Onion (Allium cepa L.) belonging to the family Amaryllidaceae is one of the most popular bulb vegetable crops in India. Amongst all the bulb grown in India, onion is commercially regarded as the most important spice crop. Onion has special qualities, which add to taste and flavor to food preparations and culinary preparations. It is used in salads, soups, sauce and pickles for seasoning foods in culinary purposes and therefore it is called queen of the kitchen. The 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. The present experiment was laid out with a view to evaluate the yield potential of different varieties of onion and their characters like growth parameters, bolting percentage, maturity days, twin bulb percentage, shape of bulb and on yield parameter.

**RESEARCH METHODS**

The experiment was conducted during Rabi 2006-07 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 viz., V1 - PRO-6, V2-Sel-383, V3-Sel-402, V4-JNDWD-207, V5-SYN-3, V6-PKV Selection White, V7-L-28, V8 -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 15 x 10 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. The yield of total harvested cured bulbs was calculated on hectare basis for each treatment. For bolting (per cent) the number of bolted plants were counted form each plot and the bolting percentage was calculated. For maturity
number of days required for 50 per cent top fall were considered for maturity and recorded in each variety. For twin bulbs after harvest the twin bulbs were separated from normal single bulbs and their percentage was worked out. The neck thickness (cm) was measured by varnier calliper and expressed in centimeters. The polar diameter of bulbs (cm) was measured by varnier caliper in cm from the junction of root plant to the top of the bulb from the same bulbs which were used for recording neck thickness and thus mean polar diameter was computed. The Equatorial diameter of bulb (cm) was measured by varnier calliper in cm from the same bulbs which were subjected for recording polar diameter and mean equatorial diameter was computed. The shape index of onion bulbs was calculated by using following formula given by Odland and Noll (1954).

\[
\text{Shape index} = \frac{\text{Polar diameter}}{\text{Transverse diameter}}
\]

**RESEARCH FINDINGS AND DISCUSSION**

The results obtained from the present investigation as well as relevant discussion have been summarised under following heads:

**Performance of different onion varieties in respect of biometric observation:**

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

**Performance on bolting percentage:**

The lowest bolting (1.48 per cent) was observed in variety PKV Sel white, while variety JNDWD-207 exhibited (1.63 per cent) slightly more bolting per cent and was at par with JNDWD-207. Variety Sel-383 (2.37 per cent) was at par with variety SYN-3 (2.82 per cent) which was superior over other varieties viz., PRO-6, Sel-402 and L-28 for to less bolting per cent. Maximum bolting (8.17 per cent) was recorded in the variety Arka Niketan. There is evidence that rapid bulb formation may suppress the formation of inflorescence. Thus, it can be explained that appropriate recommended feeding of nitrogen during early stages of growth enhances proper bulb formation and reduces bolting percentage in onion. The results were in accordance with Sharma and Sain (2003) who also noted the indefinite relationship between nutrient supply and bolting.

**Performance on maturity (days):**

The data clearly indicated that the variety Arka Niketan recorded earliness in maturity (105 days) and was found superior over all other varieties under study. The varieties Sel-402 and Sel-383 were found at par with variety PKV Sel white and required significantly less days for attaining maturity over remaining varieties. Significantly maximum days for maturity (117.33) were recorded in variety SYN-3. The probable reason for early maturity may be the transfer of photosynthathate from the leaves to bulbs enhancing the growth rate of onion causing early initiation of bulbs, early maturity and finally early harvesting. The more number of days required for maturity may be due to less photosynthesis, resulting in to more time to complete the vegetative growth. The results in present study are supported by the findings of Masika et al. (1994), Sharma and Sain (2003) in onion.

**Performance on twin bulb percentage:**

Maximum twin bulb (6.39 per cent) were observed in the variety L-28 which was statistically at par with the varieties JNDWD-207, Sel-383 and Arka Niketan. Lowest twin bulbs (1.18 per cent) were recorded under the variety PKV Sel white which was superior over all other varieties under study. The production of twin bulbs might be due to the activation of multiple growth centres in the basal part of the bulb and improper fertilization of ovary in meiotic and mitotic cell division thereby producing more number of small plants. It is

![Table 1: Performance of different onion varieties in respect of growth parameters](image-url)
affected by various factors viz., variety, time of planting and advocating late cultural practices in onion crop. The finding of present trait is similar with the findings of Sharma and Sain (2003) and Dubey et al. (2004) in onion.

Performance on neck thickness (cm):

Maximum neck thickness (1.11 cm) was recorded in varieties PKV Sel white and JNDWD-207 which were statistically at par with varieties L-28 and Sel-402 and which were found significantly more in increasing neck thickness over the remaining varieties SYN-3, Arka Niketan and PRO-6. Significantly lowest neck thickness of onion bulb (0.91 cm) was recorded in the variety Sel-383. Thin and closed neck are the most desirable characters in onion bulb indicating the bulb quality and storage life. Increase in neck thickness with higher levels of inorganic fertilizer may be due to the abnormal maturity of bulb resulting in drying of leaves from top to bottom while the neck remains thick and erect (Jones and Mann, 1963). The results are supported by the findings of Yadav et al. (2003) in onion crop.

Shape index of bulb:

Maximum shape index (0.93) was recorded in varieties SYN-3, PKV-Sel. White and PRO-6, which was significantly superior over other varieties viz., Sel-402, L-28, Arka Niketan, Sel-383 and JNDWD-207 under the study. Minimum significant shape index was recorded in the variety JNDWD-207. The shape of the bulb was directly influenced by the total number of leaves produced by plants. The comparative significant increase in height, number of green leaves due to performance of different onion varieties may have helped to accumulate more carbohydrates synthesized by leaves which were stored in the bulb resulting in bigger sized bulbs as indicated by the diameter. The results are in confirmation with those reported by Yadav et al. (2003) and Dubey et al. (2004) in onion crop.

Performance of different onion varieties in respect of Yield parameter:

The observations obtained in respect of yield parameter of different onion varieties were subjected to statistical analysis. Results obtained are presented in Table 2 under appropriate heads.

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):

Data presented in Table 2 indicated that the different varieties influenced significantly the yield per plot (kg) and per hectare (t) of onion bulbs. 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. 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 yield differences can also be attributed to difference in genetic make up of different varieties. 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.

Conclusion:

The present investigation thus revealed that variety Arka Niketan (C) was early in maturity and variety PKV Sel white was best for low twin bulb per cent. The neck thickness was

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**Table 2 : Performance of different onion varieties in respect of yield parameters**

<table>
<thead>
<tr>
<th>Tr. Code</th>
<th>Treatments</th>
<th>Number of bulbs per kg</th>
<th>Yield per plot (kg)</th>
<th>Yield per hectare (t)</th>
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<tr>
<td>V1</td>
<td>PRO-6</td>
<td>13.40</td>
<td>19.16</td>
<td>34.59</td>
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<tr>
<td>V2</td>
<td>Sel-383</td>
<td>22.18</td>
<td>13.33</td>
<td>24.68</td>
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<tr>
<td>V3</td>
<td>Sel-402</td>
<td>13.99</td>
<td>18.75</td>
<td>34.71</td>
</tr>
<tr>
<td>V4</td>
<td>JNDWD-207</td>
<td>7.56</td>
<td>22.5</td>
<td>41.50</td>
</tr>
<tr>
<td>V5</td>
<td>SYN-3</td>
<td>9.56</td>
<td>21.46</td>
<td>39.65</td>
</tr>
<tr>
<td>V6</td>
<td>PKV Sel white</td>
<td>18.36</td>
<td>15.41</td>
<td>28.54</td>
</tr>
<tr>
<td>V7</td>
<td>L-28</td>
<td>16.23</td>
<td>18.50</td>
<td>34.57</td>
</tr>
<tr>
<td>V8</td>
<td>Arka Niketan (C)</td>
<td>15.82</td>
<td>19.83</td>
<td>36.72</td>
</tr>
<tr>
<td>Mean</td>
<td></td>
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<td>18.64</td>
<td>34.37</td>
</tr>
<tr>
<td>S.E. ±</td>
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<td>0.754</td>
<td>1.39</td>
</tr>
<tr>
<td>C.D. (P=0.05)</td>
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<td>1.03</td>
<td>2.28</td>
<td>4.21</td>
</tr>
</tbody>
</table>
lowest in variety Sel-383. In respect of yield per plot and per hectare variety JNDWD-207 was superior over all other varieties.

REFERENCES


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