

Research Article

Performance of Front Line Demonstrations of onion in Dharwad district of Karnataka

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SUMMARY : Problems of onion crop production and their solutions at farming situations were studied with the participation of farmers. In this regard, frontline demonstration on onion was conducted at different locations in Dharwad district. These demonstrations focused on increased productivity of onion per unit area and get the feed back from farmers on the performances of onion variety. From the study, it revealed that over the years Arka Kalyan variety performed superior over local check. The gross returns (Rs. 83650/ha), net returns (Rs.67800/ha) and B:C(1:4.33) ratio were also recorded highest in Arka Kalyan variety compared to local check. The technology gap (34.03 t/ha), extension gap (1.90t/ha) and technology index(72.39 %) were also highest in improved variety Arka Kalyan compared to local check.

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KEY WORDS :

Frontline demonstrations, Technology gap, Extension gap, Technology index, Onion

BACKGROUND AND OBJECTIVES

Onion (*Allium cepa* L.) is one of the important commercial vegetable crops produced in India for both domestic consumption and export. India accounts for 16 per cent of the world's area and occupies the second position after China in production with a share of around 14 per cent (FAOSTAT, 2010). The productivity of onion is much low in India than the world average (Pandey, 2000; Lawande, 2005). The production and productivity of onion not only depends upon area and cultural practices but also on genotype and environment of the crop. Karnataka contributes a major area in Southern India. In Karnataka major area of onion cultivation is under rain fed situation and most of the farmers use their own seed material for cultivation, which is not regulated properly for varietal admixture and consists of a heterogeneous material which reduces productivity. Even in Dharwad district also, yield levels of onion is also lower than the state average (Anonymous, 2008). However, the technological break through has no doubt recorded greater strides in augmenting onion production and productivity. But the insufficient

and improper extension activities are the major factors resulting in non-adoption of improved package of practices developed at research institutions. Further, the replacement ratio of traditional varieties with improved varieties and non-availability of sufficient quantity and quality seeds of improved variety in a time, which is the most important input. With this in view, the present investigation was undertaken to evaluate the performance of onion variety Arka Kalyan with local variety through front line demonstrations.

RESOURCES AND METHODS

The present study was conducted at Krishi Vigyan Kendra, Saidapur farm Dharwad, in the adopted villages of the operational area of KVK for four years (2006-07 to 2009-10). The materials used for the study comprised of Arka Kalyan and Bellary red as well as local variety as check. In total, 42 demonstrations in 70 hectares area in different villages were conducted. Materials for the study with respect to frontline demonstrations and farmers practices are given in Table A. The data on production cost and monetary returns

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Table A : Details of onion growing under frontline demonstration and existing practices

Sr. No.	Operations	Existing practices	Improve practice demonstrated
1.	Variety used	Use of local/own seeds with varieties admixture and heterogeneous material	Improved high yielding and moderately disease resistant to purple leaf blotch variety Arka Kalyan seeds from Indian Institute of Horticultural Research, Bangalore
2.	Seed treatment	No seed treatment	Seed treatment with Captan (2g/kg seeds)
3.	Method of sowing	Broadcasting	Line sowing
4.	Fertilizer application	Imbalanced application of fertilizer FYM-10 t/ha N:P:K @ 60:30:00 kg/ ha	Application of recommended dose of fertilizer FYM-30/ha N:P:K @ 125:50:120 kg/ ha
5.	Weed management	Hand weeding	Spraying of Pendimethalin@1.0 kg/ha with one hand weeding at 45 DAS
6.	Sucking pest management	Non-adoption of IPM practices	Adoption of IPM practices with sowing 4 rows of maize all along the border
7.	Post harvest handling and quality improvement at farm level	Un-hygienic and improper practices	Adoption of improved post harvest handling and grading

were collected from frontline demonstrations plots for working out the economic feasibility of improved variety. Beside this data on local practices commonly adopted by the farmers were also collected. All the recommended package of practices were followed for both the varieties (Anonymous, 2007). The technology gap, extension gap and technology index were calculated as suggested by Eswaraprasad *et al.* (1993) and Samui *et al.* (2000).

OBSERVATIONS AND ANALYSIS

From the data presented in Table 1, it is inferred that demonstration yield of both Arka Kalyan and Bellary red varieties performed better than their respective local. The Arka Kalyan variety recorded higher yield of 14.88 t/ha compared to Bellary red variety (11.81t/ha). The per cent increase in yield over respective local was 14.64 and 13.12 for Arka Kalyan and Bellary red varieties, respectively. The yield improvement in Arka Kalyan variety is due to combined effect of high

yielding and moderately disease resistance for purple leaf blotch compared to other varieties. Such superiority of Arka Kalyan over local check was similarly observed by Hiremath *et al.* (2007) and Hiremath and Nagaraj(2010) in Haveri district. However, yield of onion varied in different years which might be due to the variations in soil moisture availability, rain fall, soil type and pest and disease occurrence as well as the change in the location of trials every year (Table 1).

Results from Table 1 revealed that yield of the frontline demonstrations and potential yield of the crop was compared to estimate the yields which were further categorized into technology and extension gaps. The technology gap showed the gap in the demonstration yield over the potential yield and it was highest in Arka Kalyan (34.03 t/ha.) compared to the Bellary red (24.56 t/ha.) variety. This could be due to the lack of awareness about the improved variety and its seed availability. Hence, to narrow down the technological gap, it needs to educate the farmers more and more about the improved variety and its seed production activities for further

Table 1 : Productivity of onion, yield gaps and technology index of rain fed onion cultivation in Dharwad district

Year	Area (ha)	No. of demo.	Variety	Potential yield	Yield (t/ha)		% increase over local	Extension gap (t/ha.)	Technology gap (t/ha.)	Technology index (%)
					Demo.	Farmers practice				
2006-07	10	4	Arka Kalyan	47	15.20	13.50	12.59	1.70	33.50	71.28
	10	4	Bellary red	35	12.50	10.75	14.00	1.75	24.25	69.29
2007-08	10	5	Arka Kalyan	47	14.80	12.90	10.69	1.90	34.10	72.55
	10	5	Bellary red	35	11.50	10.76	6.87	0.74	24.24	69.26
2008-09	5	2	Arka Kalyan	47	15.50	13.00	19.23	2.50	34.00	72.34
	5	2	Bellary red	35	11.25	9.75	15.38	1.50	25.25	72.14
2009-10	10	10	Arka Kalyan	47	14.00	12.50	12.00	1.50	34.50	73.40
	10	10	Bellary red	35	12.00	10.50	14.28	1.50	24.50	70.00
Mean	-	-	Arka Kalyan	47	14.88	12.98	14.64	1.90	34.03	72.39
	-	-	Bellary red	35	11.81	10.44	13.12	1.37	24.56	70.17

multiplication

Further, higher extension gap of 1.90 t/ha was recorded in variety Arka Kalyan compared to Bellary red (1.37 t/ha), which emphasized the need to educate the farmers through various extension means for adoption of improved variety Arka Kalyan to reverse wider extension gap.

The technology index shows the feasibility of the variety at the farmer's field. The lower the value of technology index more is the feasibility. Table 2 revealed that the technology index was minimum in Bellary red (70.17 %) and it was on par with Arka Kalyan (72.39%) variety suggesting the superiority and better performance of both varieties compared to local.

The year wise economics of onion production under frontline demonstrations were estimated and the results have

been presented in Table 2. The economic analysis of the data over the years revealed that Arka Kalyan variety recorded higher gross returns (Rs. 83650/ha), net returns (Rs. 67800/ha) and B:C ratio (1:4.33) compared Bellary red and local. These results are in line with the findings of Hiremath *et al.* (2007) and Hiremath and Nagaraj (2010) in Haveri district. Further, by inclusion of Arka Kalyan variety has yielded additional net returns (Rs. 15812/ha) over Bellary red variety suggesting its high yielding ability with higher profitability and good quality parameters (Table 3).

The present study observed that wide yield and management gaps exist between research recommendation and farmers practices. However, the yield levels under FLD was better than the local varieties and performance of these

Table 2 : Economics of onion production under front line demonstrations in Dharwad district (Mean over locations)

Year	Variety	Yield (t/ha)		Cost of cultivation (Rs./ha.)		Gross returns (Rs./ha.)		Net returns (Rs./ha.)		B: C ratio	
		Demo.	Farmers practice	Demo.	Farmers practice	Demo.	Farmers practice	Demo.	Farmers Practice	Demo.	Farmers practice
2006-07	Arka Kalyan	15.20	13.50	18800	19300	83600	74250	64800	54950	3.45	2.85
	Bellary red	12.50	10.75	16500	16000	68750	59125	52250	43125	3.17	2.70
2007-08	Arka Kalyan	14.80	12.90	14500	15450	74000	64500	59500	49050	4.10	3.17
	Bellary red	11.50	10.76	14200	15700	57500	53800	43300	38100	3.05	2.43
2008-09	Arka Kalyan	15.50	13.00	15600	16500	93000	78000	77400	61500	4.96	3.73
	Bellary red	11.25	9.75	14300	14500	67500	58500	53200	44000	3.72	3.03
2009-10	Arka Kalyan	14.00	12.50	14500	15500	84000	75000	69500	59500	4.79	3.84
	Bellary red	12.00	10.50	12800	14300	72000	63000	59200	48700	4.63	3.41
Mean	Arka Kalyan	14.88	12.98	15850	16688	83650	72938	67800	56250	4.33	3.40
	Bellary red	11.81	10.44	14450	15125	66438	58606	51988	43481	3.64	2.89

Table 3 : Comparison of yield and yield attributes of onion varieties under front line demonstrations in Dharwad district

Sr. No.	Character	Variety	
		Arka Kalyan	Local
1.	Growth parameters		
	Plant height(cm)	51.40	41.00
	No. of leaves/bulb	9.48	7.21
	Leaf length(cm)	34.19	27.95
	Leaf breadth(cm)	0.99	0.84
2.	Yield parameters		
	Neck thickness(cm)	1.58	1.38
	Neck length (cm)	6.01	6.53
	Scale: bulb ratio	8.78	9.75
	Bulb length(polar) (cm)	4.29	4.15
	Bulb diameter(equatorial)(cm)	4.33	1.07
	Bulb weight (g/bulb)	31.82	28.07
3.	Quality parameters		
	TSS	16.67	16.26
4.	General appearance		
	Disease reaction to purple leaf blotch	Moderately resistant	Susceptible
	Bulb size	Deep red, flat globe shaped uniform size bulb	Medium red, non-uniform size bulb

varieties could be further improved by adopting recommended management practices.

Hence, it can be concluded from the study that increased yield was due to adoption of variety Arka Kalyan and conducting front line demonstration of proven technologies yield potentials of crop can be increased to greater extent. This will subsequently increase the income as well as the livelihood of the farming community.

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