

## Performance Studies of Exotic Onion (*Allium cepa* L.) Hybrids in the Nashik Region of Maharashtra

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### Abstract

The study was conducted at National Horticultural Research and Development Foundation at Nashik during 2007-08 in randomized block design with two replications to select the good onion hybrid for cultivation in Maharashtra. It is concluded from the experiment conducted that onion hybrids Mercedes, Linda Vista, Cougar and Colina performed better in respect of yield and yield contributing traits and the variety Agrifound Light Red performed better regarding total soluble solids, dry matters and Pyruvic acid content. It is therefore suggested to the grower and exporters of onion in Nashik are that they can cultivate above hybrids for export as well as domestic consumption.

**Key words:** Onion hybrid, performance, Maharashtra

### Introduction

Onion (*Allium cepa* L.) is commercially cultivated and widely consumed as vegetable and as spices in India. India is second largest producer of onion in the world after China. A very little area under onion hybrid cultivation is noticed in India, because of non-availability of suitable hybrid seeds for different areas. The varieties grown in major onion growing region are of local types with a lot of variability for different characters. The local variety is not perfect for giving higher yield and good-quality bulbs for export. Nowadays, farmer of Maharashtra and Gujarat region are taking keen interest for exporting the good quality hybrid variety and fetching money. The hybrid varieties have a good potential to produce double yield when compared to a local variety. It is necessary to test the new hybrids from different sources to recommend the hybrids for cultivation in this region. To meet out the domestic requirement and also fulfill the export demand, selection of suitable hybrids for growing under different agro climatic conditions is required. Keeping these in view, the

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National Horticultural Research and Development Foundation evaluated the exotic and indigenous hybrids at Nashik for cultivation in these areas with comparison to standard check Agrifound Light Red, which is recommended commonly used popular variety for Rabi season (Pandey and Singh 1992).

### Materials and methods

The investigation was carried out under agro climatic conditions of Nashik, Maharashtra by National Horticultural Research and Development Foundation. Experiment was laid out in randomized block design (RBD) during late *kharif* 2007-08 in two replications. The nursery was sown on 27.9.2007 consisting of fifteen hybrids and one variety Agrifound Light Red and transplanted in the main field on 16.11.2007 at a spacing of 20 x 10 cm in the plot size of 2.0 x 1.0 m. The climate of Nashik is sub tropical and the maximum and minimum temperatures and humidity ranging between 16.0°C to 40.0°C and 48.0 % to 80.0% respectively and located at an altitude of 492.0 meter mean sea level and suitable for onion growing. Recommended package of practices and plant protection measure were followed to raise the successful crop. The crop was harvested at maturity when the tops had fallen and became withered. Field and shade curing was done, and yields were determined by removing the tops from the bulbs.

Observations were recorded on randomly selected plants in each hybrid per replication on plant height (cm), leaves per plant, neck thickness, days for bulb initiation, days for maturity, bulb diameter (cm), bulb size index (cm<sup>2</sup>), bolters (%), doubles (%), splited (%), weight of 20 bulbs (kg), total soluble solids (%), dry matters (%), Pyruvic acid (%), colour of bulbs, shape of bulbs, gross yield and marketable yield (q/ha) and disease, insect pest incidence and intensity. Mean data were analyzed for identifying critical differences and presented in Table 1.

### Results and discussions

The fifteen hybrids and one variety ALR differed significantly for all the traits except bolters (%),

splited (%) and disease and insect pest. The data presented in Table-1 revealed that highest significant plant height (74.90 cm) was noted in hybrids Linda Vista and it was at par with hybrids Mercedes (74.80 cm) and cougar (69.20 cm). The smallest plant height was observed for onion-4 (52.40 cm). The maximum leaves per plant were shown by BSS-262 (10.00) and was at par with BSS-255 (9.90), Flare (9.50), Lucifer (9.30) and Orient (9.30). Significantly lowest neck thickness was observed for BSS 258 (1.35 cm) and was at par with onion-4 (1.39 cm) and Orient (1.51 cm).

Significantly highest bulb diameter (7.69 cm) bulb size index (50.27 cm<sup>2</sup>) and 20 bulb weight (3.78 kg) was noted for hybrids Mercedes and it was at par with Cougar (7.66 cm, 49.81 cm<sup>2</sup>, 3.65 kg) and Linda Vista (7.57 cm, 47.49 cm<sup>2</sup>, 3.58 kg) respectively. Significantly highest total soluble solids (14.00%) and dry matter content (15.36%) were, however, recorded in Agrifound Light Red and was at par with BSS-442 (13.50%, 14.62%), BSS-441(13.50,14.62%), Orient (13.50,14.74%) and Flare (13.50,14.55%) respectively. Highest pyruvic acid content (13.10 micromole/g) was observed in Agrifound Light Red and was at par with BSS-442 (12.30 micromole/g) and Lucifer (12.20 micromole/g). All hybrids showed bolters and doubles except Mercedes, Cougar, Linda Vista, Colina, Ampurdan and onion-3. A minimum day taken for bulb initiation was in hybrid BSS-262 (40.0 days) followed by Mercedes (41.0 days) and BSS-255 (42.0 days). The maximum days taken in bulb initiation (51.0 days) and maturity for marketing (111.0 day) were shown by variety Agrifound Light Red. 100% thrips incidence was recorded for all hybrids. Lower nymphs per plant (21.55) were observed for variety Agrifound Light Red. Lowest incidence of stemphylium blight 60% was noted for hybrids Linda Vista, Lucifer, Flare and onion-4. Hybrid Ampurdan showed lowest stemphylium blight intensity (1.50%) followed by variety Agrifound Light Red (2.50), but it did not show significant differences.

Regarding yield, the hybrid Mercedes showed highest gross yield (724.95 q/ha) and marketable yield (690.00 q/ha) and which was at par with hybrids Linda Vista (716.25 q/ha) (657.50 q/ha). The highest yield for hybrid Mercedes was also reported by (Shankar et al 2000). It is suggested to growers and exporters of onion on the basis of experiment conducted he can grow hybrids Mercedes, Linda Vista, Colina and Cougar and get good yield and improve his socioeconomic status. The traits plant height, bulb diameter, bulb size index, 20 bulb weight, days for bulb initiation are the most prominent characters and play important

role to increase the yield of onion cultivars (Mohanty 2001, Patel et al. 1985, Patil et al. 1986, Sidhu et al. 1986).

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**Table1:** Performance of exotic hybrids during late kharif at Nashik

Hybrids	Plant Height (cm)	Leaves /plant	Neck thickness (cm)	20 Bulb weight (kg)	Bolters (%)	Doublers (%)	Split ed (%)	Gross yield (q/ha)	Market able yield (q/ha)	TSS (%)	Pyruvic Acid (%)	Days for bulb Initiation	Maturity for Marketing	Shape of bulb	Colour of bulbs	Stemphylium blight		Thrips	
																Inc (%)	Int. (%)	Inc (%)	Int. (%)
Mercedes	74.80	8.80	1.71	3.78	0.00	0.00	0.00	724.93	690.00	8.00	8.50	41.0	103.0	G Round	Yellow	80.00	3.50	100	32.75
Cougar	69.20	8.50	1.68	3.65	0.00	0.00	0.00	675.00	617.50	9.25	8.30	47.0	105.0	G Round	Yellow	80.00	3.75	100	29.60
Linda Vista	74.90	8.30	2.01	3.58	0.00	0.00	0.00	716.25	657.50	8.50	9.70	47.0	105.0	G Round	Yellow	60.00	2.75	100	28.80
Colina	65.70	8.00	1.73	2.55	0.00	0.00	0.00	505.00	445.00	9.50	8.70	44.0	105.0	G Round	Yellow	70.00	2.75	100	29.81
BSS-255	61.80	9.90	1.53	1.65	2.50	30.5	0.50	343.75	331.00	11.50	11.50	42.0	103.0	G Round	White	70.00	2.50	100	31.60
BSS-258	58.80	7.20	1.35	1.45	3.00	26.5	1.00	372.50	236.25	12.00	11.60	45.0	103.0	G Round	D Red	90.00	5.00	100	27.60
BSS-442	64.60	8.60	1.56	1.93	4.50	23.5	0.50	457.50	313.75	13.50	12.30	44.0	103.0	G Round	Red	90.00	5.25	100	26.20
BSS-262	62.50	10.00	1.60	1.70	2.50	46.5	1.00	445.00	188.75	12.00	11.50	40.0	103.0	G Round	White	90.00	4.75	100	28.20
BSS-441	63.90	9.00	1.67	1.80	6.00	24.5	0.00	432.50	272.50	13.50	12.00	44.0	105.0	G Round	Red	80.00	3.50	100	30.60
Lucifer	59.90	9.30	1.54	1.50	12.0	25.5	0.00	340.00	196.25	12.00	12.20	44.0	103.0	G Round	D Red	60.00	2.50	100	27.25
Orient	60.20	7.30	1.51	1.68	6.50	19.5	0.00	416.00	303.75	13.50	11.10	48.0	103.0	G Round	Red	70.00	2.75	100	26.10
Flare	60.50	9.50	1.65	1.65	2.50	14.5	0.00	410.00	355.00	13.50	11.90	43.0	103.0	G Round	Red	60.00	3.00	100	30.45
Ampurdan	64.00	7.70	1.67	0.80	0.00	3.00	0.00	211.25	117.50	12.50	0.00	48.0	111.0	B elliptical	L Red	50.00	1.50	100	27.85
Onion-3	66.50	8.40	1.77	1.25	0.00	3.50	0.00	187.50	177.50	10.50	10.50	49.0	111.0	B elliptical	D Red	70.00	2.25	100	27.00
Onion-4	52.40	8.80	1.39	2.33	0.50	9.50	0.50	493.75	425.00	11.00	10.90	49.0	103.0	G Round	L Red	60.00	2.25	100	26.65
ALR	68.80	9.20	1.72	1.65	2.00	40.0	1.00	427.50	370.00	14.00	13.10	51.0	111.0	G Round	L Red	70.00	2.50	100	21.55
C.D at 5%	5.56	0.75	0.17	0.45	NS	16.11	NS	86.24	100.39	1.15	1.24	---	---	-----	----	NS	NS	----	NS

