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Evaluation of Some Yellow Maize Hybrids for Grain and Forage Yields Productivity

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ABSTRACT

The importance of cereal grains to nutrition of millions of people around the world is widely recognized. After wheat and rice, maize is the most important cereal grain in the world, providing nutrients for humans and animals. Maize silage is an important supplementary feed. The important characteristics of maize silage include high yield and high metabolically energy, but low protein content. Thus, two field experiments were carried out at the Experimental Farm of Gemmeiza Station, FCRI, ARC, Egypt, during summer seasons of 2016 and 2017 to compare and evaluate grain and forage yields as well as chemical composition of yellow maize hybrids *i.e.* Single crosses SC162, SC166, SC167, SC168, SC177 and SC178, in addition to three-way crosses TWC360 and TWC368. The experiments were carried out in a randomized complete blocks design (RCBD) with four replications. The obtained results from this investigation revealed that SC178 was the latest hybrid in flowering among the studied hybrids. TWC368 produced the highest values of plant height, stalk diameter, number of leaves/plant, leaf area/plant, green plants weight/plot and forage yield/fad. SC162 was significantly surpassed other studied maize hybrids in grain plants weight/plot and forage yield/fad. SC166 produced the highest number of grains/row over both seasons. SC178 produced the highest value of 100-grain weight and carbohydrates percentage. TWC368 recorded the highest no. of rows/ear over both seasons. SC168 resulted in the highest values of grain yield and crude protein percentage. TWC360 recorded the highest crude fiber percentage over both seasons. Results obtained that, planting TWC368 or SC162 hybrids can produce maximum forage yield. In addition, growing SC168 or SC178 hybrids can produce highest grain yield under the environmental conditions of the testing location.

Keywords: Maize, Single crosses, Three-way crosses, forage yield, grain yield, chemical composition.

INTRODUCTION

Around the world today, maize (*Zea mays* L.) is a staple food for millions of individuals and through indirect consumption as a feed crop and a key component of global food security (Faisal *et al.,* 1995). It is a major calorie source for the people in the developing countries. It is used also as food for human, feed for poultry and fodder for livestock. Maize is a very convenient crop for forage production due to the high production of green mass per unit area, high energy content of dry matter and quality of biomass for silage (Mandić *et al.* 2013).

Therefore, considerable attention should be paid to increasing maize productivity either by increasing the cultivated area or increasing productivity per unit area in order to reduce the gap between production and consumption. Among the factors that enhance maize productivity is the choice of high yield hybrids.

No doubt that, choosing high yielding ability hybrids is Very important to increase the productivity of corn per unit area. For this reason, the aim of this study is to evaluate some of the yellow corn crosses to focus light on the best types of hybrids that can be used on a large scale. Gouda (1982) found that maize varieties were differed significantly in each of number of green leaves, leaf area and dry weight per plant at the growth stages 45, 60, 75 and 90 days from planting. Eraky *et al.* (1983) indicated that dry weight, leaf area, number of green leaves, plant and ear heights were positively correlated with grain yield and its components *i.e*. number of ears/plot, number of grain/row, number of grains/ear and 1000-grain weight. El-Kholy (1987) reported that, increased each of plant height, leaf area, dry weight of different plant parts as well as the dry weight of whole plant for both white and yellow maize plant the highest dry matter yield was obtained from the Arifiye hybrid, while the lowest dry matter yield was obtained from Pioneer 3163. Forage yield of Pioneer 3163 hybrid, TTM 8119 hybrid and Karadeniz Yildizi hybrid were higher than Arifiye hybrid. Gouda (1989) indicated that the rate of dry matter accumulation in maize plants between 55 to 110 days after sowing appeared to be a linear relationship of time. Since leaves and stem dry weight did not change during grain filling period, while ear dry weight increased linearly during this period. Gouda *et al.* (1992) reported that maize varieties were differed significantly in each of number of green leaves, leaf area, pant and ear heights, ear length, ear diameter, number of grains per row as well as per ear, 100 grain weight and grain yield / Fad. In general varieties could be arranged in a descending order as follow, SC 10, TWC 310, DC 204, Giza-2, DC Pionear Taba and Pop.-45Y. Faisal *et al.* (1995) showed that DC 215 W had highest percentage of endosperm (89.18%) followed by SC 10 (88.67%). The two maize hybrids could be used as source of starch industry. SC METAL Y showed highest percentage of germ (10.24%) and DC 123863 Y had the highest percentage of hull (13.89%) and also showed that highest protein percentage (12.82%). DC MF82Y showed the highest oil percentage (5.80%) and the highest percentage in amylase content (69.97%) and the lowest amylopectin (30.02%). SC RAZZO Y had the highest of carotenoid (45.09ppm) while SC ALABAX W had the lowest (4.21ppm). Soliman *at al.* (1995) founded that SC10 and TWC 320 had the tallest plants, highest ear position and ear size as well as number of kernels /ear while DC DK2771 possessed the lowest ear size, lower number of kernels /row and highest number of rows /ear. TWC DK2147 was the earliest hybrids in silking date, lowest ear position and shortest plants. SC10 out yielded TWC 320, TWC DK2147 and DC DK2771 but no significant differences between TWC 320 and TWC DK2147 at only Sharkia and Minia location. Amer *et al.* (2004) founded that SC10 out yielded the other five hybrids in stem diameter, ear diameter, number of kernels / row, grain yield; SC11 was the best for earliness, short plant and ear heights; SC122 the better for number of ear/ plant; TWC 310 was the best for ear length and TWC 327 was the best for number of rows/ ear. Extenstion Bulletin (2005) refer that the total production per faddan of forage yield of maize plants after harvest ears were determined 13 commercial maize hybrids and also the chemical analysis

for the forage were done. Results obtained for SC10 were the fresh forage yield (18.0T/fad.), and the dry matter (5.4 T/fad). Chemical analyses were (row protein 5.89, oil 2.14, fiber 27.99, soluble carbohydrate 56.11 and minerals 7.87 percent). The highest dry matter yield was obtained from the Iptas and Acar (2006); Silage maize hybrids are certified based on fresh and dry matter yield and the proportion of the ear, Tóthné (2011). Seadh *et al.* (2014) revealed that maize hybrid SC 30M84 significantly superior TWC B 3521 hybrid and resulted in the highest values of growth, yield and its components in both seasons. This means that SC 30M84 hybrid had greater growth and yield stability than TWC B 3521 hybrid. Mandic *et al.* (2015) reported that hybrid NS 6010 had significantly higher in plant height, stem diameter, number of leaves per plant and forage yield than hybrid ZP 684.

Therefore, this investigation was established to study the performance of some yellow maize hybrids and compare their grain and forage yields as well as chemical composition under the environmental conditions of Gemmeiza Agricultural Research station, Agricultural Research Center, Giza, Egypt.

MATERIALS AND METHODS

Two field experiments were carried out at the Experimental Farm of Gemmeiza Agriculture Research Station, Field Crops Research Institute, Agricultural Research Center, Giza, Egypt, during summer growing seasons of 2016 and 2017.

The experiments were carried out in randomized complete blocks design (RCBD) with four replications. Eight yellow maize hybrids were as follows; six single cross SC162, SC166, SC167, SC168, SC177 and SC178 and two three-way cross TWC360 and TWC368. Each experimental basic unit included six ridges, each of 80 cm width and 6 m length and spacing of 17.5 cm between plants; resulted an area of 28.8 m^2 / plot. The previous winter crop was wheat (*Triticum aestivum* L.) in both seasons. (Plot size was: 6m×80cm=4.8m^2/plot, no. of row in fadden =4200/ 4.8 =875 row /Fad. and number of plant in fadden =875× 34=29750 plants/ fadden).

The experimental field was well prepared for each as optional. Calcium super phosphate (15.5 % P_2O_5) was applied during soil preparation at the rate of 150 kg/fad. Nitrogen fertilizer in the form of urea (46.0 % N) was added at the rate of 120 kg N/fad in three doses, first was applied during soil preparation, second before the first irrigation after thinning and third before the second irrigation. Potassium sulphate (48 % K_2O) at the rate of 50 kg/fad was applied with the first dose of nitrogen fertilizer.

Maize grains were hand planted in hills 17.5 cm apart at the rate of 2-3 grains/hill on one side of the ridge on 25th and 28thMay in both seasons, respectively. The plants were thinned later to one plant per hill before the first irrigation to give population density (29750plants/ fedd). The first irrigation was applied after 18 days from sowing and the following irrigations were applied at 12 days intervals during the growing seasonsThe heap was performed twice to control the herbs before the first and second irrigation. Other agricultural practices have been maintained as they were usually practiced in maize fields.

Studied characters:

A- Flowering characters:

Data were recorded for number of days to 50% tasseling and silking date.

B- Forage yield and its attributes:

After 75 days from sowing, random samples of five guarded plants were taken randomly from outer ridges of each plot to determine the following characters; Plant and ear heights (cm), Stalk diameter (cm), number of leaves/plant and leaf area/plant (cm^2)

Leaf area/plant = Number of leaves/plant × (average maximum leaf length × average maximum leaf width × 0.75).

After 90 days from sowing, all plants in the second and third ridges of each plot were harvested to determine the following characters; number of green plants, green plants weight (kg) and forage yield (t/fad).

C- Grain yield and its attributes:

At harvest time (120 days from sowing) random samples of ten guarded plants were taken at random from outer ridges of each plot to determine the following characters: ear length (cm), ear diameter (cm), number of rows/ear, number of grains/row and 100-grain weight (g).

At harvest from the fourth and fifth ridges of each plot. Grain yield was determined and adjusted to moisture content of 15.5 % and transformed to ardab per faddan (one ardab = 140 kg).

D- Chemical composition:

1- Crude protein percentage in silage was estimated by the improved Kjeldahl – method according to A.O.A.C. (2007). Crude protein percentage was calculated by multiplying the total nitrogen values in maize silage by 5.75.

2- Total carbohydrates percentage was estimated using the Anthrone method as described by Sadasivam and Manickam (1996).

3- Crude fiber percentage. The usual method published by A.O.A.C. (2007) was used for determination of fiber percent.

4- Dry matter percentage. Plant samples were oven dried at 70 ^{O}C tell constant weight and then, dry matter percentage was calculated.

Statistical analyzing

All recorded data were statistically analyzed according to the method of analysis of variance (ANOVA) for the randomized complete blocks design (RCBD) for each season and then combined analysis was done between two seasons as point to by Gomez and Gomez (1984) by using MSTAT-C software. Mean performance of treatments were compared using Duncan's multiple range tests at 5 % level of probability as described by Duncan (1955).

RESULTS AND DISCUSSION

Statistical analysis of obtained data was presented in Table 1. Data showed that, the eight yellow maize hybrids *i.e.* SC162, SC166, SC167, SC168, SC177, SC178, TWC360 and TWC368 were differed significantly in flowering characters (days to 50 % tasseling and days to 50 % silking) in both seasons and combined data. It seem that SC178 was associated with delaying in tasseling and silking dates as compared with other studied yellow maize hybrids and resulted in highest values number of days required to 50 % tasseling and silking over both seasons. SC162 hybrid

ranked secondly after SC178 concerning flowering dates over both seasons. While, SC177 was the earliest hybrid as compared with the other yellow maize hybrids and recorded the lowest number of days required to 50 % tasseling and silking over both seasons.The former results might be related to the genetically make up for maize hybrids.

The results in Tables (1, 2 and 3) indicated that, studied hybrids were significantly differed in plant height in the first, second and combined data, in the first season and combined regarding number of leaves/plant and harvest plants/plot differences were non-significant. Plant height, stalk diameter, number of leaves/plant, leaf area/plant, leaves area/plant, weight harvested plants /plot and forage yield/fad were significantly increased by planting TWC368 hybrid as compared with other studied yellow maize hybrids over both seasons. While, ear height was significantly improved by planting SC166 hybrid as compared with other studied yellow maize hybrids over both seasons. Concerning harvest plants/plot, it was significantly increased by planting SC178 hybrid as compared with other studied yellow maize hybrids in the second season. SC162 came in the second rank the other hybrids concerning forage yield and its attributes over both seasons. On the other hand, TWC360 hybrid was the shortest maize plants over both seasons. SC177 hybrid registered the lowest values of ear height, harvest plants/plot, weight harvest plants /plot and forage yield/fad over both seasons. SC 178 hybrid recorded the lowest values of stalk diameter, number of leaves/plant and leaves area/plant over both seasons. The differences among maize hybrids in forage yield and its attributes might be due to the genetically factors and inheritance variation among them which affected in forage yield and its characteristics. These results are in harmony with those obtained by Gouda (1982), Eraky *et al.* (1983), Gouda (1989), Gouda *et al.* (1992), Soliman *et al.* (1995), Amer *et al.* (2004), Extension Bulletin (2005), Iptas and Acar (2006), Tóthné (2011), Seadh *et al.* (2014) and Mandic *et al.* (2015).

Table 1. Number of days from sowing to 50 % days of tasseling and silking, plant and ear heights as affected by some yellow maize hybrids during the first (2016), second (2017) and combined (Com.) over both seasons.

Characters	Days to 50 % tasseling			Days to 50 % silking			Plant height (cm)			Ear height (cm)		
Hybrids	2016	2017	Com.	2016	2017	Com.	2016	2017	Com.	2016	2017	Com.
SC 162	60.75 ab	62.00 ab	61.50 ab	61.75ab	63.00 ab	62.50 a	270.0 a	263.8 a	266.9a	145.0 ab	146.3 ab	145.6 a
SC 166	60.00 c	60.75 bcd	60.38 d	61.00 c	61.75 c	61.38 b	242.5 c	247.5 de	245.0 b	151.3 a	141.3 ab	146.3 a
SC 167	60.00 c	61.50 a-d	60.75 bcd	61.00 c	61.75 c	61.38 b	247.5 bc	250.0 cde	248.8 b	145.0 ab	143.8 ab	144.4 a
SC 168	60.25 bc	60.25 cd	60.25 d	61.25 bc	61.25 c	61.63 b	255.0 b	238.8 e	246.9 b	140.0 abc	143.8 ab	141.9 a
SC 177	60.00 c	60.00 d	60.00 d	61.00 c	62.25 bc	61.25 b	273.8 a	260.0 abc	266.9a	130.0 c	135.0 b	132.5 b
SC 178	61.00 a	63.00 a	61.88 a	62.00 a	64.00 a	62.88 a	253.8 b	251.3 bcd	252.5 b	135.0 bc	147.5 a	141.3 a
TWC 360	60.50 abc	60.75 bcd	60.63 cd	61.50 abc	61.75 c	61.63 b	248.8 bc	241.3 de	245.0 b	143.8 ab	123.8 c	133.8 b
TWC 368	60.75ab	61.75 abc	61.25 abc	61.75 ab	63.00 ab	62.38 a	275.0 a	262.5 ab	268.8a	148.8 a	142.5 ab	145.6 a
F. test	*	*	*	*	*	*	*	*	*	*	*	*
CV %	0.64	1.72	1.30	0.63	1.28	1.01	2.40	2.98	2.70	5.01	5.21	5.11

Means followed by the same letter in column are not significantly differed according to Duncan's Multiple Range Test at 5 % level of probability.

Table 2. Stalk diameter, number of leaves/plant and leaves area/plant as affected by some yellow maize hybrids during the first (2016), second (2017) and combined (Com.) over both seasons.

Characters	Stalk diameter (cm)			Number of leaves/plant			Leaves area/plant (dcm^2)		
Hybrids	2016	2017	Com.	2016	2017	Com.	2016	2017	Com.
SC 162	2.125 a	2.375 ab	2.250 ab	16.25	16.00 a	16.13 a	117.61ab	119.79ab	118.70ab
SC 166	2.050 a	2.275 bc	2.162abc	15.00	15.20 b	15.10 b	111.30bc	114.93bc	113.12bc
SC 167	2.100 a	2.375 ab	2.237abc	15.25	14.90 b	15.07 b	112.49bc	118.48bc	115.49bc
SC 168	1.975 a	2.225 c	2.100 bc	15.50	15.05 b	15.27 b	106.98c	109.92c	108.45c
SC 177	1.875 ab	2.300 bc	2.088 c	15.25	15.05 b	15.15 b	116.46bc	111.01bc	113.73bc
SC 178	1.625 b	2.100 d	1.862 d	15.00	15.05 b	15.02 b	111.49bc	116.38bc	113.93bc
TWC 360	2.025 a	2.425 a	2.225abc	15.75	14.55 b	15.15 b	110.55bc	114.63bc	112.59bc
TWC 368	2.125 a	2.450 a	2.287 a	16.50	16.00 a	16.25 a	134.16a	135.32a	134.74a
F. test	*	*	*	NS	*	*	*	*	*
CV %	8.68	3.15	6.15	6.17	3.01	4.89	12.740	10.585	8.050

Means followed by the same letter in column are not significantly differed according to Duncan's Multiple Range Test at 5 % level of probability.

Table 3. Number of green plants/plot, green plants weight/plot and forage yield/fad as affected by some yellow maize hybrids during the first (2016), second (2017) and combined (Com.) over both seasons.

Characters	harvest plants/plot			weight harvest plants (kg/plot)			Forage yield (t/fad)		
Hybrids	2016	2017	Com.	2016	2017	Com.	2016	2017	Com.
SC 162	67.00	66.25 a	66.625	77.79 a	82.35 a	80.07 a	34.03 a	36.03 a	35.03 a
SC 166	63.75	65.00 ab	64.375	72.35 ab	72.45 bc	72.40 bc	31.65 ab	31.70 bc	31.68 bc
SC 167	65.00	65.00 ab	65.000	69.95 ab	74.80 b	72.38 bc	30.60 ab	32.73 b	31.66 bc
SC 168	64.75	65.00 ab	64.875	69.10 ab	70.05 cd	69.57 c	30.23 ab	30.65 cd	30.44 c
SC 177	67.25	64.00 b	65.625	66.63 b	68.97 d	67.80 c	29.15 b	30.18 d	29.66 c
SC 178	66.75	66.75 a	66.750	66.70 b	72.32 bc	69.51 c	29.18 b	31.64 bc	30.41 c
TWC 360	64.00	65.25 ab	64.625	76.55 ab	73.72 b	75.14 b	33.49 ab	32.25 b	32.87 b
TWC 368	62.75	65.50 ab	64.125	77.95 a	82.22 a	80.09 a	34.10 a	35.97 a	35.04 a
F. test	NS	*	NS	*	*	*	*	*	*
CV %	6.23	1.76	4.57	8.46	2.80	6.22	8.46	2.80	6.22

Means followed by the same letter in column are not significantly differed according to Duncan's Multiple Range Test at 5 % level of probability.

The results in Tables 4 and 5 indicated that, grain yield and its attributes were significantly differed for the eight studied hybrids in both season and combined data, with exception for ear length and number of grains/row in the second season and ear diameter in combined over both seasons. SC162 hybrid significantly surpassed other studied hybrids for ear length and resulted in the highest values (21.75) over both seasons. While, SC166 hybrid produced the highest number of grains/row (46.9 kernels) over both seasons. However, SC178 hybrid had the highest value of 100-grain weight (32.15 g) over both seasons. TWC 368 hybrid recorded the highest number of rows/ear (15.49) over both seasons, whereas, SC168 hybrid recorded in the highest values of grain yield (33.61, 33.52 and 33.56 ardab/fad) in the first, second and combined data. On the contrary, SC177 hybrid recorded the lowest ear length over both seasons. TWC360 hybrid registered the lowest cob diameter over both seasons. SC162 hybrid recorded the lowest number of rows/ear over both seasons. SC166 hybrid formed the lowest 100-grain weight over both seasons. SC177 hybrid resulted in the lowest number of grains/row over both seasons. TWC360 hybrid gave the lowest grain yield/fad over both seasons. The advantage of SC168 hybrid in grain yield in excess of the other studied hybrids might be connected to genetic factors and genomic character for these hybrids. The obtained results of this study are moderately in contract with those obtained by Gouda*et al.* (1992), Soliman *et al.* (1995), Amer *et al.* (2004) and Seadh *et al.* (2014)

Table 4. Ear length and diameter as affected by some yellow maize hybrids during season 2016, 2017 and combined data over both seasons.

Characters	Ear length (cm)			Ear diameter (cm)		
Hybrids	2016	2017	Com.	2016	2017	Com.
SC 162	21.77 a	21.70	21.75 a	4.025 a	4.000c	4.012
SC 166	21.83a	21.65	21.73a	3.250 b	4.150abc	3.700
SC 167	23.75a	21.60	22.67a	3.025b	4.250ab	3.637
SC 168	23.02a	21.45	22.24a	3.050b	4.350 a	3.700
SC 177	17.88b	21.80	19.84b	2.650b	4.350 a	3.500
SC 178	18.77b	22.25	20.51b	3.075b	4.100 bc	3.587
TWC 360	23.27a	21.80	22.54 a	3.125b	4.300 ab	3.712
TWC 368	22.00 a	22.20	22.10 a	3.150b	4.350a	3.750
F. test	*	NS	*	*	*	NS
CV %	6.17	3.38	4.96	13.92	3.45	8.88

Means followed by the same letter in column are not significantly differed according to Duncan's Multiple Range Test at 5 % level of probability.

Table 5. Number of rows per ear, number of grains per row, 100- grain weight and grain yield ard./fad as affected by some yellow maize hybrids during season 2016, 2017 and combined data over both seasons.

Characters	Number of rows/ear			Number of grains/row			100- grain weight (g)			Grain yield (ardab/fad)		
Hybrids	2016	2017	Com.	2016	2017	Com.	2016	2017	Com.	2016	2017	Com.
SC 162	14.00 c	13.70 e	13.85 c	41.25 c	44.60	42.92 b	28.77b	30.45 b	29.61cd	32.15 a	29.36 bcd	30.75 b
SC 166	16.00 a	14.00 de	15.00 ab	48.28 a	45.70	46.99 a	23.25d	32.33 ab	27.79 e	27.83 bc	29.23 bcd	28.53 c
SC 167	14.32 bc	15.40 ab	14.86 ab	45.80 ab	47.95	46.88 a	31.13a	32.17 ab	31.65 ab	32.14 a	30.66 abc	31.40 b
SC 168	15.52 a	15.65 a	15.59 a	44.75 abc	45.85	45.30 ab	30.38 ab	29.98 b	30.17 bcd	33.6 a	33.52 a	33.56 a
SC 177	15.35 ab	15.10 b	15.23 ab	44.30 abc	44.70	44.50 ab	25.98c	32.55 ab	29.26 de	26.96 c	28.73 cd	27.84 c
SC 178	15.00 abc	14.30 cd	14.65 abc	42.75 bc	47.00	44.88 ab	30.83a	33.45 a	32.15 a	30.82 ab	32.06 ab	31.44 b
TWC 360	14.05 c	14.60 c	14.32 bc	45.65 ab	45.55	45.60 ab	30.7 a	33.50 a	32.13 a	26.07 c	27.21 d	26.64 c
TWC 368	15.52 a	15.45 ab	15.49 a	43.33 bc	45.95	44.64 ab	30.13 ab	31.78 ab	30.95 abc	27.66 bc	29.28 bcd	28.47c
F. test	*	*	*	*	NS	*	*	*	*	*	*	*
CV %	4.95	6.71	5.89	6.02	4.97	5.50	3.79	5.71	4.95	7.12	6.29	6.71

Means followed by the same letter in column are not significantly differed according to Duncan's Multiple Range Test at 5 % level of probability.

The results presented in Table 6 represent chemical composition of maize grains *i.e.* crude protein, total carbohydrates, crude fiber and dry matter percentages and deferens among studied hybrids for this traits were significantly in the first, second and combined data. SC168 hybrid significantly surpassed other studied hybrids in crude protein parentage and produced in the highest values over both seasons. SC178 hybrid produced the highest total carbohydrates percentage (59.81 %) over both seasons. However, TWC360 hybrid produced the highest crude fiber percentage (31.10%) over both seasons. SC167 hybrid produced the highest dry matter percentage (11.01%) over both seasons. On the opposite, SC178 hybrid recorded the lowest crude protein parentage (8.56%) over both seasons. SC162 hybrid registered the lowest total carbohydrates percentage (54.08%) over both seasons. SC166 hybrid recorded the lowest crude fiber percentage (26.57%) over both seasons. TWC360 hybrid produced the lowest dry matter percentage (9.27%) over both seasons. These results might be related to genetic factors of the hybrids. Similar results were obtained by Gouda (1982), Eraky *et al.* (1983), EL-Kholy (1987), Gouda (1989), Gouda *et al.* (1992), Faisal (1995), Extension Bulletin (2005), Iptas and Acar (2006), Tóthné (2011), Seadh *et al.* (2014) and Mandic *et al.* (2015).

Table 6. Crude protein, total carbohydrates, crude fiber and dry matter percentages as affected by some yellow maize hybrids during 2016 and 2017 seasons.

Characters	Crude protein(%)			Total carbohydrates(%)			Crude fiber(%)			Dry matter(%)		
Hybrids	2016	2017	Com.	2016	2017	Com.	2016	2017	Com.	2016	2017	Com.
SC 162	7.55 b	10.57ab	9.06 c	56.94 cd	51.21h	54.08c	30.78a	28.77bc	29.77ab	9.55 bcd	10.35ab	9.94bc
SC 166	9.76 a	10.40 b	10.07 b	58.81a	54.94g	56.88 b	25.81ab	27.34c	26.57 d	9.64 bc	9.70 b	9.67bc
SC 167	8.55ab	9.01 c	8.78 c	56.46 d	58.50e	57.48 b	29.80ab	29.83 bc	29.82 ab	10.56 a	11.47 a	11.0 a
SC 168	10.05 a	11.68 a	10.86 a	57.47 bc	60.99c	59.23a	24.79b	29.84bc	27.31cd	10.07ab	10.35ab	10.21abc
SC 177	8.87ab	9.57bc	9.22 c	57.47 bc	61.57 b	59.52 a	29.08 ab	28.76bc	28.92bc	9.46cd	9.35b	9.41 c
SC 178	7.34 b	9.80bc	8.56 c	57.93b	61.68 a	59.81 a	30.54 a	30.54ab	30.54ab	10.25a	11.11a	10.68ab
TWC 360	6.92 b	10.21bc	8.57 c	56.96 cd	56.99 f	56.97 b	29.59ab	32.60a	31.10a	9.04 d	9.51 b	9.27c
TWC 368	8.38ab	9.83bc	9.11 c	57.58 bc	60.43 d	59.01a	30.5 a	27.33c	28.92bc	9.49cd	10.36ab	9.92bc
F. test	*	*	*	*	*	*	*	*	*	*	*	*
CV %	12.72	12.39	12.42	8.21	4.76	6.68	10.14	11.28	10.73	11.58	7.16	9.52

Means followed by the same letter in column are not significantly differed according to Duncan's Multiple Range Test at 5 % level of probability.

CONCLUSION

It can be recommended that growing TWC368 or SC162 hybrid in order to obtain maximum forage yield, and growing SC168 or SC178 maize hybrids for maximum grain yield, under the environmental conditions of Gemmeiza Agriculture Research Station, Field Crops Research Institute, Agricultural Research Center, Giza, Egypt.

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تقييم انتاجية محصول الحبوب والعلف لبعض هجن الذرة الشامية الصفراء

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إن لمحاصيل الحبوب دور أساسى وهام في تغذية ملايين البشر حول العالم. فبعد القمح والأرز، تعتبر الذرة الشامية من أهم محاصيل الحبوب في العالم وفى مصر. حيث توفر الذرة الشامية غذاء لكل من الإنسان والحيوان. لذا يهدف هذا البحث إلى مقارنة وتقييم محصول الحبوب والعلف الاخضر والتركيب الكيميائى لبعض هجن الذرة الشامية الصفراء وهى؛ هجين فردى 162 ، 166 ، 167، 168 ، 177 و178 وهجين ثلاثى360 و368.لتحقيق هذا الغرض أقيمت تجربتان حقليتان بالمزرعة البحثية بمحطة التجارب الزراعية بالجميزة– مركز البحوث الزراعية الجيزة – مصر خلال موسمى2016 و 2017.تم تنفيذ التجارب في تصميم القطاعات كاملة عشوائية مع أربعة مكررات، ثم أجرى التحليل التجميعى بين كلا الموسمين. ويمكن تلخيص أهم النتائج المتحصل عليها فيما يلى:- تشير النتائج التي تم الحصول عليها أن الهجين الفردى 178 كان أكثر الهجن تحت الدراسة تأخراً في طرد النورات المذكرة والمؤنثة حيث أعطى أعلى عدد من الأيام لطرد 50٪ من النورات المذكرة والمؤنثة. - أدت زراعة الهجين الثلاثي 368 للحصول على أعلى القيم من صفات ارتفاع النبات ، قطر الساق ، عدد الأوراق/نبات ، مساحة الأوراق/النبات ، وزن النباتات الخضراء/وحدة تجريبية ومحصول العلف الأخضر/ فدان.- تفوق الهجين الفردي 162 معنوياً على هجن الذرة الشامية الصفراء تحت الدراسة في طول الكوز. أنتج الهجين الفردى 166 أكبر عدد من الحبوب/صف. كما أنتج الهجين الفردي 178 أعلى قيمة من وزن 100 حبة. سجلت الهجين الثلاثى 368 أكبر عدد من الصفوف/كوز. أدى زراعة الهجين الفردى 168 للحصول على أعلى القيم من محصول الحبوب للفدان. عموماً من النتائج المتحصل عليها فى هذه الدراسة يمكن التوصية بزراعة الهجين الثلاثى 368 أو الهجين الفردى 162 من أجل الحصول على أقصى إنتاجية لمحصول العلف الاخضر ، وزراعة هجن الذرة الشامية الصفراء الفردية 168 أو 178 لتعظيم إنتاجية محصول الحبوب تحت الظروف البيئية لمحطة البحوث الزراعية بالجميزة ، مصر.