# Effect of different varieties and planting time on the growth and yield of kharif onion in Shahdol district of Madhya Pradesh

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## ABSTRACT

An experiment was conducted in the adopted villages of Shahdol district of Madhya Pradesh to study the effect of different varieties and planting time on the growth and yield of kharif onion. Two cultivars of onion namely Nasik Red and Agri Found Dark Red (AFDR) were transplanted four times at a regular interval of eight days from 7 to 30 July. Farmers fields (half acre) were selected and transplanting was done on raised beds of 15 x 10 cm. Crops were grown following appropriate scientific cultural practices. The data were recorded on bulb yield and bulb weight per plant and vertical bulb diameter after harvest of crop. The maximum bulb diameter (7.4 cm), bulb weight (92.59 g) and average yield (251.97 q/ha) were observed in AFDR. Also the highest bulb yield (221.04 q/ha) was noticed in third transplanting ($T_3$) in AFDR cultivar. Thus it could be concluded that AFDR cultivar with transplanting on 23 July was the best combination for the farmers of Shahdol district, Madhya Pradesh.

**Keywords:** Kharif onion; AFDR; cultivars; transplanting; yield

## INTRODUCTION

Onion (*Allium cepa* L) belongs to the family Aliaceae. It is an important commercial crop as compared to other vegetable and spice crops. The production of onion in India was 23,262.33 thousand MT in 2017-18 with Madhya Pradesh accounting for 3,701.01 thousand MT (Anon 2019).

Onion is generally preferred to be grown as winter crop in Madhya Pradesh. This results in abnormal enhancement of price during lean period (October to March) due to demand supply gap. To mitigate this supply gap, KVK Shahdol, Madhya Pradesh intervened the farming community with the option of kharif onion. For this purpose specific scientific package of practices was tested and optimized as suited to the local climatic conditions of Shahdol, Madhya Pradesh.

The growth and yield of crop is governed by the genetical (varietal) and cultural practices factors. Brewster (1994) reported that the genetical and environmental factors affect the performance of a cultivar by influencing the important traits. Also most of the onion cultivars are very sensitive to photoperiod with limited adaptation range.

Thus it is crucial to assess the stability in performance of recommended varieties of onion for a specific location especially for kharif onion. Mondal et al (1986) reported that the planting time greatly influences the growth and yield of onion. Thus varieties need to be tested on location specific performance. Hence the study was conducted to assess the performance of different cultivars of kharif season to find out the suitable variety and date of planting to maximize the production of onion in the area.

## MATERIAL and METHODS

The experiment was conducted in KVK adopted villages namely Bhamraha, Amraha and Chatha of Sohagpur block of Shahdol district, Madhya Pradesh during the year 2015-16 and 2016-17.

The soil of the selected fields was clayey loam in texture. Two cultivars of onion namely Nasik Red

and Agri Found Dark Red (AFDR) were transplanted four times at a regular interval of eight days from 7 to 30 July viz $T_1$ (7 July), $T_2$ (15 July), $T_3$ (23 July) and $T_4$ (30 July) with three replications.

Farmers fields (half acre) were selected and transplanting of seven week-old seedlings was done on raised beds of 15 x 10 cm. Crops were grown following appropriate scientific cultural practices. The data were recorded by selecting twenty five randomly selected plants of each variety from each field. Bulb quality attributes such as bulb yield, bulb weight per plant and vertical bulb diameter were recorded after harvest of the crop. The means of varietal influence (V), date of planting (T) and their combinations (VT) were calculated.

Table 1. Effect of varieties and date of transplanting on bulb diameter, bulb weight and total yield of onion

| Variety | Transplanting time | | | | Mean |
|---|---|---|---|---|---|
| | $T_1$ | $T_2$ | $T_3$ | $T_4$ | |
| **Bulb diameter (cm)** | | | | | |
| Nasik Red | 5.2 | 5.8 | 7.8 | 6.4 | 6.3 |
| AFDR | 6.9 | 6.9 | 8.2 | 7.6 | 7.4 |
| Mean | 6.1 | 6.4 | 8.0 | 7.0 | |
| **Bulb weight (g)** | | | | | |
| Nasik Red | 82.24 | 78.97 | 98.4 | 86.45 | 86.52 |
| AFDR | 89.71 | 85.97 | 103.98 | 90.68 | 92.59 |
| Mean | 85.975 | 82.47 | 101.19 | 88.565 | |
| **Total yield (q/ha)** | | | | | |
| Nasik Red | 152.45 | 161.66 | 165.52 | 162.87 | 160.63 |
| AFDR | 234.67 | 243.85 | 276.56 | 252.79 | 251.97 |
| Mean | 193.56 | 202.755 | 221.04 | 207.83 | |

## RESULTS and DISCUSSION

The results are given in Table 1. The data show that the maximum bulb diameter (7.4 cm) was noticed in cultivar Agri Found Dark Red (AFDR). The highest bulb diameter was noted on third date of transplanting ($T_3$) ie 23 July (8.0 cm). It was observed during trial that early or delayed transplanting resulted in lower bulb diameter. The highest value of bulb diameter pertaining to variety and transplanting date interaction was observed to be 8.2 cm in combination $V_2T_3$ (AFDR variety with 23 July as date of transplanting).

The weight of the bulb is directly proportional to bulb diameter ie more the bulb diameter more is its mean weight.

The more bulb weight (92.59 g) was noted in cultivar AFDR. The effect of transplanting dates on bulb weight followed the similar trend as noted in case of bulb diameter. The maximum bulb weight (101.19 g) was noted in $T_3$ (23 July transplanting). Transplanting before or after 23 July resulted in lower weight of the bulb. The interaction effect of variety and transplanting date was highest for $V_2T_3$ combination (103.98 g). The highest bulb yield (251.97 q/ha) was observed in cultivar AFDR. The highest bulb yield (221.04 q/ha) among different transplanting dates was recorded in third transplanting $T_3$ (23 July). Transplanting of seedlings on earlier dates resulted in reduced bulb yield. The combination effect of variety and date of transplanting for bulb yield was observed to be highest 276.56 q/ha for treatment combination $V_2T_3$.

Sharma (2009) and Kandil et al (2013) also advocated the role of transplanting dates on growth and yield of onion. Bhagchandani et al (1972) also reported better performance of AFDR for kharif onion production.

## CONCLUSION

It was found that the maximum yield quality attributes such as bulb diameter, bulb weight and bulb yield were obtained in cultivar Agri Found Dark Red (AFDR). Also the highest bulb yield (221.04 q/ha) was noticed in third transplanting ($T_3$) in AFDR cultivar. Thus it could be concluded that AFDR cultivar with transplanting time of 23 July is the best suited combination for kharif onion production for the farmers of Shahdol district, Madhya Pradesh.

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