International Journal of Chemical Studies

P-ISSN: 2349–8528
E-ISSN: 2321–4902
www.chemijournal.com
IJCS 2020; 8(2): 2683-2685

Received: 10-01-2020
Accepted: 12-02-2020

PK Ray
Subject Matter Specialist (Horticulture), Krishi Vigyan Kendra, Saharsa, Bihar, India

KM Singh
Senior Scientist & Head, Krishi Vigyan Kendra, Saharsa, Bihar, India

Anjani Kumar
Director, ICAR-ATARI, Zone-IV, Patna, Bihar, India

RR Singh
Dean (Agriculture), Bihar Agricultural University, Sabour, Bhagalpur, Bihar, India

Umesh Singh
Associate Dean cum Principal, MBAC, Saharsa, Bihar, India

Corresponding Author:
PK Ray
Subject Matter Specialist (Horticulture), Krishi Vigyan Kendra, Saharsa, Bihar, India

Dissemination of improved bottle gourd variety and its production technology through front line demonstrations

PK Ray, KM Singh, Anjani Kumar, RR Singh and Umesh Singh

DOI: https://doi.org/10.22271/chemi.2020.v8.i2ao.9153

Abstract
The present study was carried out the evaluating the performance of improved cultivars with scientific package and practices on production, productivity and profitability of Bottle gourd. Frontline demonstrations were conducted during 2015-16 and 2017-18 with evaluation the performance of Narendra Shankar Lauki-4 variety of Bottle gourd in Sattarkattaiya blocks of the district and record the feedback information of farmer's. The results revealed that average yield of Bottle gourd under frontline Demonstrations were 297 and 311 q/ ha as compare to 256 and 260 q/ ha recorded in farmer's practice and average yield increase of 16.01 and 19.61 per cent, respectively. It was observed that the benefit cost ratio (B: C) of recommended practice (FLD's) were 2.10 and 2.15 as compared to 1.88 and 1.87 in farmer's practice during consecutive years of study blocks. The average extension gap 46 q/ ha and average technology gap 61 q/ ha was recorded. Therefore, the results clearly indicates that the use of improved varieties and package and practices with scientific intervention under frontline demonstration programme contribute to increase the productivity and profitability of pulses in Bihar state.

Keywords: Yield gap, technology gap, technology index and B.C. ratio

Introduction
Bottle gourd (*Lagenaria siceraria* [Mol.] Standl.) belongs to the family Cucurbitaceae, is one of the most important cucurbitaceous crops in India and grown in rainy season as well as summer season vegetable but its fruits are available in the market throughout the year. It is also known as "poor man's vegetable" in India. This delicious vegetable is also known by different names such as quash, calabash gourd, doodhi and lauki, birdhouse gourd, trumpet gourd and white flowered gourd (Thakur *et al*., 2015) [10]. Bottle gourd is used for preparation of burfi, juice, raita, kaporkand, pickles, kofta, doodhi halwa etc. are also common. It has a cooling effect and prevents constipation and has diuretic and cardio tonic properties. Regular consumption of this vegetable provides relief to people suffering with digestive problems and used for reducing the blood sugar in diabetic patients.
Nutritional value of bottle gourd per 100 g of edible portion is 96.1% moisture, 0.2 g proteins, 0.1 g fat, 0.5 g mineral, 0.7 mg fiber, 2.5 g carbohydrates, 12 kcal energy, 20 mg calcium, 10 mg phosphorus, 0.2 mg niacin, 0.01 mg riboflavin, 0.03 µg thiamine and it is also rich source of minerals like iron and vitamins like C and B complex (Singh and Singh, 2014) [7]. The bottle gourd growing leading states in India are Rajasthan, Gujarat, Punjab, Uttar Pradesh, Bihar, West Bengal, Madhya Pradesh, Maharashtra, Andhra Pradesh and Tamil Nadu (Anon, 2015) [1].

Material and Methods
Krishi Vigyan Kendra, Saharsa, Bihar conducted front line demonstrations on bottle gourd cv. *Narendra Shankar Lauki-4* during the year 2015-16 and 2017-18 in *summer* season. Totally 27 demonstrations in an area of 2 hectares were conducted on bottle gourd crop on farmers field. FLD's were conducted to study the gap between potential yield (365 q/ha), demonstration yield, extension gap and technology index. The data on output of improved and local bottle gourd plots were recorded. The farmers were guided by KVK scientists in respect of package of practices to be followed during the crop season. Technology gap, extension gap and technology index were calculated using following formula as suggested by Samui *et al* (2000) [6].

$$\text{Percent increase yield} = \frac{\text{Demonstration yield - farmers yield}}{\text{Farmers yield}} \times 100$$

Technology gap = Potential yield – Demonstration yield

Extension gap = Demonstration yield- yield under existing practice

$$\text{Technology index (\%)} = \frac{\text{Potential yield- Demonstration yield}}{\text{Potential yield}} \times 100$$

Table 1: Package of practices followed by farmers under FLD and in general

Particulars	Technology interventions	Farmer's practices
Variety	Narendra Shankar Lauki-4	Local cultivar
Seed rate	3.5 kg/ha	5 kg/ha
Seed treatment	Treated with *Trichoderma viride* 4 g	No use
Time of sowing	Last week of January	Last week of February
Method of sowing	Dibbing method at a spacing of 2m x 2m	Broadcasting, no direction of sowing methods
Fertilizer management	100: 60: 60 (N:P:K) kg/ha	Either no use of fertilizers or use only DAP (40-50 kg/ha)
Weed management	30 days after planting first weeding is done. Subsequent weeding is done at a monthly interval.	No use
Water management	Irrigate the field before dibbling the seeds and thereafter once a week.	No use
Plant protection	Spraying with 0.05% malathion or dusting with 5% malathion dust @ 10 kg/ha for controlling Red pumpkin beetle.	No use

Table 2: Performance of the FLD during 2015-16 and 2017-18

Year	Crop (variety)	Area (ha)	Yield (q/ha)			% increased yield over local check	Technology gap (q/ha)	Extension gap (q/ha)	Technology index (%)
			Potential of variety	FLD yield	Farmers Practices				
2015-16	Bottle gourd (N. S. L.-4)	1.0	365	297	256	16.01	68	41	18.63
2017-18	Bottle gourd (N. S. L.-4)	1.o	365	311	260	19.61	54	51	14.79
Average		1.o	365	304	258	17.81	61	46	16.71

Result and Discussion

The two year data presented in the table -2. In comparison to the year 2015-16, yield during the year 2017-18 was higher both in the demonstration plot (311 q/ha) and farmers plot (260 q/ha). However in during both the years the mean yield in the demonstration plots were higher than the farmers plot by 16.01 and 19.61 percent respectively during 2015-16 and 2017-18. The data indicates that with the recommended bottle gourd production technology the yield can be increased. Diwedi *et al.* (2010) [2] also observed that technology adoption is the key to increase crop productivity. The mean yield of the two year demonstration was 304 q/ha than that of farmers practices (258 q/ha).

Technology Gap

The differences between potential yield and yield of demonstration plots was 68 and 54 q /ha during 2015-16 and 2017-18 respectively. On an average technology gap under two year FLD programme was 61 q/ha. This may be due to the soil fertility, managerial skills of individual farmer's and climatic condition of the area. Hence, location specific recommendations are necessary to bridge these gaps. These findings are similar to Singh *et al.* (2011) [8] and Misra *et al.* (2014) [3].

Extension Gap

Interestingly the extension yield gap ranging between 41.0 and 51.0 q/ha during the period of study was higher that the Technological yield gap. This throw light that the field agricultural extension workers needs to be technologically upgraded in their knowledge on bottle gourd production technology either through skilled based field training or short In-service training and visit to Research stations. The field agricultural extension workers also need to be trained on skills of transfer of technology for effective translation of knowledge into potential yield of the crop. Another approach may also to be engage farmers on regular basis in Krishi Vigyan Kendra on production of bottle gourd. Singh *et al.* (2014) [7] in their study on extension gap also agrees with the present observation.

Technology Index

The technology index shows the feasibility of the demonstrated technology at the farmer's field. The technology index varied from 14.79 to 18.63 percent indicates that a minor gap existed between technology evolved and technology adoption at farmers field similar result was found by Raj *et.al* (2013) (Table 2). On an average technology index of 16.71 per cent was observed during the two years of FLD programme, which shows the effectiveness of technical interventions. This accelerates the adoption of demonstrated technical interventions to increase the yield performance of bottle gourd.

Economic Return

In order to found the economic feasibility of the demonstration technologies over and above the control, some economic indicators like cost of cultivation, net return and B:C ratio was worked out. The economic viability of improved demonstrated technology over farmers practice was calculated depending on prevailing price of inputs and outputs cost and represented in the term of B:C ratio (Table 3). It was found that the cost of production of bottle gourd under demonstration varied from Rs. 70627 to 72310/ha with an average of Rs. 71468 as against 67875 to 69341 with an average Rs. 68608 under control.

The cultivation of bottle gourd under improved technologies gave higher net return of Rs. 77873/ha and Rs. 83190/ ha in the year 2015-16 and 2017-18 respectively with an average net return of Rs. 80531/ha which was lower Rs. 60392/ha in farmer's practices. The benefit cost ratio of bottle gourd ranged from 2.10 to 2.15 in demonstration plots and from 1.87 to 1.88 in farmer's practice plots during two years of demonstration with an average of 2.1 in demonstration and

1.8 under farmer's practices. This may be due to higher yield obtained and lower cost of cultivation under improved technologies compared to local check (farmers practice). This finding is similar with the findings of Singh *et al*., (2011) [8] and Misra *et al.* (2014) [3].

The B:C ratio was recorded to be higher under demonstration against control during all the years of study. Scientific method of bottle gourd cultivation can reduce the technology gap to a considerable extent, thus leading to increased productivity of bottle gourd in district which in term will improve the economic condition of the growers. Moreover, extension agencies in the district need to provide proper technical support to the farmers through different educational and extension methods to reduce the extension gap for better bottle gourd production.

Table 3: Economics of FLD and farmers practices

Year	Cost of cultivation (Rs./ha)		Gross return (Rs./ha)		Net Return (Rs/ha)		B:C Ratio	
	Farmers practices	under FLD	Farmers practices	under FLD	Farmers practices	under FLD	Farmers practices	under FLD
2015-16	67875	70627	128000	148500	60125	77873	1.88	2.10
2017-18	69341	72310	130000	155500	60659	83190	1.87	2.15
Average	68608	71468	129000	152000	60392	80531	1.875	2.125

References

1. Anonymous. National Horticulture Database, Gurgaon. New Delhi, 2015, 44.
2. Diwedi AP, Diwedi V, Singh RP, Singh, Mamta, Singh DR. Effect of front line demonstration on Yield of Fieldpea in Ghazipur District of Uttar Pradesh. Ind. J. of Ex. Edu. 2010; 46(3, 4):129-131.
3. Misra PK, Singh PN, Singh SN, Pradeep, Kumar. Adoptation extent and horizontal spread of Tomato (*Lycopericon esculentum* Mill.) cultivation through frontline demonstration in eastern Uttar Pradesh of India. Euro. J of Biotech. and Biosci. 2014; 1(6):40-44.
4. Raj AD, Yadav V, Rathod JH. Impact of front line demonstrations (FLD) on the Yield of Pulses. Int. J of Sci. and res. Pub. 2013; 3(9):1-4.
5. Saganuwan S. Tropical Plants with Antihypertensive, Antiasthmatic, and Antidiabetic Value, J. of Herbs, Spices & Medicinal Plants. 2009; 15(1):24-44.
6. Samui SK, Maitra S, Roy DK, Mondal AK, Sahan D. Evaluation of front line demonstration on groundnut (*Arachis hypogea* L). J of Indian Soc. of Coastal Agric. Res. 2000; 18(2):180-183
7. Singh B, Singh SK. Evaluation trial of bottle gourd. The Asian J Hort. 2014; 9(1):116-119.
8. Singh R, Soni EL, Singh V, Bugalia HL. Dissemination of improved production technologies of solanaceous vegetable in Hanswara district of Rajasthan through Frontline demonstration. Raj. J Ext. Edu. 2011; 19:97-100.
9. Singh SRK, Mishra A, Gautam US, Dwivedi AP, Chand Prem. Scouting technological vis-a-vis extension gaps in soybean production in Madhya Pradesh. Ind. Res. J Ext. Edu. 2014; 14(2):41-45.
10. Thakur P, Sharma D, Visen VK, Dash SP. Evaluation of bottle genotypes. Plant Archives. 2015; 15(2):1037-1040.