



Productivity enhancement of sesame (*Sesamum indicum* L.) through improved production technologies/ frontline demonstrations

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(Received: August 27, 2015; Revised received: March 25, 2016; Accepted: March 29, 2016)

Abstract: Sesame is one of the important oilseeds crop in India, which plays a major role in supplementing the income of small and marginal farmers. One of the major constraints of traditional sesame farming is low productivity of local varieties. To replace this anomaly, Krishi Vigyan Kendra, Kalaburagi has conducted frontline demonstration at adopted farmer's field. The results shows that cultivation of high yielding varieties of sesame, DSS-9 recorded increase yield of 10.43 and 17.01% during 2010-11 and 2013-14, respectively over local check. The technology gap which shows the gap in the demonstration yield over potential yield were 6.35 and 7.36 q/ha for 2010-11 and 2013-14, respectively. The highest extension gap of 1.07 was recorded in during 2010-11 this high extension gap requires urgent attention by the extension and development agencies. The technology index is 26.40 and 36.50 per during 2010-11 and 2013-14, respectively which shows the good performance. There is a need to adopt multi pronged strategy that involves enhancing sesame production through area expansion and productivity improvements through better adoption of improved technology.

Key Words: Frontline Demonstration, Technology gap, Extension gap, Technology index

Introduction

Sesame (*Sesamum indicum* L.) is called as queen of oilseeds crops by virtue of its excellent oil quality. It is having the highest oil content (46-64%) and dietary energy (6355 k cal/kg). Its oil unlike other fats is highly stable and does not develop rancidity leading to loss of flavor and vitamin. India is the largest producer and exporter of sesame in the world (Puspha *et al.*, 2003). The oilseeds scenario in the country has undergone a sea change. The main contributors to such transformation have been, i) availability of improved oil seeds production technology and its adoption, ii) expansion of cultivated area, iii) price support policy, iv) institutional support, particularly establishment of technology mission on oilseeds in 1986 (Hedge, 2004). It is in oils that India is on shaky grounds (Chand, 2002). Inefficiencies in the oil-processing sector are one reason; the other factor is the subsidy- driven ability of foreign producers to sell cheap oil. This finding indicates that oilseeds production in the country faces a threat due to inefficiency of processing and marketing and also due to transmission of volatility in world prices to the domestic market. In the medium term, accelerating import substitution, improving efficiency of the oil processing sector, and judicious use of tariffs are vital (Chand *et al.*, 2004). The improved technology packages were also found to be financially attractive. Yet, adoption levels for several components (of the improved technology were low, emphasizing the need for better dissemination (Kiresur *et al.*, 2001). Several biotic, abiotic, and socioeconomic constraints inhibit exploitation of the yield potential and these needs to be addressed. Kalaburagi and its population

wholly dependent on agriculture and allied activities. Arhar is the main crop grown in this area. The sesame crop is cultivated in summer season from February to. With the start of technology mission on oilseeds, frontline demonstration on sesame using new crop production technology was started with the objectives of showing the productive potentials of the new production technologies under real farm situation over the locally cultivated sesame crop.

Materials and Methods

The present investigation was carried out during the *kharrif* season in the adopted villages of 'Krishi Vigyan Kendra of Kalaburagi (Karnataka state). Materials and methods adopted for front line demonstration are given in table 1. Locally cultivated varieties were used as local check. The FLD was conducted to study the gaps between the potential yield and demonstration yield, extension gap and the technology index. In the present evaluation the data on output of sesame cultivation were collected from FLD plots, besides the data on local practices commonly adopted by the farmers of this region. To estimate the technology gap, extension gap and the technology index the formulae is used (Samui *et al.*, 2000).

Technology gap = Potential yield - Demonstration yield

Extension gap = Demonstration yield - Farmers yield

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

Results and Discussion

Frontline demonstration was conducted on 5 hectares of land with 24 demonstration plots involving DSS-9 sesame variety. On an average sesame variety DSS-9 has given higher yield of

Table-1: Details of Sesame DSS-9 growing under Existing Farmer's Practices and Improved Practices adopted in Frontline demonstrations at farmer's field in Kalaburagi (Karnataka)

| Operations | Existing Farmer's Practices | Improved/Recommended practices adopted in demonstrated Plot (FLDs) |
|---------------------------|---|---|
| Variety | Local | DSS-9 |
| Time of Sowing | August | June-July |
| Seed Treatment | Not done | Imidacloprid 60FS @ 5 gm /kg seeds |
| Method of sowing | Broadcasting | Line sowing |
| Plant Protection Measures | Non-adoption of recommended package of practices and injudicious use of pesticides and spray Dursban 20 EC(Chloropyriphos)@500ml/acre | Spray of Imidacloprid 17.8 SL @ 0.3 ml/ltr of water at 45 and 60 DAS @ 300 ml / ha + Sparay of Hexaconazole @1 ml/lit of water at 45 and 60 DAS @ 1 lit/ha + Use of Dimethoate 1.75 ml/litr |

Table-2: Performance of Front Line Demonstrations (FLD) of Sesame in Kalaburagi (Karnataka)

| Year | Area (ha) | No. of Farmers | Seed yield (q/ha) | | | % increase over control | Techn-ology gap | Extension gap | Techn-ology Index (%) | B. C. ratio | |
|---------|-----------|----------------|-------------------|----------------|---------|-------------------------|-----------------|---------------|-----------------------|----------------|-------------|
| | | | Potential | Demons-tration | Control | | | | | Demons-tration | Local check |
| 2010-11 | 5 | 12 | 10 | 7.36 | 6.29 | 17.01 | 2.64 | 1.07 | 26.40 | 3.68 | 0.73 |
| 2013-14 | 5 | 12 | 10 | 6.35 | 5.75 | 10.43 | 3.65 | 0.6 | 36.50 | 4.01 | 0.75 |
| Average | | | | 6.86 | 6.02 | 13.72 | 3.15 | 0.84 | 31.45 | 3.85 | 0.74 |

7.36 and 6.35 q/ha in comparison with local variety during 2010-11 and 2013-14 respectively. The result indicates that the Frontline demonstration has given a good impact over the farming community of kalaburagi as they were motivated by the new agricultural technologies applied in the FLD plots (Chand, 2002).

Yield of sesame was, however varied in different years, which might be due to the soil moisture availability & rainfall condition, climatic aberrations, disease and pest attacks as well as the change in the location of trials every year. The high yielding variety had performed extremely well when compared to local check. The percentage increase in the yield over local check was 17.01 and 10.43 for during 2010-11 and 2013-14, respectively. The technology gap which shows the gap in the demonstration yield over potential yield were 2.64 and 3.65 during 2010-11 and 2013-14, respectively. The technology gap observed may be attributed to dissimilarity in the soil fertility status and weather conditions. Hence location specific recommendation appears to be necessary to bridge the gap between the yields. The highest extension gap of 1.07 was recorded during 2010-11 which emphasized the need to educate the farmers through various means for the adoption of improved high yielding varieties and newly improved agricultural technologies to reverse this trend of wide extension gap. More and more use of new HYV's by the farmers will subsequently change this alarming trend of galloping extension gap (Hedge, 2004). The new technologies. will eventually lead to the farmers to discontinuance of old varieties with the new technology, The technology index shows the feasibility of the evolved technology at the farmers' field. The lower the value of technology index more is the feasibility of the technology (Sagar and Chandra, 2004; Sumi, 2000; Puspha and Senthikumar; kiresue, 2001). The technology index is 26.40 and 36.50 per cent during 2010-11 and 2013-14, respectively which shows the good performance of ICM

in Kalaburagi conditions and this will accelerate the adoption of newer technologies to increase the productivity of sesame in this area. These results are in conformity with the findings of Sagar and Ganesh Chandra (2004).

Despite the lower yield levels in Kalaburagi areas, the newer technologies for production of Sesame variety has given a very good result in comparison to local check. These practices may be popularized in this area by the extension agencies to mitigate the large extension gap. Mainly small and marginal farmers are associated with the cultivation and the use of new production technologies will substantially increase the income as well as the livelihood of the farming community. There is a need to adopt multi pronged strategy that involves enhancing sesame production through area expansion and productivity improvements through better adoption of improved technology.

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