

Effect of various planting materials and different date of planting on growth and bolting of *Kharif* onion (*Allium cepa* L.) cv. AGRIFOUND DARK RED

D.D. NAYEE*, L.R. VERMA AND H.H. SITAPARA

Department of Horticulture, C.P. College of Agriculture, Sardarkrushinagar Dantiwada Agricultural University, SARDARKRUSHINAGAR (GUJARAT) INDIA

ABSTRACT

A field experiment was conducted on sandy loam soil of Horticulture Instructional Farm, C.P. College of Agriculture, S.D. Agricultural University, Sardarkrushinagar during the year 2005 and 2006. The experiment was conducted on "Effect of various planting materials and different date of planting on growth and bolting of *Kharif* onion (*Allium cepa* L.) cv. AGRIFOUND DARK RED." Twelve treatments comprising of four planting materials viz., seedling, 1.5 – 2.0 cm, 2.0 – 2.5 cm and 2.5 – 3.0 cm size onion sets and three dates of planting viz., 10th, 20th and 30th July were tested in Factorial Randomized Block Design (FRBD) with four replications. On the basis of pooled data, relationship of different growth characters with various planting materials and different date of planting revealed that the highest plant population was found in D_3P_4 , while maximum plant height and neck thickness of plant was recorded with treatment combination D_2P_3 . Number of leaves per plant and bolting per cent were not affected by combination of various planting materials and different date of planting.

Key words : Onion, Bolting, Planting materials, Planting dates

INTRODUCTION

Onion is one of the most important vegetable crop of India. Onion is used green as well as bulb. It is popular salad crop and mature onion bulbs are widely used as a cooked vegetable in soups, stews and casseroles in addition to a flavouring agent in many additional dishes. Onion possesses nutritional and medicinal importance. The outstanding characteristic of onion is the pungency (which is due to volatile oil known as Allyl-propyl-disulphide).

Onion is mainly a *winter* season crop; however, it is raised during *Kharif* in Maharashtra and Gujarat to catch the off season market. Onion is propagated by seeds and bulb. By propagation of sets we can get early yield as compared to propagation by seedlings. The growth and yield of cultivated crop plants is mainly influenced by two factors viz., genetical and cultural or management. The second factor deals with cultural practices viz., planting date, sowing method, seed rate, planting materials, spacing, fertilizer, irrigation, plant protection, weed control etc. The time of sowing and planting materials exerts a distinct effect on growth of onion. Therefore, the present study was undertaken to study the effect of various planting materials and different date of planting on growth of *Kharif* onion.

MATERIALS AND METHODS

The experiment was conducted on sandy loam soil of Horticulture Instructional Farm, C.P. College of Agriculture, S.D. Agricultural University, Sardarkrushinagar during the year 2005 and 2006. Twelve

treatments comprising of four planting materials viz., seedling, 1.5 – 2.0 cm, 2.0 – 2.5 cm and 2.5 – 3.0 cm size onion sets and three dates of planting viz., 10th, 20th and 30th July were tested in Factorial Randomized Block Design (FRBD) with four replications. All the recommended cultural practices were adopted during growing season.

RESULTS AND DISCUSSION

The plant stand was found significant during both the years of experimentation and in pooled analysis. The maximum plant stand (98.08 %, 96.91 % and 97.50 %) was found in the year 2005, 2006 and in pooled analysis, respectively with planting of 2.5 – 3.0 cm size onion sets (P_4). The data presented in Table 1 revealed that the maximum plant stand (94.12 % and 92.25 %) was found in 2005 and 2006 with 30th July (D_3) planting. The combined effect of various planting material and different date of planting on plant stand was found significant in both the years of experimentation and in pooled data. The data (Table 2) revealed that maximum plant height (37.17 cm, 41.36 cm and 39.26 cm) were recorded with P_3 i.e. 2.0 – 2.5 cm size onion sets in the year 2005, 2006 and in pooled analysis, respectively. It is clear from the data that the maximum plant height (34.32 cm, 34.93 cm and 34.63 cm) were recorded with D_3 i.e. 30th July in the year 2005, 2006 and in pooled analysis, respectively. From the data in Table 2 it can be said that the maximum plant height were recorded with D_2P_3 in the year 2005, 2006 and in pooled analysis. These results are in accordance with

Table 1 : Influence of different treatments on per cent plant stand

Treatments	Percent plant stand		
	2005	2006	Pooled
Planting material			
P ₁ (Seedling)	74.58	73.83	74.21
P ₂ (Onion set size 1.5 – 2.0 cm)	95.92	94.16	95.04
P ₃ (Onion set size 2.0 – 2.5 cm)	97.92	95.66	96.79
P ₄ (Onion set size 2.5 – 3.0 cm)	98.08	96.91	97.50
S. E. ±	0.469	0.556	0.364
C. D. (P=0.05)	1.354	1.605	1.028
Date of planting			
D ₁ (10 th July)	87.62	86.75	87.19
D ₂ (20 th July)	93.12	91.44	92.28
D ₃ (30 th July)	94.12	92.25	93.19
S. E. ±	0.406	0.481	0.315
C. D. (P=0.05)	1.173	1.390	0.891
Interaction (D x P)			
S. E. ±	0.812	0.963	0.630
C. D. (P=0.05)	2.346	2.780	1.781
C. V. %	1.77	2.14	1.96

with D₃ *i.e.* 30th July during both the years of experimentation and in pooled analysis as compared to earlier planting, which was followed by D₁ *i.e.* 10th July. Maximum numbers of leaves were recorded with interaction effect of D₂P₃ in the year 2006 and in pooled analysis. While it was found non-significant difference during the first year 2005 (Table 2). Same results were obtained by Sankar *et al.* (1999) and Arya *et al.* (2006), Singh *et al.* (1993), Movalia (1996), Singh *et al.* (2002) and Cramer (2003).

Maximum neck thickness (1.20 cm) was recorded with planting of 2.0 – 2.5 cm size onion sets (P₃) as compared to other size sets and seedlings during both the years of experimentation and in pooled analysis. The maximum neck thickness (0.95 cm) of plant was recorded with D₃ *i.e.* 30th July in the year 2005, 2006 and in pooled data. Maximum neck thickness was recorded with treatment combination of D₂P₃ in both the years of experimentation and in pooled analysis (Table 3). These results are collaborated with the findings of Singh *et al.*

Table 2 : Influence of different treatments on plant height (cm) and number of leaves per plant

Treatments	Plant height (cm)			Number of leaves per plant		
	2005	2006	Pooled	2005	2006	Pooled
Planting material						
P ₁ (Seedling)	23.77	24.51	24.14	5.60	6.15	5.87
P ₂ (Onion set size 1.5 – 2.0 cm)	34.06	34.43	34.24	7.85	7.77	7.72
P ₃ (Onion set size 2.0 – 2.5 cm)	37.17	41.36	39.26	8.62	8.40	8.52
P ₄ (Onion set size 2.5 – 3.0 cm)	33.63	34.08	33.86	8.15	7.12	8.13
S. E. ±	1.249	1.000	0.800	0.341	0.204	0.199
C. D. (P=0.05)	3.597	2.879	2.263	0.981	0.587	0.562
Date of planting						
D ₁ (10 th July)	31.29	31.21	31.25	7.57	7.23	7.25
D ₂ (20 th July)	31.36	33.14	32.25	7.65	7.50	7.53
D ₃ (30 th July)	34.32	34.93	34.63	7.73	7.64	7.68
S. E. ±	1.082	0.866	0.693	0.295	0.176	0.172
C. D. (P=0.05)	3.115	2.493	1.960	0.850	0.508	0.486
Interaction (D x P)						
S. E. ±	2.164	1.732	1.386	0.590	0.353	0.344
C. D. (P=0.05)	6.230	4.986	3.919	NS	1.016	0.973
C. V. %	13.67	10.47	12.11	16.90	9.69	13.63

N.S.-Non significant

findings of Sankar *et al.* (1999) and Arya *et al.* (2006), Movalia (1996), Gupta *et al.* (1999), Singh *et al.* (2002) and Khurana *et al.* (2003).

Maximum number of leaves per plant was recorded with planting of 2.0 – 2.5 cm size onion sets *i.e.* P₃ as compared to small and large size sets. Minimum number of leaves per plant was observed with P₁ *i.e.* transplanting of seedlings. Higher number of leaves were recorded

(2002).

Maximum bolting (%) was recorded with planting of large size sets *i.e.* 2.5 – 3.0 cm size (P₄), while minimum or no bolting was recorded with P₁ *i.e.* seedling in the year 2005, 2006 and in pooled analysis. The highest bolting per cent (5.28) were noticed with crop planted on 10th July *i.e.* D₁ (Table 3). These results are in accordance with results of Nehra *et al.* (1994), Lawade and Kale

Table 3 : Influence of different treatments on neck thickness (cm) and bolting (%)

Treatments	Neck thickness (cm)			Bolting (%)		
	2005	2006	Pooled	2005	2006	Pooled
Planting material						
P ₁ (Seedling)	0.55	0.53	0.54	0.58	0.58	0.58
P ₂ (Onion set size 1.5 – 2.0 cm)	0.99	0.98	0.99	4.17	4.00	4.08
P ₃ (Onion set size 2.0 – 2.5 cm)	1.17	1.22	1.20	4.00	3.92	3.96
P ₄ (Onion set size 2.5 – 3.0 cm)	0.98	1.01	1.00	10.42	10.08	10.25
S. E. ±	0.025	0.020	0.016	0.251	0.225	0.168
C. D. (P=0.05)	0.071	0.057	0.045	0.724	0.649	0.476
Date of planting						
D ₁ (10 th July)	0.90	0.91	0.90	5.37	5.19	5.28
D ₂ (20 th July)	0.92	0.96	0.94	4.44	4.31	4.37
D ₃ (30 th July)	0.96	0.95	0.95	4.56	4.44	4.50
S. E. ±	0.021	0.017	0.014	0.217	0.195	0.146
C. D. (P=0.05)	NS	NS	0.039	0.627	0.562	0.413
Interaction (D x P)						
S. E. ±	0.043	0.034	0.027	0.434	0.389	0.292
C. D. (P=0.05)	0.122	0.099	0.077	NS	NS	NS
C. V. %	9.19	7.30	8.29	18.13	16.77	17.49

N.S.- Non significant

(1986) and Bhonde *et al.* (1990).

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