

Performance of improved onion (*Allium cepa* L.) varieties under Marathwada region in respect of yield parameters and total soluble solids

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ABSTRACT : An experiment entitled "Performance of improved onion (*Allium cepa* L.) varieties under Marathwada region" was conducted at Department of Horticulture, Marathwada Agricultural University, Parbhani (Maharashtra) during *Rabi* 2006-2007, with eight varieties and three replications having the plot size of 2.25 m x 2.00 m as gross plot and 2.10 m x 1.90 m as net plot by adopting sowing on 15 cm x 10 cm. Significantly more number of cured bulb per kg (22.18) was recorded in the variety Sel.-383 over rest of varieties under study. Mean fresh weight, cured weight and yield of bulb was found to be highest in variety JNDWD-207. Maximum TSS was recorded in variety Arka Niketan (13.00 per cent).

Key Words : Onion, Variety, Vegetative growth, Yield, TSS

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Onion (*Allium cepa* L.) belonging to the family Amaryllidaceae. Among the fresh vegetables onion, tomato and mushroom are reported to be highly export competitive. India is a traditional exporter of onions. India exports 1873002 Lakh MT onion bulbs worth 283428.50 lakh rupees and global picture of onion shows that though India leads in total area, the per hectare productivity is as low as 16.41 MT and in Maharashtra per hectare productivity is 21.55 MT compared to top ranking Korea (66.67 MT) (Anonymous, 2009). This is mainly due to certain constraints like non adoption of appropriate scientific production technology under suitable agroclimatic conditions for particular area and for particular variety, for increasing onion yield and productivity. Total soluble solids percentage of bulb is also an important quality parameter regarding demand for export of onion in global market. Thus present experiment was laid out with a view to evaluate the yield potential of different varieties of onion and their characters, yield parameter like weight of fresh and cured bulb, number of bulbs per kg, bulb yield and quality parameter TSS of bulb (per cent).

RESEARCH PROCEDURE

The experiment was conducted during *Rabi* 2006-2007 at Department of Horticulture, College of Agriculture, Parbhani.

The experiment was laid out in Randomized Block Design (RBD) with three replications and eight varieties of onion for present study. The eight varieties were V_1 -PRO-6, V_2 -Sel-383, V_3 -Sel-402, V_4 -JNDWD-207, V_5 -SYN-3, V_6 -PKV Sel white, V_7 -L-28, V_8 -Arka Niketan(C). The organic manure like FYM (20 t/ha) that was incorporated in soil 15 days before transplanting. Inorganic fertilizers used were urea, single super phosphate and muriate of potash. Recommended dose of fertilizer was 100 : 50 : 50 kg NPK/ha. The necessary preparatory tillage and intercultivation operations were done. Healthy, uniform seedlings of eight weeks old were selected for transplanting and transplanted at spacing of 15X10 cm. Harvesting of mature bulb was done when 50 per cent neck fall was observed. For biometric observations five plants were selected randomly from each plot as a observational plant and were labeled. After harvesting the weight of bulbs was recorded. The average weight of five observational plants was considered as average weight of fresh bulb. The bulbs were field cured for seven days by wind row method and weight of cured bulbs was recorded and average was computed. The weight of total harvested cured bulbs was recorded for each net plot separately and average net plot yield was calculated. The weight of total harvested cured bulbs was calculated on hectare basis for each treatment. Total soluble solids (w/weight) were determined with hand refractometer and the values recorded at 20° C before storage. Number of bulbs per kg was

calculated by following formula :

$$\text{Number of bulbs/kg} = \frac{1000 \text{ (g)}}{\text{Average weight of cured bulb (g)}}$$

RESEARCH ANALYSIS AND REASONING

The results obtained from the present investigation have been discussed in the following sub heads:

Performance of different onion varieties in respect of yield and quality.

The observations obtained in respect of yield and quality parameters of different onion varieties were subjected to statistical analysis. Results obtained are presented in Table 1 under appropriate heads.

Mean weight of fresh bulb and cured bulb (g):

There was significant difference in respect of mean fresh and cured weight of onion bulbs as affected by different varieties of onion. Significantly maximum fresh weight of bulb (137.76 g) was obtained in variety JNDWD-207 over rest of the varieties under study. Lowest fresh weight of bulb (50.25 g) was recorded in the variety Sel.-383. Maximum cured weight of bulb (132.27 g) was obtained in the variety JNDWD-207 which was superior over all other varieties under study. The next best variety for high cured weight of bulb (104.67 g) was observed in SYN-3 which was statistically at par with variety Sel-402 under study. Lowest cured weight of bulb (45.20 g) was obtained in variety Sel-383. The mean bulb weight performance was significantly superior due to potential inherited development characters in different onion varieties in respect of fresh and cured weight of onion bulbs as observed in different varieties under agroclimatic conditions of Marathwada region. The increase in the average bulb weight was mainly due to increase bulb diameter as discussed earlier.

Similar results were obtained by Mohanty *et al.* (2000), Mehta *et al.* (2003) and Yadav *et al.* (2003) in onion crop.

Number of bulbs per kg:

Significantly more number of cured bulb per kg (22.18) was recorded in the variety Sel.-383 over rest of varieties under study. Lowest number of cured bulb per kg (7.56) was obtained in variety JNDWD-207.

Yield per plot (kg) and per hectare (t):

Highest bulb yield per plot (22.5 kg) was obtained in variety JNDWD-207 which was at par with variety SYN-3 and superior over rest of the varieties under study. Lowest bulb yield per plot (13.33 kg) was obtained in variety Sel-383. As regard to yield per hectare, the variety JNDWD-207 recorded highest yield (41.50 t/ha) which was found at par with variety SYN-3 and superior over rest of the varieties under study. Significantly lowest bulb yield was recorded by variety Sel-383 (24.68 t/ha). The more increase in yield appeared due to increased growth of plants in respect of height of plant and number of leaves per plant. The healthy top growth might be due to more photosynthesis. The higher amount of photosynthesis might have produced more food material, thereby increasing in size of bulbs as indicated by diameter and average bulb weight which are important yield contributing characters. The present results are in agreement with those of Mohanty *et al.* (2000), Mehta *et al.* (2003), Patil *et al.* (2003) and Dubey *et al.* (2004) in onion.

Total soluble solids (Per cent):

Maximum TSS was recorded in variety Arka Niketan (13.00 per cent) followed by variety Sel-402 (11.30 per cent) which was at par with varieties *viz.*, SYN-3, PRO-6, JNDWD-207 and L-28 which were superior over other varieties *viz.* PKV-Sel white and Sel-383 under study. Significantly, lowest TSS (10.15 per cent) was recorded in the variety Sel.-383 under study. Flavour

Table 1: Performance of different onion varieties in respect of yield parameters and total soluble solids (per cent)

Tr. Code	Treatments	Fresh weight of bulb (g)	Cured weight of bulb (g)	Number of bulbs per kg	Yield per plot (kg)	Yield per hectare (t)	Total soluble solids (per cent)
V ₁	PRO-6	79.38	74.67	13.40	19.16	34.59	11.02
V ₂	Sel-383	50.25	45.20	22.18	13.33	24.68	10.15
V ₃	Sel-402	76.43	71.47	13.99	18.75	34.71	11.30
V ₄	JNDWD-207	137.76	132.27	7.56	22.5	41.50	11.00
V ₅	SYN-3	110.43	104.67	9.56	21.46	39.65	11.21
V ₆	PKV Sel white	58.60	54.50	18.36	15.41	28.54	10.24
V ₇	L-28	66.30	61.63	16.23	18.50	34.57	10.99
V ₈	Arka Niketan (C)	68.43	63.22	15.82	19.83	36.72	13.00
Mean		80.95	75.95	14.63	18.64	34.37	11.11
S.E. ±		1.24	1.21	0.34	0.754	1.39	0.203
C.D. (P=0.05)		3.76	3.66	1.03	2.28	4.21	0.617

intensity of onion is influenced by genetic potential of a cultivar and the environment in which the cultivar grows. These results are in consequences with the findings of Ranjalingam *et al.* (2001) and Mehta *et al.* (2003)

LITERATURE CITED

- Anonymous (2009). www.Maharashtrastate Agricultural marketing board.
- Dubey, B.K., Bhone, S.R. and Singh, L. (2004). Studies on the performance of red onion advance lines under Nasik Region of Maharashtra. *News letter National Hort. Res. & Dev. Foundation*, **24** (2):1-37.
- Mehta, D.R., Golani, I.J., Vaddoria, M.A. and Dobariya, K.L. (2003). Stability analysis for bulb yield and its attributes in onion. *Veg. Sci.*, **30** (1):33-36.
- Mohanty, B.K., Hossain, M.M. and Prusti, A.M. (2000). Varietal assessment of common onion for horticulture traits during *Kharif* season. *Orrisa J. Hort.*, **28** (2):8-11.
- Patil, B.T., Ranpise, S.A. and Birade, R.M. (2003). Studies on performance of colour garlic selection under Nasik conditions of Maharashtra. *Orrisa J. Hort.*, **31** (1): 54-57.
- Rajalingam, G.V. and AhariPriya, K. (2001). Association between yield and quality traits in onion *Allium cepa* L. variability aggregatum DON. *Madras agric. J.*, **88** : 344-345.
- Yadav, R.L., Sen, N.L. and Yadav, B.L. (2003). Response of onion of nitrogen and potassium fertilization under semi arid condition of Rajasthan, *Indian J. Hort.*, **60**(2):176-178.
