.1
171	54.8	83.5	201	211	269	264	4.4	4.8	14	16.9	23	28.1	0.7	1.15	103.0	378	28	35.3
172	52.8	84.0	200	212	269	263	5.0	4.4	13	12.3	23	22.9	0.7	0.94	87.3	424	31	37.4
173	57.8	89.0	197	212	259	259	7.5	8.0	12	12.7	18	23.1	0.6	0.99	120.0	528	34	41.9
174	58.8	76.5	197	213	264	263	3.9	4.6	12	13.3	20	24.9	0.6	0.98	104.0	414	30	35.6
175	52.3	85.5	206	214	269	269	4.1	4.2	13	16.3	23	29.7	0.5	0.95	165.0	405	26	29.7
177	51.2	70.2	196	213	259	264	4.6	4.6	12	13.0	21	28.7	0.6	1.02	136.0	375	27	65.2
178	52.2	83.7	197	212	259	268	5.1	5.7	13	16.2	21	34.5	0.8	1.56	39.3	301	32	40.8
179	56.7	87.2	197	213	259	269	6.1	6.3	13	15.0	21	29.9	0.8	1.23	73.8	422	33	42.0
181	57.2	84.2	196	213	259	264	6.1	6.4	13	15.4	22	29.5	0.8	1.25	90.0	424	33	41.6
182	53.2	71.7	198	214	259	264	5.6	5.8	15	17.2	23	38.5	0.7	1.58	88.7	396	29	37.8
183	53.7	82.2	198	212	264	264	6.0	5.7	13	13.8	21	29.9	0.8	1.24	155.0	407	33	41.1
184	57.2	87.2	198	212	259	264	5.4	5.8	11	14.8	17	28.1	0.7	1.25	135.0	421	35	45.8
187	55.7	80.7	197	211	259	264	5.8	6.3	11	14.0	17	22.9	0.6	0.94	138.0	416	32	40.6
188	58.7	82.2	202	213	264	264	5.0	5.5	13	15.8	21	28.5	0.8	1.19	84.0	375	32	41.6
190	56.7	80.7	198	213	264	264	5.5	5.5	14	16.0	25	32.3	0.7	1.28	122.0	398	29	35.4
192	57.2	87.2	198	214	259	263	5.1	5.7	12	14.8	18	35.5	0.7	1.43	163.0	453	32	40.7
193	51.7	70.2	197	215	264	263	4.8	4.6	11	13.4	16	26.9	0.5	0.99	89.3	406	31	38.1
194	49.2	68.2	202	213	269	263	5.2	4.9	13	15.8	22	29.3	0.7	1.04	73.0	389	27	34.9
196	48.2	79.2	199	213	269	263	4.8	4.7	12	13.8	19	26.7	0.5	0.95	72.8	367	28	38.4
197	51.7	68.7	200	212	274	263	5.4	5.1	14	15.8	23	31.9	0.7	1.28	107.0	364	28	36.3
198	52.7	70.2	198	213	274	268	5.2	5.1	13	14.8	20	27.7	0.7	1.22	132.0	379	33	39.6
199	57.7	68.7	200	214	274	269	5.8	4.9	16	16.4	25	28.7	0.7	1.09	150.0	380	27	36.9
200	56.7	73.2	200	213	269	269	4.3	4.1	11	14.8	19	27.9	0.5	0.92	180.0	384	29	34.2
201	60.1	77.0	204	214	273	267	5.2	6.2	13	18.8	26	39.6	0.7	1.51	152.0	361	29	33.3
202	62.1	77.5	204	215	273	267	5.3	4.8	13	16.8	23	31.2	0.7	1.17	57.9	352	29	35.0
203	62.1	86.5	204	213	268	263	5.2	5.2	13	16.0	22	25.6	0.7	1.12	138.0	450	31	39.3
204	56.1	77.0	198	210	263	263	4.7	5.1	12	14.6	19	26.2	0.7	1.12	71.3	357	30	36.0
206	56.6	88.0	198	213	268	262	5.2	5.1	14	14.8	25	26.2	0.8	1.17	94.8	389	33	39.1
207	60.1	87.5	197	213	258	262	5.2	5.2	13	15.2	24	30.0	0.8	1.31	140.0	426	32	38.6
210	42.1	79.5	197	212	258	259	4.6	4.5	11	15.0	17	29.0	0.6	1.24	61.9	300	31	39.0
211	53.6	76.5	197	212	254	259	4.8	4.9	13	15.2	24	29.4	0.9	1.28	108.0	471	33	41.3
212	53.6	86.5	198	213	258	259	4.5	4.7	13	16.4	22	33.8	0.7	1.51	152.0	430	31	37.2
213	52.6	75.5	197	210	263	263	4.9	4.8	14	16.6	26	34.8	0.9	1.44	68.4	389	32	38.0
214	57.6	87.5	204	214	268	263	4.3	4.9	13	15.2	22	32.2	0.6	1.23	58.3	395	27	35.5
216	51.6	78.5	202	214	268	263	4.0	4.1	14	16.0	25	31.0	0.9	1.37	67.8	427	30	35.7
217	59.1	88.0	202	214	268	262	5.5	5.2	14	18.0	25	32.4	1.0	1.50	133.0	439	32	38.9
218	58.1	84.0	201	213	268	263	5.2	5.3	13	17.0	26	32.2	0.9	1.48	127.0	449	32	42.5
219	55.6	84.0	197	211	263	259	5.2	5.6	12	15.4	19	31.2	0.8	1.46	140.0	477	35	43.3
221	52.6	86.5	195	214	258	262	5.0	4.8	12	15.6	23	34.2	0.9	1.33	133.0	420	33	37.7
222	57.1	98.0	200	215	263	262	4.9	5.7	12	16.2	23	31.0	0.8	1.36	78.6	373	35	39.6
223	54.6	90.0	199	214	263	263	5.0	6.0	11	14.6	19	28.2	0.8	1.32	83.1	415	33	43.5
224	55.6	90.0	202	214	268	263	4.6	7.3	11	13.8	20	27.4	0.6	1.09	109.0	414	29	37.4
227	53.2	90.4	197	213	258	264	4.8	5.6	11	13.2	16	25.8	0.6	1.11	137.0	472	33	41.1
228	55.2	94.9	196	214	258	264	5.1	5.6	13	13.6	23	24.0	0.8	0.95	65.0	412	32	38.8
229	56.2	94.9	197	214	263	264	4.9	5.6	12	15.0	22	26.2	0.7	1.09	130.0	443	29	36.8
231	51.7	79.4	200	213	258	264	4.7	5.3	12	13.4	20	26.4	0.6	0.94	117.0	484	28	36.6
232	51.7	79.4	199	214	263	264	4.4	4.7	13	14.2	25	29.4	0.7	1.13	158.0	431	31	37.7

Table 2. Continue

G. NO	Plht		Hdtm		Mtrt		Spkl		Nsps		Ngps		Gwps		Yield		Tkw	
	I yrs	II yrs	I yrs	II yrs	I yrs	II yrs	I yrs	II yrs	I yrs	II yrs	I yrs	II yrs	I yrs	II yrs	I yrs	II yrs	I yrs	II yrs
244	54.2	90.4	202	214	263	260	4.7	4.9	13	12.8	20	20.4	0.6	0.77	127.0	464	30	38.3
246	49.2	94.9	199	214	258	259	4.7	5.8	11	15.2	19	28.0	0.7	1.12	114.0	465	32	39.2
247	60.2	101.0	204	216	258	259	4.8	5.1	14	14.0	26	27.0	0.8	0.95	85.0	501	30	35.7
248	54.2	67.9	196	214	263	264	5.1	5.5	14	15.2	24	32.6	0.7	1.49	43.9	295	32	44
Means	**55.0**	**84.5**	**200**	**213**	**263**	**262**	**5.1**	**5.2**	**13**	**14.6**	**21**	**27.2**	**0.7**	**1.1**	**102.0**	**411**	**31**	**38.8**
Artico	54.0	77.5	198	210	261	261	7.2	7.4	14	14.4	25	26.9	0.8	1.18	91.3	406	34	42.5
Bayraktar	52.0	70.6	195	207	256	260	7.2	7.9	12	14.7	21	28.8	0.8	1.07	149.0	465	34	39.1
Gerek	50.0	73.0	197	211	260	260	6.8	7.6	11	14.5	20	28.6	0.7	1.05	104.0	464	30	36.5
Karahan-99	52.0	76.1	198	212	260	262	8.9	9.3	14	15.5	28	32.6	0.9	1.33	99.5	466	31	38.1
Carisma	45.0	58.8	198	211	260	261	6.7	7.3	14	16.6	27	41.1	0.8	1.41	108.0	354	28	34
St. ort.	51	73.4	198	211	260	261	7	7.4	13	15.1	24	30.9	0.8	1.20	109	428	31	38.2
LSD (%5)	7	9.81	2.37	0.97	5.39	3.7	0.5	1.4	1.2	1.78	4.4	6.48	0.1	0.24	30.6	50.8	1.4	2.37
CV	11	10.5	0.92	0.35	1.59	1.09	5.3	13	7.2	8.99	13	16.4	13	15.5	21.2	9.04	3.5	4.77

Plht: Plant height(cm); Hdtm: Heading time (day); Mtrt: Maturation time (Day), Spkl: Spike length(cm); Nsps: Number of spikelet per spike (number); Ngps: Number of grain per spike; Gwps: Grain weight per spike; Yield (kg da-1); Tkw: Thousand kernel weight (g)

Table 3. Mean, minimum, maximum values and coefficients of variation of the studied properties in local Topbaş wheat pure lines

	2015-2016				2016-2017			
Colu mn	**Minimum Maximum**	**Mean**	**Distribution test value**	**Coefficient of variation**	**Minimum Maximum**	**Mean**	**Distribution test value**	**Coefficient of variation**
Mtrt	254.1-274.9	263.2	0.9587*	1.77	257.2-268.8	262.4	0.9287*	0.89
Spkl	3.52-8.86	5.1	0.8786*	15.21	3.76-9.25	5.2	0.8619*	17.05
Nsps	10.2-15.7	12.7	0.9892	8.78	11.4-18.7	14.6	0.9922	8.80
Ngps	13.5-30.0	21.3	0.9955	15.05	16.9-41.1	27.2	0.9875	15.90
Gwps	0.39-1.04	0.7	0.9941	17.57	0.53-1.68	1.1	0.9906	18.39
Plht	33.1-65.6	54.7	0.9347*	9.76	67.9-105.4	84.5	0.9798*	9.24
Hdtm	192.8-207.4	199.8	0.9497*	1.51	207.1-218.5	213.2	0.9861	0.89
Tkw	24.0-40.6	31.2	0.9857	9.06	29.7-65.2	38.8	0.8630*	10.13
Yield	26.7-192.9	102.4	0.9838	34.69	277.0-528.4	410.6	0.9664	11.81

*: Suitable for normal distribution according to Shapiro-Wilk test. Mtrt: Maturation time (day), Spkl: Spike length (cm); Nsps: Number of spikelet per spike (number); Ngps: Number of grain per spike; Gwps: Grain weight per spike; Plht: Plant height (cm); Hdtm: Heading time (day); Tkw: Thousand kernel weight (g); Yield (kg da-1)

lanılan hibrit çeşitler arasında günlük nem **Plant height:** The mean plant height of landraces **Plant height:** The mean plant height of landraces *Triticum compactum* wheat genotypes was (54.7 cm), and the mean plant height of the standard varieties used in the trial was (51.4 cm) in 2015-2016 growing seasons. Of the genotypes, genotype 25 had the lowest values with 33.19 cm, genotype 67 had the highest with 65.69 cm. In 2016-2017, the mean plant length of landraces *Triticum compactum* wheat genotypes was measured as 84.5 cm and the mean plant length of standard varieties as 73.4 cm (Table 2). It was found that the genotype 248 had the lowest plant length with 67.90 cm and the genotype 31 had the highest plant length with 105.4 cm. In both years, it was found that Carisma had the lowest plant length and Artico had the highest plant height. During the 2015-2016 period, the plant height coefficient of variation 9.76% and 2016-2017 growth seasons 9.24% were determined (Table 3). Since the coefficient of variation is calculated from the mean squares of genotypes, it is considered the measure of variation between the studied properties of genotypes. 10% or more coefficient of variation is accepted as sufficient variation for growers (Kılıç et al. 2016; Akçura and Topal 2008; Karagöz and Zencirci 2005). Partigöç (2009) compared local bread wheat genotypes in irrigation and rainfed conditions and found that the height of the plant varies in irrigation conditions (57.4-103.3 cm) and dry conditions (43.8 - 61.4 cm). Similar to the findings in this study.

The mean heading time of Topbaş genotypes was determined as 199.8 days in 2015-2016, 213.2 days in 2016-2017, while the mean heading time of standard varieties were determined as 197.5 days in 2015-2016 and 210.7 days in 2017-2018. Mean maturation time of Topbaş genotypes was determined as 263.2 days in 2015-2016 and 262.2 days in 2016-2017, while the mean maturation time of standard varieties was determined as 259.9 days in 2015-2016 and 261 days in 2017-2018.

Spike length: The mean spike length of *Triticum compactum* wheat genotypes in 2015-2016 was 5.1 cm, the mean spike length of the standard varieties used in the experiment was 7.0 cm. The genotype 182 had the lowest spike length with 3.5 cm and the genotype 141 had the highest spike length with 8.3 cm. In 2016-2017, the mean length of spike of

Table 4. Grain color of topbaş wheat genotypes and the coefficient of infection of the yellow rust and stem rust diseases

G.No	Grain	Yellow rust	Stem rust	G. No	Grain	Yello w rust	Stem rust	G.No	Grain	Yellow rust	Stem rust
	Color	CI	CI		Color	Cİ	CI		Color	CI	CI
6	Red	40	12	131	White Beyaz	24	80	193	Red	100	0
24	White	40	40	132	White eyaz	20	100	194	White	100	80
25	White	80	40	133	White	60	60	196	Red	4	100
26	White	12	0	134	Red	100	0	197	White	0	0
28	Red	60	60	136	Red	100	20	198	White	20	100
31	Red	60	40	137	Red	100	100	199	White	12	0
34	White	10	20	138	Red	40	100	200	White	100	0
37	Red	12	10	139	White	60	100	201	Red	40	40
38	White	4	60	141	Red	40	40	202	White	8	20
39	White	0	20	142	Red	60	60	203	White	40	60
41	White	12	100	143	White	24	100	204	White	8	20
54	White	60	60	144	White	20	100	206	White	40	60
57	Red	4	40	146	White	6	60	207	White	60	20
62	White	100	100	147	White	0	20	210	White	40	100
67	White	0	100	148	White	12	60	211	White	60	100
68	White	12	80	149	White	100	0	212	White	60	60
74	White	40	0	150	White	100	0	213	Red	60	40
78	Red	100	100	152	White	100	60	214	Red	80	0
79	White		100	153	White	24	40	216	White	80	0
82	Red	100	80	154	White	100	40	217	White	100	0
86	Red	100	60	156	White	100	0	218	Red	100	0
88	White	40	100	157	White	0	60	219	White	100	0
92	Red	20	60	158	Red	24	80	221	White	100	0
97	Red	100	24	159	Red	100	40	222	White	100	0
98	White	40	100	161	White	100	80	223	White	8	0
99	Red	40	100	162	White	40	100	224	Red	60	0
101	Red	100	80	163	White	40	100	227	White	100	0
102	Red	0	0	164	Red	4	100	228	White	12	20
103	Red	100	10	166	White	12	100	229	White	1	20
104	Red	100	0	167	White	100	100	231	White	60	100
106	Red	100	60	168	White	100	100	232	White	40	0
108	Red	0	60	169	Red	100	100	233	White	0	100
109	White	4	60	171	White	60	100	234	Red	40	100
111	White	100	0	172	White	100	0	236	Red	60	20
112	Red	20	0	173	White	60	0	237	White	60	20
113	White	100	60	174	White	80	60	238	Red	40	100
114	White	100	100	175	Red	60	60	239	Red	10	60
116	White	36	60	177	White	0	100	241	Red	0	0
117	Red	60	40	178	Red	100	60	242	White	40	0
118	White	8	20	179	Red	60	0	243	White	100	0
119	White	60	60	181	Red	0	0	244	White	100	0
121	White	20	60	182	White	4	100	246	Red	100	0
122	Red	40	60	183	White	60	0	247	White	100	0
123	White	40	60	184	Red	24	0	248	White	100	100
124	White	60	0	187	White	100	0	Artico	Red	100	0
127	White	100	100	188	White	100	0	Bayraktar	White	60	40
128	White	100	100	190	Red	0	0	Carisma	Red	40	40
129	Red	100	0	192	White	100	100	Gerek	White	80	40
								Karahan 99	White	24	40

G. No: Number of genotypes. CI: Coefficient of infection

Table 5. Correlation of genotypes between properties (r)

	Mtrt	Spkl	Nsps	Ngps	Gwps	Plht	Hdtm	Yield
Spkl	-0.1531							
Nsps	0.3096**	0.2117*						
Ngps	0.1511	0.2512**	0.7725**					
Gwps	-0.0221	0.3556**	0.5321**	0.7223**				
Plht	0.0250	0.1234	0.0464	-0.0288	0.1967*			
Hdtm	0.3680**	-0.2205**	0.1364	0.0754	-0.0504	0.1645		
Yield	-0.1523	0.1674*	-0.0670	0.0953	0.1117	0.3386**	0.0296	
Tkw	-0.2726**	0.2505**	-0.2809**	-0.1512	0.3868**	0.2866**	-0.3914**	0.0885

*;p<0.05, **p<0.01 Mtrt:Maturation time (day), Spkl: Spike length (cm); Nsps: Number of spikelet per spike (number); Ngps: Number of grain per spike; Gwps: Grain weight per spike; Plht:Plant height (cm); Hdtm:Heading time (day); Tkw:Thousand Kernel weight (g); Yield (kg da-1)

Triticum compactum wheat genotypes was measured as 5.2 cm and the standard varieties as 7.4 cm. The genotype 227 had the lowest spike length with 3.8 cm and the genotype 141 had the highest spike length with 8.9 cm. In both years, Carisma was found to have the lowest spike length and Karahan 99 the highest spike length (Table 2). Coefficient of variation in spike length was found as 15.21% in 2015-2016 and 17.05% in 2016-2017 (Table 3). Considering the coefficient of variation in spike length, it can be said that landraces *Triticum compactum* wheat populations have the potential to be used in breeding studies. Akçura (2006), in his work on the local bread wheats, stated that spike length average was 7.95 cm, coefficient of variation was 17.39% in overall bread wheat populations in Turkey. Dotlacil et al. (2003) stated that there was a proportionally wide variation in the spike length and a coefficient of variation (11-20%) in the experiment set consisting of a total of 222 materials including winter local wheat varieties and registered wheat varieties.

Number of spikelets per spike: The average number of spikelets of Topbaş wheat genotypes in 2015-2016 was 12.7, the mean number of spikelets per spike of the standard varieties used in the experiment was 13. Among the genotypes, the genotype 25 had the lowest value with 10.2 and the genotype 162 was the highest with 15.7. In 2016-2017, the mean number of spikelets of Topbaş wheat genotypes was measured as 14.6 and the mean number of spikelets of standard varieties as 15.1. The genotype 98 had the lowest number of spikelets with 11.5 and the genotype 79 had the highest genotype with 18.8 highest number of spikelets (Table 2). The coefficient of variation of number of spikelets per spike was 8.78% in 2015-2016 and 8.80% in 2016-2017. Considering the fact that the number of grains in long spike is generally higher than short ones, it can be said that the majority of local Topbaş wheat populations have the potential to be used in breeding studies in terms of spike length. Through Akçura's study of local populations of bread wheat in 2006 in Turkey; it was found that the mean number of fertile spikelets per spike was 14.92, and the coefficient of variation was 8.60%. We can say that there is a variation that can be used in breeding studies in terms of the number of spikelets where the results overlap with this study.

Number of grain per spike: The mean number of grains in Topbaş wheat genotypes for 2015-2016 was 21.3, The mean number of grains of the standard varieties used in the experiment was 23.8. Genotype 111 had the lowest number of grain with 13.5 per spike, while genotype 206 had the highest number of grain with 30.0 per spike. In 2016-2017, the mean number of grains in spike of Topbaş wheat genotypes was measured as 27.2 and the mean number grains in spike of standard varieties as 30.9. It was found that genotype 204 had the lowest number of grains in spike with 17.0, genotype 141 had the highest number with 39.6 (Table 2).

Grain weight per spike: The mean grain weight per spike of Topbaş wheat genotypes in 2015-2016 was 0.7 g, and the mean grain weight per spike of the standard varieties used in the experiment was 0.8 g in the spike. Genotype 26 had the lowest grain weight per spike with 0.39 g, genotype 101 with the highest grain weight per spike with 1.04 g. In 2016-2017, grain weight per spike of Topbaş wheat genotypes was measured as 1.1 g and grain weight per spike of standard varieties as 1.2 g. Genotype 108 had the lowest grain weight per spike with 0.53 g and the genotype 24 had the highest grain weight per spike with 1.69 g (Table 2). The CV of number of grain per spike was determined as 15.05% in 2015-2016 and 15.90% in 2016-2017 period (Table 3). Considering the coefficient of variation in grain number in spike, it is seen that the variation in local Topbaş wheat populations is wide. Grain weight coefficient of variation was determined as 17.57% in 2015-2016 and 18.39% in 2016-2017 period (Table 3). Considering the coefficient of variation in grain weight per spike, it is seen that the variation of local Topbaş in wheat populations is wide.

Thousand kernel weight: Mean of thousand kernel weight of Topbaş wheat genotypes of 2015-2016 were determined as 31.2 g, and the mean of thousand kernel weight of standard varieties used in the experiment was 31.2 g. Genotype 31 had the lowest with 24.1 g and genotype 67 had the highest with 40.7 g. In 2016-2017, mean of thousand kernel weight of Topbaş wheat genotypes were measured as 38.8 g and 38.2 g for standard varieties. Genotype 175 had the lowest value with 29.7 g and genotype 177 had the highest value S with 65.2 g for thousand kernel weight (Table 3). Coefficient of variation of thousand kernel weight was determined as 9.06% in 2015-2016 and 10.13% in 2016-2017. The CV of thousand kernel weight was determined as 9.06% in 2015-2016 and 10.13% in 2016-2017. It is seen that the CV of thousand kernel weight of local Topbaş wheat populations will provide an opportunity for selection in breeding studies in which the variation is wide. According to the CV of thousand kernel weight, local Topbaş wheat populations are suitable for selection in breeding studies. There are similar studies on this subject. Kılıç et al. (2016), conducted a study with 145 local wheats. They reported that the number of grain per spike was ranged between 10.95-38.58, grain weight per spike 0.28-1.4 g, thousand kernel weight 20.30-40.42 g. Şahin et al. (2019) stated that the weight of a thousand kernel weight between 31.94 and 41.6 g in their study with cultivated wheat grown in rainfed conditions. The fact that the weight of

thousand kernel weight is too high or too low is not preferred for the industrialists who use wheat. They stated that during processing of large and very small wheat grain genotypes, there may be losses during the screening and cleaning stages. According to Şahin et al. (2004), having a large grain become a problem in storage and cleaning of the mill equipment. Very small grains can also cause trouble during cleaning. Bread wheat genotypes with very small grains are not preferred for the grain industrialist. Because, during normal cleaning, more than 10% may be lost and dandruff output is high.

In order to determine the disease values of the trial, a planting was done in the disease observation garden in Sakarya Maise Research Institute by using the Modified Cobb scale with the results. Each type of rust analysis was carried out according to disease severity (1, 5, 10, 20, 30, 40, 50, 60, 70, 80, 90, 100) and reaction type in the flag leaves of plants (Peterson et al. 1948). Coefficients of infection were found by multiplying the values read for yellow rust and stem rust by the determined coefficients. For yellow rust, 0 infection coefficients for 12 genotypes, 100 infection coefficients for 49 genotypes were calculated. For leaf rust, 0 infection coefficients for 43 genotypes, 0 infection coefficients for 39 genotypes were calculated (Table 4).

Yield: The mean yield of Topbaş wheat genotypes for 2015-2016 was 102.4 kg da-1, and the average yield of the standard varieties used in the trial was 109.3 kg da-1. It was determined that genotype 24 had the lowest yield with 26.76 kg da-1 and genotype 200 had the highest yield with 180 kg da-1. The mean yield of Topbaş wheat genotypes for 2016-2017 was 410.6 kg da-1 and it was 427.7 kg da-1 for standard varieties. It was found genotype 88 had the lowest yield with 277 kg da-1, while genotype 173 had the highest yield with 528 kg da-1 (Table 3). Coefficient of variation of the yield was determined as 34.69% in 2015-2016 and 11.81% in 2016-2017 period (Table 2). When the coefficients of variation of the yield are analyzed, it is seen that the variation of local Topbaş wheat populations is wide. Veen and Palmer (1997), studied with *Triticum spelta, Triticum dicoccum, Triticum compactum* species that they found plant height of *Triticum compactum* as 50-110 cm, grain size in spike as 18-62 pieces, thousand kernel weight as 19-42 g, yield as 16-444 kg da-1, which coincides with the findings in this study.

In the research, the relations of the features examined on the basis of visual inspection and evaluation are given in Figure 2. In the analysis made with the biplot method, PC1 (1st main component) constituted 28.5% of the total variation, PC2 (the 2nd main component) constituted 23.3% of the total variation, both did 51.8% in total. In Figure 2, while tkw (thousand kernel weight), yield, plht (plant height), spkl (spike length), gwps (grain weight of per spike) vectors were less than 90 degrees, in the same direction and positive region, hdtm (heading time), mtrt (maturation time) nsps (number of spikelet per spike), ngps (number of grain per spike) were in the negative region. Considering the numerical correlation of the thousand kernel weight with other properties, it has a significant positive relationship with plht (r = 0.2525 **) gwps (r = 0.3868), plht (r = 0.2866 **), and it has a negative relation with nsps (r = -0.2809), mtrt (r = -0.2726 **) (Table 5). Similarly, Kılıç and his colleauges (2016) stated in their study that the thousand grain weight had a significant and positive relationship with grain number per spike (0.211 **), grain weight per spike (0.455 **), and had a negative relationship with number of spikelet per spike (-0.16 **). The results are similar in both studies, except for the number of spikelets. When looking at the shape of the PCA, it is seen that the tkw, yield, plht, gwps weight vectors are close to each other and form a group. It was observed that bts and nsps formed a group of hdtm and a group at the time of maturation.

Result

140 pure lines belonging to Topbaş wheat genotypes selected from local wheats collected from different cities in Turkey were evaluated for the use of biscuit research. Trial material consisted of 49 red and 91 white genotypes. Significant variations were detected among the traits that affect the grain yield such as the number of grains per spike, grain weight per spike, thousand kernel weight, spike length, number of spikelet per spike. In addition to creating an important genetic resource for studies on biscuit wheat breeding, this will enable new species with high yield and good biscuit quality with the result of selection studies. Since the coefficients of infection of yellow rust and stem rust diseases also vary, it is a fact that this can also be helpful in developing a durable genotype in breeding studies. It is thought that the supply of sustainable and safe food in risky situations such as global warming in agriculture can be overcome by using local wheat genetic resources in breeding programs. 15 genotypes used in this study (74, 102, 114, 121, 124, 141, 146, 147, 177, 181, 199, 207, 214, 216, 242) were selected to be used as parents in breeding programs.

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