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Extension gap analysis of frontline demonstration of maize variety HQPM 5 in hill ecosystem of Kiphire district Nagaland

[1]N Khumdemo Ezung, [2]LJ Bordoloi, [3]H Kalita and [4]Tiatula Jamir

[1]Chief Technical Officer, Krishi Vigyan Kendra Kiphire, ICAR for NEH Region, Nagaland Centre, India

[2]Senior Scientist and Head, Krishi Vigyan Kendra Kiphire, ICAR for NEH Region, Nagaland Centre, India

[3]HoRC, ICAR for NEH Region, Nagaland Centre, India

[4]Block Technology Manager, Agricultural Technology Management Agency, Chumoukedima, Nagaland, India

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Corresponding Author: N Khumdemo Ezung

Abstract

Krishi Vigyan Kendra Kiphire, ICAR for NEH Region, Nagaland Centre, conducted Frontline Demonstration to study the impact of high yielding maize variety HQPM 5 during two consecutive years, 2021-22 and 2022-23 where 20 farmers were selected randomly for demonstrating the technology in an area of 0.25 hectare per farmer. The crop was sown in the first fortnight of April and harvested in the month of August during both the years. The average data on yield was recorded for both demonstration and the farmers practice for analyzing the different parameters. During both the years the highest average yield was recorded from Maize variety HQPM 5 *i.e.* 26.13 q/ha and 27.33q/ha as against the farmers' practice *i.e*. 17.82 q/ha and 16.70 q/ha and the percentage increase was recorded at 46.63 and 63.65 as compared to farmers' practice. The average net return from the demonstration during 2021-22 and 2022-23 was Rs. 27160 and Rs. 28160 as against Rs. 15640 and Rs.13400 under farmers' practice, which recorded a B:C ratio of 2.08 and 2.06 in case of demonstration and 1.78 and 1.67 in case of farmers' practice during both the years.

Keywords: Front line demonstration, technology gap, extension gap, technology index

Introduction

Kiphire district lies in the eastern part of Nagaland and is the ninth district of Nagaland which was carved out of Tuensang on January 24, 2004. Kiphire district is surrounded by Myanmar in the east, Tuensang in the north, Phek in the south and Zunheboto district in the west. The district had a total area of 1526.36 sq. km with an altitude of 896.42 MSL. The climate is humid and hot during summer and cold during winter with winter temperature touching a low of 2.7 °C and a high of 37 °C during summer. Monsoon period extends from June to September and sometimes up to October where sufficient amount of rainfall was received over the years. It has 104 recognized villages and a total household of 11015 with a population of 74,033 (2011 census).

Maize is the major crop taken up by the farmers of the district on a large scale which is commercially grown and covers majority of the land under cultivation, which accounts for 5539 ha with a production of 7320 MT (Nagaland Statistical Handbook, 2022). The cultivation of the maize is mostly of local variety which, besides longer in crop duration, gives very less productivity (13.21 q/ha). However, there is still a wide gap between the production potential and actual production realized by the farmers. This may be due to partial adoption of recommended package of practice and non-adoption of high yielding varieties by the farmers. However, there is immense scope to increase the production and productivity of maize in the district. Frontline demonstration was conducted with the objective to motivate the farmers to adopt high yielding variety and improved package of practices for obtaining higher yield and income.

Methodology

The impact study was conducted in Kiphire, Nagaland where Frontline Demonstration (FLDs) on Maize variety HQPM 5, was taken up for cultivation at farmers field during the consecutive *Kharif* seasons of 2021-22 and 2022-23. The impact assessment study was carried outbon comparative basis between the technology demonstrated and farmers' practice which is the local variety. A total of 20 farmers was selected randomly for demonstrating the technology on their fields during the year 2021-22 and 2022-23. The crop was sown in the first fortnight of April and harvested in the month of August during both the years. A field size of 0.25 ha was taken up for cultivation by each farmer, where demonstration was conducted. The demonstration in farmers' field was regularly monitored from sowing till harvest by the KVK scientist, where growth and yield parameters were recorded for arriving at conclusion. The average yield and economics of demonstration and farmers' practice was also recorded and

analyzed.

To estimate the extension gap, technology gap and technology Index, the following formulae as suggested by Samui *et al.* (2000) [9], Kadian, *et al.* (2004) [6] were considered. The analytical tool used for assessing the performance of the FLDs are as follows.

Extension Gap = Demonstration Yield −Farmers' Practice

Technology Gap = Potential Yield− Demonstration Yield

$$\text{Technology Index} = \frac{\text{Potential Yield} - \text{Demonstration Yield}}{\text{Potential Yield}} \times 100$$

$$\text{B.C Ratio} = \frac{\text{Gross return}}{\text{Gross cost}}$$

Results and Discussion

Yield analysis

Data pertaining to table 1 reveals that the highest average yield was recorded in maize with variety HQPM 5 (26.13 q/ha and 27.33 q/ha) by following improved packages of practices as against the farmers' practice (17.82 q/ha and 16.70 q/ha) during the year 2021-22 and 2022-23, which resulted an increase in yield percentage of 46.63 and 63.65 percent respectively over the farmers' practice.

Gap analysis

Data pertaining to table 2 reveals a wide extension gap which stand at 8.31 q/ha and 10.63 q/ha during the year 2021-22 and 2022-23 respectively. This gap in extension indicates that there is a need to motivate and educate the farmers through various means for adoption of the new variety and improved packages of practices to bridge the gap. It was also observed that the there is a wide technology gap during both the years. A lower technology gap during 2022-13 was recorded at 17.67 q/ha as compared to 2021-22, which was recorded at 18.87 q/ha. These differences in technology gap during different years may be attributed to differential climatic conditions. The technology index indicates the feasibility of the evolved technology at farmer's field. Lower the technology index, higher is the feasibility of the technology. Higher technology index reflects the inadequacy of the technology or insufficient extension service to transfer the technology. The technology index during 2022-23 was lower (39.26) than during 2021-22(41.93). The gap analysis reveals that that more effort needs to be done through different means so as to educate and encourage the farmers about the new technologies so as to reduce these gaps.

Economic Analysis of Frontline demonstration of Maize on Farmers field

Perusal to data depicted in table 3 reveals that the adoption of new maize variety which not only results in higher yield but also provided higher benefit cost ratio *i.e.* 2.08 and 2.06 as against 1.78 and 1.67 in the farmers' practice. This may be due to higher yield obtained by high yielding variety of maize and by following recommended practices. The table also reveals that the demonstration recorded higher gross return and net return as compared to the farmers' practice.

Table 1: Yield analysis of Frontline Demonstration of Maize var. HQPM 5 in farmers field

Year	No of Demonstration	Technology Demonstrated	Demonstration yield q/Ha	Farmers Practice q/ha	Percent increase
2021-22	20	HQPM 5	26.13	17.82	46.63
2022-23	20	HQPM 5	27.33	16.70	63.65

Table 2: Gap analysis of Frontline Demonstration of Maize var. HQPM 5 in farmers field

Year	Technology Demonstrated	Potential yield q/ha	Demonstration Yield q/ha	Farmer's Practice q/ha	Extension Gap q/ha	Technology Gap q/ha	Technology Index q/ha
2021-22	20	45	26.13	17.82	8.31	18.87	41.93
2022-23	20	45	27.33	16.70	10.63	17.67	39.26

Table 3: Economic Analysis

Year	Practice	Gross cost Rs/ha	Gross return Rs/ha	Net return Rs/ha	B.C Ratio
2021-22	Demonstration	25100.00	52260.00	27160.00	2.08
2021-22	Farmers' practice	20000.00	35640.00	15640.00	1.78
2022-23	Demonstration	26500.00	54660.00	28160.00	2.06
2022-23	Farmers' practice	20000.00	33400.00	13400.00	1.67

Conclusion

The FLD conducted to study the performance of the maize variety and improved package of practice reveals that the farmers' obtained high net return from the adoption of the new maize variety HQPM 5. However, there is a need to further motivate the farmers to adopt the new technologies so as to ensure horizontal spread of the technology. Further the study also reveals that there is a need for the extension agencies to provide all technical support, so as to popularize the technology, which in turn will fill the gap, thereby, ensuring high production and profitability for the farmers.

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