

## Yield Gap Analysis of Rapeseed-Mustard (*Brassica campestris*) through Front Line Demonstrations under Rainfed Condition In Uttarakhand

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### Abstract

Krishi Vigyan Kendra, Jakhdhar, Rudraprayag, Uttarakhand lies in Central Himalayan Region conducted 30 demonstrations on Rapeseed-mustard during the year in 2012-13 and 2013-14 in three adopted villages. The critical inputs were identified in existing production technology through farmers meetings and group discussions with the farmers. The mean data of two years revealed that an average yield of 697 Kg/ha was obtained under demonstration plots over farmer's practice (544 Kg/ha) with an additional yield of 153 Kg/ha and the average increase over farmer's practice was observed by 28.62%. The average technology gap and technology index were found to be 504 Kg/ha and 42%, respectively.

**Keywords:** FLD, adoption, technology gap, extension gap, technology index, rapeseed-mustard.

### Introduction

Rapeseed-Mustard, because of resilience to grow under diverse agro-climatic conditions and characteristics like low input requirement has emerged as a major strategic component in enhancing domestic production of edible oils and oilseeds. Exploiting the latent potential for enhancing domestic oilseed production and productivity by tackling major biotic and abiotic production constraints forms the cornerstone of the strategy to attain edible oil self-sufficiency. The policy stance has to be carefully designed taking into consideration a host of factors like the livelihood security of oilseed producers, level of desired import dependency, trade efficiency, changes in dietary standards and nutritional requirements, rising demand for vegetable oils in bio fuel production etc.

The major constraints to boost up the production of oilseeds in hilly areas are observed as poor productivity of oilseeds due to poor resources of the farmers, lack of technical knowhow, reluctance towards oilseed production, uncertainty of weather conditions, non-availability of quality seed etc., which leads to their reluctance toward

proper scientific management of the crop. Keeping these facts in to consideration, Front line demonstrations in Rudraprayag district of Uttarakhand had been designed and conducted to make cultivation of rapeseed-mustard, more remunerative, productive and sustainable.

### Material and Methods

The study was conducted by Krishi Vigyan Kendra, Jakhdhar in the farmer's field of three villages viz. Bainoli, Syalsu and Devshal during Rabi season in 2012-13 to 2013-14 in Rudraprayag district of Uttarakhand lies in *Central Himalayan Region*. During these two years of study, an area of 1.2 ha was covered with plot size 0.02 ha under front line demonstration with active participation of 30 farmers each year. Before conducting FLDs, a list of farmers was prepared from group meeting and specific skill training was imparted to the selected farmers regarding different aspects of cultivation<sup>[5]</sup>. The difference between the demonstrated package of practices and existing farmer's practices are given in Table-1.

The soils of the farmer's fields were Sandy-loam in texture, medium to low in NPK

and low in organic matter. In demonstration plots, use of quality seeds of improved variety, line sowing and timely weeding, nutrient management as well as need based of pesticide were emphasized and comparison has been made with the existing farmer's practices (Table-1). The traditional practices were

maintained in case of local checks. The data were collected from both FLD plots as well as plots of farmers using their traditional practices. Finally the extension gap, technology gap, technology index along with the benefit cost ratio were worked out.

**Table 1 Details of package of practices followed under FLD Vs. FP.**

| Sl. No | Particulars         | FLD  | FP  |
|--------|---------------------|--|---|
| 1.     | Farming situation   | Rainfed  | Rainfed   |
| 2.     | Variety             | PT 303   | Local   |
| 3.     | Time of Sowing      | Second fortnight of October.   | Second fort night of October to first fort night of Nov |
| 4.     | Method of sowing    | Line sowing was done at 30 cm row spacing  | Broadcasting  |
| 5.     | Seed treatment      | 5 Kg/ha  | 10 Kg/ha  |
| 6.     | Nutrient management | FYM @ 300 Kg/ha  | FYM @ 300 Kg/ha   |
| 7.     | Plant protection    | Need based application of Immidachloprid 7.8 SL + Sulfex to protect the crop from sucking pests and disease. | -   |
| 8.     | Weed management     | Two hand weeding at 15 and 35DAS.  | -   |

### Results and Discussion

**Grain yield:** The data given in Table-2 revealed that the maximum yield was recorded (703 Kg/ha) during 2013-14 and minimum yield was recorded in year 2012-13 (690 Kg/ha) under demonstrated plots and the mean grain yield was recorded 697 Kg/ha in both

years under demonstrated plots which was higher over FPs (544 Kg/ha). On an average 28.62 per cent increase in yield was recorded under FLDs over FPs. The results are in conformity with the finding of earlier investigators<sup>[2, 3, 4]</sup>.

**Table 2 Productivity, technology gap, extension gap, technology index in Rapeseed–mustard under FLD Vs. FP.**

| Year    | Seed yield Kg/ha |     |     | % Increase over FP | Technology gap (Kg/ha) | Extension gap (Kg/ha) | Technology index (%) |
|---------|------------------|-----|-----|--------------------|------------------------|-----------------------|----------------------|
|         | Potential yield  | FLD | FP  |                    |                        |                       |                      |
| 2012-13 | 1200.00          | 690 | 532 | 30.41              | 510                    | 158                   | 43                   |
| 2013-14 | 1200.00          | 703 | 555 | 26.82              | 497                    | 148                   | 41                   |
| Mean    | 1200.00          | 697 | 544 | 28.62              | 504                    | 153                   | 42                   |

**Yield parameters:** The results clearly indicated the positive effects of FLDs with improved package of practices over the existing farmer's practices towards enhancing

the yield of rapeseed-mustard in Rudraprayag district of Uttarakhand with its positive effect on yield attributes (Table-3).

**Table 3 Yield attributing parameters under FLD Vs. FP.**

| Sl. No. | Yield attributing parameters | Under FLD | Existing FP |
|---------|------------------------------|-----------|-------------|
| 1.      | Number of siliqua per plant  | 115.6     | 71.2        |
| 2.      | Number of seed per siliqua   | 11.42     | 8.48        |
| 3.      | Test weight                  | 3.25-3.48 | 2.68-2.85   |

**Extension and technology gap:** Table-2 revealed that there was 153 Kg /ha of extension gap which emphasizes the need to educate the farmers through various means for adoption of improved agricultural production techniques to minimise the extension gap. The technology gap was observed of 504 Kg/ha which might be due to the dissimilarity in soil fertility status as well as erratic weather conditions prevailing in the region. Similar finding were recorded by many others<sup>[1]</sup>.

**Technology index:** Data of the technology index in Table-2 revealed that the feasibility of the evolved technology at the farmer's fields. The lower the value of technology index the more is the feasibility of technology. Higher value of technology index (42%) during the

study period in region might be due to the dissimilarity in soil fertility status, erratic weather condition, insect-pests as well as wild animals attack.

**Economics:** The higher cost of cultivation Rs. 5,775 involved in FLD plots as compared to Rs. 5,702 under FP plots (Table-4). The FLD plots fetched higher mean gross returns (Rs. 19,061/ha) and net returns (Rs. 13,286/ha) with higher benefit: cost ratio (2.30). While in FP plots the gross returns, net returns and benefit: cost ratio were Rs. 14,894, Rs.9,192 and 1.61 respectively. It was also reported higher net returns and B: C ratio in the demonstrations due to on improved technologies compared to the farmer's practices<sup>[6]</sup>.

**Table 4 Economics of rapeseed-mustard under FLD Vs. FP.**

| Year    | Cost of cultivation (Rs. / ha) |      | Gross returns (Rs. / ha) |       | Net returns (Rs. / ha) |       | B:C Ratio |      |
|---------|--------------------------------|------|--------------------------|-------|------------------------|-------|-----------|------|
|         | FLD                            | FP   | FLD                      | FP    | FLD                    | FP    | FLD       | FP   |
| 2012-13 | 5704                           | 5668 | 16905                    | 13026 | 11201                  | 7358  | 1.96      | 1.30 |
| 2013-14 | 5846                           | 5736 | 21216                    | 16761 | 15370                  | 11025 | 2.63      | 1.92 |
| Mean    | 5775                           | 5702 | 19061                    | 14894 | 13286                  | 9192  | 2.30      | 1.61 |

### Conclusion

Thus, it may be concluded that the yield and returns in rapeseed-mustard crop increased substantially with the improved agro-techniques. However, the grain yield level under FLDs was better than the FPs and performance of the variety could be further improved by adopting recommended agro-techniques. So, there is need to disseminate the improved agro-techniques among the farmers with effective extension methods like training and field demonstrations. The farmers should be encouraged to adopt the recommended

agro-techniques for getting maximum returns in specific locations.

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