



Study On Performance Of Bhima Super Variety Onion In Davanagere District

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Abstract:

Onion is one of the most important commercial crop of the Davanagere District under rain fed condition. Due to use of local varieties and unscientific management practices farmers are getting lower productivity. For this Krishi Vigyan Kendra conducted series of demonstrations over the years with the best performing variety Bhima Super in different locations of the district. The results obtained from the present demonstrations on the Performance of onion (*Allium cepa* L.) varieties for growth and yield traits in Davanagere district during kharif season of 2016-17, 2017-18, 2022-23, 2023-24 are recorded. The economic analysis of the data revealed that variety Bhima Super recorded highest gross returns (Rs. 320956/ha), Net returns (Rs.208219/ha) and BC ratio (2.82). Hence it can be concluded from the study that the Bhima Super variety performed better in growth and yield attributes compared to local varieties and best suited to kharif season for cultivation in central dry zone and southern transitional zone of Karnataka.

Key Words: Bhima Super, Demonstration, Varieties, Productivity etc.

Introduction

Onion (*Allium cepa* L.) is one of the important commercial vegetable crops cultivated extensively in India and it belongs to family Alliaceae. Onion is an indispensable item in every kitchen as vegetable salad and condiment, therefore commands, an extensive internal market. Onion is liked for its flavour and pungency which is due to the presence of organic compound rich in sulphur (Allyl propyl disulphide). Onion bulb is a rich source of minerals like phosphorus, calcium and carbohydrates. It also contains protein and vitamin C. It is being used in several ways as a fresh, frozen and dehydrated bulb. India ranks second in the world in area and production after China and third in export after Netherland and Spain. India is producing 23,610.10 million tonnes of onion from an area of 1,293 ha with an average productivity 16.10 t/ha. In Karnataka, it is grown about 195.28 million ha with an average production of 2,986.59 million tonnes and productivity 15.29 t/ha (Horticulture statistics at a Glance-2018).

Onion cultivar shows wide variation in their yielding ability when grown over varied agro-climatic conditions. Different cultivars perform variations in the productivity in different soil and climatic conditions. Davanagere District being one of the major vegetable producing area in Onion (1354 ha). It is being cultivated in Honnali, Nyamathi and Jagalur Taluks. The performance of the existing local varieties in the district is below the average productivity of the District. Also the keeping qualities of the local variety was very poor which is leading to the early disposal of the produce for the lowest price by the farmers. Therefore, keeping this in view, the different constraints cited above and realizing the need of comprehensive study to select the most suitable high yielding variety with better growth, yield and quality by screening existing cultivar of onion for Davanagere District.

Material and Methods

Frontline demonstration on Performance of Bhima Super variety was carried out in two different locations of Jagalur and Nyamathi Taluk in the year 2016-17, 2017-18 and 2022-23, 2023-24 in Jagalur Taluk respectively. In Jagalur Taluk the control variety was Bellary red where as in case of Nyamathi its Nyamathi local variety. Ten Farmers for each demonstration was selected and soil test for the each plot was done before sowing of the crop. Seeds were treated with *Trichoderma harzianum* @ 4g per kg of seed. Each farmer was given seeds for about one acre and the relevant package of practices from time to time was provided. Randomly ten plants from each plot were selected to record the observations on Germination (%), Plant Height (cm), Number of Leaves, Collar Thickness (cm), Five Weight of Bulb (g), Total Bulb Yield (q/ha). The Benefit cost ratio was obtained by recording all the cost of production and returns.

The incidence of diseases were calculated based on the ratings of 0-5 scale (Sharma, 1986). The crop was recorded with the incidence of Thrips and Purple blotch disease at 15 days interval. The varieties are hence placed in different categories for their performance against disease resistance or susceptibility according to score.

As per the recommendation of Singh (2004) percent of the surface of the leaf affected was determined. The infection on leaves was graded in 0-9 scale on the basis of severity/Intensity/Incidence of infection on leaves. The disease incidence was calculated with percentage ratio of infected area with the total leaf area.

Results and Discussion

The results obtained from the present demonstrations on the Performance of onion (*Allium cepa* L.) varieties for growth and yield traits in Davanagere district during kharif season of 2016-17, 2017-18, 2022-23, 2023-24 are discussed and presented in table 1 & 2.

As per the available data, onion varieties had profound effect on growth and quality parameters. The highest marketable yield (223.7 q/ha) was obtained in Bhima Super variety compare to local variety (150.1 q/ha). The superiority of Bhima Super variety is mainly due to higher germination percent (91.6), plant height (62.04 cm), Number of leaves per plant (10.88). The variation in bulb yield of different varieties of onion is also been reported under different locations.

Maximum plant height (63.72 cm), number of leaves per plant (13.17), leaf length (51.85 cm), bulb diameter (5.95 cm), fresh weight of bulb (102.53 g), cured weight of bulb (93.38 g), bulb yield (262.56 q/ha), minimum neck thickness of bulb (1.10 cm) and bolting percentage (0.70%) were observed in Bhima Dark Red as reported by Aswani et al (2023). The superiority and higher yield of Bhima Super was reported by Kerur et.al (2016) in Karnataka, Lawande et.al (2011) in Maharashtra.

Apart from good productivity, the Bhima Super variety recorded the lowest pest incidence (Thrips-13.36 %) and disease incidence (Purple Blotch -11.90 %) and stem phyllum Blight (14.33 %) compare to local varieties (Table 3).

The year wise economics of onion under demonstrations were estimated and results have been presented in Table 3. The economic analysis of the data revealed that variety Bhima Super recorded highest gross returns (Rs. 320956/ha), Net returns (Rs.208219/ha) and BC ratio (2.82). The similar study on better economic returns by the production of Bhima Super variety with other varieties was reported by Kerur et.al (2016). The highest and significant total bulb yield (282.63 q/ha) and marketable yield (251.83 q/ha) were recorded in the genotype Bhima Super. The parameters like polar diameter of bulb (4.98 cm), equatorial diameter of bulb (5.46 cm) and Average bulb weight (69.33 g) recorded significantly higher in the genotype Bhima Super as reported by Umamaheshwarappa et al (2018).

The ranking of onion varieties based on the basis of farmer's feedback presented in the Table 4. According to this data Bhima Super Variety is most preferred variety among all the parameters compared to local variety.

The consumer preference was more in case of Bhima Super variety for its high shelf-life and fetches higher price in the market. Bhima Super variety registered 43.21% increased yield over Agri found Dark Red variety as reported by Biswanath Sahoo et al (2020).

Conclusion:

The perception of the farmers and ranking provided by them for the Bhima Super variety was superior for the characters like Size of the bulb, attractive shape, colour of the skin, better yield, good shelf life and good consumer preference. However for the availability of quality seeds the local varieties seeds are more readily available to farmers than Bhima Super. This is mainly due to poor participation of the farmers on the participatory seed production. Similar evaluation of onion varieties for productivity performance was reported by Hiremat et.al 2018. Hence it can be concluded from the study that the Bhima Super variety performed better in growth and yield attributes compared to local varieties and best suited to kharif season for cultivation in central dry zone and southern transitional zone of Karnataka.

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Table 1: Growth parameters of Onion Varieties

Sl.No	Parameters	Local Variety					Bhima Super				
		2016-17	2017-18	2022-23	2023-24	Mean	2016-17	2017-18	2022-23	2023-24	Mean
01	Germination (%)	84.20	84.00	82.5	82.6	83.32	93.00	90.04	90.10	91.1	91.6
02	Plant Height(cm)	55.34	58.98	54.31	58.12	56.68	58.41	62.83	61.48	65.46	62.00
03	No of leaves/plant	8.72	9.02	7.46	8.92	8.53	9.29	10.39	11.40	12.44	10.88
04	Collar Thickness(cm)	1.28	1.37	1.12	1.23	1.25	1.39	1.49	1.34	1.51	1.43

Table 2: Yield and Economics of Onion Varieties

Sl.No	Parameters	Local Variety					Bhima Super				
		2016-17	2017-18	2022-23	2023-24	Mean	2016-17	2017-18	2022-23	2023-24	Mean
01	Total Yield(q/ha)	160.4	152.6	142.6	144.8	150.1	194.6	212.4	231.8	256	112736
02	Gross cost(Rs/ha)	105280	120764	120368	122178	171147	96457	106688	122117	125680	320956
03	Gross returns (Rs/ha)	192480	228900	213900	217200	213120	233524	318600	347700	384000	320956
04	Net Returns(Rs/ha)	87199	108135	93531	95.21	95971	137066	211912	225582	258319	208219
05	BC ratio	1.82	1.90	1.78	1.79	1.82	2.42	2.99	2.84	3.05	2.82

Table 3: Performance of pest and disease incidence of Onion Varieties

Sl.No	Parameters	Local Variety					Bhima Super				
		2016-17	2017-18	2022-23	2023-24	Mean	2016-17	2017-18	2022-23	2023-24	Mean
01	Thrips incidence (%)	18.37	17.48	18.18	18.91	18.23	13.26	12.18	14.46	13.56	13.36
02	Purple Blotch Incidence (%)	23.41	28.81	26.11	28.16	26.62	12.98	12.46	11.61	11.18	11.90
03	StemPhylium Blight (%)	26.41	29.18	29.92	27.6	28.27	14.81	14.11	13.81	14.61	14.33
	Scale of Both Diseases	Moderately Susceptible					Moderately Resistant				

Note: Scale references are given in the table 5 & 6

Table 4: Varietal Performance and Farmers feedback on various characters of Onion

Sl.No	Variety	Size	Shape	Colour	Skin	Yield	Market Preference	Availability of seeds	Total Points	Ranking
01	Bellary Red	3	3	4	4	3	4	2	23	III
02	Nyamathi Local	3	3	3	4	3	3	2	21	II
03	Bhima Super	1	2	1	2	1	1	3	11	I

(Preference Scale: 1-6(1-Highest Preference, 6- Lowest Preference))

Table.5 Scale for categorizing the varieties against the stemphylium blight of onion

Score	Disease Severity (%)	Disease reaction
0	<5	Immune(I)
1	6-10	Resistant(R)
2	11-20	Moderately Resistant(MR)
3	21-40	Moderately susceptible (MS)
4	41-60	Susceptible(S)
5	>60	Highly Susceptible(HS)

Table.6 Scale for categorizing the varieties against the purple blotch of onion

Sl No	Percent leaf area covered	Grade(X)
1	1	0
2	2	1
3	2-10	3
4	11-25	5
5	26-50	7
6	>50	9