



Short Communication

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## Performance of Potato Variety *Kufri Jyoti* in the Farmers' Field of Udalguri District of Assam with Proper Fertility Management

Debasish Borah<sup>1\*</sup>, Bhaskar Baruah<sup>1</sup>, Himadri Rabha<sup>1</sup> and R.K. Saud<sup>2</sup>

<sup>1</sup>Krishi Vigyan Kendra, Udalguri, Assam Agricultural University, Lalpool BTR, Udalguri, Assam (784 514), India

<sup>2</sup>Directorate of Extension Education, AAU, Jorhat, Assam (785 013), India

\*Corresponding email: drdebasishborah@gmail.com

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### ABSTRACT

Field demonstrations were conducted at farmers' field of Kacharital village, District Udalguri, BTR, Assam during the *rabi* season of 2020-21 and 2021-22. The soil was sandy loam in texture, acidic (pH 5.7) in reaction and medium in available nitrogen (282.50 kg ha<sup>-1</sup>), phosphorus (28.75 kg ha<sup>-1</sup>) and potassium (140.80 kg ha<sup>-1</sup>). Increase in the number of leaves plant<sup>-1</sup>, plant height, higher number of tubers plant<sup>-1</sup>, total tuber yield, was recorded in the treatment receiving Recommended Dose of Fertilizers (RDF) + FYM which was much higher than the control. The applications of recommended dose of fertilizer with FYM positively influence growth and yield of crop, economic parameters.

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## INTRODUCTION

Potato is one of the most important tuber crops of Assam as well as the country. It is a versatile food crop with capacity to be grown from sea level to the snowline with varying physico-chemical properties of the soil. It produces more food per unit area per unit time than any other food crop (Shekhawat *et al.*, 1999). Potato is mostly grown as rainfed crop in Assam but it is also cultivated in irrigated condition in some localities. Production and productivity of potato is much lower than the national level due to several causes like use of low yielding varieties, high incidence of pest and diseases particularly late

blight infestation, delayed sowing, improper fertility management practices rainfed cultivation, *etc.* Variety plays a very important role in increasing the production and productivity in potato. Use of high yielding varieties which are less susceptible to pest and diseases, proper fertility management will increase the yield of the crop.

## MATERIALS AND METHODS

The demonstration was conducted at farmers' field of Kacharital, Bhergaon, District Udalguri, BTR, Assam during the *rabi* season of 2020-21 and 2021-

22. The soil was sandy loam in texture, acidic (pH 5.7) in reaction and medium in available nitrogen (282.50 kg ha<sup>-1</sup>), phosphorus (28.75 kg ha<sup>-1</sup>) and potassium (140.80 kg ha<sup>-1</sup>). Two different treatments comprising of control (no fertilizer), FYM + RDF (Recommended dose of fertilizer), were tested. FYM was applied @ 20 t ha<sup>-1</sup>. A recommended dose of fertilizer @ 60-50-50 of NPK (kg ha<sup>-1</sup>) was followed. The fertilizers were applied as per the treatment. Planting of the tubers of variety Kufri Jyoti was done at a spacing of 50 cm × 20 cm. Entire dose of nitrogen, phosphorus, potassium and FYM were applied as basal in line and covered with thin layer of soil so that the tubers did not come into contact with the fertilizers.

## RESULTS AND DISCUSSION

### 1. Number of Leaves Plant<sup>-1</sup>

Data presented in table 1 revealed that, the highest number of leaves plant<sup>-1</sup> at 30 days after sowing

**Table 1:** Effect of fertility management on number of leaves plant<sup>-1</sup> and plant height at different growth stages

Treatment	Number of leaves plant <sup>-1</sup>			Plant height (cm)		
	30 DAS	60 DAS	90 DAS	30 DAS	60 DAS	90 DAS
Control	22.35	27.25	39.25	20.45	35.60	47.40
FMM + RDF	27.20	37.40	61.22	21.22	48.35	59.40

[DAS = Days after Sowing]

### 3. Number of Tubers

The results of the data presented in table 2 revealed that the highest number of tubers plant<sup>-1</sup> was in the plants receiving RDF + FYM (13.28 and 13.60 for both the years respectively) which was much higher in the control (7.20 and 7.40) . This may be due to better vegetative growth of the crop resulting from

(DAS) was found in the treatment receiving RDF + FYM (27.20) which is higher than the control (22.35). Similar trend was also seen at 60 and 90 DAS of the crop. Number of leaves plant<sup>-1</sup> was found to be the highest in treatment receiving FYM + RDF. This may be due to availability of nutrients at optimum level as the fertilizers were applied at optimum level. Khalak and Kumaraswamy (1992) also reported that increase in fertilizer level increased the growth attributes in potato.

### 2. Plant Height

Plant height was found to be maximum in the treatment receiving FYM + RDF and it was higher than the control. Similar trend was also recorded at 60 and 90 DAS; the maximum plant height was recorded in plants receiving RDF + FYM (Table 1). This may be due to higher availability of nutrients and moisture to the crop. The interaction of nutrients in soils and plants is an important factor in determining their growth and yield (Sharma, 1992).

higher fertilizer and moisture availability at these treatments. The increased nutrient uptake can be attributed to fertilizer application by which more nutrients were made available and they also promoted the growth of roots (Sujatha and Krishnappa, 1995). Lal and Arora (1994) reported that application of fertilizers at optimum dose, increases the number of tubers plant<sup>-1</sup>.

**Table 2:** Effect of fertility management on number of tubers plant<sup>-1</sup>, yield plant<sup>-1</sup> and total tuber yield

Treatment	No of tubers plant <sup>-1</sup> (no)		Yield plant <sup>-1</sup> (g)		Total tuber yield (q ha <sup>-1</sup> )	
	2020-21	2021-22	2020-21	2021-22	2020-21	2021-22
Control	7.20	7.40	85.00	84.40	81.25	83.20
FMM + RDF	13.28	13.60	132.25	158.44	118.00	132.00

#### 4. Yield Plant<sup>-1</sup>

Table 1 revealed that the highest yield plant<sup>-1</sup> was recorded in treatment receiving FYM + RDF (132.25 g, 158.44 g for both the years respectively) which is higher than the control (85.00 g and 84.40 g, respectively). This is due to better vegetative growth and higher number of tubers plant<sup>-1</sup> at these treatments.

#### 5. Total Tuber Yield

Application of recommended dose of fertilizer increased tuber yield. The highest tuber yield was recorded in the treatment FYM + RDF (118.00 q ha<sup>-1</sup>

and 132.00 q ha<sup>-1</sup> for the year 2020-21 and 2021-22, respectively) which is higher than the control (81.25 q ha<sup>-1</sup> and 83.20 q ha<sup>-1</sup>, respectively).

This might be attributed by the better vegetative growth, higher values of yield attributing characters such as number of tubers plant<sup>-1</sup>, tuber yield plant<sup>-1</sup>.

#### 6. Economic Parameters

Results shown in table 3 revealed that gross cost, gross and net return. B:C ratio is found be much higher than the control. Similar result was also recorded by Sharma and Borah (2004).

**Table 3:** Economic parameters of potato crop

Treatment	Gross Cost (Rs. ha <sup>-1</sup> )	Gross Return (Rs. ha <sup>-1</sup> )	Net Return (Rs. ha <sup>-1</sup> )	B:C Ratio
Control	48,804.00	1,21,500.00	72,696.00	2.49
FMM + RDF	57,574.00	1,77,000.00	1,19,426.00	3.07

The study finally showed that the application of recommended dose of fertilizer with FYM positively influence growth and yield of crop, economic parameters.

#### CONCLUSION

The field demonstrations conducted at Kacharital village, Udalguri, BTR, Assam during the *rabi* seasons of 2020-21 and 2021-22 clearly demonstrate the significant benefits of using the Recommended Dose of Fertilizers (RDF) combined with Farm Yard Manure (FYM) on potato crops. The treatment with RDF + FYM resulted in substantial improvements in several growth parameters, including the number of leaves plant<sup>-1</sup>, plant height, number of tubers plant<sup>-1</sup> and overall tuber yield. The enhanced vegetative growth and increased nutrient availability due to the combined application of RDF and FYM led to higher economic returns, as evidenced by the increased yield and favorable B:C ratio compared to the control. These findings highlight the importance of adopting integrated nutrient management practices to optimize crop productivity and profitability. The study underscores the potential of RDF + FYM as a sustainable approach to enhance

potato yield and ensure economic viability for farmers in the region.

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#### Conflict of Interest

The authors declare no conflict of interest.

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