Table (I): Seasonal variations in maize grain yield and some attributing characters.

Season	Plant height (cm)	Ear height (cm)	Number of days to: 50% tasseling	Number of days to: 50% silking	No. of rows/ ear	No. of kernels/ row	Grain yield per plant (gm)	Shelling percentage (%)
1986	265.91^{a}	49.42^{a}	63.96^{b}	67.02^{b}	13.98^{a}	39.69^{a}	120.93^{a}	78.35^{a}
1987	231.36^{b}	44.24^{b}	66.91^{a}	70.58^{a}	13.06^{b}	32.44^{b}	98.76^{b}	71.15^{b}

Table (2): Average performance of maize varieties regarding grain yield and some attributing characters (combined of the two seasons).

Variety	Plant height (cm)	Ear height (cm)	Number of days to: 50% tasseling	Number of days to: 50% silking	No. of rows/ ear	No. of kernels/ row	Grain yield per plant (gm)	Shelling percentage (%)
Nab El-Gamal	241.6^{b}	130.4^{c}	61.5^{c}	64.17^{b}	9.65^{b}	35.93^{a}	101.92^{c}	79.6^{a}
Cairo-I	266.7^{a}	148.2^{a}	67.2^{a}	70.11^{a}	14.61^{a}	37.37^{a}	110.01^{b}	70.1^{d}
Moshtohor-I	247.2^{b}	139.0^{b}	66.4^{ab}	70.39^{a}	14.70^{a}	36.99^{a}	119.02^{a}	73.8^{c}
Moshtohor-2	239.1^{b}	132.7^{bc}	65.8^{b}	69.56^{a}	14.12^{a}	36.97^{a}	107.33^{bc}	76.4^{b}
Moshtohor-3	245.4^{b}	137.9^{bc}	66.3^{ab}	69.73^{a}	14.51^{a}	36.06^{a}	110.92^{b}	74.8^{bc}

Table (3): Grain yield, some of its components, and plant characteristics as affected by nitrogen fertilization levels (combined analysis of 1986 and 1987).

N levels (faddan)	Plant height (cm)	Ear height (cm)	Number of days to: 50% tasseling	50% silking	N of rows/ ear	No. of kernels/ row	Grain yield per plant (gm)	Shelling percentage (%)
30 kg	247.8[a]	135.5[a]	65.34[a]	68.8[a]	13.51[a]	34.82[a]	104.11[b]	74.36[a]
60 kg	249.5[a]	137.5[a]	65.53[a]	68.9[a]	13.48[a]	36.38[a]	107.62[b]	74.22[a]
90 kg	248.6[a]	140.5[a]	65.33[a]	68.7[a]	13.57[a]	37.04[a]	117.42[a]	75.46[a]

and outyielded Nab El-Gamal, Cairo-1, Moshtohor-2 and 3 by 16.77%, 8.19%, 10.89% and 7.30%, respectively. Such superiority of Moshtohor-1 might be attributed to the high number of rows per ear. However, 100-kernel weight and number of ears per plant could have some effect.

It could be concluded that Moshtohor-1 is the most promising variety and must be evaluated under different locations, years and other cultural treatments for high yield potentiality. In addition, estimation of the relative proportions of additive, non-additive genetic and environmental variances are needed to compute the heritability, prediction of response to selection. And this may help in designing of the most effective breeding schemes for high yield potentiality of the three new varieties (Moshtohor-1, 2 and 3) especially the first one. Also, the modified mass selection of Gardener (1963), might be effective in this respect.

C- Response to nitrogen fertilization:

Results in table (3) revealed that nitrogen fertilization had significant effects on grain yield per plant. Whereas, the other studied traits were not significantly affected by nitrogen levels. Such increase in grain yield per plant may be due to the accumulative effect of the yield components.

Application of nitrogen fertilization up to 90 kg/faddan significantly increased grain yield per plant. These results are in partial agreement with those obtained by El-Rouby (1961); Khalifa (1970); Moursi et al., (1970); Hussein et al., (1978) and Khalifa et al., (1983).

D- Interaction effects:

Statistical analysis of the data on all studies traits, showed that the interactions effects of: Varieties X fertilization, Varieties X years, and fertilization X years were not significant in both seasons. In addition, all studied maize characters in both seasons showed no significant response to variety X fertilization X years interaction. Consequently, Interaction data were excluded.

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تقييم بعض الأصناف التركيبية الجديدة من الذرة الشامية

على عبد المقصود الحصـــــرى سيدهم أسعد سيدهـــــــــم

أجرى هذا العمل بمركز البحوث والتجارب الزراعية بكلية الزراعة بمشتهر وذلك لتقييم ثلاثة أصناف تركيبيـــة جديدة وهى مشتهر ١ ، مشتهر ٢ ، مشتهر ٣ بالاضافة الى صنفين محليين هما : ناب الجمل ، والقاهرة١ ، وذلك تحت ثلاثة مستويات من التسميد الأزوتى (٣٠، ٦٠، ٩٠ كجم ن / فدان) خلال موسمى ١٩٨٦ ، ١٩٨٧ .

وأظهرت النتائج أن الفروق كانت معنوية بين جميع الأصناف وذلك لكل الصفات المدروسة ماعدا صفة عـــــدد حبوب الكـــــوز .

ولقد أعطى الصنف مشتهر ١ أفضل محصول وتفوق على كلا من ناب الجمل والقاهرة ١ ومشتهر٢ ،ومشتهر٣ بمقدار ١٦٫٧٧٪ ، ٨٫١٩ ٪ ، ١٠٫٨٩٪ ، ٧٫٣٠ ٪ على الترتيب .وكان للتسميد الأزوتى تأثير معنـــوى علىمحصول الحبوب وأعطت المعاملة ٩٠ كجم ن / فدان أفضل محصول بينما لم تتأثر معنويا بقية الصفـــــات المدروسة بالتسميد الآزوتى .

EVALUATION OF SOME NEW SYNTHETIC VARITIES OF MAIZE

BY

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ABSTRACT

These work was undertaken at the Agricultural Research Experimental Center of the Faculty of Agriculture, Moshtohor to evaluate three new synthetic varieties viz, Moshtohor-1, 2 and 3. These new varieties as well as two local ones, i.e., Nab El-Gamal and Cairo-I were evaluated under different nitrogen fertilization levels during the two successive seasons 1986 and 1987. The differences among varieties were significant for all traits except for number of kernels per row. Moshtohor-1 produced the highest grain yield per plant and outyielded Nab El-Gamal, Cairo-1, Moshtohor-2 and 3 by 16.77%, 8.19%, 10.89% and 7.30%, respectively.

Nitrogen fercilization had significant effects on grain yield per plant and the best treatment was 90 kg N/faddan. Whereas, the other studied traits were not significantly affected by nitrogen treatments.

INTRODUCTION

Maize (Zea mays, L.) represents one of the most important summer cereal crops grown in Egypt. It cultivated areas reached 1.8 million faddan* (1986). Increasing crop potentiality of maize is of national interest for breeders. Therefore, many attempts are being made either to improve the already cultivated varieties or to develop new ones. Synthetic varieties are considered as one of the main activities to produce new maize varieties, which could be utilized as open-pollinated varieties or they may serve as sources for developing new inbred lines.

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* Ministry of Agriculture, Statistics Section.

Synthetic varieties are somewhat more favourable than the hybrid F_1 seeds in most of the developing countries, since there is no need to produce its seeds yearly. Recently, many researchers used this method in maize breeding such as: Hallauer and Eberhart (1966), Burton et al., (1971); Hallauer, (1972); Eberhart et al., (1972) and Cross and Hammond (1982).

Along the same line, other authors investigated the response of various maize varieties to different nitrogen fertilization levels in respect of yield and its components. Among those are: Khalifa, (1970); Moursi et al., (1970); Varma et al., (1972); Hussein et al., (1978) and Khalfa et al., (1983).

The target of this study was to evaluate some maize varieties under different nitrogen fertilization levels.

MATERIALS AND METHODS

Three new synthetic maize varieties (Moshtohor-1, 2 and 3), as well as, two local ones, i.e., Nab El-Gamal (open-pollinated) and Cairo-1 (composite variety) were evaluated under three levels of nitrogen fertilization during the two successive seasons 1986 and 1987 at the Agricultural Research Experimental Center, Fac. Agric., Moshtohor. The procedures of developing the three new synthetic varieties (Moshtohor-1, 2 and 3) are described by El-Hosary (1986).

The levels of nitrogen treatments viz, 30, 60 and 90 kg N/faddan were tried in the form of ammonium nitrate (33.5% N). Nitrogen was applied before the first irrigation in both seasons.

A split-plot design with three replications was used in this study. Nitrogen levels were randomly assigned to the main plots and varieties to the sub-plot. Each sub-plot included 5 ridges of 4 m length and 70 cm width. Hills were spaced at 30 cm with two kernels per hill. Planting date was June 24 and July 2 in 1986 and 1987, respectively. Plants were thinned to secure one plant per hill before the first irrigation 3 weeks after planting. Other cultural practices were carried out as usual.

Data concerning tasseling date, silking date (number of days to 50% tasseling and silking), plant height, ear height, number of rows/ear, number of kernels/row, shelling

percentage and grain yield per plant were recorded on 30 gaurded plants of each sub-plot. The grain yield per plant was adjusted to 15.5% moisture content.

Data were statistically analysed according to Snedecor and Cochran (1967). Duncan's (1955), multiple range test was used for comparison between means.

RESULTS AND DISCUSSION

A- Seasonal effect:

Results in table (1) show the averages of the two seasons of the study. From the results it is evident that all characters were significantly different amongst the two seasons. Higher mean values for all characters, except tasseling and silking dates, were obtained in the first season. The reduction in mean values in the second season could be attributed to delay planting (July 2nd) as compared to the first one (June 24th).

B- Varietal performance:

Results in table (2) showed that the differences among varieties were significant for all traits studied except for number of kernels per row in the combined analysis of 1986 and 1987 seasons.

As for tasseling and silking dates, Nab El-Gamal cultivar appeared to be the earliest vairety, whereas Cairo-1 and Moshtohor-1 were the latest varieties. The same conclusion was obtained by Bedeer (1984), who found significant differences among some maize varieties for earliness.

With regard to plant and ear heights, Cairo-1 cultivar gave the highest averages, whereas Moshtohor-2 and Nab El-Gamal had the lowest values (table 2). Bedeer (1984), found that the open-pollinated varieties Giza-2 and Cairo-1 were taller than Pioneer 514.

Concerning number of rows per ear, Moshtohor-1 gave the highest value, but without significant superiority over that recorded for Cairo-1, Moshtohor-2 and 3. However, Nab El-Gamal had the lowest number of rows per ear.

Nab El-Gamal cultivar had the highest shelling percentage, whereas Cairo-1 gave the lowest value of this trait.

For grain yield per plant, results in table (2) showed that Moshtohor-1 produced the highest grain yield per plant