Assiut J. of Agric. Sci., 39 (5) (37-51)

YIELD AND YIELD COMPONENTS OF ONION GROWN BY SETS AS AFFECTED BY SOWING DATE AND SET SIZE UNDER ASSIUT CONDITIONS

H. A. Hussein; M. A. Farghali; A. K. Metwaly and G. Abd ElHaseib

Faculty of Agric., Hort. Dept., Assiut Univ., Assiut, Egypt.

Abstract: The present work was carried out on the Experimental Farm, Faculty of Agriculture, Assiut University, Assiut during 2005/2006 and 2006/2007 seasons to study the effects of planting date and dry set size on emergence percentage, final stand and yield and its components of onion cv. Giza 6 grown by sets. Planting on September 15th gave the highest emergence %, final plant stand and the highest of single center bulbs percentage while early planting at August 15th exhibited the least % of the two parameters. Planting at Aug.30th resulted in the highest single bulbs yield per feddan the lowest percentage of bolting and the highest weight of double bulbs per feddan. Planting on August 15th gave the highest percentage of double and bolter bulbs and weight of bolters per feddan. .Using of 3 cm dry sets resulted in the highest percentage of emergence and final stand, the highest bolting percentage, the highest bolters and single bulbs weight per feddan and the highest total yield per feddan. The interaction (set size x planting date) was significant in many of studied characters. Planting at Aug.30th using of 3 cm diameter sets resulted the highest total yield per feddan.

Key words: dry sets, emergence, bolting, planting date, doubling.

Introduction

Onion crop is amongst the main vegetable crops in Egypt. It is predominantly produced by trans-plants developed from seeds. The second method to produce early onion crop in Egypt is planting with sets which called Mekawar onion. According to the statistics of Ministry of Agriculture, the area cultivated with the Nili (Mekawar) onion was 9585 and 15346 feddan yielding 111741 and 180060 tons with an average of 11.658 and 12.125 ton/fed during 2006 and 2007 seasons, respectively. However in Assiut Governorate the respective value for Nili onion were 3596 and 4296 feddan yielding 45183 and 79834 tons with an average of 12.565 and 18.583 tons/feddan. Such method of planting is promising for the possibility of exportation and for the dehydration industry as well.

Received on: 30/11/2008 **Accepted for publication on**: 3/1/2009
Referees: Prof.Dr. Abo Maref .Al-Dmarani Prof.Dr. Mohamed M. Abd-Alla

Sprouting (emergence) of the seed bulbs or dry sets is greatly affected by the availability of low (cold) temperature required for such trait. This is directly related to the planting date and in turn the temperature prevailing. However, many workers Abdoh, (1983); Yamashita (1986) and Farrag *et al*., (1994) reported that storage temperature of seed set at 20^{o} C encouraged emergence and affected subsequent onion plant growth and development . Cold storage of sets promoted bulb formation and development. Therefore, under condition of the experimental period of the present investigation early in the season, the prevailing temperature was about 28-30°C then tended to decrease expecting to affect onion plant growth and development. On the other hand, size of the dry sets used was also reported to affect subsequent onion plant growth and development (Decoteau, 2000).

The aim of this work was to study the effects of planting date and dry set size on emergence percentage, final stand and yield and its components of onion cv. Giza 6 grown by sets.

Materials and methods

The present work was carried out on the clay soil of the Experimental Farm, Faculty of Agriculture, Assiut University, Assiut during 2005-2006 and 2006-2007 seasons.

Three planting dates i.e. August 15th, August 30 th and September 15 th in both seasons of study were tested. Sets used in the study were of three sizes (diameter) i.e., 1 cm, 2 cm and 3 cm.

The experiment was laid out in a split plot design with three replicates. The tested planting dates contributed as the main plot, while sizes of the sets were randomly distributed to the sub-plots. Experimental plots were consisted of 5 ridges each of 3 meters in length and 0.6 meter in width forming a plot area of 10 5 m^2 equal to 1/400 f..Planting was done on both sides of the ridges at 10 cm between onion sets .Normal cultural practices for the autumn crop onion were applied as usually done in commercial fields.

In order to produce the sets used in the present work, seeds of cv. Giza 6 onion were sown at a rate of 30 kg/fed. Sowing was done on both sides of NS ridges, 50 cm apart sowing date was 1st February in both seasons of the study. At harvesting time, sets were pulld from soil, cured and then stored at room conditions until used for planting time in the next season. At planting time sets were cleaned and dry sets of good shape free from disorder were classified (graded) into the three used sizes of 1 cm,2 cm and 3cm .

Data recorded

1- Emergence percentage:

Emerged plants were counted at 3 days intervals until no more emerged plants were detected (constant number of emergence) then, emergence (%)

was calculated as Emergence% = $\frac{\text{Total sets emerged}}{\text{Total sets planted}} \times 100$

2- Final stand: Number of surviving plants at time of harvest

3-Yield and its components:

Bulbs were harvested in around mid-February when about 30% of tops were falling down. After harvesting, onions were left in the field for about two weeks to cure. Roots and tops were trimmed and bulbs classified into single center bulbs, doubles and bolters. Then the following data were recorded:

1- Number, weight and percentage of single center bulbs: Only bulbs that show one growing point were counted.

2- Percentage and weight of bolting bulbs.

3- Number, weight and percentage of external double bulbs.

4- Total weight of bulb yield = weight of single bulbs +weight of double bulbs + weight of bolting bulbs.

5- Average bulb weight (g).

6-Average diameter of single bulb (cm) : mean of 10 bulbs from each replicate.

Statistical analysis

Data were subjected to statistical analysis according to Gomez and Gomez (1984) while data transformation was mentioned for percentage before statistical analysis. Significance among means were tested using the Dunkan's multiple range test.

Results and Discussion

I- Emergence percentage:

Data presented in Table 1 show that the total emergence % was significantly affected by planting date in both seasons of study. Planting on September 15th gave the highest emergence % while early planting at August 15th exhibited the least % of emergence. The larger dry sets (3 cm diameter) gave the highest values for emergence % (92.4%, 90.8% during 2005/2006 and 2006/2007 seasons) respectively while the 1 cm sets gave the lowest percentage of emergence. The planting date x set size interaction was significant in both seasons .The highest emergence % in both seasons was obtained by growing 3 cm diameter dry sets on September 15th.Our results are in agreed with Farag and Koriem (1990) who reported that delaying planting date up to September 16 significantly increased emergence percentage. El-Shaikh *et al.,(* 2002) found that planting date on the 1st October gave the best results for the percentage of dry sets emergence. Singh *et al*., (2002a) reported that planting of mother 2.1-2.5 cm sets in 21th August resulted in the highest recovery percentage. Hosseny *et al*., (2003) reported that the percentage of emergence was significantly increased with large onion sets (16-24 mm).

2-Final plant stand percentage:

Data presented in table 1 show that the percentage of final plants stand was significantly affected by planting date and set size in both seasons of .Planting on September 15th gave the highest % final plant stand as an average of all tested set sizes. The lowest in this respect was obtained with planting on August 15th as an average of all tested set sizes during both seasons. Within each of the tested planting dates using 3 cm dry sets gave the highest % of final plant stand in both seasons while using 1 cm dry sets gave the lowest. El-Murabaa (1967)and Farrag (1994) concluded that early planting (August 15th) showed lower plant stand than did later plantings.Farghali *et al*. ,(1991) reported that planting of dry onion sets in early as August 15th gave the lowest stand %. El-Shaikh *et al*. 2002 found that planting on the1st of October gave the best results for percentage of missing plants. Singh et al.**,(** 2002a) reported that planting of 2.1 – 2.5 cm dry sets on 21th of August and 1st and 11th September produced significantly higher recovery percentage. Hosseny *et al*., (2003) reported that missing plants increased by increasing of set size.

3 - Yield and its components

3.1- Single bulbs percentage

Table 2 shows the percentage of single bulbs from the total bulbs number per plot. Planting date significantly affected the percentage of single bulbs in both seasons. Planting on September 15th gave the highest percentage of single bulbs. Although differences among the three set diameters tested did not reach the level of significance in both seasons. There was a significant effect of planting date x set diameter interaction .The highest values were found with 1 cm set diameter at 15th September while 3 cm diameter gave the highest percentage when planted on 30th August in the two seasons. Shalaby et al.,(1991a) found that percentage of single center bulb was significantly increased when planting date was October 1st.

3.2-Bolting bulbs percentage

Data of this character are presented in Table 2. Planting on Aug.30th resulted in the lowest percentage of bolting. Using 3 cm dry set gave the highest value. The interaction between planting date and set size significantly affected the percentage of bolting bulbs in 2006-2007 season, the differences among interaction combinations were insignificant while during 2005/2006 season. One cm sets gave higher percentage of bolting when were planted on Aug.15th (16.2 and 18.5% in 2006 and 2007 seasons respectively while when were planted at Sep.15th gave only 12 and 12.5% bolting. Jasa 1967 reported that sets up to 15 mm in diameter planted in the autumn produced 6.41-8.05% bolters compared with 7.22 -9.39 % when planted in the spring.Shalaby *et al*.,(1991b)and Farrag *et al*., (1994) found

that the larger dry sets used, the higher the% of bolters.Khokhar *et al.*,(2001**)** found that bulbs developing from large sets (21-25 mm) showed significantly higher percentage of bolting (40%) than medium (29.4%) or small (20.8%)sets. Singh *et.al*,. (2002b) reported that the increase in set size resulted in the increase in bolting percentage.

3.3-External double bulbs percentage.

Data presented in Table 2 show that number % of external double bulbs was significantly affected by planting dates in both seasons of study. Planting on August 15th gave the highest % of external double bulbs as an average of all tested set sizes. While planting on Sep.15th gave the lowest percentage of external double bulbs. The Difference among the three set diameters tested did not reach the level of significance in both seasons. Significant effect of planting date x set diameter was found on % of external double bulbs. Planting of 1 cm set diameter at Aug.15th resulted in the highest number of bolting plants while the same size gave the lowest percentage of bolting when planted on Sep.15th in the two seasons of study**.** Awad (1960) showed that early planting(August 15th) using smaller set size resulted in high percentage of external doubles**.** Rabinowitch (1979) reported that onion bulbs obtained from the larger sets were more prone to doubling than bulbs from smaller sets. Yamashita *et al.,(* 1986) found that sets diameter of >3.0 cm produced many split or double onions.

3.4-Bulb diameter (cm):

Data presented in Table 3 show that bulb diameter was insignificantly affected by the planting date or the set size in both seasons. The interaction between set size and planting date was significant in its effect on bulb diameter in the first season of study. The greatest values for bulb diameter were obtained when planting was done on August 30th using sets of 1 cm in diameter, while the smallest were obtained by planting on August 15th using sets of 3 cm in diameter. On the other hand, the second season showed no significant differences among the treatment combination Singh et.al.,(2002b) reported that early planting (21st of August) resulted in the greatest bulb diameter. Singh and Singh(2003) reported that the largest sets resulted in the greatest bulb diameter (5.05 and 5.28 cm) **.**Sharma *et al*., (2004) reported that in Kharif Onion planting the date August 15th recorded the greatest bulb diameter.

3.5-Average single center bulb weight (g)

Data presented in Table 3 show that during 2006-2007 season the average weight of single center bulbs was significantly affected by planting date. The least in this respect was planting on August 15th. The same trend was found during 2005-2006 season although differences among planting dates did not reach the level

of significance. However, during both seasons of study planting on August 30th gave the highest average single center bulb weight. During both seasons of study the size of seed dry sets used did not significantly affect average single center bulb weight The interaction between planting date and set size showed significantly effect .The highest average single center bulb weight was obtained by using 1 cm diameter planted on August 30th in the two seasons. Dumitrescu and Radoi (1984) found that the highest yield (42 t/ha) of good quality bulbs (108 g) was obtained by planting sets 14-21 mm in diameter. Yamashita *et al.*,(1986) found that onion sets of >2.5 cm in diameter produced larger bulbs than smaller sets. Sharma *et al.*,(2004) found that in Kharif Onion planting on August 15th recorded the greatest bulb weight.

3.6-Weight of single bulbs (ton/fed.)

Data presented in Table 4 show that average single bulb yield (ton/fed.) was significantly affected by planting date in both seasons of study. Planting on August 30th gave the highest single bulbs yield in the first season while planting at Sep.15th gave the highest in the second season. The lowest in this respect was on August 15th planting in the two seasons. Using 3 cm in diameter sets exhibited the highest values for average bulb yield.The interaction between planting date x set size was significant in the two seasons of study. Mursy (1983) reported that single bulb yield was significantly increased with larger size of sets.

3.7- Weight of bolting bulb ton/fed.

Data presented in Table 4 show that the earliest planting August 15th produced the highest weight of bolting bulbs as compared the other tested planting dates. Using sets of 3 cm resulted in higher weight of bolting bulbs in the two seasons. The interaction between planting date x set size was significant in the two seasons of study. Sets of 1 cm diameter gave the lowest bolters weight when planted on Sep.15th in the two seasons but when were planted on the other dates gave higher weights. Natlop and El-Haber (1983) tested sets of 0.8-1.1 to 1.9-2.2 mm in diameter and reported that the percentage of bolting bulbs was significantly increased with larger sets.

3.8 Weight of double bulbs (ton/fed.)

Data presented in Table 4 show that the average weight of double bulbs per fed. was affected by planting date. Planting on August 30th gave the highest value for weight of double bulbs. The least on this respect was planting on September 15th. These results reveal that growing onion by sets during September is better to reduce weight of double bulbs. However, during both seasons of study, the size of dry sets used did not significantly affect weight of double bulbs, although using 2 cm gave the heaviest but insignificant weight of

double bulb. On the other hand, the interaction between planting date and set size was significant in its effect on weight of double bulbs. Sets of 1 cm gave higher values on Aug. 15th than these of Sep. 15th planting. Natlop and El-Haber (1983) reported that sets of 1.9-2.2 mm in diameter resulted in higher records of double bulbs. Yamashita *et al.*, (1986) reported that sets diameter of >3.0 cm produced many split or double onion.

3.9-Total yield (ton/fed.)

Data presented in Table 5 show that the total yield (ton/fed) was significantly affected by planting date and set size in both seasons. Planting on August 30th gave the highest total yield/fed. as an average of all tested set sizes. The lowest in this respect was planting on August 15th. Using 3 cm dry sets gave the highest values for total bulb yield/fed. On the other hand, there was significant effect for planting date x set size interaction on the total yield ton/fed. The highest total bulb yield was obtained by using 3 cm sets planted on September 15th in the two seasons.

Jasa (1967) reported that larger sets u(p to 15 mm in diameter) were the most suitable for autumn planting. Suciu *et al.*, (1979a) found that sets of 14-22 mm in diameter gave the highest yield (19.2-29.7 t/ha).Suciu *et al.* 1979b found that the highest economic returns were obtained from plots planted with the largest sets, the yield was over 30 t/ha. Mursy (1983) reported that the size of sets had no marked effect on total bulbs yield. Natlop and El-Haber (1983) tested sets 0.8-1.1 to 1.9-2.2 mm in diameter and reported that the yield rase with small sets. Dumitrescu and Radoi (1984) reported that highest yield (42 t/ha) was obtained by planting sets 14-21 mm in diameter.Yamashita *et al.* 1986 found that onion sets diameter of >2.5 cm produced higher yields than smaller sets .Madisa (1994) in a trail comparing sizes of sets for planting, showed that yields were the highest with 0.75-1.0 sets (45.4 t/ha) while larger 1-2.5 cm and smaller 0.5-0.76 cm sets. produced yields of 37.6 and 30.6 t/ha, respectively. Khokhar *et al.*, (2001) reported that medium 16-20 sets and large 21-25 mm in diameter produced significantly higher bulb yield than small sets. Singh and Singh (2001) reported that in kharif onion cv. N. 53, in Agra, Uttar Pradesh, India the combination of bigger set size (2.1-2.5 cm) and planting on 21st August (D1 T1) produced the maximum yield (62.94-68.48 q/ha) of (A) grade bulbs. Singh *et al*., (2002a) found that sets measuring 2.1-2.5 cm produced significantly higher yield of A and B grade bulbs. Singh and Singh (2002) reported a cumulative effect of size and date of planting of sets .The early date of planting (21st August) of large size sets (2.1-2.5cm) resulted in the maximum marketable bulb yield, net income, cost: benefit ratio and cost of cultivation compared with the September planting. Hosseny *et al*., (2003) found that total onion yield was significantly

increased with large onion sets (16-24 mm). Singh and Singh. 2003 found that the largest sets 2.1-2.5 cm resulted in the greatest gross bulb yield (349.97 and 371.5 quintal/ha), marketable bulb yield (336.78 and 364.56 quintal/ha), recovery of grade (A) bulbs (10.14 and 11.47%) and recovery of grade (B) bulbs (86.14 and 88.33% for two consecutive seasons, respectively .Sharma *et al*. 2004found that in Kharif Onion production planting on August 15th recorded the highest average bulb yield. Further delay in planting drastically reduced the bulb yield. .

Table (5): Total yield/fed. of Giza 6 cv. grown on different dates using 3 set sizes during 2006 and 2007 seasons.

Year / Date	Set size	2005-2006				2006-2007			
		Aug.,15th	Aug.,30th	Sep.,15th	Mean	Aug.,15th	Aug.,30th	Aug.,30th	Mean
Total yield	1cm	8.252 ab	10.080 b	7.716 d	8.69 B	8.732 d	10.336 b	8.452 d	9.17
	2cm	9.252 bc	12.264 a	10.332b	10.62A	9.896 bc	12.760 a	10.732 b	11.12A
	3cm	7.388 d	12.220 a	12.560a	10.72 A	8.944 cd	12.560 a	13.220 a	11.57A
	mean	8.037 C	11.520 A	10.202B		9.024 C	11.885 A	10.802B	

Means of each trait within each season for planting dates and seed set size or their interactions followed by the same letter or letters are not significantly different at the 0.05 level**.**

References

Abdoh, A.E. 1983. Studies on production on onion (*Allium cepa* L.) from dry sets. Ph.D. Thesis, Fac. Agric., Univ. Assiut, Egypt.

Awad, 1960. Studies on some morphological characters of the onion plant and methods of bulb production. M.Sc. Thesis, Cairo Univ., Fac. of Agric.

Decoteau, D.R. 2000 Vegetable crops.Prentice Hall Inc.Upper Saddle River, New Jersey, pp. 464.

Dumitrescu, M. and V. Radoi. 1984**.** The influence of planting date, set quality and planting density on onion yield quality and quantity. Anale Institutalde Cercetari Pentru Legumiculture si floriculture, Vidra 1984, 7, 291-298. [C.F. Hort. Abst. 55, 4466].

El-Murabaa, A.I. 1967. Production of "Mokawar" onions as affected by planting date, size and cutting of sets. Alex. J. Agric. Res. 15: 405-413.

El-Shaikh, K.A.A.; M.H. Hosseny; A.A. Gamie and K.G. Abd El-Latif. 2002. Effect of planting dates and ridges orientation on the emergence and yield of dry onion

sets in the field. Mansoura Univ. J. of Agric. Sci./, 27 (11): 7573-7581.

Farag, I.A. and S.O. Koriem. 1990. Effect of nitrogen fertilizer, spacing and size of set on growth yield and quality of onion bulbs. Assiut J. of Agric. Sci., 21 (1): 267-268.

Farghali, M.A.; M.A. Farrag and H.A. Hussein. 1991.Effect of planting date and seed cooling on onion grown by sets. II- Harvesting time and yield. Minia J. Agric. Res. & Dev., Vol.16, No. 3.

Farrag, M.A.; H.A. Hussein and M.A. Farghali. 1994. Effect of planting date and seed cooling on onion grown by set. I- Emergence and morphological characters. Minia J. Agric. Res. & Dev. 16 (3): 830-849.

Gomez, K.A. and A.A. Gomez. 1984. Statistical Procedures for Agricultural Research 2nd Ed. Wily, New York.

Hosseny, H.M.; K.A.A. El-Shaikh and A.A. Gamie. 2003. Effect of set size and planting depth on the emergence and yield of dry onion sets. Zagazig J. Agric. Res. 30 (1): 71-81.

Jasa, B. 1967. Results of comparative traits with autumn and spring planted onion sets. Rost Vyroba, 13: 47-54. [C.F. Hort. Abst. 38, 7874].

Khokhar, K.M.; S.I. Hussain; Tariq Mahmood; Hidayatullah; M.H. Bhatti. 2001. Effect of set size on bulb yield, maturity and bolting in local and exotic cultivars of onion during autumn season. Sarhad Journal of Agriculture (2001) 17 (3): 355-358 Peshawar. Pakistan. [C.F. Hort. Abst. 72, 6447].

Madisa. 1994. The effect of planting date, set size and spacing on the yield of onion in Botswana. Acta Hort. No. 358: 353-357. ISPN 90-6605-136-1. [C.F. Hort. Abst. 66, 5818].

Mursy, M.M. 1983. Ph.D. fac. Agric., Assiut Univ.

Natlop, N.A. and M.I. El-Haber. 1983. The effect of set sizes and planting dates on bolting and yield of onion c.v Baasheka. Iraqi J. Agric. Sciences ZANCO, 1 (1): 51-62. Mosul University, Mosul, Iraq.

Rabinowitch, H.D. 1979. Doubling of onion bulbs as affected by size and planting date of sets. Ann. Appl. Biol. 93: 63-66.

Shalaby, G.I.; A.I. El-Muraba; N.M. Kandeel and A.A. Gamie. 1991a. Effect of some cultural practices on onion bulbs production grown by sets. II- Plant density and set size. Assiut J. of Agric. Sci., 22 (5): 83-101.

Shalaby, G.I.; A.I. El-Muraba; N.M. Kandeel and A.A. Gamie. 1991b. Effect of some cultural practices

on onion bulbs production grown by sets. III- Planting dates, direction of ridges and cultivars. Assiut J. of Agric. Sci., 22 (5): 103-121.

Sharma, P.K.; G.L. Yadav and Sudesh Kumar. 2004. Effect of methods and dates of planting of onion sets on the bulb, yield of kharif onion. National Horticultural Research and Development Foundation Nashik, India, 23 (4): 1-3.

Singh, A.K. and V. Singh 2001. Different grade bulb production and economics of Kharif onion as influenced by set size, spacing and planting time. New Botanist. Today and Tomorrow's Printers & Publishers, New Delhi, India, 28: 1/4, 195-200. (Ovid Search results).

Singh, A.K. and V. Singh 2002. Effect of cultural practices on marketable bulb yield and economics of Kharif onion (*Allium cepa* L.). New Botanist. Today and Tomorrow's Printers & Publishers, New Delhi, India, 13: 1/2, 27-31. (Ovid Search results)

Singh, A.K. and V. Singh 2003. Influence of set size and time of planting on the growth, yield grade of kharif onion bulbs. Annals of Agricultural Research Indian Society of Agricultural Science, New Delhi, India, 2002, 23 (4): 654-658.

Singh, A.K.; V. Singh and K. Nainwal 2002a. Effect of size, distance and date of planting of mother sets on the quality of Kharif onion (*Allium cepa* L.). Progressive Horticulture, Horticultural Experiments and Training Center, Chaubattia, India, 34: 1, 109-112. (Ovid Search results).

Singh, A.K.; V. Singh and K. Nainwal 2002b. Production of marketable and un-marketable grades bulb of Kharif onion as affected by cultural practices. Progressive Horticulture, Horticultural Experiments and Training Center, Chaubattia, India, 34: 2, 254-257. (Ovid Search results).

Suciu, Z.; A. Costin; E. Diaconu and T. Nan. 1979b. Studies on the effect of bulb size, planting depth and density on the production of bunching onions. Timisoava, Agronomic 16, 211-216. [C.F. Hort. Abst. 51, 8513].

Suciu, Z.; E. Bolica and M. Lonica. 1979a. Contribution to cultivation of onions for bulbs using sets. Timisoava Agronomic 16, 223-227. [C.F. Hort. Abst. 51, 8514].

Yamashita, F.; K. Moriwaka and N. Takase 1986. Studies on the culture of onion sets. 1- Effect of onion set size temperature treatment during storage period and planting date. Research Bulletin of Aichi-Ken Agri. Rese Center, Japan No. 18, 128-135. [C.F. Hort. Abst. 38, 338

تأثير ميعاد الزراعة وحجم البصيلات على المحصول ومكوناته فى البصل المنزرع بالبصيلات تحت ظروف أسيوط

حسن أحمد حسين – محمد علي فرغلي – أيمن قطب متولي – جمال عبد الحسيب

كلية الزراعة - جامعة أسيوط - قسم البساتين (خضر) - مصر .

أجرى هذا البحث بمزرعة كلية الزراعة جامعة أسيوط خلال الموسمين (2006/2005)، (2007/2006) بهدف دراسة تأثير مواعيد الزراعة و حجم البصيلات علي نسبة الانبات و النباتات المتبقية حتي اخر الموسم و كذلك المحصول و مكوناته .وقد تمت الزراعة فى ثلاث مواعيد هى 15 أغسطس ، 30 أغسطس ، 15 سبتمبر كما تمت الزراعة باستخدام ثلاث احجام من البصيلات هي قطر 1 سم ، 2 سم ، 3 سم على مسافة 10 سم بين النباتات . وكان الصنف المستخدم هو الصنف جيزه 6 .

أظهرت النتائج أن الزراعة في 15 سبتمبر(الميعاد المتأخر) ادت الي الحصول علي أعلي نسبة انبات ونباتات متبقية ياحقل وأيضا أعلي نسبة أبصال مفردة في حين أن الزراعة في 15 أغسطس(الميعاد المبكر) نتج عنه ادني القيم من القياسات السابق ذكرها. أدت الزراعة في 30 أغسطس(الميعاد المتوسط) الي الحصول علي أعلي وزن أبصال مفردة للغدان و أقل نسبة من الابصال المزهرة وأعلي وزن للابصال المزدوجة للفدان . اظهرت الزراعة في 15 أغسطس أعلي نسبة من الابصال المزهرة و المزدوجة وكذلك وزن الابصال المزهرة للفدان.

تفوقت البصيلات المستخدمة في الزراعة من حجم 3 سم (الحجم الكبير) في العديد من الصفات المدروسة حيث نتج عنها أعلي نسبة انبات وأعلي نسبة نباتاتمتبقية بالحقل واعلي وزن للابصال المفردة للفدان وأعلي محصول كلي وزنا للفدان الا انها انتجت أعلي القيم من حيث نسبة الابصال المزهرة في القطعة التجريبية و كذلك وزن الايصال المزهرة بالطن للفدان.

أظهر التفاعل بين حجم البصيلة المستخدمة في الزراعة و ميعاد زراعتها تأثيرا معنويا في الكثير من الصفات المدروسة فالبرغم من أن حجم 3 سم للبصيلة المستخدمة كان أفضل الأحجام المستخدمة الا أنها انتجت افضل النتائج عندما زرعت في ميعاد 30 أغسطس.