

Original Research Article

Analysis of Yield Gap in Onion under Front Line Demonstration at Janjgir-Champa District of Chhattisgarh, India

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ABSTRACT

Day by day increasing cost of cultivation in onion reducing the net profit of onion growing farmers. The vigor of variety one of the major constrain in production of onion. After evaluation of onion variety Agri found dark red over locally available seed grown onion the front line demonstration of Agri found dark red variety were carried out during 2012-13 and 2013-14 in different locations of Janjgir-champa district of Chhattisgarh. The demonstration was focused on maximum productivity per unit area and feedback of farmers on performance of variety. The variety produced higher yield (average 212q/ha) over locally available variety but remain behind to touch its potential yield (250q/ha). The gross returns, net returns and B: C Ratio were recorded higher in Agrifound Dark Red as compared to local. Further the technology index and its adoption index were also highest in variety Agrifound Dark Red.

Keywords

Onion, Front Line Demonstration, Extension gap, Technology gap, Technology index

Introduction

Onion (*Allium cepa* L.) is one of the important commercial vegetable crop cultivated in India for both domestic consumption and export purpose. India accounts for 16% of the world's area and occupies the second position after China in production with a share of around 14 percent. Karnataka contributes a major area in South India 84,800 ha and produces 4, 86,130 t of onion annually. The area under onion cultivation in Chhattisgarh 20076 ha with production of 309541 MT and Janjgir-champa district cover an area of 1000ha with the production of 18000 MT. (Anonymous 13). The productivity of onion is much low in India than the world average (pandey, 2000: Lawande, 2005). Even in Janjgir-Champa district of Chhattisgarh,

Yield levels is also low than the state average (Anon, 2008) however, the technology break through has no doubt recorded greater strides in augmenting onion production and productivity.

But insufficient and improper extension activities results in non-adoption of improved package developed at research institutes. Further the replacement ratio of traditional varieties with improved varieties and non-availability of sufficient quantity of quality seeds of improved variety in a time, are the major constraints in onion cultivation. Hence to improve the production of onion, variety Agri found dark red was evaluated with local variety under front line demonstrations. Thus, front line

demonstrations are effective tools in introducing new technologies to the farmers on the basis of results obtained in their fields.

Materials and Methods

Under large scale demonstration of onion variety Agri found dark red was introduced through front line demonstrations of KrishiVigyan Kendra, Janjgir-Champa from 2012-13 to 2013-14 in different locations of this district. Each demonstration was comprised of 0.4 ha, local variety was grown for comparison. The recommended package of practices was followed for the crop (Anon, 2007).

The data on production cost, input used, monitory returns, technology gap and adoption index were collected and analyzed for the economic feasibility of the recommended technology (Eswaraprasad, *et al.*, 1993), and were calculated by using following formula as suggested by samui *et al.*, (2000).

Technology gap = (Potential yield) – (Demonstration yield)

Adoption index = (Ai/Pi) x 100

Extension gap = Demonstration yield – yield under existing practice

Potential yield - Demonstration yield
Technology index = ----- x100
Potential yield

Where, Ai=Adoption score obtained by the farming community for ith crop

Results and Discussion

Yield levels of varieties and their potential yield under front line demonstrations trials

was compared to estimate the yield gap. The technology gap shows big gap in the demonstration yield over the potential yield and it was higher in Agrifound dark red compared to local variety during 2012-13 and 2013-14 (Table I, Figure 1). This may be attributed to dissimilarity in the soil fertility status, weather condition and unaware of educate the farmers more about the improved variety and its production technology. The adoption index was higher in Agrifound dark red variety compared to local.

This could be due the high yielding ability and moderately disease resistance for purple leaf blotch with good quality parameters result in better market preference compared to local (Table III). The variety Agrifound dark red have shown increased yield over local variety. These findings are in line with the results of Hiremath *et al.*, (2007), Hiremath *et al.*, (2014) and S. Rajput *et al.*, (2016). The increment in yield ranged between 13.95 to 19.42 percent (Table II).

The percent increase in yield over local check was higher (19.42) during 2012-13 compared to local. However variations in the yield of onion in different years might be due to the variations in soil moisture availability, rainfall, and soil type as well as change in the location of demonstrations every year.

The higher gross return, net returns and benefit cost ratio was recorded higher in improved variety compared to local check (Table II). The economic analysis reveal that by adoption of improved variety Agrifound dark red with minimal additional cost results in higher additional net returns over local showing its profitability. A Similar result on profitability of onion was observed by Hiremath *et al.*, (2007) and Hiremath *et al.*, (2014).

Table.1 Potential yield, yield gap and adoption index of onion

Year	Variety	potential yield	Demonstration yield	Technology gap	Technology index	Extension gap	Adoption Score by Respondent (AI)	Possible Score	Adoption index
2012-13	Agri found dark red	250	209	41	16.4	34	04	07	57.14
	Local	200	175	25	12.5	-	02	07	28.57
2013-14	Agri found dark red	250	215	35	14	30	05	07	71.42
	Local	200	185	15	7.5	-	02	07	28.57

Table.2 Impact of improved variety Agrifound dark red on yield and economics of onion over local Check

Year	Variety	No of Demon	yield (qt/ha)	% Yield Increase over Local	Cost of Cultivation (Rs/ha)	Gross Returns (Rs/ha)	Net Returns (Rs/ha)	B:C Ratio
2012-13	AFDR	10	209	19.42	48400	125400	77000	2.59
	Local		175		44300	105000	60700	2.37
2013-14	AFDR	10	215	13.95	43200	118250	75050	2.73
	Local		185		40600	92500	51900	2.27

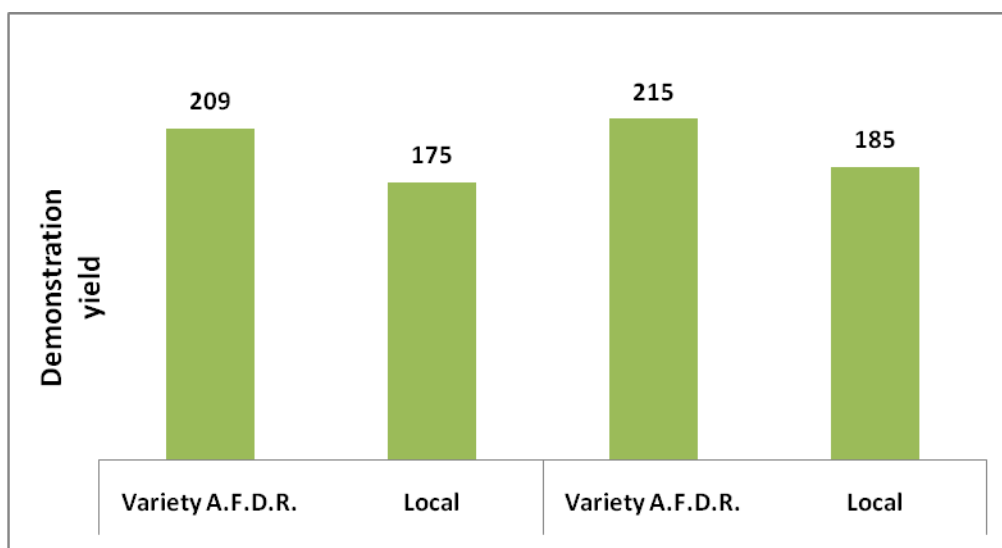
Table.3 Comparative studies on different parameter of 'Agrifound dark Red' and Local Check

Parameters	Local Check					AFDR				
	Plant height	No.of leaves /bulb	Leaf length (cm)	bulb weight (gm)	bulb diameter (cm)	Plant height	No.of leaves /bulb	Leaf length (cm)	bulb weight (gm)	bulb diameter (cm)
Mean	49	10.1	41.3	45.2	4.07	61.04	22.3	50.2	100.1	6.02
SD	0.98	0.8	1.177	1.216	0.54	1.729	1.51	1.95	2.79	0.34
CV%	0.02	0.079	0.042	0.026	0.13	0.028	0.068	0.038	0.029	0.056
Range	48-50.3	9-11	40-43.8	43.3-46.3	3.6-5	58.6-63.02		47.9-52.8	95.5-103	5.9-6.5

Table.4 Biometric observation on yield and yield attributes of onion as influenced by variety under farm condition (Mean over Two Years)

S. No	Particulars	Variety	
1.	Growth parameters	Agri Found Dark Red	Local
	Leaf length (cm)	50.2	41.3
	SD	1.95	1.77
	CV%	0.038	0.042
	Plant height (cm)	61.04	49.00
	SD	1.73	0.98
	CV%	0.029	0.02
	No of leaves/bulb	22.3	10.1
	SD	1.52	0.8
	CV%	0.068	0.079
2.	Yield parameters		
	Bulb diameter (cm)	6.02	4.07
	SD	0.34	0.54
	CV%	0.056	0.13
	Bulb weight (g)	100.1	45.2
	SD	2.79	1.216
	CV%	0.029	0.026
	General appearance		
	Colour of bulb and shape,size	Deep red with attractive rose color, flat globe, shaped uniform	Medium red, non-uniform size bulb
4.	Keeping quality of bulbs	Medium	Low
5.	Market preference	Higher price (20% higher)	Lower price

Fig.1 Comparison of Demonstration Yield over local variety



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