EFFECT OF PLANTING DATES AND RIDGES ORIENTATION ON THE EMERGENCE AND YIELD OF DRY ONION SETS IN THE FIELD

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ABSTRACT

This investigation was carried out in Shandweel Agriculture Research Station during 2000/2001 and 2001/2002 seasons. Onion sets of cultivar Giza 6 Mohassan were used in this work to study the effect of planting dates and orientation of ridges on the emergence of dry onion sets in the field. The obtained data obviously indicated that the last planting date(1 October) gave the best results for the percentage of emergence , daily of emergence rate and percentage of missing plants in both seasons. Also, the orientation of ridges significantly affected all studied characters except the total bulb yield in both seasons. The best results achieved by the orientation of ridges from east to west(south side).Moreover, the interaction between the two studied factors take the same general trend in both seasons.

INTRODUCTION

Onion (***Allium cepa L***.) one of the most important crops in Egypt. Many factors affect growth of onion plants and subsequently on yield and quality. One of these factors is planting dates. Also, row orientation has effect on plants due to that the difference in temperature and shading which plants exposed . Many investigators showed that planting dates and row orientation had significant effect on plants such as

Robinson(1974) who studied the effect of row direction on Sunflower planted in east-west and north-south rows and found that row direction did not influence achene yield, weight but plants lodged significantly more in E-W than N-S row. **Philbrook and Oplinger(1989)**tested soybean plants planted as plots in north-south and east-west orientation. E-W row orientation had a lodging rating 0.4 units greater than N-S orientation but no yield difference. **Park and Lee(1990)**planted garlic at various dates between 2 Sep. and 1Feb. He found that the emergence rate did not differ with planting date. **Shalaby *et al.*(1991)**found that in onion bulbs production grown by sets, average weight of bulb and culls yield were significantly decreased using Shandweel cv., while direction of ridges had no significant effect. However,

exportable and marketable yield were significantly increased by S-N ridge. **Farag *et al.*(1994)**Found that garlic planted in the northern side of ridge exhibited higher values for bulb weight and total yield , while it was lower in respect of dry matter of the cloves as compared to the southern one. **Rsdkiewicz and Tendej(1994)** found that the mid April sowing produced 50% more planted divisions than the mid May sowing in chive clusters. The seeds sown in April was 30.8% higher than that from the May sowing. **Farghali(1995)** studied the effect of three planting dates(1 Sep. , 1 Oct. or 1 Nov.) on onion cultivar Giza6 for two seasons. The results showed that, planting on Oct. or Nov. significantly increased the number of heads per plant, the percentage of flowering plants, flower stalk length and number of capsules per head as compared with planting on Sep. Planting on Nov. gave the highest seed yield and 1000 seed weight. **Gazaly (1995)**studied the effect of row orientation and genotype on growth and yield of cucumber. The results indicated that, N-S ridge was better than E-W ridge in most of studied characters in summer season . Moreover , the eastern side in the N-S ridge was the best. However, in the fall season E-W ridges gave the highest total yield, fruit weight and length of the main stem with the southern side is the best. **Ali *et al.*(1996)** six planting dates(7 Oct. to 21 Dec. at 15 day intervals) and 4 planting distances(20,30,40 or 50cm between rows) on onion cultivar Texas Early Grano. The highest yield was obtained with planting on 22 Oct. with 20cm between rows. **Ajmal *et al.*(1997)** studied the effect of sowing date on two garlic cultivars were sown on 6 dates from 19 Sep. to 24 Oct. at weekly intervals. Yields were highest from sowing in the last week of Sep. or first fortnight of Oct. **Trevisan *et al.*(1997)** studied the effect of planting date on marketable yield and quality of bulbs for 10 garlic cultivars. The results indicated that in all cultivars, marketable yields and percentage of high quality bulbs were greatest with bulbs planted on 18 May. **Ha injong e*t al.*(1998)** investigate the effect of 3 sowing dates for transparent mulsh cultivation, 4 sowing dates for non-mulsh cultivation on the of marketable yield. 5 September was the best time for sowing seeds, and the best time for transplanting was 20-30 October. **Kumar *et al.*(1998)**studied three transplanting dates(25 Des. , 5 and 15 Jan.) on onion. 15 January gave the best survival rate, most

vigorous growth, earliest maturing and heaviest bulbs. **Kanwar *et al.*(2000)**studied the response of 8 planting dates(from 1 Sep. to mid Des. At fortnightly intervals) and 3 levels of plant density on onion seed yield and quality. Planting date on 1 Oct. was later than the first fortnight of Dec. to flower and mature. The highest number of umbels /plant were produced on onion sown from Oct. to mid Nov. The 1 Nov. sowing date gave the highest seed yield.

The percentage of emergence is a common problem in production of onion sets related to degree of temperature. Hence this investigation was carried out as attempt to contribute in solving this important problem through evaluate the effect of planting date and direction of ridges on the emergence of onion sets during 2000/2001 and 2001/2002 seasons.

MATERIALS AND METHODS

The present study was carried out at Shandweel Research Station to study the effect of planting dates and orientation of ridges on the emergence of dry onion sets during seasons 2000/2001 and 2001/2002 seasons. The soil is loam clay in texture as shown in Table(1).

Table (1) Chemical and physical properties for experimental soil sites

Seasons	Soil analysis					
	Texture	PH	O.M	Nutrient status in soil(ppm)		
				N	P	K
2000/2001	Clay Loam	8.00	1.80	38	17.0	364
2001/2002	Clay Loam	7.85	1.59	33	11.5	248

The set-size 8-16 mm in diameter of Giza 6 Mohassan cultivar was used in this investigation. The experiment included 6 treatments which were the combination of three planting dates ,i.e, 1 Ogust, 1 September and 1 October and two direction of ridges i.e., south-north and east-west. These treatments were randomized in split plot design with four replicates. The main plots contained the planting dates while sub- plot contained the direction of ridges. The plot size was 2 x 3 m(1/700 fed.) each

plot consisted of 4 ridges 50cm apart and 3 m long and planted in both sides of ridge planting was at 7cm apart. Recommended cultural practices and weed control were followed for the commercial of production onion grow from sets. Results were recorded on side of ridge for the following characters:

1-Percentage of emergence was calculated by following equation (Bortlett,1937).

$$\frac{\text{Number of emergence sets}}{\text{Total number of planting sets}} \times 100$$

2-daily of sprouting rate

3-Percentage of missing plants was calculated by the following eqution

$$\frac{\text{Number of missing plants}}{\text{Total number of planting sets}} \times 100$$

4-Total bulb yield(ton/fed.)

Data were subjected to statistical analysis and means were compared using the L.S.D method according to **Steel and torri(1982).**

RESULTS AND DISSCTION

1-Percentage of emergence

Data in Table (2) demonstrated the percentage of emergence as affected by planting dates, orientation of ridges and their interaction. Data revealed that there were significant increment for this trait from the first planting date i.e., (1 August) up to the last planting date ,i.e., (1 October). In general the highest values were (94.73 and 94.97%) obtained from the last planting date ,i.e.,(1 October) in the first and second seasons ,respectively. The results in the above mentioned Table also showed that the orientation of ridges significantly affected this character in both seasons. However, the highest percentage of emergence were (93.00 and 92.96%) resulted from the orientation of ridges from east to west (south side) compared to the lowest values (78.76 and 77.15%) produced by the same orientation (north side) in the two experimental seasons.

It's clear from the results illustrated in Table (2) that the combination between the two studied factors significantly affected the percentage of emergence in the two experimental seasons. However ,the highest values of this trait were (98.80

and 99.37%) obtained from the interaction between the last planting date (1 October) and the orientation of ridges from east to west (south side) compared to the lowest results (67.50 and 61.03%) resulted from the first planting date (1 August) and the same orientation of ridges but from the north side. These results are held good in the first and second season, respectively.

Table (2): Effect of planting dates and ridges orientation on percentage of emergence in the 2000/2001 and 2001/2002 seasons.

Planting date		Season 2000/2001				Season 2001/2002			
		1 Oug.	1 Sep.	1 Oct.	Mean	1 Oug.	1 Sep.	1 Oct.	Mean
Orientation ridges	Side								
South-North	South	72.3	85.2	92.5	83.40	74.1	87.4	90.4	83.99
	North	78.2	90.6	97.1	88.69	79.7	93.5	98.4	90.55
East-West	East	83.3	96.8	98.8	93.00	80.7	98.8	99.3	92.96
	West	67.5	78.3	90.4	78.76	61.0	78.7	91.6	77.15
	Mean	75.3	87.7	94.7		73.9	89.6	94.9	

L.S.D. at 0.05

Planting dates 9.66 3.08

Orientation 5.49 5.03

Dates x orientation 7.50 6.84

2-Daily of emergence rate:-

Data presented in Tables (3and 4) illustrated the effect of planting date, orientation of ridges and the interaction between them on daily emergence rate. The results clearly indicated that the two studied factors affected this trait in both seasons. Where the values of this trait were increased gradually in the first planting date with the all studied treatments. Moreover, the highest value of daily emergence rate obtained after(9days) was from the last planting date ,i.e.(1 October) and the orientation of rides from east to west (south side). These results held good in the two experimental seasons.

3-Percentage of missing plants:-

Data dealing with the effect of planting date, the orientation of ridges and their interaction on the percentage of missing plants in the 2000/2001 and 2001/2002 seasons are shown in Table (5). Planting date significantly affected this character in both seasons. The percentage of missing plants gradually decreased from the first planting date ,i.e. (1Ougust) to the last planting date ,i.e.(1 October).While, the lowest values (best results) were (4.92 and 4.75%) resulted from the last planting date in the first and second season ,respectively. The increment induced in the percentage of emergence previously discussed surely reflected on this character. The orientation of ridges significantly affected the percentage of missing plants in the two experimental seasons. The lowest percentage of missing plants (best results) were (7.55 and 6.77%) achieved by the orientation of ridges from east to west (south side), on the other hand the highest values of this trait(worse results) were

(21.61 and 22.67%) produced by same orientation of ridges but from the north side. Considerable and significant influence was detected owing to the studied combination between the two studied factors in the two experimental seasons. The lowest values (best results)were (1.00 and 0.33%) produced when onion sets planted in last date (1 October) and the orientation of ridges from east to west (south side). On the contrary the highest results (worse values) were (43.50 and 39.03%) resulted from the same interaction between the two studied factors but from the north side. These results are true in the first and second seasons, respectively. These results can be explained in the light of the positive effect of some interaction on the percentage of emergence previously mentioned.

Table (5): Effect of planting dates and ridges orientation on percentage of missing plants in the 2000/2001 and 2001/2002 seasons .

Planting date		Season 2000/2001				Season 2001/2002			
		1 Oug.	1 Sep.	1 Oct.	Mean	1 Oug.	1 Sep.	1 Oct.	Mean
Orientation ridges	Side								
South-North	South	29.6	14.3	7.00	16.99	27.6	12.3	9.33	16.44
	North	23.6	8.00	2.33	11.33	22.0	6.00	1.33	9.77
East-West	East	18.3	3.33	1.00	7.55	19.0	1.00	0.33	6.77
	West	34.5	21.0	9.33	21.61	39.0	21.0	8.00	22.67
	Mean	26.5	11.6	4.92		26.9	10.0	4.75	

L.S.D. at 0.05

Planting dates 9.36 3.60

Orientation 6.55 4.37

Dates x orientation 8.95 5.98

4-Total bulb yield

Data presented in Table(6) obviously cleared that the planting date affected the above mentioned character but the differences were more announced and statistically approved in the first season only. However, the highest total bulb yield resulted from the second planting date, i.e. (1 September). This results held true during the two experimental seasons. It is evident from the obtained data presented in Table(6) that the orientation of ridges increased total bulb yield but this increment failed to be a significant from the statistical point of view in both experimental seasons. Regarding the effect of interaction between the two studied factors on this character, data in

the same Table showed that the studied interaction failed to show significant effect in the two studied seasons. Moreover, the combination between the second planting date ,i.e., (1 September) and the orientation of ridges from south to north (west side) resulted in higher total bulb yield in both experimental seasons.

Table (6): Effect of planting dates and ridges orientation on total bulb yield (ton/fed.) in the 2000/2001 and 2001/2002 seasons .

Planting date		Season 2000/2001				Season 2001/2002			
		1 Oug.	1 Sep.	1 Oct.	Mean	1 Oug.	1 Sep.	1 Oct.	Mean
Orientation ridges	Side								
South-North	South	5.10	7.20	7.00	6.43	5.40	7.00	8.05	6.82
	North	6.15	10.0	9.10	8.43	7.00	10.2	10.00	9.09
East-West	East	5.70	9.05	7.24	7.33	9.40	10.0	8.00	9.13
	West	2.00	4.05	6.00	4.02	6.03	8.70	6.91	7.21
	Mean	4.74	7.58	7.34		6.96	8.99	8.24	

L.S.D. at 0.05

Planting dates	**2.15**	**N.S**
Orientation	**N.S**	**N.S**
Dates x orientation	**N.S**	**N.S**

In this investigationit is clear that the planting date was one of the main factors affected the yield and quality of plants, therefor we must detect the best time to sow for the suitable propose and each day later could affect negatively growth of plants. In this investigation the date of 1 Octosber was the best compare to the other dates. These results were in agreement with those obtained by Ali *et al* .1996, Trevisan *et al,* 1997, Ha injong e*t al. ,*1998, Kumar *et al.,*1998 and Kanwar *et al.,* 2000 they found, influence of planting date on the growth and yield of plants. Concerning, the effect both ridges orientation on onion plants, the influence of ridges orientation or the studied characters may be due to that the difference in temperature and shading which plants exposed in the studied ridges orientations. The obtained results agree with the finding of Robinson, 1974 , Philbrook and Oplinger ,1989 , Shalaby *et al.,* 1991 , Farag *et al.,* 1994 ,Gazaly ,1995, they reported that the row orientation could be affect the yield and quality of plants.

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تأثير ميعاد الزراعة و اتجاه التخطيط على انبات البصيلات الجافه والمحصول فى البصل

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اجرى هذا البحث فى محطة البحوث الزراعية بشندويل خلال موسمى الزراعة 2001/2000 و 2002/2001.وتمت زراعة البصيلات من الصنف جيزه 6محسن فى هذة الدراسة وذلك لمعرفة تأثير كلا من ميعاد الزراعة واتجاة التخطيط على انبات البصيلات فى الحقل. وأوضحت النتائج ان ميعاد الزراعة فى 1 اكتوبر اعطى احسن النتائج لنسبة انبات البصيلات وكذلك فى نسبة الانبات اليومى و نسبة النباتات الغائبة فى كلا الموسمين. وايضا اظهرت النتائج ان اتجاه التخطيط اثر معنويا فى كل الصفات المدروسة ما عدا صفة المحصول الكلى للفدان فى كلا موسمي الزراعة.و قد ظهر ان افضل النتائج كان فى حالة التخطيط من الشرق الى الغرب(على الجانب الجنوبى) كما ان التفاعل بين عاملى الدراسة قد اخذ نفس الاتجاه فى كلا موسمى الزراعة.