



# Asian Journal of Plant Sciences

ISSN 1682-3974

**science**  
alert

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## A Study of Adaptation of Some Corn Cultivars as Grown Second Crop

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**Abstract:** This research was conducted in the 2000 and 2001 second crop season in the Southeastern Anatolia Region of Turkey. The experimental design was a completely randomized block with three replications. In the research, were used 23 corn cultivars to determine high yielding. The grain yields of the corn cultivars varied between 7195.20-12966.30 kg ha<sup>-1</sup> in the research. In all the observed characters, statistically significant differences were determined among cultivars. The positive and significant relationships were determined between the grain yields and all other investigated characters ( $p < 0.01$ ). As a result, Otello and P3162 were determined as high yielding cultivars under Southeastern Anatolia Region conditions as second crops season.

**Key words:** Corn, cultivars, second crop, yields, correlation

### INTRODUCTION

Maize is most important cereal crops after wheat and rice in the world and it has the widest distribution of any cereal. The crop is primarily grown for its grain, which is consumed as human food. In some developed countries, maize is also grown for animal feed and as a base for industrial products such as oils, syrup and starch. Crop residues can be used as fodder, bedding, building materials and fuel (Gibbon and Pain, 1995).

Maize have been grown many countries of the world. It has got 147 million tones productions and 721 million ha<sup>-1</sup> sowing area in the world, 3 million tones productions and 700,000 ha<sup>-1</sup> sowing area in Turkey (FAO, 2004).

The maize produced was utilized as human food 35%, animal food 30%, raw material of forage industry 20%, raw material of starch and glucose industry 10% and seed 5% in our country (Akman and Sencar, 1991).

The region has an important potential for livestock with about 4 million sheep, 1.5 million goats and 700 000 cattle (Anonymous, 2001). To meet the increasing needs for feed in the region, the best adapted maize cultivars should be produced both main crop and second crop season.

The most important component for obtaining the high yield is that to use the best adapted cultivars in any region. Cultivars may show to different yield ability depend on soil and climatic condition one region to another, so it should determinate that the best adaptable cultivars for any region. In addition to, cultivars of different origin may give the higher yield then domestic cultivars.

In previous studies; the yield and adaptation of different cultivars of maize were investigated and the results varied widely. Grain yield varied between 4920 and 16850 kg ha<sup>-1</sup>, plants height were 165.6 to 283 cm high, 1000 seed weight varied between 198.4 and 414.8 g, grain yields per ear varied between 113.7 and 235.9 g, ear length between 14.6 and 21.8 cm. ear diameter between 3.5 and 5.31 cm. first ear height between 61.1 and 126.7 cm (Cesurer *et al.*, 1999; Colkesen *et al.*, 1997; Farinelli *et al.*, 2003; Gozubenli *et al.*, 1997; Gul *et al.*, 1998; Konak *et al.*, 1997; Oktem *et al.*, 1999; Oz and Kopar, 2003; Sonmez, 2000; Turgut *et al.*, 2000). The variation among yield obtained from these similar studies was shown to importance of using suitable cultivars for any region, so while any cultivar gives 4920 kg ha<sup>-1</sup> grain yield, a cultivar adapted to the region able give 1600 kg ha<sup>-1</sup> grain yield.

As a consequence, we aimed to determinate of more suitable maize cultivars for obtaining the high yield in this region at second crop season.

By this research, 23 maize varieties (8 domestic, 15 foreign origins) investigated as second crop to determination of most suitable varieties in the Southeastern Anatolia Region of Turkey.

### MATERIALS AND METHODS

This research was been carried out in Diyarbakir (37°54' N, 40°14' E altitude 660 m).

Generally, Mediterranean and East Anatolian continental climates are dominant in this region. The average annual temperature is 15.8°C, rainfall is 481.6 mm and the average relative humidity is about 53.8%. The average temperature can reach 30°C in July and August.

Table 1: Corn cultivars that to assure Institutions/Company and their origins

Cultivars	Institution/Company	Origin
ADA 919	Sakarya Agriculture Research Institute	Turkey
ADA 892	Sakarya Agriculture Research Institute	Turkey
ADA 897	Sakarya Agriculture Research Institute	Turkey
ADA 8924	Sakarya Agriculture Research Institute	Turkey
DK 623	DeKalb Seed Company	USA
DK 626	DeKalb Seed Company	USA
DK 711	DeKalb Seed Company	USA
DK 743	DeKalb Seed Company	USA
DRANG	Ciba-Geigy Seed Company	USA
DOGE	KWS Seed Company	Germany
G 4522	Funks Seed Company	USA
G 4662	Funks Seed Company	USA
G 4507	Funks Seed Company	USA
LG 55	SAPEKSA Seed Company	France
OTELLO	Poltar Seed Company	Spain
P 3167	Pioneer Seed Company	USA
P 3162	Pioneer Seed Company	USA
P 3394	Pioneer Seed Company	USA
P 3163	Pioneer Seed Company	USA
TTM 815	Karadeniz Agriculture Research Institute	Turkey
TTM 8119	Karadeniz Agriculture Research Institute	Turkey
TTM 813	Karadeniz Agriculture Research Institute	Turkey
TUM 82-7	Karadeniz Agriculture Research Institute	Turkey

The lowest average temperature can be 7°C in December and January. The earliest frost in the region is usually at the end of October and the last frost around end of April. Most rain falls in winter and there is almost no rainfall from July to September. The highest humidity (70%) occurs in winter, lowest (27%) in summer.

The soils of the experimental area were thinly structured alluvial material or limestone. The soil is low in organic material and phosphorus, has adequate calcium and high clay content (49-67%) in the 0-150 cm profile (Anonymous, 1997).

Twenty three cultivars of maize were used in the research. These cultivars and their source institutions/companies and origins are shown in Table 1.

The experimental design was a completely randomized block with three replications.

Seed was sown by hand in four-row plots with rows 70 cm apart and 6 m long. Sowing took place on 04 July 2000 (first year) and 02 July 2001 (second year). The experimental area was fertilized with 200 kg ha<sup>-1</sup> nitrogen (N) and 100 kg ha<sup>-1</sup> phosphorus (P) before planting.

Analysis of variance was done by using a MSTAT-C statistic program and differences were compared by Duncan's.

## RESULTS AND DISCUSSION

**Grain Yield:** As shown in Table 2, the differences between the cultivars with respect to the grain yield were found significant for each year and average of the these years. The average grain yield was 11167 kg ha<sup>-1</sup> in 2000, 10074 kg ha<sup>-1</sup> in 2001 and the two years average value was 10620 kg ha<sup>-1</sup>.

Table 2: The average grain yields (kg ha<sup>-1</sup>) of cultivars and formed statistically groups

Cultivars	2000	2001	Average
ADA 919	7687.50g	6702.90g	7195.20h
ADA 892	12805.30abc	10872.20abcde	11838.80abc
ADA 897	10633.60cde	9391.50cdef	10012.60defg
ADA 8924	9684.10defg	7937.90fg	8811.00fg
DK 623	11791.90abcd	10602.20abcde	11197.10bcd
DK 626	12317.80abc	11255.00abcd	11786.40abc
DK 711	9231.00efg	9731.70bcdef	9481.40efg
DK 743	11271.40cde	9373.40cdef	10322.40cdef
DRANG	10533.30cde	10064.00abcdef	10298.70cdef
DOGE	8079.50fg	9233.30def	8656.40g
G 4522	11002.80cde	10425.60abcde	10714.20cde
G 4662	13752.70a	11643.90abc	12698.30ab
G 4507	12646.40abc	10973.90abcde	11810.20abc
LG 55	11425.90cde	8714.40efg	10070.20defg
OTELLO	13599.20ab	12333.30a	12966.30a
P 3167	11301.00de	10177.70abcdef	10739.40cde
P 3162	13812.50a	11970.30ab	12891.40a
P 3394	11496.80bcde	10937.10abcde	11217.00bcd
P 3163	11398.30cde	10442.60abcde	10920.50cde
TTM 815	10621.00cde	9559.20cdef	10090.10defg
TTM 8119	10848.30cde	9503.50cdef	10175.90defg
TTM 813	9902.20def	9817.80 bcdef	9860.00defg
TUM 82-7	10998.50cde	10039.20abcdef	10518.90cde
LSD	1899	1958	1348
CV	10.33	11.87	11.06

\*Means shown with the same letter in the same column are not significantly different at 0.05 probability level

The highest grain yields were from P 3162 in 2000, they were followed by G 4662, Otello and ADA 892. In 2001, Otello produced the highest yield and this was followed by P 3162, G 4662 and DK 626.

Averaged over the two years, Otello (12966 kg ha<sup>-1</sup>) was gave the highest grain yield, followed consecutively by P 3162, G 4662 and ADA 892. The lowest yields were obtained from ADA 919, Doge and ADA 8924 (Table 2). It is considerable that the cultivars have foreign origins (otello and p 3162) give higher yield than domestic cultivars.

It is considerable that the cultivars have foreign origins (otello and p 3162) give higher grain yield than domestic cultivars, so this result have supported that the cultivars have foreign origins should add any adaptation investigates.

**Grain yield per ear:** From Table 3, the differences between the cultivars with respect to the grain yield per ear were found significant for each year and average of the these years. The average grain yields per ear were 161.98 g in 2000, 151.75 g in 2001 and the two years average value was 156.87 g.

The highest grain yield per ear values were from Otello in 2000, they were followed by G 4662, P 3162 and ADA 892. In 2001, Otello produced the highest yield too and this was followed by P 3162, G 4662 and G 4507.

Averaged over the two years, Otello (197.54 g) gave the highest grain yield per ear, followed consecutively by P 3162, G 4662 and G 4507. The lowest yields were obtained from ADA 919, ADA 8924 and Doge (Table 3).

**Ear weight:** As shown in Table 4, the differences between the cultivars with respect to the ear weight were found

Table 3: The average grain yields per ear (g) of cultivars and formed statistically groups

Cultivars	2000	2001	Average
ADA 919	109.55h	98.03f	103.79i
ADA 892	194.93abc	156.80bcd	175.87bcd
ADA 897	153.20ef	140.33cde	146.77fgh
ADA 8924	138.90fg	117.80ef	128.35h
DK 623	170.67bcdef	155.80bcd	163.24cdef
DK 626	175.47abcde	169.60abc	172.54bcde
DK 711	138.87fg	152.93bcd	145.90fgh
DK 743	160.87def	143.33bcde	152.10efg
DRANG	154.03ef	154.93bcd	154.48def
DOGE	116.33gh	147.73bcde	132.03gh
G 4522	155.33def	156.33bcd	155.83def
G 4662	200.49ab	170.40abc	185.45ab
G 4507	186.90abcd	169.83abc	178.37abc
LG 55	165.13cdef	134.93de	150.03efg
OTELLO	205.00a	190.07a	197.54a
P 3167	163.73def	153.40bcd	158.57cdef
P 3162	197.00ab	174.00ab	185.50ab
P 3394	160.22def	159.87abcd	160.05cdef
P 3163	161.00def	155.13bcd	158.07cdef
TTM 815	155.25def	139.07cde	147.16fgh
TTM 8119	157.33def	143.53bcde	150.43efg
TTM 813	151.67ef	151.07bcd	151.37efg
TUM 82-7	153.73ef	155.40bcd	154.57def
LSD	26.95	27.22	18.89
CV	10.11	10.90	10.49

Table 4: The average ear weight (g) of cultivars and formed statistically groups

Cultivars	2000	2001	Average
ADA 919	129.60h	121.40f	125.50i
ADA 892	229.27abc	190.33abcd	209.80abcd
ADA 897	176.20ef	169.53bcde	172.87fgh
ADA 8924	164.20fg	148.80ef	156.50h
DK 623	199.00cde	188.53bcd	193.77cdef
DK 626	203.00bcde	204.60abc	203.80bcde
DK 711	164.07fg	185.33bcde	174.70fgh
DK 743	188.87def	173.40bcde	181.14efgh
DRANG	178.00ef	189.80abcd	183.90efg
DOGE	137.07gh	181.13bcde	159.10gh
G 4522	183.13def	191.53abcd	187.33def
G 4662	234.53ab	201.33abcd	217.93ab
G 4507	217.03abcd	207.50ab	212.27abc
LG 55	193.57def	167.47cde	180.52efgh
OTELLO	237.13a	227.07a	232.10a
P 3167	190.73def	188.47bcd	189.60cdef
P 3162	228.80abc	207.87ab	218.34ab
P 3394	185.87def	190.93abcd	188.40cdef
P 3163	188.40def	191.03abcd	189.72cdef
TTM 815	182.03ef	163.33de	172.68fgh
TTM 8119	185.48def	171.73bcde	178.61efgh
TTM 813	178.90ef	177.80bcde	178.35efgh
TUM 82-7	180.57ef	193.67abcd	187.12def
LSD	28.92	32.31	21.38
CV	10.28	10.67	9.98

significant for each year and average of the these years. The average ear weights were 189.37 g in 2000, 184.03 g in 2001 and the two years average value was 186.70 g.

The highest ear weight values were from Otello in 2000, they were followed by G 4662, ADA 892 and P 3162. In 2001, Otello produced the highest yield too and this was followed by P 3162, G 4662 and DK 626.

Averaged over the two years, Otello (186.70 g) was gave the highest ear weight, followed consecutively by P 3162, G 4662 and G 4507. The lowest yields were obtained from ADA 919, ADA 8924 and Doge (Table 4).

**Ear diameter:** The differences between the cultivars with respect to the ear diameter were found significant for each year and average of the these years. The average ear diameters were 4.50 cm in 2000, 4.18 cm in 2001 and the two years average value was 4.34 cm (Table 5).

The highest ear diameter values were from P 3162 in 2000, they were followed by ADA 892, DK 626 and G 4662. In 2001, Otello was given the highest ear diameter and this was followed by G 4507, ADA 892 and P 3394.

Averaged over the two years, Otello (4.64 cm) was gave the highest ear diameter value, followed consecutively by ADA 892, P 3392 and G 4507. The lowest values were obtained from ADA 919, ADA 8924 and ADA 897 (Table 5).

**Ear length:** As shown in Table 6, the differences between the cultivars with respect to the ear length were found

Table 5: The average ear diameter (cm) of cultivars and formed statistically groups

Cultivars	2000	2001	Average
Ada 919	4.00e	3.38i	3.69h
ADA 892	4.72a	4.55abc	4.64a
ADA 897	4.40bcd	3.89h	4.15g
ADA 8924	4.24de	3.43i	3.84h
DK 623	4.43abcd	4.08efgh	4.26efg
DK 626	4.70ab	4.43abcd	4.57abc
DK 711	4.25de	4.12defgh	4.19fg
DK 743	4.44abcd	4.28abcdefg	4.36cdefg
DRANG	4.56abcd	4.41abcde	4.49abcd
DOGE	4.28de	4.16defgh	4.22efg
G 4522	4.40bcd	4.34abcdef	4.37bcdefg
G 4662	4.69ab	4.33abcdef	4.51abcd
G 4507	4.61abc	4.58ab	4.60ab
LG 55	4.64abc	4.02fgh	4.33defg
OTELLO	4.68ab	4.59a	4.64a
P 3167	4.55abcd	3.89h	4.22efg
P 3162	4.73a	4.29abcdefg	4.51abcd
P 3394	4.67abc	4.55abc	4.61a
P 3163	4.45abcd	4.30abcdefg	4.38bcdefg
TTM 815	4.52abcd	4.25bcdefg	4.39bcdef
TTM 8119	4.61abc	4.23cdefg	4.42abcde
TTM 813	4.36cd	3.97gh	4.17fg
TUM 82-7	4.46abcd	4.16defgh	4.31defg
LSD	0.2653	0.2850	0.1920
CV	5.55	4.14	3.84

Table 6: The average ear length (cm) of cultivars and formed statistically groups

Cultivars	2000	2001	Average
ADA 919	18.48abcdef	18.11cdefg	18.30cdefghi
ADA 892	18.36abcdef	17.55defg	17.96defghi
ADA 897	18.16bcdef	20.48abcd	19.32bcdef
ADA 8924	18.72abcdef	17.84defg	18.28cdefghi
DK 623	17.08def	17.49defg	17.29efghi
DK 626	18.05bcdef	19.38abcdef	18.72cdefgh
DK 711	19.67abcd	20.46abcd	20.07abcd
DK 743	16.38f	17.49defg	16.94hi
DRANG	17.74cdef	19.64abcdef	18.69cdefgh
DOGE	18.43abcdef	20.24abcde	19.34bcde
G 4522	17.21def	17.02efg	17.12ghi
G 4662	21.03a	19.75abcdef	20.39abc
G 4507	20.16abc	21.76ab	20.96ab
LG 55	20.06abc	18.20cdefg	19.13bcdefg
OTELLO	20.60ab	22.60a	21.60a
P 3167	18.09bcdef	18.68bcdefg	18.39cdefghi
P 3162	17.54cdef	19.46abcdef	18.50cdefgh
P 3394	19.62abcd	19.37abcdef	19.50bcde
P 3163	20.19abc	16.85fg	18.52cdefgh
TTM 815	16.78ef	15.95g	16.37i
TTM 8119	17.75cdef	16.69fg	17.22fghi
TTM 813	19.14abcde	19.44abcdef	19.29bcdef
TUM 82-7	18.83abcdef	21.14abc	19.99abcd
LSD	2.252	2.734	1.746
CV	7.35	8.77	8.11

Table 8: The average first ear height (cm) of cultivars and formed statistically groups

Cultivars	2000	2001	Average
ADA 919	98.80abcde	81.13cde	89.97cdefg
ADA 892	122.07a	89.93abc	106.00ab
ADA 897	92.40bcde	61.00fgh	76.70ghi
ADA 8924	100.93abcde	56.60gh	78.77fghi
DK 623	78.33e	57.87gh	68.10i
DK 626	91.93cde	78.87cde	85.40defgh
DK 711	103.47abcd	65.47efgh	84.47defgh
DK 743	93.47bcde	51.33h	72.40hi
DRANG	115.00abc	89.00abc	102.00abc
DOGE	115.07abc	80.00cde	97.54abcde
G 4522	112.47abc	76.80cdef	94.64bcde
G 4662	102.53abcd	87.00abcd	94.77bcde
G 4507	102.40abcd	82.67bcde	92.54bcdef
LG 55	106.87abc	75.47cdef	91.17cdef
OTELLO	113.33abc	99.33ab	106.33ab
P 3167	98.60abcde	67.33efgh	82.97efgh
P 3162	98.27abcde	52.67h	75.47hi
P 3394	80.87de	70.07defg	75.47hi
P 3163	101.87abcde	82.00cde	91.94bcdef
TTM 815	116.47ab	103.00a	109.74a
TTM 8119	113.13abc	92.20abc	102.67abc
TTM 813	105.47abc	74.60cdef	90.04cdefg
TUM 82-7	117.97a	80.13cde	99.05abcd
LSD	20.05	14.82	12.29
CV	11.77	11.81	11.92

Table 7: The average plant height (cm) of cultivars and formed statistically groups

Cultivars	2000	2001	Average
ADA 919	257.50	202.40defgh	229.95bcdef
ADA 892	265.73	212.33abcde	239.03abcd
ADA 897	267.53	187.80fghi	227.67cdef
ADA 8924	260.07	182.07hi	221.07def
DK 623	230.60	199.67defghi	215.14ef
DK 626	249.00	211.53abcde	230.27bcdef
DK 711	250.67	209.00bcdef	229.84bcdef
DK 743	242.80	182.53hi	212.67f
DRANG	260.13	214.33abcd	237.23abcd
DOGE	266.13	221.73abcd	243.93abc
G 4522	270.40	227.67abc	249.04a
G 4662	256.67	207.33cdefg	232.00abcde
G 4507	256.03	223.13abcd	239.58abcd
LG 55	258.40	189.73efghi	224.07def
OTELLO	267.67	231.33ab	249.50a
P 3167	258.87	184.33ghi	221.60def
P 3162	248.13	178.40i	213.27f
P 3394	236.07	190.23efghi	213.15f
P 3163	262.27	211.00bcdef	236.64abcd
TTM 815	262.20	233.67a	247.94ab
TTM 8119	258.67	219.07abcd	238.87abcd
TTM 813	255.47	203.47defgh	229.47bcdef
TUM 82-7	275.53	200.00defghi	237.77abcd
LSD	0.D.	19.75	15.34
CV	0.D	5.84	5.78

Table 9: The average 1000 seed weight (g) of cultivars and formed statistically groups

Cultivars	2000	2001	Average
ADA 919	233.73h	208.38i	221.06h
ADA 892	294.59cdef	267.98bcdefgh	281.29cde
ADA 897	279.42ef	250.62efgh	265.02ef
ADA 8924	271.29fg	240.79gh	256.04fg
DK 623	288.31def	258.74defgh	273.53cdef
DK 626	302.38cde	284.39abcd	293.39bc
DK 711	286.42def	266.18bcdefgh	276.30cde
DK 743	282.39ef	262.50cdefgh	272.45def
DRANG	297.08cde	247.26fgh	272.17def
DOGE	253.71g	237.74h	245.73g
G 4522	296.98cde	278.24abcdef	287.61bcd
G 4662	338.95a	299.58ab	319.27a
G 4507	317.23bc	294.58abc	305.91ab
LG 55	307.91cd	276.31abcdef	292.11bcd
OTELLO	337.06ab	301.60a	319.33a
P 3167	284.08ef	284.11abcde	284.10cde
P 3162	329.01ab	296.69ab	312.85a
P 3394	303.35cde	258.70defgh	281.03cde
P 3163	283.22ef	267.22bcdefgh	275.22cdef
TTM 815	279.55ef	278.09abcdef	278.82cde
TTM 8119	292.49def	271.59bcdefg	282.04cde
TTM 813	280.23ef	290.40abcd	285.32cde
TUM 82-7	294.13def	265.98bcdefgh	280.06cde
LSD	19.92	28.14	17.00
CV	4.13	6.36	5.27

significant for each year and average of the these years. The average ear lengths were 18.61 cm in 2000, 18.94 cm in 2001 and the two years average value was 18.78 cm.

The highest ear length values were from G 4662 in 2000, they were followed by Otello, P 3162 and G 4507. In 2001, Otello was given the highest ear length and this was followed by G 4507, TUM 82-27 and ADA 897.

Averaged over the two years, Otello (21.6 cm) was gave the highest ear length value, followed consecutively by G 4507, G 4662 and DK 711. The lowest values were obtained from TTM 815, Dk 743 and G 4522 (Table 6).

**Plant height:** The differences between the cultivars with respect to the plant height were found significant for 2001

Table 10: Correlation between grain yields, plant heights, ear weights, ear diameters, ear lengths, 1000 seed weights, grain yields per ear and first ear heights

Cultivars	Plant height	Ear weight	Ear diameter	Ear length	1000 seed weight	Grain yield per ear	First ear height
Grain yield	0.305**	0.947**	0.728**	0.292**	0.685**	0.973**	0.245**
Plant height		0.146	0.515**	-0.020	0.380**	0.240**	0.855**
Ear weight			0.660**	0.378**	0.617**	0.987**	0.131
Ear diameter				0.115	0.658**	0.706**	0.473**
Ear length					0.155	0.357**	-0.032
1000 seed weight						0.671**	0.315**
Grain yield per ear							0.198*

Significance \* p<0.05; \*\* p<0.01

year and average of the two years, non significant for 2000 year (Table 7). The average plant height was 257.24 cm in 2000, 205.34 cm in 2001 and the two years average value was 231.29 cm.

The highest plant height value was from TUM 82-27 in 2000, they were followed by G 4522, Otello and ADA 897. In 2001, TTM 815 was given the highest plant height, and this was followed by Otello, G 4522 and G 4507.

Averaged over the two years, Otello (249.50 cm) was gave the highest plant height, followed consecutively by G 4522, TTM 815 and Doge. The lowest values were obtained from DK 743, P 3394 and P 3162 (Table 7).

**First ear height:** As shown in Table 8, the differences between the cultivars with respect to the first ear height were found significant for each year and average of the these years. The average first ear height was 103.55 cm in 2000, 76.28 cm in 2001 and the two years average value was 89.92 cm.

The highest first ear height value was from ADA 892 in 2000, they were followed by TUM 82-7, TTM 815 and Doge. In 2001, TTM 815 was given the highest first ear height value and this was followed by Otello, TTM 8119 and ADA 892.

Averaged over the two years, TTM 815 (109.74 cm) was gave the highest first ear height, followed consecutively by Otello, ADA 892 and TTM 8119. The lowest values were obtained from DK 623, DK 743 and ADA 897 (Table 8).

**1000 seed weight:** From Table 9, the differences between the cultivars with respect to 1000 seed weight were found significant for each year and average of the these years. The average 1000 seed weight was 292.76 g in 2000, 269.03 g in 2001 and the two years average value was 280.90 g.

The highest 1000 seed weight value was from G 4662 in 2000, they were followed by Otello, P 3162 and G 4507. In 2001, Otello was given the highest 1000 seed weight value and this was followed by G 4662, P 3162 and G 4507.

Averaged over the two years, Otello (319.33 g) was gave the highest 1000 seed weight value, followed consecutively by G 4662, P 3162 and G 4507. The lowest values were obtained from ADA 919, Doge and ADA 8924 (Table 9).

**Correlations:** The positively and significant relationships were determined between the grain yields and all other characters (p<0.01). The plant height was positively and significant correlated with ear diameter, 1000 seed weight, grain yield per ear and first ear height (p<0.01), negative but no significant correlated with ear length. The ear weight was positively and significant correlated with ear diameter, ear length, 1000 seed weight and grain yield per ear (p<0.01). The ear diameter was positively and significant correlated with 1000 seed weight, grain yield per ear and first ear height (p<0.01). The ear length was positively and significant correlated with grain yield per ear (p<0.01), negative but no significant correlated with first ear height. The 1000 seed weight was positively and significant correlated with grain yield per ear and first ear height (p<0.01). The grain yield per ear was positively and significant correlated with first ear height (p<0.05) (Table 10).

The performance of twenty three corn cultivars at second crop season with respect to yield and yield component was determinate in this study.

According to these findings, Otello and P 3162 cultivars should be recommended because their high grain yields aimed all farmers. However, our study was determinate that cultivars have foreign origins may show best performance at difference regions, for Otello (Spain) and P 3162 (USA) have succeed in our region with high yield.

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