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Phule nilima: New variety of garlic for Maharashtra

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Abstract
The garlic variety Phule Nilima (Sel. 10-3) was found superior in respect of growth, yield and yield contributing characters. The average bulb yield obtained in various trials was 170.14 q/ha which was 27.88% higher than check variety Phule Baswant. The plants are tall with semi erect and dark foliage, leaves per plant medium having medium length and breadth of leaf. The bulbs are large with ovate in shape and flat at base. The bulbs are violet/purple in colour with maximum (28.33) number of cloves/bulb. This variety is suitable for *rabi* season under irrigated condition. It has also better consumer preference among the farming community.

Keywords: garlic, phule nilima, selection, PLW, DUS, losses

Introduction
Garlic (*Allium sativum* L.) is the second most widely cultivated Allium after onion. It is regarded as one of the important bulb crop grown and used as a spice or condiment throughout India. It is commodity of mass consumption, consumed in various ways by almost all the sections of the society and highly placed for its flavour enhancing capacity. It is practically used all over the world for flavouring various dishes. It is in demand almost all the year round all over the world both in fresh form and also in dehydrated forms. Garlic has higher nutritive value than other bulb crops. It has good export potential as fresh bulbs as well as in the form of dehydrated products. The medicinal value of the crop has boosted the scope of the crop and it has many medicinal uses also. India ranks second in area (2.45lakh ha.) as well as in the production (12.26 lakh MT). The average productivity of garlic in India is 50 q/ha, which is quite low as compared to other garlic growing countries (Anon., 2015) [3]. The lack of improved varieties of garlic and non-availability of quality seed or planting material are the main constraints in the production and productivity, apart from the other factors. The garlic possesses a wide range of variability on bulb characters and yield attributes as well as the storability, in spite of being vegetatively propagated crop. The varieties Godawari, Sweta and Phule Baswant developed by Mahatma Phule Krishi Vidyapeeth, Rahuri are well familiar in the garlic growing area of Maharashtra. However, it was felt need to locate elite types with bold cloves, appreciating violet colour, tolerant to diseases and pests with good potential for yield. According four promising garlic genotypes *viz;* Sel. 10-1, Sel. 10-2, Sel. 10-3 and Sel. 10-7 were selected and tested along with Phule Baswant as check. Among these selections Sel. 10-3 (Phule Nilima) was proved to be more promising and has been recently released for commercial cultivation in garlic growing areas of Western Maharashtra (Anon. 2014) [2].

Materials and Methods
An effective collection of local germplasm for farmers field was done by the scientists of All India Coordinated Research Project on Vegetable Crops, Mahatma Phule Krishi Vidyapeeth, Rahuri during 2008-09. From these different garlic collections, the selections having the violet coloured bulbs and cloves with big size bulbs (30-35 g) were selected. The four selections *viz.;* Sel. 10-1, Sel. 10-2, Sel. 10-3 and Sel. 10-7 were tested with Phule Baswant commercial check as station and multilocation trials at Rahuri, Pune, Sangli, Nashik and Kolhapur under irrigated conditions. According it was tested for different spacings and fertilizer levels. The experiment plot having medium black having soil pH 6.5. These selections were evaluated in randomized block design with four replications during *rabi* season 2010-11 to 2013-14. The planting of cloves was done in month of October every year. All the agronomic and plant protection measures were adopted for better crop growth and yield as and when required. Five plants form each replication were randomly seleted and observations on plant height (cm), number of leaves per plant, neck thickness (cm), polar and equatorial diameter of bulb (cm), average weight of bulb, number of cloves/bulb, average weight of 10 cloves, bulb colour and

physiological loss in weight (%) were recorded and means were used for stastical analysis as per method suggested by Panse and Sukhatme (1985) [7].

Results and Discussion

The yield differences in four station trials (Table 1) were significant and Sel. 10-3 (Phule Nilima) recorded significantly maximum bulb yield of 174.35 q/ha than the rest of selections and check variety Phule Baswant consistently for all the years.

In multilocation trials conduted during 2012-13 and 2013-14 in jurisdiction of MPKV.,Rahuri. The significantly maximum bulb yield was recorded by same Sel. 10-3 at Rahuri, NARP, Pune, Pimpalgaon Baswant, Nashik respectively than check variety Phule Baswant which was recorded significantly low yield for both years (Anon. 2013) [1]. Similar findings also reported by Khar *et.al.* (2011) [5] for Bhima Omkar variety of garlic.

The data presented in table 1 revealed that the garlic Sel. 10-3 significantly recorded average bulb yield of 170.14 q/ha than the check variety Phule Baswant (134.12 q/ha). The perventage increase in bulb yield over check was about 27.88% and 3.73 to 8.26% over the other garlic seleciotns. Thus, new variety of garlic Phule Nilima (Sel. 10-3) gave the 27.88% higher yield over check variety Phule Baswant and comparative performance of in different trials also confirmed the superiority of Sel. 10-3 (Anon. 2014) [2]. Similar trend was reported by Khar *et.al.*,(2011) [5] and Mehta *et.al.*,(2011) [6] of garlic varieties in Pune and Chhattisgarh conditions.

The ancillary observations presented in Table 2 and 4 indicated that plant of garlic Sel. 10-3 having medium tall (67.34 cm) having semi erect and dark folige. The number of leaves per plant was medium (11.54) with medium length and breadth of leaf. The bulbs was large (3.84 cm) with ovate in shape and flat at base. The dry external colour of scale was purple and anthocynin strips on external scale was present. The number of cloves were many (28.330 which was radially distributed and external cloves sparely present. The Sel. 10-3 found moderately resistant to purple blotch incidence (12.84%) and minimum incidence of thrips/plant (1.08) and number of mites/leaf (5.80) was observed on this selection under investigation. Overall the plant growth, bulb characters and reaction to major disease and pests garlic Sel. 10-3 was found better as compared to other selections and check. (Anon. 2014) [2].

The physiolocal loss in weight (PLW) studies 20 kg sample of each selection and check variety were kept for 6 months after harvesting and shade curing. The data presented in Table 4 indicated that Sel. 10-3 recorded significantly minimum PLW 5.57, 5.82, 8.12, 11.66, 14.63 and 18.87% after six month storage under ambient condition respectively. The PLW in each month was worked out and progressive data not recorded. However, significantly maximum PLW was recorded by check variety Phule Baswant (5.93, 6.71, 10.08, 16.70, 24.09 and 28.62% respectively) from 30 to 180 days after storage (Anon, 2014) [2].

On the basis of different station and multilocaiton trials conducted it is indicated that Sel. 10-3 (Phule Nilima) recorded maximum bulb yield than check variety. The bulbs are large, purple/violet in colour with semi-erect and dark foliage, moderately resistant to purple blotch disease with minimum infestation of thrips and mites under field condition during *rabi* season. Considering overall performance of garlic Sel. 10-3 was released in Joint Agresco Meeting held at Dr. BSKKV., Dapoli during 2014 in name of Phule Nilima. Similarly, it is released at State Level during 2016 for cultivation in Western Maharashtra (Anon, 2016) [4]. The cultivation of this variety will enhancing the production and productivity of this important bulb crop in the state.

Table 1: Overall yield (q/ha) performance of garlic selections in different trials.

Sr. No.	Selections	Station trial	MLT trial	Pooled Mean	% increase over
1	Sel. 10-1	146.03	142.05	144.04	8.26
2	Sel. 10-2	145.02	142.72	143.87	8.13
3	Sel. 10-3	174.35	165.93	170.14	27.88
4	Sel. 10-7	140.68	135.37	138.025	3.73
5	Phule Baswant (c)	136.66	131.58	134.12	--
	S.E.±	7.7225	7.701	7.7105	--
	C.D. at 5%	23.8575	23.24	23.545	--
	C.V. %	9.6075	11.44	10.52	--

Table 2: Ancillary observations of garlic selections. (Pooled mean of three years)

Sr. No.	Selections	Plant height (cm)	No. of leaves / plant	Neck thickness (cm)	Polar diameter of bulb (cm)	Equatorial diameter of bulb (cm)	Av. wt. of bulb (g)	No. of cloves / bulb	Av. wt of 10 cloves (g)	Purple blotch incidence (%)	No. of thrips / plant	No. of mites / leaf	Bulb colour
1	Sel. 10-1	66.39	11.48	0.97	3.60	4.50	30.05	30.57	9.50	17.82 (24.95)	6.43 (2.62)	9.58 (3.09)	Violet
2	Sel. 10-2	63.20	11.41	0.99	3.64	4.57	31.00	29.91	10.01	23.56 (29.00)	1.11 (1.31)	7.23 (2.77)	White
3	Sel. 10-3	67.34	11.54	0.93	3.84	4.70	33.30	28.33	12.02	12.84 (20.96)	1.08 (1.24)	5.80 (2.48)	Violet
4	Sel. 10-7	64.45	11.47	1.03	3.87	4.50	30.10	27.27	10.10	16.03 (23.81)	1.67 (1.46)	12.14 (3.53)	White
5	Phule Baswant (c)	64.04	11.54	0.92	3.00	4.16	26.96	26.15	10.30	20.38 (26.78)	3.61 (2.02)	7.57 (2.82)	Violet
	S.E.±	1.59	0.28	0.04	0.10	0.12	1.32	1.68	0.17	0.96	0.07	0.10	--
	C.D. at 5%	N.S.	N.S.	N.S.	0.31	0.37	3.97	5.04	0.53	2.88	0.22	0.33	--
	C.V. %	4.21	4.86	8.71	5.26	5.28	7.87	10.70	9.67	--	--	--	--

Table 3: Storage studies of garlic selections (pooled mean)

Sr. No.	Selection	PLW (%)						Total losses (%)
		30 DAS	60 DAS	90 DAS	120 DAS	150 DAS	180 DAS	
1	Sel. 10-1	4.57 (12.34)	5.76 (13.89)	8.80 (17.25)	13.74 (21.76)	18.41 (25.41)	22.33 (28.20)	22.33
2	Sel. 10-2	6.17 (14.39)	8.04 (16.47)	11.07 (19.43)	16.39 (23.88)	19.28 (25.68)	25.49 (30.32)	25.49
3	Sel. 10-3	5.47 (13.53)	5.82 (13.97)	8.12 (16.56)	11.66 (19.97)	14.63 (22.49)	18.87 (25.75)	18.87

4	Sel. 10-7	3.55 (10.86)	4.81 (12.66)	7.22 (15.58)	11.10 (19.46)	16.70 (24.12)	20.13 (26.66)	20.13
5	Phule Baswant (c)	5.93 (14.09)	6.71 (15.01)	10.08 (18.51)	16.70 (24.12)	24.09 (29.40)	28.62 (32.34)	28.62
	S.E.±	0.09	0.12	0.04	0.08	0.16	0.03	--
	C.D. at 5%	0.28	0.38	0.14	0.25	0.50	0.10	--
	C.V.%	1.39	1.71	0.52	0.75	1.28	0.23	--

Table 4: DUS characters of garlic Selection 10-3

Sr. No.	Name of Characters			Sel. 10-3
1.	Plant	:	Density of leaves	Medium
2.	Plant	:	Number of leaves per pseudostem	Medium (11.54)
3.	Foliage	:	Attitude	Semi erect
4.	Leaf	:	Intensity of green colour	Dark
5.	Leaf	:	Waxiness	Present
6.	Leaf	:	Length (25-35 cm)	Medium (39.0)
7.	Leaf	:	Width (1.5-2.5 cm)	Medium (1.9)
8.	Leaf	:	Shape in cross section	Slightly concave
9.	Pseudostem	:	Length (5-10 cm)	Medium (6.5)
10.	Pseudostem	:	Width of the base (1.0-1.5 cm)	Medium (1.0)
11.	Pesudostem	:	Intensity of anthocynin colouration at base	Present
12.	Flowering stem	:	(Present / Absent)	Absent
13.	Flowering stem	:	Curvature	Absent
14.	Flowering stem	:	Length (<70 cm)	Short (60)
15.	Flowering stem	:	Bulbils	Absent
16.	Time of maturity (from date of planting) : (130-160 Days)			Medium (140-150)
17.	Bulb	:	Size (diameter) (3.5-5 cm)	Large (3.84)
18.	Bulb	:	Shape in longitudinal section	Ovate
19.	Bulb	:	Shape in cross section	Elliptic
20.	Bulb	:	Position of cloves at tip of bulb	Exerted
21.	Bulb	:	Position of rost disc	Exerted
22.	Bulb	:	Shape of base	Flat
23.	Bulb	:	Compactness of clove	Medium
24.	Bulb	:	Ground colour of dry external scales	Purple
25.	Bulb	:	Anthocyanin strips on dry external scales	Present
26.	Bulb	:	Number of cloves (>20)	Many (28.33)
27.	Bulb	:	Distribution of cloves	Radial
28.	Bulb	:	External cloves	Sparely present
29.	Bulb	:	Skin adherence of dry external scales	Medium
30.	Clove	:	Size (diameter) (1-2 cm)	Medium (1.1)
31.	Clove	:	Colour of clove	Purple
32.	Clove	:	Colour of flesh	Yellowish

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References

1. Anonymous. Proposal for release of garlic variety Phule Nilima submitted to Research Review Committee Meeting, at MPKV. Rahuri, 2013, 101-110.
2. Anonymous. Proposal for release of garlic variety Phule Nilima submitted to Research Finding and Release Committee Meeting at MPKV, Rahuri and joint Agresco meeting held at Dr. BSKKV, Dapoli, 2014, 17-18
3. Anonymous. National Horticulture Board Database. Govt. Of India. 2015, 166.
4. Anonymous. Release of varieties of Horticulture crop in State Seed Sub Committee Meeting, Mumbai, 2016.
5. Khar A, Lawande KE, Devi A, Mahajan V. Bhima Omkar a promising garlic variety. In souvenir of National Symposium on "Alliums: Current Scenario and Emerging Trends" organized by Indian Society of Alliums and Directorate of Onion and Garlic, Pune, India. 2011, 174.
6. Mehta N, Tirney T, Khare CP, Fatima SA, Wagh Y. Performance of Indra Garlic 2011-1 in Chhattisgarh plains situation In souvenir of National Symposium on "Alliums: Current Scenario and Emerging Trends" organized by Indian Society of Alliums and Directorate of Onion and Garlic, Pune, India, 2011, 150.
7. Panse VS, Sukhatme PV. Stastical methods for Agriculture workers. 4th Edn. ICAR, New Delhi. 1985, 157-165.