PERFORMANCE OF DIFFERENT RABI ONION VARIETIES UNDER AKOLA CONDITIONS

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ABSTRACT

An experiment was carried out during Rabi season during the year 2012-2013 at Main garden, Department of Horticulture, Dr. PDKV, Akola. The study was undertaken on ten varieties of onion using randomized block design with three replications. The ten varieties were V_1(Akola Safed), V_2 (BhimaSubhra), V_3(BhimaShweta), V_4 (Agrifound White), V_5 (PhuleSafed), V_6 (Bhima Shakti), V_7 (BhimaKiran), V_8 (N-2-4-1), V_9 (ArkaNiketan), V_{10} (Agrifound Light Red). Among the ten varieties Bhima Shakti was the best in respect of growth parameter and yield parameter as it recorded the maximum plant height, maximum number of leaves as well as weight of fresh, cured bulb, diameter of bulb, marketable bulb yield and bulb yield hectare, followed by variety Akola Safed. The varieties Bhimakiran , PhuleSafed took the minimum period whereas Akola Safed took the maximum period to harvest .The TSS was recorded maximum in BhimaKiran followed by Phule-Safed ,whereas minimum bolting percentage and minimum splitting percentage were recorded inAgrifound light Red and BhimaShweta respectively. Minimum neck thickness was recorded in ArkaNiketan.

Keywords: Varieties, Performance, Growth, Yield, Rabi Onion.

INTRODUCTION

Onion is one of the most important horticultural crops grown worldwide for its culinary preparations and spicing food dishes. Besides used as condiments the medicinal properties of onion add value to its importance. India is the second largest producer of onion in the world, but lag far behind of many countries in terms of productivity. Even though Maharashtra is a pioneer state in onion production contributing 25% of country's onion .Still there is a need of efforts to increase the productivity. Adoption of high yielding varieties is

very important to increase the onion production,so that domestic availability and export of onion can be made on regular basis.

Different countries prefer different size of onions for example onion bulb having size of 40- 60 mm is required by different countries of middle east while other countries like Malaysia, Singapore and African ports prefer onion bulb having size of 25 – 30 mm .Therefore, it is necessary to find out the varieties which are fulfilling the mentioned size so, that we can recommend the farmers to grow such fulfilling varieties in order to enhance the exporting of onion.

Successful bulb production in any region depends upon selecting suitable cultivars that will grow satisfactorily under the conditions imposed by the specific environment. Recently area under onion in Vidarbha region is increasing every year, farmers are growing different varieties of onion which are mostly local types and performance of such local types is poor. Keeping this point in view, it was thought imperative to find out suitable varieties of onion for this region.

MATERIAL AND METHODS

The experiment was carried out in plot number 11 of the main garden, University Department of Horticulture, Dr. PanjabraoDeshmukhKrishiVidyapeeth, Akola during *rabi* season in year 2012- 2013 .Ten varieties of onion were evaluated using randomized block design with three replications. Onion seedlings were transplanted on 6th January 2013 at the spacing of 15 x 10 cm.There were ten varieties as treatment in each replicated block viz. V_1(Akola Safed), V_2 (BhimaSubhra), V_3(BhimaShweta), V_4 (Agrifound White), V_5 (PhuleSafed), V_6 (Bhima Shakti), V_7 (BhimaKiran), V_8 (N-2-4-1), V_9 (ArkaNiketan), V_{10} (Agrifound Light Red). Five plants per treatment were selected randomly to record observations on growth, yield and quality parameters viz. plant height, number of leaves per plant, days to harvest, neck thickness, weight of fresh and cured bulb, diameter of bulb, number of marketable bulb, marketable bulb yield per plot, marketable bulb yield per hectare, total yield per plot , total yield per hectare.

The data obtained from field trials during the course of the present investigation were analyzed statistically by using the random block design (RBD) with the standard mean error (SEm±) and critical difference (CD) was evaluated at 5% level of

significance. All the experiments were carried out taking three replicates for each treatment (Panse and Sukhamate, 1967).

RESULTS AND DISCUSSION

Growth Observations

The data presented in the Table 1. revealed that the plant height were significantly differ among various onion varieties at 30, 60, and 90 days after transplanting (DAT). The maximum plant height at 30 DAT was recorded in varietyPhuleSafed and at 90 DAT Bhima Shakti recorded the maximum . The variety Agrifound White recorded the minimum plant height both at 30 and 90 DAT.

At initial stage increase rate of plant height was slow due to the low temperature exist during that stage. But from 30 DAT onwards sudden increase in the height was observed and increase rate was rapid between 30-60 DAT as compared to the increase in between 60 – 90 DAT .Besides all the plant heights of different varieties were found to be dissimilar due to the different genetic constitution of the varieties. These results are in close agreement with the findings of Jadhav*et al* . (1990), Soni*et al.,* (1993) ,Makwana*et al* . (1999).

Similarly, the numbers of leaves were significantly influenced by the varieties of onion upto 90 DAT. The maximum number of leaves were recorded in varietiesAgrifound Light Red, Bhima Shakti, Bhima Shakti at 30, 60 and 90 DAT respectively. However, the minium number of leaves were recorded in varieties N-2-4-1, BhimaShweta and ArkaNiketan at 30,60,90 DAT respectively. Similar results were reported by Jadhav*et al.*,(1990) , Makwana*et al.,* (1999) and Mohanty*et al.*, (2002).

Table 1. Growth parameters as influenced by different varieties

Varieties	Plant height (cm)			Number of leaves / plant			Days to harvest
	30 DAT	60 DAT	90 DAT	30 DAT	60 DAT	90 DAT	
V1 -Akola Safed	36.42	52.33	66.82	5.00	6.86	12.1	113

V2 - BhimaSubhra	35.65	54.00	59.24	5.20	6.53	10.7	100
V3 - BhimaShweta	31.26	50.06	62.24	4.46	6.03	11.1	111
V4 – Agrifound White	30.41	49.03	56.24	4.73	6.86	10.3	105
V5 – PhuleSafed	38.19	52.03	64.14	5.20	7.33	10.7	99
V6 – Bhima Shakti	33.17	54.66	70.54	5.53	7.66	12.6	107
V7 – BhimaKiran	32.46	47.82	64.82	4.63	7.33	9.13	99
V8 – N-2-4-1	32.22	53.8	66.34	3.76	7.20	11.2	101
V9 – ArkaNiketan	33.65	45.00	63.63	4.06	7.33	9.00	100
V10 – Agrifound Light Red	35.06	48.33	69.00	5.60	6.03	9.33	109
SE (m) ±	0.45	1.52	1.54	0.29	0.17	0.60	1.40
C.D. at 5%	1.35	4.51	4.57	0.89	0.51	1.81	4.17

In respect of days to harvest also significant difference among varieties were observed and maximum days taken for maturity was recorded in Akola Safed whereas , minimum period were taken by BhimaKiran and PhuleSafed .This might be due to genetic characters of individual varieties. These results are also in conformity with Jadhav*et al.,* (1990), Bhonde*et al.,* (1992) and Soni*et al.,* (1993) also reported the influence of onion varieties on days for harvesting.

Yield Observations

The data in the Table.2 indicated that yield contributing parameters were significantly influenced by various varieties. These difference in neck thickness and weight of fresh and cured bulb among various varieties may be due to different varietal characters of onion. Maximum neck thickness was recorded in variety Agrifound Light Red and minimum in ArkaNiketan and regarding weight of bulb the variety Bhima Shakti recorded the maximum weight both in fresh and cured state. Whereas, the variety BhimaSubhra recorded the minimum weight both in fresh and cured state. These results are in close agreement with the findings of Bhonde*et al.,* (1992), Mohanty*et al.,* (2002), Dewangan*et al.,* (2012), Jadhav*et al.,* (1990), Masthanareddy and Sulikeri (1998).The variety Bhima Shakti recorded the maximum bulb diameter and minimum in ArkaNiketan. Similar result were reported by

Mohanty*et al.,* (2002), Sarada*et al.,* (2009), Sharma A.K. (2009). Maximum number of marketable bulb was observed in Akola Safed and minimum number in ArkaNiketan. Similar results were reported by singh*et al.,* (2011)and Dewangan*et al.,* (2012).

Table 2. Yield parameters as influenced by different varieties

Name of the varieties	Neck thickness of bulb (cm)	Fresh weight of bulb (gm)	Cured weight of bulb (gm)	Diameter of bulb (cm)	Number of marketable bulbsper pot	Marketable yield per plot (kg)	Marketable yield per hectare (q)	Total yield per hectare (q)	Total yield per plot (kg)
Akola Safed	1.57	155.53	110.66	6.92	116	10.11	337.6	431.3	12.93
BhimaSubhra	1.33	121.00	95.00	6.68	111	6.70	287.9	287.9	8.63
BhimaShweta	1.4	154.26	127.00	6.54	114	10.72	357.4	377.3	11.32
Agrifound white	1.35	138.46	109.66	6.66	106	6.15	205.1	283.16	8.49
Phulesafed	1.16	170.46	144.60	6.96	99	7.31	243.7	277.5	8.32
Bhimashakti	1.47	196.3	149.33	7.10	107	11.83	394.2	432.3	12.97
BhimaKiran	1.30	154.86	126.33	6.82	99	10.01	333.7	367.72	11.03
N-2-4-1	1.38	182.06	141.33	6.90	101	9.03	301.1	335.43	9.88
ArkaNiketan	0.94	154.00	127.73	5.36	94.6	6.26	208.8	230.23	6.90
Agrifound light red	1.68	186.13	140.6	6.97	109.3	8.73	291.2	294.63	8.83
SE (m) ±	0.10	9.48	5.81	0.20	1.63	0.52	18.1	22.1	0.67
C.D. at 5%	0.31	28.16	17.2	0.61	4.85	1.54	54.01	65.8	1.99

The variety Bhima Shakti recorded the maximum marketable yield per plot and per hectare whereas the variety Agrifound White recorded the minimum marketable yield per plot and per hectare. These results are in close agreement with the findings of Khar*et al.,* (2007), Singh *et al.,* (2011) and Dewangan*et al.,* (2012). Highest bulb yield per plot and per hectare was observed in Bhima Shakti and minimum bulb yield per plot and per hectare was

recorded in ArkaNiketan.Similar results were reported by Sharma *et al.* (2009), Yadav*et al.*, (2010) and Dwivedi.

Quality observations

The data presented in the Table.3 indicated that TSS, bolting percentage and splitting percentage were significantly influenced by the varieties of onion.

Table 3. Quality parameters as influenced by different varieties

Name of the varieties	Total soluble solids (°Brix)	Bolting (%)	Splitting (%)
Akola Safed	13.26	1.00 (0.98)	1.00 (0.98)
BhimaSubhra	14.23	1.22 (1.11)	1.26 (1.22)
BhimaShweta	13.23	2.43 (1.56)	0.75 (0.85)
Agrifound white	14.63	0.36 (0.58)	2.8 (1.67)
Phulesafed	15.02	1.26 (1.03)	1 .00 (0.94)
Bhimashakti	14.56	0.5 (0.71)	2.02 (1.40)
BhimaKiran	15.33	1.00 (0.94)	2.26 (1.50)
N-2-4-1	15.00	0.5 (0.71)	1.25 (1.08)
ArkaNiketan	13.5	1.24 (1.12)	1.96 (1.40)
Agrifound light red	14.23	0.76 (0.85)	1.42 (1.18)
SE (m) ±	0.09	0.31	0.27
C.D. at 5%	0.29	0.39	0.39

Significantly maximum TSS was recorded in variety BhimaKiran which was followed by the varieties PhuleSafed and N-2-4-1 whereas, minimum TSS was observed in variety ArkaNiketan. Similar results were reported by Saimbhi and Bal(1996), Suchet*aet al.*(1996), Masthanareddy and Sulikeri(1998).

In case of bolting percentage the variety Agrifound White recorded the minimum and maximum was registered in variety BhimaShweta. In fact bolting of onion were known to caused by factors like temperature, poor seed quality, poor soil, spacing, size of seedlings but in our condition experiment less percent of bolting were observed in each

variety, although minimum and maximum percent of bolting among varieties, this may be due to high temperature prevailed throughout the growing season and genetic characters of the varieties. The results are in conformity with the findings of Bhonde*et al.,* (1992), Jaiswal*et al.,* (1984) and Bhamburkar*et al.,* (1986).

Similarly in splitting percent, maximum splitted bulb was observed in Agrifound White followed by BhimaKiranand Bhima Shakti whereas , minimum percent of splitted bulb was recorded in BhimaShweta. These results are in conformity with the findings of Jadhav*et al.,* (1990) and Soni*et al.,* (1993).

The TSS recorded in all varieties found to be slightly toward higher side this might be because of climatic condition of Akola .Here the summer temperature is higher than other places.

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