Yield Gap Analysis of Toria (*Brassica campestris*) in Tinsukia District of Assam

P. Ahmed[1], R.K. Nath[2], A.C. Sarmah[3] and P.C. Deka[4]

1.S.M.S (Agronomy), 2. S.M.S (Entomology), 3. Programme Coordinator, 4. Programme Assistant
Krishi Vigyan Kendra, Tinsukia-786 125 (Assam Agricultural University, Jorhat, Assam)
Corresponding author e-mail: pervesahmed@gmail.com

Paper Received on June 01, 2017 , 2017, Accepted on June 24, 2017 and Published Online on July 01, 2017

ABSTRACT

The present study was carried out at five different villages of Tinsukia district of Assam where frontline demonstration of HYV of toria (TS 36) was conducted by KVK, Tinsukia. A total of 55 nos. of FLDs were evaluated to find out the yield gaps between HYV toria variety TS 36 and variety grown by farmers. Yield data of both demonstration and farmers practice were recorded and their yield gap, technology gap, extension gap and technology index were analyzed. Toria yield of variety TS 36 registered 29.9 to 39.33 percent higher over farmer's variety. On an average technology gap was recorded 1.91 q/ha, while average extension gap was recorded 3.46 q/ha. Average technology index was recorded 15.93 percent.

Key words: *Yield gap; Technology gap; Extension gap; Technology index; Frontline demonstration;*

Oilseed crops are a significant part of the agricultural economy in India. India is the fourth largest oilseed economy in the world. Rapeseed and Mustard is the second most important edible oilseed after Ground nut sharing 27.8 per cent in India's oil seed economy. In terms of acerage, oilseeds occupy 14.1 per cent and rape seed mustard alone occupies 3 per cent of the total cropped area in the country (*Shekhawat et. al., 2013*). The rapeseed mustard group broadly includes Indian mustard, yellow sarson, brown sarson, raya and toria crops. Rapeseed and Mustard have caught the fascination of farmers in Assam and this is more particularly in areas where the rice crop transplanted in July- August, is subjected to damage by floods. In areas where the early maturity rice varieties are being grown also, rape seed become a popular succeeding crop.

In Assam, rapeseed-mustard is cultivated in 2.81 lakh ha with a production and productivity of 1.88 lakh MT and 6.67 q/ha, respectively. (Anonymous, 2015) which is lower than the national average. Tinsukia district of Assam has a sizeable area under rapeseed-mustard cultivation with area and production 0.14 lakh ha and 0.10 lakh MT, respectively (*Anonymous, 2015*). However, with the available improved technologies, it is possible to bridge the yield gap and increase the productivity up to the potential level (12.0 q/ha).The reasons for low productivity are poor knowledge about newly released crop production and protection technologies and their management practices in the farmer's field. As toria is one of the major oilseed crops in Tinsukia district of Assam. KVK, Tinsukia has conducted various FLDs on toria using high yielding variety TS -36 developed by Assam Agricultural University from last seven years with the objectives of showing the production potential of the new production technologies under actual farm situation. Keeping the above points in view, the present study was undertaken to find out the effects of FLDs on bridging the yield gap in terms of technology gap, extension gap and technology index.

METHODOLOGY

The study was undertaken by KVK Tinsukia during Rabi seasons from 2004-05 to 2010-11 in the farmer's field of five different villages of Tinsukia district on toria variety TS-36. During these seven years of FLDs,

an area of 28 ha was covered involving 55 practicing farmers. Before conducting FLDs, a list of farmers was prepared from group meeting and specific skill training was imparted to the selected farmers. Use of quality seeds of improved varieties (TS-36), line sowing and timely weeding, need based pesticide as well as balanced fertilizer were applied in demonstration plots and comparison has been made with the farmer's practices (Table 1). The yield data from both the demonstration and farmers practice were recorded and their technology gap, extension gap and the technology index were worked out using methods developed by *Samui et al. (2000)* as stated below:

Tech. gap = Potential yield – Demo. Plot yield

Ext. gap = Demo. Plot yield – Farmer's plot yield

$$\text{Tech. index} = \frac{Pi - Di}{Pi}$$

Where

Pi= Potential yield; Di= Demonstration yield

RESULTS AND DISCUSSION

Results of 55 nos. of FLDs conducted during 2004-05 to 2010-11 in 28 ha area on farmer's field of five different villages of Tinsukia district indicated that the yield of toria variety TS 36 was substantially higher than the variety grown by the farmers during all the seven years (Table 1). The yield of toria in different demonstration plots ranged between 9.7 to10.54 q/ha over the study period which was 29.9 to 39.33 percent higher over farmer's variety. On an average 34.28 percent increase in yield was obtained in the demonstration plots whereas average yield in farmer's field was recorded only 6.43 q/ha. The maximum yield in demonstration plots was recorded (10.54 q/ha) during 2006-07 and minimum yield of 9.7 q/ha was recorded in the year 2004-05. These results are in conformity with the findings of *Katare et al. (2011), Meena et al .(2012), Dutta (2014)* and *Sarmah et al. (2014).*

The poor productivity in farmers practice might be mainly due to factors like use of non descript local variety, late sowing owing to late vacation of field after harvesting of medium to long duration winter paddy and low level of agronomic management in addition to non-availability of resources in time. The result clearly depicts the positive effects of FLDs over the existing practices towards enhancing the yield of toria in Tinsukia district.

The technology gap were 2.3, 2.13, 1.46, 2.0, 1.49, 1.78 and 2.22 q/ha during 2004-05, 2005-06, 2006-07, 2007-08, 2008-09, 2009-10 and 2010-11, respectively. The average technology gap was recorded 1.91 q/ha during the period of study. The technology gap ranging between 1.46 to 2.3 q/ha reflected the farmer's participation in conducting FLDs. The variation in technology gap observed might be due to dissimilarity in soil fertility and management factors. Benefit Cost ratio was recorded higher (1.75 to 3.2) under demonstration plots compared to farmer's plot (1.37 to 1.6) in all the year of study. Hence, higher B:C ratios proved economic viability of the interventions made under FLD. Similar finding were reported by *Dutta (2014)* and *Sarmah et al. (2014)* in rapeseed and mustard. Therefore, to exploit the potential of improved production and protection technologies efforts through FLDs ought to be increased awareness among the farmers.

The extension gap ranging between 2.9 to 3.7 q/ha during the period of study emphasizes the need to educate the farmer through various means for adoption of improved agricultural production to reverse the trend of wide extension gap. To increase the productivity and production of toria, seed replacement of non-descriptive varieties by HYVs is very much essential. In this context, front line demonstrations are playing an important role in

Table 1. Comparison of demonstration package and farmers practices under FLD on toria

Particulars	Demonstration	Farmers practice
Farming situation	Irrigated medium land	Rainfed medium land
Variety	TS 36	Local
Time of sowing	Mid Oct to Mid Nov	1st week of December
Method of sowing	Line sowing	Broadcasting
Seed rate	10 kg/ha	12 kg
Fertilizer dose (NPK)	60:40:40 kg/ha	Only FYM
Borax	10 kg/ha	Nil
Plant protection	Need based application	No plant protection
Interculrure	One weeding at 15-20 DAS	No weeding

Table 2. Productivity, technology gap, extension gap and technology index in toria (var. TS-36) under FLDs

Year	Area (ha)	No. oF farmers	No. of demo.	Seed Yield(q/ha) P	D	PF	% increase over control	Tech gap (q/ha)	Ext. gap (q/ha)	Tech. index (%)	B:C ratio D	PF
2004-05	3	5	5	12.00	9.70	6.80	29.90	2.3	2.9	19.17	1.75	1.5
2005-06	5	10	10	12.00	9.87	6.30	36.17	2.13	3.37	17.75	2.25	1.4
2006-07	3	5	5	12.00	10.54	6.50	38.33	1.46	3.64	12.17	3.2	1.43
2007-08	5	10	10	12.00	10.00	6.30	37.00	2.0	3.7	16.67	2.5	1.44
2008-09	5	10	10	12.00	10.51	6.40	39.11	1.49	3.61	12.42	3.0	1.37
2009-10	2	5	5	12.00	10.22	6.20	39.33	1.78	3.42	14.83	2.7	1.6
2010-11	5	10	10	12.00	9.78	6.53	33.23	2.22	3.58	18.50	2.2	1.52
Total	28	55	55	84	70.62	45.03	-	13.38	24.22	111.50	-	-
Mean				12	10.09	6.43	34.28	1.91	3.46	15.93	-	-

P= Potential D= Demonstration FP= Farmers' practice

popularizing the HYV of toria in the study area.

The present study indicated reduction in technology index from 19.17 per cent during 2004-05 to 12.17 per cent during 2006-07 which exhibited the feasibility of demonstrated technology in the study areas (Table 2). The lower value of technology index, the more is the feasibility of technology. As such fluctuation in technology index (ranging between 12.17-19.17 per cent) during the study period in certain villages, might be attributed to the dissimilarity in soil fertility status, weather conditions, non-availability of irrigation water and insect pest attack in the crop. Similar finding were reported by *Dutta (2014)* in rapeseed and mustard and findings of *Mitra and Samajdar (2010)* who opined that lower the value of technology index, more is the feasibility of the technology demonstrated.

CONCLUSION

From the present study a conclusion can be drawn that adoption of improved production technology can reduce the technology gap to a considerable extent thus leading to increased productivity of rapeseed –mustard in the district. Moreover, Krishi Vigyan Kendra 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 oilseed production in the district. More efforts should be made to motivate the farmers for adoption of improved agricultural technologies including HYV to revert the trend of wide extension gap.

REFERENCES

Anonymous (2015). Statistical handbook Assam, Directorate of Economics and Statistics, Government of Assam.

Dutta, R (2014). Yield gap analysis of rapeseed-mustard in North Bank Plain Zone of Assam. *Indian Res. J.Ext.Edu.* **14** (3): 122-124

Katare, Subhash; Pandey S.K. and Mustafa, Mohd (2011). Yield gap analysis of Rapeseed-mustard through front line demonstrations. *Agric. Update*, **6**: 5-7.

Meena, BL; MeenaRP ;Meena RH and Balai CM (2012). Yield gap analysis of rapeseed-mustard through front line demonstrations in agro climatic zone IV of Rajasthan. *J. Oilseed Brassica, **3** (1) : 51-55*

Mitra, Biplab and Samajdar,T. (2010). Yield gap analysis of rapeseed-mustard through Front Line Demonstration. *Agri. Ext. Review* (April-June): 16-17.

Samui, S.K; Maitra, S; Roy, D.K; Mandal, A.K. and Saha, D.(2000). Evaluation of front line demonstration on groundnut. *J. Indian Soc. Coastal Agri. Res.*, **18** (2): 180-183.

Sarmah, H; Sarma, R; Sarmah, A.K.; Upamanya, G.K.and Kalita, N. (2014). Yield gap analysis of Toria (*Brassica campestris*) in Barpeta district of Assam. *Indian Res. J. Ext. Edu.* **14** (2): 127-129

Shekhawat, K.; Rathore, S.S.; Premi, O.P.; Kandpal, B. K. and Chauhan, J.S. (2012). Advances in agronomic management of Indian mustard (*Brassica juncea* (L.) Czernj. Cosson): *Intl. J. Agronomy*, 2012: **14**

• • • • •