



Evaluation of Multiplier Onion Varieties Suitable for Ariyalur District

Y Raja joslin, G Alagukannan, A Rajkala and S Shobana

ICAR Krishi Vigyan Kendra (CREED),
Cholamadevi, Ariyalur District, – 612 902 (Tamil Nadu)

ABSTRACT

Multiplier onion (*Allium cepa* var. *aggregatum*) is an important commercial vegetable crops grown in Ariyalur and Perambalur districts of Tamil Nadu. This multiplier onion is commonly propagated by bulbs rather than nursery raising and planting of seedlings. It is famous for its use in sambar preparation, an important south Indian dish. It produces small size bulbs, many in number usually up to 6 numbers, to form an aggregated cluster. In general the cost of cultivation of multiplier onion goes higher and the net income is reduced for farmers due to the high cost of bulb seed material during the peak season. In order to reduce the cost of cultivation, the cultivation of onion through seeds, nursery raising and transplanting techniques advocated to the farmers. A new variety CO (On) 5 developed by TNAU, Coimbatore and a variety Arka ujjwal developed by ICAR-IIHR, Bangalore for multiplier onion were evaluated along with check during 2017-18. The observations were recorded on five randomly selected plants and bulb yield on plot basis in each replication on growth, yield, quality parameters and BCR. Variety Arka ujjwal was the earliest in maturity in 88 duration followed by the variety CO (On) 5 matured in 94 days during rabi season. The highest bulb yield was recorded in CO (On) 5 onion variety 14.5t/ha followed by Arka ujjwal 12.88t/ha and local ottanchathiram variety 12.1t/ha during rabi season. The variety CO (On) 5 was found to be multiplier onion variety suitable for Ariyalur district of Tamil Nadu. It has 6 uniform bulblets per bulb which were attractive pink coloured bold size bulbs and oval in shape tapering towards neck with high yield.

Key Words: Multiplier onion, cost of cultivation, Bulb seed material, seed onion, transplanting techniques, bulblets, maturity, bulb yield.

INTRODUCTION

Multiplier onion (*Allium cepa* var. *aggregatum*) is one of the most important commercial vegetable crops in Ariyalur and Perambalur Districts of Tamil Nadu. In India multiplier onion is cultivated in an area of 7, 56,000 ha. The production and productivity of multiplier onion in India is 12.16 Mt and 16.10 t/ha, respectively (www.nhb.gov.in). In Tamil Nadu multiplier onion is cultivated in an area of 30,255 ha with a production of 2, 86,000t. The average productivity of multiplier onion in Tamil Nadu is 9.45 t/ha (www.tn.gov.in). Multiplier onion is commonly propagated by bulbs rather than seed.

The high cost of the seed material *i.e.* bulb cost is a major problem which drastically increases the cost of cultivation of multiplier onion and quality of the bulb planting material. Multiplier onion is used both as raw and mature bulb stage as vegetable and spice.

The bulb of onion consists of swollen bases of green foliage leaves and fleshy scales. The three months from November - December (or) March to April is the best season for onion cultivation in Tamil Nadu. There is a general concept that multiplier onion cultivated by seed through nursery

Table 1. Biometric characters and yield of selected multiplier onion varieties

Growth parameters of Multiplier onion				
Sr.No	Parameter	Treatments		
		T1 (local Ottanchathiram)	T2 (CO (On) 5)	T3 (Arka ujjwal)
1.	Plant height at 30 DAP (cm)	20.2	22	21.4
2.	Plant height 45 DAP (cm)	30.1	33.5	32.4
3.	Diameter of leaf sheath at 45 DAP (cm)	1.28	1.52	1.41
4.	Root length (cm)	4.1	4.8	4.5
5.	Number of leaves/plant (Nos.)	10.3	9.2	6.5
6.	Weight of bulb (g)	29	30	32
7.	Number of bulblets per bulb (Nos.)	4.4	5.5	3.8
8.	Diameter of bulb (cm)	4.25	4.1	4.3
9.	yield (t/ha)	12.10	14.50	12.88
10.	BC ratio	2.50	3.65	3.24
Yield parameters of Multiplier onion				
11.	Weight of the compound bulb (g)	7-16	11-21	9-18
12.	No. of bulblets/kg (Nos.)	92	78	62
13.	No. of compound bulbs/kg (Nos.)	15.5	21	17
14.	yield/plant (g)	49.5	56	51
Quality parameters of Multiplier onion				
15.	Thickness of neck (cm)	1.1	1.2	0.95
16.	Basic colour of dry skin	Dark red	Dark pink	Light pink
17.	Adherence of skin after harvest	Medium	Medium	Strong
18.	Colour of epidermis of fleshy scale	Whitish pink	Whitish pink	Whitish pink

raising and transplanting is cheaper than the onion cultivated by bulb methods. The onion crop raised by seeds comes to harvest at 120 DAS and by bulb method it comes to harvest at 90 DAS. Onion can be grown under a wide range of climatic conditions but it succeeds best in mild season without extremes of heat and cold. Successful onion production depends on the selection of varieties that are adapted to different climatic conditions imposed by specific environment. No systematic study has been conducted to assess the suitable multiplier onion varieties for getting higher yield under Ariyalur district conditions of Tamil Nadu. Hence,

the present experiment was conducted to study the performance of different multiplier onion varieties for their suitability for cultivation in Ariyalur District of Tamil Nadu.

MATERIALS AND METHODS

The investigation was carried out by Krishi Vigyan Kendra, Ariyalur district during 2017-18 to assess the performance of multiplier onion varieties in Ariyalur district under scientific management practices. Three high yielding multiplier onion varieties namely local ottanchathiram variety (T1), CO (On) 5 (T2) and Arka ujjwal (T3) were tested

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were transplanted on beds of 1m width at spacing of 15x10 cm during the first week of November, 2017. Recommended cultural practices like seed treatment with *Pseudomonas fluorescence* @ 10g/kg of seed, seedling root dipping and basal soil test based fertilizer application along with farm yard manure 25t/ha, top dressing, seed management, integrated pest and disease management, irrigation etc were followed to raise the crop successfully. The observations recorded were plant height, number of leaves/plant, weight of bulb diameter of leaf sheath, root length, No. of bullets/kg, diameter of the bulb, days to harvest, weight of compound bulb (g), No. of compound bulbs/kg, number of bulbs/clump, yield/plant, bulb yield and BCR.

RESULTS AND DISCUSSION

The results revealed that highest plant height at 45 DAT (33.5cm) was reported in onion variety CO (On) 5 followed by Arka ujjwal (32.4cm) and the lowest in local ottanchatiram variety. Similarly, onion variety Arka ujjwal registered maximum number of leaves (10.3) followed by local ottanchathiram variety. The highest bulb yield of 14.5t/ha was obtained in variety CO (On) 5 followed by Arka ujjwal (12.88t/ha) and the lowest bulb yield in local variety (12.1t/ha). Highest benefit to cost (B: C) ratio (3.65) was reported in onion variety CO (On) 5 followed by Arka ujjwal (3.24) and the lowest in local variety (2.5). The highest bulb weight was noticed in Arka ujjwal (32g) followed by CO (On) 5 (30g) local variety (29g).

The market preference was slightly less for Arka ujjwal variety as the size of the onion is big and colour of the onion is dull pink. Mostly the consumers prefer small sized and pink coloured onion like CO (On) 5 variety then the other varieties.

Among the three varieties of multiplier onion, CO (On) 5 performed well at Varanasi village of Ariyalur district (Table 1). The tallest plant height (22cm) at 30 DAT after transplanting was observed in CO (On) 5 followed by Arka ujjwal (21.4 cm) whereas the shortest plant height was recorded in

Ottanchatiram local variety (20.2 cm). The highest diameter of the leaf sheath (1.52 cm) at 45 DAP was observed in CO (On) 5 followed by Arka ujjwal (1.41cm) and local ottanchatiram variety (1.28 cm). The reason for the better performance of these growth parameters was due to varietal characters of CO (On) 5, proper weed management, seed treatment, pest and disease management and as well as optimum level of major and micro nutrients added in the soil based on soil test.

The findings of Deen and Mosleh (2008) supported that increased yield may be because of difference in yield components as bulb volume, average weight of the bulbs and crop stand. The high yielding performance of onion variety CO (On) 5 at farmer's field was also reported by Acharaya *et al* (2015). Increase in bulb yield was mainly attributed to positive association between yield and yield contributing parameters like bulb weight and size in terms of equatorial and polar diameters of the bulb. Thickness of neck is one of the important characters which indicate vigour of the plant (Manna, 2013).

CONCLUSION

It was concluded from the study that multiplier onion variety CO (On) 5 gave highest yield of 14.5t/ha than Arka ujjwal and local variety. Similarly, onion variety Arka ujjwal registered highest bulb weight of 32g than other varieties. The results revealed that the overall performance of multiplier onion variety CO (On) 5 was superior to other varieties and found most suitable for cultivation in Ariyalur district of Tamil Nadu.

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