

Performance of onion (*Allium cepa* L.) cultivars as *kharif* crop under different dates of transplanting

SUMMARY

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SUMMARY

The present investigation entitled “**Performance of onion (*Allium cepa* L.) cultivars as *kharif* crop under different dates of transplanting**” was carried out at Horticulture Research Farm of the Department of Horticulture, School of Agricultural Sciences and Technology, Babasaheb Bhimrao Ambedkar University, Vidya Vihar, Rae Bareli Road, Lucknow during 2018-19 and 2019-20. The result was discussed in light of literature available and research work reported by earlier workers on onion and related. The experimental findings are now summarized and presented below:

Vegetative growth and attributes:

Effect of different dates of transplanting and varieties on vegetative growth of *kharif* onion.

1. The maximum plant height (66.93 cm) was observed during both the years with D₄ x V₂ (30th September transplanting x L-883 variety) followed by D₆ x V₁ (20th October x Agrifound Dark Red) and the minimum plant height (62.22 cm) was recorded in D₁ x V₁ (30th August x Agrifound Dark Red).
2. The number of leaves per plant (14.99) was observed maximum with treatment D₄ x V₂ (30th September transplanting x L-883 variety), followed by in D₆ x V₁ (20th October x Agrifound Dark Red),
3. Leaf length was also found maximum in V₂ (L-883) when (47.60), transplanted on 30th September (D₄) followed by (47.16) D₆ x V₁ (20th October x Agrifound Dark Red), whereas the minimum leaf length (43.34) and was recorded in D₁ x V₁ (30th August x Agrifound Dark Red).
4. Similarly, maximum neck thickness (23.19 mm) was observed during both the years under treatment D₄ x V₂ (30th September transplanting x L-883 variety), followed by D₆ x V₁ (20th October x Agrifound Dark Red) (23.03 mm).

Yield parameters as influenced by different dates of transplanting and varieties.

1. Transplanting on $D_4 \times V_2$ (30th September transplanting), of variety V_2 (L-883) showed delay in harvesting 30th August transplanting caused early harvesting by taking minimum days to harvest.
2. The maximum fresh weight of bulb (116.26 g) was observed with during both the years of treatment $D_4 \times V_2$ (30th September transplanting x L-883 variety), followed by $D_6 \times V_1$ (20th October x Agrifound Dark Red) while minimum value of fresh weight of bulb (79.16 g) was recorded $D_1 \times V_1$ (30th August x Agrifound Dark Red)).
3. Maximum average weight of bulb after short curing (77.27 g) during both the years was obtained in the treatment $D_4 \times V_2$ (30th September transplanting x L-883 variety), followed by $D_6 \times V_1$ (20th October x Agrifound Dark Red)), while minimum average weight of bulb after curing (61.49 g) was recorded $D_1 \times V_1$ (30th August x Agrifound Dark Red)).
4. Treatment $D_4 \times V_2$ (30th September transplanting x L-883 variety) caused maximum bulb yield followed by $D_6 \times V_1$ (20th October x Agrifound Dark Red)), (9.46 kg) while the minimum bulb yield per plot (7.99 kg) was recorded with the $D_1 \times V_1$ (30th August x Agrifound Dark Red)).

Similar trend was also observed in case of yield per ha also. The mature harvested onion bulb exhibited higher bulb size in respect of length of bulb, volume of bulb when transplanted on 30th September (D_4) and variety V_2 had better bulb size over V_1 . The bulb diameter was also significantly influenced by dates of transplanting and variety. It was observed that both polar and equatorial diameter was recorded maximum under treatment $D_4 \times V_2$ (30th September transplanting x L- 883 variety).

Effect of dates of transplanting and varieties on morphological characteristics of bulb.

1. The maximum dry matter content of bulb (15.22%) was recorded with treatment ($D_4 \times V_2$ (30th September transplanting x L-883 variety), followed by $D_6 \times V_1$ (20th

October x Agrifound Dark Red)), while the minimum dry matter content of bulb (10.08 %) was recorded with D₁ x V₁ (30th August x Agrifound Dark Red).

2. The maximum specific gravity (1.17 g/cc) was recorded with D₄ x V₂ (30th September transplanting x L-883 variety), followed by D₆ x V₁ (20th October x Agrifound Dark Red), in both year while, the minimum specific gravity (1.08 g/cc) was recorded with the D₁ x V₁ (30th August x Agrifound Dark Red).
3. Maximum number of fresh scales (11.75), per bulb was recorded with D₄ x V₂ (30th September transplanting x L-883 variety), followed by D₆ x V₁ (20th October x Agrifound Dark Red). The minimum number of scales (6.17) was recorded with the D₁ x V₁ i.e. 30th August x Agrifound Dark Red.

Quality attributes of onion bulbs.

1. A significant increase in TSS in bulb was found with 20th September transplanting of (V₂) followed by D₇ x V₁ (30th October x Agrifound Dark Red). The minimum total soluble solids (9.24 °Brix) was recorded with the D₁ x V₁ (30th August x Agrifound Dark Red).
2. The maximum total sugars (10.17 %) was recorded during both the year with D₃ x V₂ (20th September transplanting x L-883 variety), followed by (9.99 %) D₇ x V₁ (30th October x Agrifound Dark Red), while the minimum total sugar (8.81%) was recorded with the (D₁ x V₁ 30th August x Agrifound Dark Red).
3. Similarly, reducing sugar and non- reducing sugar content in bulb was also analysis and found maximum with 20th September transplanting (D₃) in variety L-883 (V₂). D₇ x V₁ also had high sugar (reducing and non- reducing) close to D₃ x V₂. Also show the maximum reducing sugar (5.66 %) was recorded during both the year followed by D₇ x V₁ (30th October x Agrifound Dark Red),
Highest acidity was found in early transplanting i. e. D₁ x V₁ (30th August x Agrifound Dark Red), followed by D₂ x V₁ (10th September x Agrifound Dark Red), while the minimum acidity percentage (0.35 %) was recorded with the D₄ x V₁ (30th September x Agrifound Dark Red).

4. The maximum sulphur content was recorded during both the year with $D_6 \times V_2$ (10th October transplanting x L-883 variety), (0.39 %), followed by $D_3 \times V_1$, (20th September transplanting x Agrifound Dark Red), (0.32%) while the and maximum sulphur content was observed.
5. Regarding economic assessment of *kharif* onion production, maximum B:C ratio was recorded during both the year with $D_2 \times V_2$ (20th September transplanting x L-883 variety), followed by $D_2 \times V_1$ (10th September transplanting + Agrifound Dark Red), while lower B: C ratio was recorded with the $D_8 \times V_1$ (10th November transplanting + Agrifound Dark Red).

Conclusion

In the present investigation, it was noticed that maximum values for vegetative growth and yield contributing traits like plant height, number of leaves/plant, leaf length, neck thickness, average bulb weight, bulb yield, as well as bulb physical quality parameters like length of bulb, polar diameter, equatorial diameter, volume of bulb, dry matter content, number of scale were observed when Variety L 883, were transplanted on 30th September ($D_4 \times V_2$). However, chemical quality parameters namely total soluble solids, total sugars, reducing sugar, non-reducing sugar, ascorbic acid, acidity were found to be superior in Variety L 883 when transplanted on 20th September ($D_3 \times V_2$). While, maximum sulphur content was estimated when variety L- 883 was transplanted on 20th October ($D_6 \times V_2$). It was also clear that all the varieties (V_1, V_2) produced higher yield when transplanted on 30th September (D_4) which exhibited maximum income and high B: C ratio. Therefore, it can be concluded that cultivar L-883 transplanting on 30th September ($D_4 \times V_2$) can be suggested for off-season onion production in the subtropical agro-climatic region of Central Uttar Pradesh for better bulb growth, yield and getting more profit for growers.