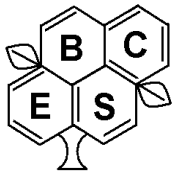

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EFFECT OF PLANTING DATES ON GROWTH, YIELD AND QUALITY OF SOME GREEN ONION (*ALLIUM CEPA L.*)CULTIVARS FOR LOCAL MARKETING AND EXPORTATION

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ABSTRACT

Two field experiments were conducted at the experimental farm of Hort. Res. Inst. (Qaha farm), Kalubia governorate during 2009/10 and 2010/11 seasons to test the response of three cultivars of green onion *(Allium cepa L.);* one of them is the local cv. Giza 20 and the other two cultivars are imported of foreign these cvs are. (Leone and Totem) to three different planting dates i.e., October 15th , October 31st and November 15th , referred to as early, mid and late planting date, respectively). The effects from interactions between planting dates and cultivars on growth, yield, quality and chemical composition of the three cultivars were also studied.

The obtained results indicated that delaying date of planting to 15th of November significantly reduced vegetative growth, yield and quality of the three cvs., as well as their contents of N,P, K, protein and Vit. C percentages, while planting the local cv. Giza 20 on October, 31st (the second date) greatly increased vegetative growth, total yield, bulb diameter and neck length, as well as the content of N, P, K and protein, but the content of Vit. C and sulphur was less than that in the two imported cvs. Leone and Totem. On the other hand, planting of the foreign cvs. on the early date (October, 15th) was better than planting them on the other two dates, as it caused a marked precocity in harvesting date and great improvement in some important characters needed for exporting, such as minimizing the bulb diameter, elongating the neck length and improving the quality through increasing content of Vit. C and sulphur. In general, the local

cv. Giza 20 was better for local marketing where from growth, yield and pungency when planting on Oct., 31st while the foreign cvs. Leone and Totem were promising for export where from earliness and quality when planting on 15th October.

Thus, it could be recommended to planting the local green onion cv. Giza 20 on end of Oct. for local market, and planting the two imported cvs. Leone and Totem on mid of Oct. for exporting.

Keywords: green onion *(Allium cepa L.)*, planting date, cultivars, growth, yield, quality, local marketing, exporting.

INTRODUCTION

In the light of the environmental changes that facing the world nowadays, and reflection of this on the weather of Egypt and its direct effect on the times suitable for cultivating the different vegetable crops. It was necessary to carry out some studies to detect the proper planting dates for either exporting or local marketing.

Onion (*Allium cepa L.*) is one of the Alliaceae family of great economic importance, widely cultivated all ever the world. Now a days world onion production has increased been by about 25% over the past ten years with current production being around 55 million tones making it the second most important vegetable crop after tomatoes **(Rodrigues, *et al*.2003)**. The average intake in the world 7kg per capita per year **(FAOSTAT, 2002).** In Egypt, the mean of total area cultivated with onion every year is about 106125 feddans, and the mean total yield is at least 1453913 tonnes/year while the average intake is about 18.2kg per capita per year where green onions is about 5%-7% of this area with an average productivity of 4.7 to 5.7 tons / fed. (EAS, 2010)**.**

Onion is very much used in our daily diets; in soups, meat dishes, rice, sandwiches, kababs, beans and may cooked as a vegetable **(Hassain *et al.,* 2001).** It has a great culinary and medicinal volue, since it contains chemical compounds like anti-inflammatory, anticholesterol, anticancer, and antioxidant properties which are effective to heart diseases, diabetes, osteoporosis and other diseases **(Griffitho *et al.,* 2002).** Furthermore, **Alexia (2011)** said that onions are high in Vit. C, K, allicin, cuercitina, antioxidants with a big role in combating stress. The rich content in vitamins and minerals of the green onion may help prevent cardiovascular disease, may reduce the

risk of ovarian and breast cancer in women. Substances in the green onion stimulate production of enzymes that neutralize cancer cells. Eating onions helps to rebalance the body's hormonal state.

Onion growth and set production are usually affected by cultivar, planting date, density and environmental conditions **(Cheema *et al.*, *2003*).** In this regard, **Ansari *et al.* (2000)** found that maximum of total bulb yield, bulb diameter, leaves number and weight of cvs. Ringer Grana,cvs. Primavera and Savanna sweet onion cultivars at harvest time were obtained from plating on August, 1st , while the minimum values were obtained on August 31st. The highest bulb weight was scored in the planting date of August, 21st , but the lowest weight was achieved on August, 1st and 31st sawing dates.cvs. Primavera and Ringer Grana. brought about the maximum and minimum bulb diameter, respectively. Interactive effects of sawing date and cultivar indicated that the highest number of leaves in cv. Primavera. was got on August, 1st. In general, planting on 1st and 11th of August would be better for those tested green onion cvs., while planting on 21st August would be useful to produce early onion bulb. Similarly, **Ansari (2007)** mentioned that the best date of set production in Primavera, Texas Yellow Grana, Ramhormozy and Behbalany onion cvs. was late February. Maximum and minimum weights and diameters of sets were obtained in case cvs. of Primavera and Behbahany. Respectively, but maximum and minimum set neck diameters were obtained from cvs. Behbahany and Primavera, respectively. The maximum fresh weight, height and diameter of set were cv. in Texas Yellow Grana at late January, while the minimum was in Ramhormozy cv. at late March. Maximum and minimum set neck diameter were in Behbahany at late January and in Primavera at late March, respectively.

Concerning planting date effects, **Hassain *et al.* (2001)** reported that planting bulbs of green onion cv. Gilasi on 21st. July showed maximum number of leaves/plant (38.4) and days taken to uprooting (122.9) of green yield, while minimum number of leaves/plant (26.1) on 15th September and days taken to uprooting (60.9) were recorded on 29th September. Planting bulbs on 29th Sept. significantly enhanced the total marketable yield/ha (28.3t) and benefit ratio (0.54). similar observations were also registered by **Galmarini *et al* (1995), Gonzalez *et al.* (1997), Al-Moshileh (2007)** and **Tshering and Zangma (2010)** on some cultivars of onion.

This trial, however was done to determine the best planting date for tested cultivars to production green onion for local marketing and/or exportation.

MATERIALS AND METHODS

Two field experiments were carried out at the Experimental farm of Hort. Res. Inst. (Qaha farm), Kalubia governorate throughout the two consecutive seasons of 2009/10 and 2010/11 to study the effects of planting date, cultivar and their interactions on growth, yield and quality of three cultivars of green onion.

Seeds of green onion *(Allium cepa L.)* cvs Giza 20 (local cv.), and Leone and Totem (imported foreign cvs) were sown under plastic house conditions (as the mean of inside temperatures) during the period of germination ranged between 27 and 33°C and relative humidity between (50-65%) in foam trays (its capacity is 210 cell) filled with peatmoss amended with some nutrients, and covered with a thin layer of the same peatmoss on the following dates: 1st September, 16th Sept. and 1st October in the two seasons. The trays were irrigated once every day morning with a fine-pored watering cane. After germination by 45days, the seedlings resulted from each sowing date were transplanted on 15th October, 31st Oct. and 15th November, respectively into experimental plots with area of about 9.6 m^2 (as each plot contained 4 ridges with length of 4m and width of 60 cm) at 15cm in between on the tow sides of the ridge. The experimental included in treatment, which were the combination of three tested cultivars via three planting dates. Physical and chemical properties of the soil used in the two seasons are determined according to the standard methods described by **Richards (1954)** and illustrated in Table (1).

Table (1) a: Some physical and chemical analyses of the experimental soil samples from Qaha farm in both seasons.

Depth (cm)	Particle size distribution (%)				Texture	pH	Organic matter (%)	EC (m.mhos/cm)	Available mineral content %			
	Coarse sand	Fine sand	Silt	Clay					N	P	K	SO_4^-
0-30	8.85	34.23	25.04	31.88	Clay loam	8.2	2.0	0.76	0.84	0.63	3.2	0.54

Table (1) b: Mean monthly air temperature at Qaha district during the growing seasons of 2009 and 2010.

Month	2009 / 2010			2010 / 2011		
	Max	Min	Mean	Max	Min	Mean
Aug	38.67	22.49	30.89	39.93	24.47	31.84
Sep	35.34	20.90	27.29	35.83	23.02	28.68
Oct	30.24	19.11	24.14	32.23	19.84	25.86
Nov	23.58	15.26	18.71	24.41	14.11	18.07
Dec	20.91	11.71	16.15	17.80	9.08	13.40
Jan	1952	10.42	14.80	18.42	8.82	13.61
Feb	21.25	10.43	15.89	21.32	1156	16.28

The experimental design in the two seasons was a split plot in complete random with three replicates **(Mead *et al*., 1993)**, the main plots were devoted for planting date treatments, while the sub-plots conducted for the three cultivars. All care agronomy operations were carried out in all treatments similarly.

At harvesting time (after 60 days from each planting date), a random sample consisted of 20 plants was taken from each experimental plot to determine: plant height (cm), number of leaves/plant, plant fresh weight (g), bulb diameter (cm) and neck length (cm). In addition, plants of each plot were harvested and weighed to calculate total yield (ton /feddan).

A representative sample of 100 grams of plants was taken, oven dried in dry samples of plants, the percentages of nitrogen (using a micro-Kjeldahle method indicated by **Pregl, 1945**), phosphorus (using

a colorimetric method described by **Luatanab and Olsen, (1965)** and potassium (using the flame photometer set as explained by **Jackson, 1973**) were determined. Besides, sulphur was determined with a turbidimetry method **(ABHA, 1989),** and protein content was assessed through multiply N% by 6.25 (to calculated crude proteins) according to **A.O.A.C. (1980).** Vitamin C concentration (mg/100g f.w.) was measured by the method of **Schwimmer and Weston (1961)** in fresh samples.

Statistical analysis of experimental data was accomplished with using **SAS program (1994)**, and the means were separated and compared by **Duncan's multiple range test (1955)** at 5% level.

RESULTS AND DISCUSSION

Effect of planting date, cultivar and their interactions on:

1. Vegetative growth:

It is evident from data presented in Table (2) that the late date of planting (November, 15th) significantly reduced all measured plant growth parameters of the three used cultivars comparing with early and mid planting dates (mid and end of Oct., respectively), In this respect, early and mid planting dates improved plant height (cm), number of leaves/plant and plant fresh weight (g). In addition, the second planting date (end of Oct.) gave, the best results than the early planting date on (mid of Oct.) with non-significant differences in most cases, except for plant height character that was significantly higher in both seasons. This may attributed to that temperature and environmental conditions at early and mid planting date were more suitable for the best and healthy growth in the three cultivars than late time. In this regard, **Mettananda (2003)** reported that temperature, photoperiod and interaction between them are the main environmental factors affecting on growth and development of onion. **Abu-Rayyan and Abu-Irmaileh (2004)** stated that temperature affects on all functions of onion plant

The same data also indicate that growth of the three used cvs. was different, but the supremacy was for the local cv. Giza 20, which gave the tallest and heaviest plants with higher number of leaves compared to the imported cvs Leone and Totem in the two seasons. Among the two foreign cvs, cv. Totem grow better than cv. Leone, it exhibited more number of leaves and plant fresh weight

measurements. In this respect, the superior of the local cv. Giza 20 in plant growth may be due to that it was already acclimated to the local environmental conditions, than the imported cvs. In this concern, **Ansari (2007)** affirmed that onion cultivars reactions to the changes of temperatures and photoperiod were different due to difference of their genotypes (genetic constituents).

Table (2) Effect of planting dates, cultivars and their interactions on vegetative growth of green onion (*Allium cepa L.*) plants during 2009/10 and 2010/11 seasons.

Treatments	2009/10			2010/11		
	Plant height (cm)	No. of leaves per plant	Plant F.W. (g)	Plant height (cm)	No. of leaves per plant	Plant F.W. (g)
Planting dates (P)						
(P_1) 15th Oct.	40.4b	8.5a	76.7a	42.0b	8.0a	74.3a
(P_2) 31st Oct.	45.4a	8.9a	77.7a	46.1a	8.1a	76.3a
(P_3) 15th Nov.	39.5b	7.0b	47.6b	34.9c	6.7b	41.4b
Cultivars (C)						
(C_1) Leone	37.5b	6.7c	42.7c	35.4b	6.5c	41.3c
(C_2) Totem	37.6b	7.6b	51.5b	36.7b	7.3b	48.8b
(C_3) Giza 20	49.7a	9.5a	107.9a	50.7a	9.0a	102.0a
Interaction (PxC)						
P_1xC_1	37.0de	7.3cd	48.7e	38.6ef	7.0e	46.1de
P_1xC_2	35.5e	8.4b	60.0c	37.3f	8.0c	57.4c
P_1xC_3	47.3b	9.7a	121.0b	50.0b	9.3b	119.5b
P_2xC_1	40.3cd	7.1d	40.1f	39.6de	6.9e	42.3ef
P_2xC_2	40.9c	7.8bc	52.1d	41.6d	7.5d	50.7d
P_2xC_3	55.0a	10.4a	141.0a	57.0a	10.1a	135.9a
P_3xC_1	35.0e	5.7e	39.5f	28.1h	5.8g	35.4g
P_3xC_2	36.3e	6.7d	42.1f	31.3g	6.4f	38.3fg
P_3xC_3	47.0b	8.5b	60.3c	45.3c	8.0c	50.7d

- Means within a column having the same letters are not significantly different according to Duncan's Multiple Range test (DMRT) at 5% level.

The interaction effects between planting date and cultivars on all vegetative growth traits were significant, especially the interaction between cv. Giza 20 and planting on Oct., 31st, which gave the highest records over all other interactions in both seasons. Therefore, the best date for planting the local cv. Giza 20 was the end of October, while for the imported cvs. Leone and Totem was mid of October, as it gave the highest means comparing with other times in most cases in both seasons. Cultivation of cv. Giza 20 on 15th October recorded also a significant increment in vegetative growth, but it was less than that of cultivation on 31st Oct. This may ascribed to that the day length and temperature during this time enable more suitable conditions for the best growth and development than the late planting. In this regard, **Ansari *et al.* (2000)** revealed that sowing date on 1st and 11th August would be better for planting of green onion cultivars, while 21st August would be useful to produce early onion bulbs.

The previous findings supported by the argument of **Galmarini *et al.* (1995), Hassain *et al.* (2001), Ansari (2007)** and **Tshering and Zangma (2010)** who have suggested October plantation of onions for higher leaf yield.

2. Yield and quality traits:

According to data presented in Table (3), it is clear from such data that means of total yield (ton/fed) and quality characteristics (expressed as bulb diameter, neck length and Vit. C content were significantly increased of plants cultivated on mid and end of October in comparison to means of plants cultivated on November, 15th (the late time)during both seasons of study. In addition, means of yield and quality traits in the two seasons were closely near together, with the exception of vit. C content which significantly declined in the second season for plants raised on October, 31st (21.3mg/100g f.w.) compared to those raised on October, 15th (25.0mg/100g f.w.). These results could be explained as done before in case of vegetative growth.

As for the effect of cultivars, it was noticed that the local cv. Giza 20 gave the highest yield and best quality in both seasons except for Vit. C content that was higher in both cvs Leone and Totem imported, with the prevalence of cv. Leone which scored 23.3 and 24.2 mg/100g f.w. in the first and second seasons, respectively.

This may indicate the need of the imported cultivars to more time to be adapted for the local climatic conditions of Egypt, as a main

factor to improve its quantity and quality. This was emphasized by **Ansari (2007)** who mentioned that local onion cvs. Ramhormozy and Behbahany could stress more assimilates and so, gave bigger sets and higher yield than the improved cvs. Primavera and Texas Yellow Grana.

Table (3) Effect of planting dates, cultivars and their interactions on yield and quality traits of green onion (*Allium cepa L.*) plants during 2009/10 and 2010/11 seasons.

Treatments	2009/10				2010/11			
	Total yield (ton//fed.)	Bulb diameter (cm)	Neck length (cm)	Vit. C (mg/100g f.w)	Total yield (ton//fed.)	Bulb diameter (cm)	Neck length (cm)	Vit. C (mg/100g f.w)
Planting dates (P)								
(P_1) 15th Oct.	2.82a	1.5a	4.5ab	24.5a	2.72a	1.5a	4.5a	25.0a
(P_2) 31st Oct.	2.84a	1.5a	4.7a	22.8b	2.67a	1.5a	4.5a	21.3b
(P_3) 15th Nov.	1.69b	1.1b	4.1b	16.3c	1.49b	1.1b	3.9b	16.9c
Cultivars (C)								
(C_1) Leone	1.57c	1.1b	3.7b	23.3a	1.47c	1.0b	3.5b	24.2a
(C_2) Totem	1.91b	1.1b	3.5b	20.8b	1.76b	1.1b	3.4b	22.1b
(C_3) Giza 20	3.86a	1.9a	6.1a	19.5c	3.65a	2.0a	6.0a	17.0c
Interaction (PxC)								
P_1xC_1	1.83e	1.2cd	4.0c	27.1a	1.67de	1.3c	3.7c	29.1a
P_1xC_2	2.29c	1.3cd	3.9c	25.3ab	2.10c	1.3c	4.0c	28.1a
P_1xC_3	4.33b	2.0ab	5.6b	21.0c	4.38b	2.1a	5.7b	17.9e
P_2xC_1	1.47f	1.1cd	3.8c	24.1b	1.51ef	1.1c	3.8c	24.1b
P_2xC_2	1.94e	1.2cd	3.6c	21.1c	1.79d	1.2c	3.6c	20.9c
P_2xC_3	5.10a	2.1a	6.8a	23.4b	4.72a	2.1a	6.8a	19.1de
P_3xC_1	1.41f	0.9d	3.3c	18.9d	1.24f	0.8d	3.3c	19.4de
P_3xC_2	1.50f	0.8e	3.1c	16.1e	1.39ef	0.8d	3.1c	19.1de
P_3xC_3	2.15d	1.6bc	6.0ab	14.0f	1.84cd	1.8b	6.0ab	14.1f

- Means within a column having the same letters are not significantly different according to Duncan's Multiple Range test (DMRT) at 5% level.

Significant effects were also observed due to the interaction treatments, as plants of the local cv. Giza 20 planted on the second planting date (end of Oct.) gave the highest total yield, the widest bulb diameter and the tallest neck length over all other interactions in the two seasons. Cultivation of the local cv. in the first date (mid of Oct.) also recorded higher averages, but they were less than those of planting in the second date, with the exception of bulb diameter trait in the second season that was the same average in both dates (2.1cm).

On the other hand, the maximum content of Vit. C in the two seasons was attained by cvs Leone and Totem cultivated on the first date (Oct., 15th), with the mastery of cv. Leone reflected the highest value of (27.1 and 29.1 mg/100g f.w. against 25.3 and 28.1mg/100g f.w. for cv. Totem) in the first and second seasons, respectively. The lowest records in both seasons, however were gained from the three used cultivars planted on the late time of planting (Nov., 15th), except for neck length of the local cv. in the first season that reached 6.0cm with non-significant difference in comparison to the mean of the same cv. planted on end of October, which was 6.8cm.

Obtained results are in agreement with those of **Gonzalez *et al.* (1997)** and **Ansari *et al.* (2000)** on onions, who postulated that suitable planting dates varies with location and cultivar of onions. **Al-Moshileh (2007)** pointed out that increasing of onion total yield may be due to favorable temperatures which influence on growth, and in turn the yield.

3. Chemical composition:

Data in Table (4) exhibit that planting on mid or end of October resulted in the highest content of N, P, K, protein and S as percentages, with the superiority of the early planting date (Oct., 15th) that raised the previous constituents to the utmost high values, especially in the second season comparing with the other planting dates. The opposite was the right concerning planting on the late planting (Nov., 15th), which resulted in the lowest values of all assayed chemical constituents.

Data also show that the foregoing components were higher in the tissue of the local cv. Giza 20 than either both of the imported cultivars used in this experiment (Leone and Totem) in the two seasons, especially the percent of sulphur which responsible of pungency in onion tissues. In this regards, **Leja et al. (2008)** stated

that pungency of onion results from the presence of the volatile sulphur compounds in leaf and bulb tissues.

The interactions of planting date and cultivar show many significant responses, the most pronouncing of them was cultivation of cv. Giza 20 on the second date (31st Oct.) which led to augmented the percentages of N, P, K and protein to the highest means over all other interactions in both seasons.

Table (4) Effect of planting dates, cultivars and their interactions on chemical composition of green onion (*Allium cepa L.*) plants during 2009/10 and 2010/11 seasons.

Treatments	2009/10					2010/11				
	N%	P%	K%	Protein %	S%	N%	P%	K%	Protein %	S%
Planting dates (P)										
(P_1) 15th Oct.	2.99a	0.282a	2.80a	17.12a	0.420a	2.78a	0.286a	2.82a	18.72a	0.477a
(P_2) 31st Oct.	2.89a	0.276a	2.75a	16.70a	0.373b	2.67a	0.265b	2.59b	18.06a	0.390b
(P_3) 15th Nov.	2.28b	0.205b	1.94b	12.98b	0.293c	2.08b	0.223c	1.87c	14.27b	0.346c
Cultivars (C)										
(C_1) Leone	2.32c	0.216b	2.09b	13.49b	0.243b	2.16b	0.218b	2.06c	14.51c	0.283b
(C_2) Totem	2.58b	0.234b	2.34b	14.64b	0.250b	2.38b	0.242b	2.21b	16.11b	0.301b
(C_3) Giza 20	3.27a	0.312a	3.06a	18.66a	0.393a	2.99a	0.313a	3.03a	20.43a	0.430a
Interaction (PxC)										
P_1xC_1	2.71c	0.261bc	2.44cd	15.43bcd	0.420b	2.47cd	0.250cde	2.51c	16.97cd	0.470ab
P_1xC_2	2.98c	0.275bc	2.81bc	16.55bc	0.380c	2.76bc	0.279bc	2.65c	18.62bc	0.463bc
P_1xC_3	3.29b	0.310b	3.15b	19.37ab	0.460a	3.11ab	0.330ab	3.31b	20.56ab	0.500a
P_2xC_1	2.30d	0.210de	2.11def	13.18cd	0.341d	2.11de	0.211de	1.95ef	14.43de	0.360ef
P_2xC_2	2.65c	0.240cd	2.30de	15.00cd	0.381c	2.40cd	0.239cde	2.22d	16.56cd	0.390de
P_2xC_3	3.71a	0.380a	3.83a	21.93a	0.400bc	3.51a	0.345a	3.61a	23.80a	0.420cd
P_3xC_1	1.94d	0.179e	1.71f	11.87d	0.271f	1.90e	0.195e	1.71f	12.12e	0.321f
P_3xC_2	2.10d	0.189e	1.90ef	12.37d	0.290ef	1.98e	0.210de	1.75f	13.12e	0.350ef
P_3xC_3	2.81c	0.246cd	2.20de	14.69cd	0.321de	2.35de	0.265cd	2.16de	17.56c	0.371e

- Means within a column having the same letters are not significantly different according to Duncan's Multiple Range test (DMRT) at 5% level.

This was true regarding sulphur content when the transplants of cv. Giza 20 was planted on the first date (15th Oct.).In this connection, the best chemical composition in the two foreign cvs. was recorded

when they were cultivated on the early planting date (15th Oct.). On the other hand, the lowest content of the measured constituents for the three used cultivars in both seasons were gained from planting on Nov., 15th (the late time).

The previous results may be discussed and interpreted as indicated before in case of the effects on vegetative growth. However, they are in harmony with those revealed by **Cheema *et al*. (2003), Al-Moshileh (2007)** and **Leja *et al*. (2008)** who mentioned that chemical composition of onions differs according to the environmental conditions, cultivar and agricultural practices.

From the aforementioned results, it could be concluded that cultivation of the foreign cvs. Leone and Totem on the first planting date (15th Oct.) gave the earliest yield, smallest bulb diameter, longest neck and highest content of Vit. C, and these are considered some preferred characters for exportation, whereas planting the local cv. Giza 20 on the mad planting date (31st Oct.) recorded the best growth, highest yield and better pungency, and these are the important characters needed for local marketing.

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تأثير مواعيد الزراعة المختلفة علي نمو، محصول وجودة بعض أصناف البصل الأخضر للتسويق المحلي والتصدير

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أجريت تجربتان حقليتان بالمزرعة التجريبية لمعهد بحوث البساتين (مزرعة قها) بمحافظة القليوبية خلال موسمي 2010/2009، 2011/2010 وذلك لاختبار استجابة ثلاث أصناف من البصل الأخضر (Allium cepa L.) ، أحدهما الصنف المحلي جيزة-20 (Giza 20) والآخران صنفين مستوردين هما: Leone ، Totem لثلاثة مواعيد زراعة مختلفة، هي: 15 أكتوبر (موعد مبكر) ، 31 أكتوبر (موعد متوسط) و 15 نوفمبر (موعد متأخر). أيضا تم دراسة تأثير التفاعلات بين مواعيد الزراعة والأصناف علي النمو، المحصول، الجودة والتركيب الكيميائي للأصناف الثلاثة موضع الدراسة.

ولقد أوضحت النتائج المتحصل عليها أن تأخير موعد الزراعة إلي 15 نوفمبر (الموعد الثالث) أدي إلي خفض النمو الخضري، المحصول والجودة للأصناف الثلاثة معنوياً، وكذلك محتواهم من النيتروجين، الفوسفور، البوتاسيوم، البروتين وفيتامين سي ، بينما أدت زراعة الصنف المحلي (جيزة-20) في 31 أكتوبر (الموعد الثاني) إلي زيادة كبيرة في النمو الخضري، المحصول، قطر البصلة، طول العنق، وكذلك محتوي الأنسجة من النيتروجين، الفوسفور، البوتاسيوم والبروتين، إلا أن محتوي هذه النبات من فيتامين سي والكبريت كان أقل مما هو في الصنفين المستوردين (Leone and Totem). علي الجانب الآخر، فقد كانت زراعة الصنفين المستوردين في الموعد المبكر (15 أكتوبر) أفضل من زراعتهما في الموعدين الآخرين، حيث أحدثت الزراعة في هذا الموعد تبكيراً ملحوظاً في موعد الحصاد وتحسناً كبيراً في بعض الصفات الهامة للتصدير (كصغر قطر البصلة، إطالة العنق وتحسين الجودة من خلال زيادة محتوي النباتات من فيتامين سي والكبريت). وبصفة عامة، فإن الصنف المحلي (جيزة -20) كان هو الأفضل للتسويق المحلي من حيث النمو، المحصول الكلي والحرافة عند زراعته في الموعد الثاني (31 أكتوبر)، بينما كانت الأصناف المستوردة هي الأفضل للتصدير من حيث تبكيرها في المحصول وتميزها ببعض صفات الجودة المطلوبة لهذا الغرض عند زراعتها مبكراً في الموعد الأول (15 أكتوبر).

وعليه، يمكن التوصية بزراعة صنف البصل الأخضر المحلي (جيزة – 20) في نهاية أكتوبر إذا كان الهدف هو التسويق المحلي، وزراعة الأصناف المستوردة (Leone and Totem) في منتصف أكتوبر إذا كان بهدف التصدير.