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## Studies the suitable variety of onion for dehydration

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### Abstract

An experiment entitled "Studies on evaluation of different varieties of onion for dehydration." was conducted during year 2020-21 at Horticulture Research Scheme (Vegetable), Department of Horticulture, VNMKV, Parbhani. The experiment was laid out in Randomized Block Design for field research experiment and Completely Randomized Design for laboratory experiment with three replications and twelve varieties viz. Bhima Kiran, Bhima Super, Bhima Dark Red, Bhima Light Red, Bhima Safed, Bhima Raj, Bhima Shakti, Bhima Shweta, Bhima Shubhra, Bhima Red, N-2-4-1, Phule Samarth. Analysis of variance revealed significant differences among the varieties in all characters. In respect of growth parameter Phule Samarth was recorded maximum number of leaves (12.8), maximum chlorophyll-a content (20.92) and chlorophyll-b (10.34). The variety Phule Samarth showed best results for all yield parameters.

**Keywords:** Dehydration, growth, onion, parameters, variety

### Introduction

Onion (*Allium cepa* L.) is the most important underground bulbous vegetable crops grown in India. It grows well in mild climate without extreme heat or cold or excessive rainfall. It is widely cultivated for internal consumption as well as for the export. Globally, the country occupies the second position after china in onion production with a share of around 14% ([www.agriexchange.apeda.gov.in](http://www.agriexchange.apeda.gov.in)). Commercially cultivated in Maharashtra, Bihar, Gujrat, Karnataka, Orissa and Uttar Pradesh states in India. India is a traditional exporter of onions rank third after Netherland and Spain (Singhal, 1996)<sup>[7]</sup>. Onion is the rich source of amino acid, anthocyanin, flavonols and phenolics. Fresh onion contains around 86.8 per cent of moisture, 11.6 per cent of carbohydrates, 9mg/100g ascorbic acid, 1.2 per cent protein, 0.2-0.5 per cent of calcium, 0.05 per cent phosphorus and small amount of vitamin B1 (Thiamine), vitamin B2 (Riboflavine) and iron.

It contains good characteristics of taste and flavor to food and also significant therapeutic values. It has wide range of beneficial properties like antioxidant, anti-cholesterolaemic, anti-mutagenic for the human (Skerget *et al.*, 2009)<sup>[8]</sup>. Eating raw onions are useful to reduce the cholesterol levels because they increase levels of high density lipoproteins. It also useful in control the coronary heart disease, cancer prevention, reduces high blood pressure and for skin and hair. Sulphur compounds present in onion will help to prevent the growth of cancer cells. Onions are also used in the treatment of anaemia, urinary disorders, bleeding piles and teeth disorders.

### Material and Methods

An experiment entitled "studies on evaluation of different varieties of onion (*Allium cepa* L.) for dehydration" was conducted at experimental Farm, Horticulture Research Scheme (vegetable), Vasantrao Naik Marathwada Krishi Vidyapeeth, Parbhani.(M.S.) This chapter outlines are specifics of the material used and procedures to be followed during the process of the investigations.

### Growth parameter

- a. **Height of plant (cm):** Height of plant from the base of the plant to tip of the main stem was measured with scale. Plant height was measured at 30 and 60 days after transplanting and mean values were expressed in centimeter.
- b. **Number of leaves per plant:** Number of leaves was counted at 30 DAT and 60 DAT at from selected plants. The mean was calculated.

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### Yield parameter

- a. **Length of bulb (cm):** The length of each selected bulbs was measured by using digital vernier caliper from the base to tip of the bulbs and average of five fruits was computed and expressed in centimeters.
- b. **Diameter of bulb (cm):** The diameter of the selected bulbs was measured at the centre of fruits by using Digital Vernier caliper and average of ten fruits was recorded.
- c. **Average weight of bulb (gm):** The weight of each selected bulbs measured by using weighing balance and average weight of five bulb weight was calculated.
- d. **Yield per plot:** Fruit yield per plot was recorded as the weight of whole fruits per plot and was expressed in kilograms.
- e. **Chlorophyll-a 3 and Chlorophyll-b:** Chlorophyll-a and chlorophyll-b contain of onion bulb were determined by using spectrophotometer. In this method fresh leaf samples were weighted, 0.1 g for every individual sample. Refrigerated 80% cc. acetone was used in order to drive the protein-chlorophyll complex and to extract the chlorophyll.

### Result and Discussion

#### Growth parameter

- a. **Height of plant:** Height of plant was recorded at 30 and 60 days after planting are presented in Table No.1. The data in respect of height of plant showed significant differences at all stages of growth. At 30 days after planting, significantly maximum height was recorded in variety Bhima Shubhra (29.21 cm) which was at par with the variety Bhima super (28.90 cm), Bhima Raj (28.28cm) and Bhima Kiran (28.04). However, minimum plant height was observed in variety N-2-4-1 (25.41 cm), Bhima Red (26.04cm), Bhima Light Red and Phule Samarth (26.74cm) at par with each other. At 60 DAP, non-significant plant height was observed in different onion varieties.
- b. **Number of leaves per plant:** The data regarding the number of leaves per plant were recorded at 30 and 60 days after planting and presented in Table No. 1. The data regarding the number of leaves per plant was recorded at 30 days after planting revealed that, significantly maximum number of leaves per plant was recorded in variety Phule Samarth (6.8) which was at par with N-2-4-1 (5.6). However, minimum number of leaves per plant was recorded in variety Bhima Super (4.40) and Bhima Shakti (4.46), Bhima Light Red (4.56) and Bhima Dark Red (4.66) at par with each other. The data pertaining the number of leaves per plant was recorded at 60 days after planting revealed that, significantly greater number of leaves per plant was recorded in variety Phule Samarth (12.8) followed by Bhima super (9.70), Bhima Safed (9.64) and Bhima Dark Red (9.47). However, least number of leaves was observed in variety Bhima Red (8.33). Similar variation in Height of plant and number of leaves among different varieties were reported by Sikdar *et al.*, (1986) <sup>[6]</sup> plant spacing showed significant effects on most of the growth and yield characteristics. Wider spacing produced the maximum number of leaves per plant.

### Yield parameter

- a. **Length of bulb (cm):** Data in respect of length of bulb was recorded after harvesting and presented in Table No.1. From the data presented in Table No. 1 observed that significantly maximum length of bulb was recorded in variety Phule Samarth (6.70 cm) followed by in variety Bhima Red (5.04), Bhima super (4.90 cm) and Bhima Shubhra (4.87) which were at par with each other. However, minimum length of bulb was found in variety Bhima Light Red (4.3 cm). These results are in close conformity with the results obtained by Umamaheswarappa *et al.*, (2018) <sup>[9]</sup> revealed that significantly the highest polar diameter of bulb (4.98 cm) was recorded in the genotype Bhima Super followed by Agri found White (4.68 cm) as compared to other of the genotypes.
- b. **Diameter of bulb (cm):** Data in respect of weight of bulb was recorded after harvesting and presented in Table No. 1. The data presented in Table 1. found non-significant results of diameter of bulb in onion varieties studied. These results are in close conformity with results obtained by Abdelkader *et al.*, (2014) <sup>[1]</sup>, Kasera *et al.*, (2019) <sup>[4]</sup> showed that the variety Bhima Red (V8) recorded significantly higher diameter of bulb (6.61 cm) and lower diameter of bulb was recorded by Agri found Dark Red (5.31 cm).
- c. **Average weight of bulb (gm):** Data in respect of average weight of bulb was recorded after harvesting and presented in Table No. 1. From the data presented in Table 1. showed significantly maximum average weight of bulb was recorded in variety Phule Samarth (116.17 g) followed by in Bhima Kiran (99.20 g) and Bhima Shubhra (97.25g) which were at par with each other. However, minimum average weight of bulb was recorded in variety Bhima Red (71.14g). Average weight of bulb was significantly differed in onion varieties. These results are in close conformity with the results obtained by Gosai *et al.*, (2018) <sup>[3]</sup> revealed that the highest in Bhima Shakti (86.99g) and lowest in Brown Spanish (52.48g). Weight of bulb influenced by genetic make up of different variety and adaptability of environmental conditions.
- d. **Yield per plot:** Data in respect of yield of bulb per plot different turmeric varieties are presented in Table No.1. The significantly highest yield of bulb per plot was recorded in variety Phule Samarth (21.99 kg) followed by in Bhima Shakti (17.00 kg) and Bhima super (16.69 kg) which were at par with each other. However, minimum yield of bulb per plot was recorded in variety Bhima kiran (12.81 kg). These results are in close conformity with results obtained by Pardeshi and Waskar (2012) <sup>[5]</sup> observed that JNDWD-207 was higher in yield per plot (22.5kg) and variety Sel-383 had minimum yield (13.33kg). Highest yield observed due to the increased growth of plant regarding with height of plant and number of leaves per plant.

### Chlorophyll content

The data in respect to the Chlorophyll a and Chlorophyll b of fresh harvested different varieties of onion are presented in Table No.1. The data showed that significantly maximum Chlorophyll a and Chlorophyll b of fresh onion was recorded in variety Phule Samarth (20.92) and (10.34), respectively followed by in Bhima Shkti (19.94) and (10.9), respectively.

The minimum Chlorophyll a and Chlorophyll b were recorded in variety Bhima Dark Red (16.28) and (6.36), respectively. These results were in agreement with findings of Ghodke *et al.*, (2018) [2] reported that the higher chlorophyll content was

observed in leaf tissue of onion variety Bhima kiran chlorophyll contents increased in irrigated condition and decreased in drought condition.

**Table 1:** Growth and yield parameters of different varieties of onion.

Treat. Symbol	Variety	Height of plant (cm)		Number of leaves per plant		Yield parameters				Chlorophyll content	
		30 DAS	60 DAS	30 DAS	60 DAS	Length of bulb (cm)	Diameter of bulb (cm)	Ave. wt. of bulb	Yield/ plot (Kg)	Chl-a	Chl-b
T <sub>1</sub>	B.kiran	28.04	53.06	5.23	8.63	4.75	6.04	99.20	12.81	16.40	6.43
T <sub>2</sub>	B.super	28.90	52.21	4.40	9.70	4.90	5.83	95.87	16.69	18.02	7.69
T <sub>3</sub>	BDR	26.96	55.45	4.66	9.47	4.49	6.13	85.38	14.55	16.28	6.36
T <sub>4</sub>	BLR	26.67	56.74	4.56	9.26	4.3	5.88	76.84	12.89	19.60	8.62
T <sub>5</sub>	B. Safed	27.33	56.29	4.73	9.64	4.67	6.20	81.64	15.24	18.69	8.19
T <sub>6</sub>	B. Raj	28.28	53.62	4.73	8.63	5.04	5.32	79.97	15.69	16.80	6.86
T <sub>7</sub>	B. Shakti	27.57	55.32	4.46	9.40	4.73	5.98	86.24	17.00	19.94	10.09
T <sub>8</sub>	B. Shweta	27.73	55.41	5.26	8.73	4.70	6.05	94.37	15.17	18.45	7.96
T <sub>9</sub>	B.Shubhra	29.21	54.56	5.00	8.93	4.87	5.95	97.25	14.42	19.31	8.27
T <sub>10</sub>	B. Red	26.41	52.82	5.36	8.33	4.58	5.47	71.14	14.08	16.77	6.52
T <sub>11</sub>	N-2-4-1	25.74	53.70	5.60	8.56	4.57	6.33	78.98	13.94	18.05	7.35
T <sub>12</sub>	P.Samarth	26.44	50.63	6.80	12.80	6.70	6.72	116.71	21.91	20.92	10.34
SE ±		0.41	1.25	0.41	0.42	0.34	0.39	4.81	1.35	0.31	0.19
CD @ 5%		1.21	N/A	1.22	1.26	1.00	N/A	14.21	3.99	0.92	0.57

(B- Bhima, Chl- Chlorophyll, D-Dark, L- Light, R- Red, P- Phule, Treat- Treatments)

### Conclusion

This research finding concluded that yield parameters highest yield of fresh onion per plot, length of bulb, diameter of bulb and average weight of bulb were found in Phule Samarth (21.99 kg), (6.70cm), (6.72cm) and (116.17g), respectively. The variety Phule Samarth showed best results for all yield parameters. In respect of vegetative growth characters, variety Bhima Light Red recorded maximum plant height (56.74 cm). While maximum number of leaves (12.8), chlorophyll-a content (20.92) and chlorophyll-b (10.34) were recorded in Phule Samarth. The variety Phule Samarth showed at par results for all growth characters except plant height.

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