

Effect of front line demonstration of improve maize varieties and bio-fertilizer in central Gujarat

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Abstract: Maize (*Zea mays* L.) is one of the most important cereal grains grown worldwide in a wider range of environments because of its greater adaptability. It is mainly used as a food source and now has become the most important raw material for animal feed. Attempts are made to improve productivity and to increase the area under maize by adopting improved maize varieties. To compare local check total of 165 FLDs were carried out in a systematic manner on the farmer's field to show the worth of new maize varieties. It was observed the improved maize varieties recorded a higher average yield of 2114.35 kg/ha (GAYMH-1), 2134.32 (GAWMH-2) and 3339 kg/ha (GAWMH-2) in *kharif* and 3906.47 kg/ha (GAYMH-1) and 3318.56 kg/ha (GAWMH-2) in *rabi*, respectively. The per cent increase was found to increase 17.58 per cent, 13.00 per cent and 12.42 per cent in *kharif* and 26.01 per cent and 15.10 per cent in *Rabi*, respectively. Frontline demonstrations can promote new crops and technologies and improve their popularity. Such improvements in crop technology will help farmers in reducing yield gaps and will improve their knowledge, attitude and skill.

Keywords: FLDs · Improved maize varieties

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Introduction

One of the most adaptable new commercial crops is maize (*Zea mays* L.), also known as 'corn' and having a wide range of climatic tolerance. It is referred to be the queen of cereals everywhere. After rice and wheat, maize is the third-most significant food crop in India. Maize is one of the principal sources of cereals for food, fodder, and processed industrial products. Around 790 million tonnes of maize are produced worldwide each year, and in some nations, it serves as a staple meal, accounting for more than one-third of the calories and proteins consumed. The developing world's need for maize is expected to treble by 2050, and it will likely surpass other crops in terms of worldwide production (Chaudhari *et al.*, 2017). It has assumed greater significance due to its demand for food, feed and industrial utilization. The global production of maize is next to wheat and rice. India produces between 10 to 14 million tonnes of maize annually, 80 to 90 per cent of which is harvested during the *kharif* season (Rai *et al.*, 2018). Due to high nutritional content of maize and the entire plant, it is widely used as fodder in several Indian states. By using improved high-yielding cultivars and suggested scientific practices, maize productivity per unit could be raised. In light of the aforementioned consideration, frontline demonstrations were regularly conducted in farmer's fields to highlight the value of new varieties and persuade them to use maize to enhance productivity (Rai *et al.*, 2016).

The productivity of maize may be improved by applying scientific and sustainable management production practices. This is usually achieved by adopting high-yielding varieties. Frontline demonstrations of crop cultivation mainly aim at advertising the newly released

crop production technologies and its management practices directly in the farmer's fields. These are conducted in fields ranging from varying agro-climatic zones. Furthermore, frontline demonstrations help to examine the factors assisting in higher crop production, field constraints during production, as well as generating production data and farmer's feedback information. The study aimed to find out yield, and percent increase effecting the adoption of new improved variety. Therefore, a study was carried out on "Effect of front line demonstration of improve maize varieties and bio-fertilizer in central Gujarat".

Materials and methods

To show the effect of FLDs of improved maize varieties, a study was carried out in the central Gujarat districts of Panchmahal, Dahod and Mahisagar. These districts were selected purposively because FLDs were given to these districts and maize was the main crop grown in these districts.

The main purpose of FLDs was given to above districts is that to increase the maize productivity and to show the effect of FLDs of improved maize varieties and make farmers aware about the new hybrids and improved technologies. Purposive sampling technique was used for the selection of farmers. Front line demonstrations were planned and conducted at the farmer's fields under ICAR-AICRP project. Each demonstration was conducted in an area of 0.4 ha and adjacent to the farmer's fields in which the crop was cultivated with farmer's practice/local variety. The package of practices included were improved hybrids, maintenance of optimum plant stand, recommended fertilizers dose, plant protection measures. The spacing followed was at 60 x 20 cm sown with the seed rate of 8 kg/acre. All the participating farmers were trained on all aspects of maize production management. A total of 32 farmers were selected as respondent through

proportionate sampling. There is 12.8 ha area was covered by the frontline demonstration.

In addition, 133 farmers received FLDs through the STATE project. In this total, 53.2 ha area was covered in frontline demonstration. In this demonstration only Bio-fertilizer was given as fertilizer with package of practices included were improved maize varieties, maintenance of optimum plant stand, spacing followed was at 60 x 20 cm sown with the seed rate of 8 kg/acre. Production information was gathered and analyzed, including the average yield of maize hybrids and average yield of local varieties, and the percentage increase over FLDs and farmer's practices.

Sampling technique

Purposive sampling technique was used for selection of farmers.

Results and discussion

A comparison of frontline demonstration based on farmers' practice was analyzed and presented under the ICAR-AICRP project in Table 1. In this total 12.8 ha area was covered in front line demonstration in *kharif* and *rabi* season. During the period of study, it was observed that in a frontline demonstration, the improved maize varieties recorded a higher average yield of 3339 kg/ha (GAWMH-2) in *kharif* and 3906.47kg/ha (GAYMH-1) in *rabi* as compared to local check 2840 kg/ha in *kharif* and 3102.65 kg/ha in *rabi*, respectively. Similarly, the per cent increase in improved maize varieties was found to increase by 17.58 % in *kharif* and 26.01 per cent in *rabi* was reported by Chaudhari *et al.* (2017) and Kumar *et al.* (2010).

Besides, A Comparison of frontline demonstrations based on farmers' practices was analyzed and presented under the State improvement project in different districts of central Gujarat in Table 2. In this total, 53.2 ha area

Table 1. Yield and % increase in FLD under AICRP over local check

S.No.	Season	District	Variety	No. of FLDs	Total area (ha)	Average yield of FLDs (kg/ha)	Average yield local check (kg/ha)	% increase over local check
1	Rabi 2021-2022	Panchmahal, Mahisagar and Dahod	GAYMH-1	17	6.8	3906.47	3102.65	26.01
2	Kharif 2022	Panchmahal	GAWMH-2	15	6	3339	2840	17.58

Note: Hybrid cultivar: GAYMH-1 (Gujarat Anand Yellow Maize Hybrid-1, GAWMH-2 (Gujarat Anand White Maize Hybrid-2)

Table 2. Yield and % increase in FLDs along with bio-fertilizer under State project over local check

S.No.	Season	District	Variety	No. of FLDs	Total area (ha)	Average yield of FLDs (kg/ha) + bio-fertilizer	Average yield local check (kg/ha)	% increase over local check
1	Rabi 2021-2022	Panchmahal, Mahisagar and Dahod	GAWMH-2	73	29.2	3318.56	2883.49	15.10
2	Kharif 2022	Mahisagar	GAYMH-1	23	9.2	2114.35	1880.65	12.42
		Panchmahal, Mahisagar	GAWMH-2	37	14.8	2134.32	1888.78	13.00

Note: Local check = farmer's own stored seed

was covered in frontline demonstration in *Kharif* and *rabi* season to show the impact of Bio-fertilizer as only fertilizer. During the period of study, it was observed that in a front-line demonstration, the improved maize varieties with Bio-fertilizer recorded a higher average yield of 2114.35 kg/ha (GAYMH-1) and 2134.32 (GAWMH-2) in *kharif* and 3318.56 kg/ha (GAWMH-2) in *rabi* as compared to local check 1880.65 kg/ha and 1888.78 kg/ha in *kharif* and 2883.49 kg/ha in *rabi*, respectively. Similarly, the per cent increase in improved maize varieties was found to increase by 12.42 & 13.00 per cent in *kharif* and 15.10 per cent in *rabi* was reported by Rai *et al.* (2018 & 2016); Kumar *et al.* (2010) and Chaudhari *et al.* (2017).

From these results, it is revealed that the performance of improved maize varieties was found better than the local check and local practices.

Conclusion

The Study revealed that the productivity, production and area under maize cultivation can be improved by adopting improved maize varieties which can be popularized through front-line demonstration in different districts of central Gujarat. It was observed that improved maize varieties recorded a higher average yield of 2114.35 kg/ha (GAYMH-1), 2134.32 (GAWMH-2) and 3339 kg/ha

(GAWMH-2) in *kharif* and 3906.47 kg/ha (GAYMH-1) and 3318.56 kg/ha (GAWMH-2) in *rabi*, respectively. The per cent increase was found to increase 17.58 per cent, 13.00 per cent and 12.42 per cent in *kharif* and 26.01 per cent and 15.10 per cent in *rabi*, respectively. New crop varieties and technologies can be promoted with frontline demonstrations. These provide good platforms for advertising the benefits with proven results. Further, these platforms help to improve the knowledge, attitude and skills of farmers, which will help reduce the prevailing yield gaps.

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