



## Interactive Effect of Fertilizer Levels and Different Combinations of Biofertilizers on Economics of Barley in 2015-16

Priti Malik\*, Meena Sewhag and Karmal Malik

Department of Agronomy, CCS Haryana Agricultural University, Hisar- 125004(Haryana), India

\*Corresponding Author E-mail: [priti.malikhau@gmail.com](mailto:priti.malikhau@gmail.com)

Received: 13.08.2019 | Revised: 17.09.2019 | Accepted: 24.09.2019

### ABSTRACT

The present experiment entitled, “Interactive effect of fertilizer levels and different combinations of biofertilizers on economics of barley in 2015-16” was conducted during the Rabi season of 2015-16 at the Agronomy research farm of Chaudhary Charan Singh Haryana Agricultural University, Hisar. The experiment was laid out in split plot design with three fertilizer levels (50, 75 and 100 per cent RDF) in main plots and seven different combinations of biofertilizers (Uninoculated, seed inoculation with *Azotobacter*, *Azospirillum*, *PSB*, *Biomix*, *Azotobacter+PSB* and *Azospirillum+PSB*) in sub plots replicated thrice. Based on the research investigation it was found that highest gross returns, net returns as well as benefit: cost ratio was recorded with application of 100 % RDF in 2015-16. The increase in net returns with application of 100 % RDF as compared to 50% RDF was Rs 9,554 in the year 2015-16. Seed inoculation with *Biomix* resulted in net returns of Rs. 36, 346 in year 2015-16. Least value for gross returns was recorded in uninoculated treatment. Seed inoculation with *Biomix* resulted in highest benefit: cost ratio while lowest value of benefit: cost ratio was obtained with uninoculated treatment.

**Keywords:** fertilizer levels, Biofertilizers, *Biomix*, Economics, RDF.

### INTRODUCTION

Barley (*Hordeum vulgare*) is a well known self pollinating crop. It is a diploid crop having 14 chromosomes in it. In the year 2016, total world barley production was around 141 million tonnes. Barley is a widely adaptable crop, now is currently very popular in temperate regions where it is grown as a summer crop and grown as a winter crop in case of tropical areas. Time for barley germination is from 1 to 3 days. It grows well under the cool conditions, but it is not a particularly winter hardy crop.

Keeping these points under the consideration, present investigation was taken on “Effect of fertilizer levels and different combinations of biofertilizers on Nitrogen content and uptake by grain and straw in 2015- 16”.

The field experiment was performed during rabi season of 2015-16 which was replicated thrice having the split plot design at Research Area of Agronomy, Chaudhary Charan Singh Haryana Agricultural University, Hisar, Haryana (India) situated at 29°10' N latitude and 75° 46' E longitude at an elevation of 215.2 m above the mean sealevel.

**Cite this article:** Malik, P., Sewhag, M., & Malik, K. (2019). Interactive Effect of Fertilizer Levels and Different Combinations of Biofertilizers on Economics of Barley in 2015-16, *Ind. J. Pure App. Biosci.* 7(6), 472-474. doi: <http://dx.doi.org/10.18782/2582-2845.7789>

Treatments taken in the main plots were fertilizer levels as 50 % RDF, 75 % RDF and 100 % RDF and in sub plot were uninoculated, *Azotobacter*, *Azospirillum*, PSB, *biomix* i.e *Azotobacter* +*Azospirillum*+PSB, *Azotobacter*+PSB and *Azospirillum* +PSB in a split plot design.

The expenditure incurred on individual treatment was worked out from the detail assessment of the fixed and variable costs involved such as land preparation, plant

protection, chemicals, seed and labour engaged in different operations. Gross income for all treatment was calculated separately taking into consideration grain and stover yield of individual crop. Thereafter, net returns were calculated after subtracting expenditure incurred on the individual treatment from the gross expenditure of the same treatment.

To ascertain the economic viability treatment wise benefits cost (B: C) ratio was calculated using the following formula:

$$B: C = \frac{\text{Gross Returns (₹/ha)}}{\text{Cost of cultivation (₹/ha)}}$$

## RESULTS AND DISCUSSION

The data related to gross returns, net returns and B: C ratio of barley influenced by various fertilizer levels and seed inoculation with various combinations of biofertilizers is presented in table 1. Highest gross returns, net returns and benefit: cost ratio was recorded

with application of 100 % RDF (₹ 58,922/ha, ₹ 37,585/ha and 2.76). The net return varied from ₹26,450 to ₹50,914. Benefit: cost ratio of barley increases significantly with increase in fertilizer levels from 50 to 100 % RDF. The increase in net returns with application of 100 % RDF as compared to 50% RDF was ₹9,554.

**Table 1: Effect of fertilizer levels and different combinations of biofertilizers on economics of barley**

Treatment	Gross return (₹/ha)	Net return (₹/ha)	B:C
	2015-16		
<b>Fertilizer levels</b>			
50 per cent RDF	48,717	28,031	2.36
75 per cent RDF	52,331	31,319	2.49
100 per cent RDF	58,922	37,585	2.76
SEm±	213	213	0.02
CD at 5 %	677	677	0.06
<b>Biofertilizers</b>			
Uninoculated	47,439	26,450	2.26
Seed inoculation with <i>Azotobacter</i>	52,005	30,997	2.48
Seed inoculation with <i>Azospirillum</i>	53,282	32,274	2.54
Seed inoculation with <i>PSB</i>	53,788	32,780	2.56
Seed inoculation with <i>Biomix</i>	57,354	36,346	2.73
Seed inoculation with <i>Azotobacter</i> + <i>PSB</i>	54,019	32,991	2.57
Seed inoculation with <i>Azospirillum</i> + <i>PSB</i>	55,376	34,348	2.63
SEm±	251	251	0.01
CD at 5 %	762	762	0.03

Higher returns with increase in fertilizer levels are mainly because of higher yields recorded with higher fertilizer levels. Results are in similarity with Chakrawarti and Kushwaha (2006) who reported that the higher net profit was seen with 90 kg N ha<sup>-1</sup> compared to 60, 30 kg N ha<sup>-1</sup> and control treatments. Similar results were recorded by (Kumar, 2005).

Similar findings were also reported by (Sonawane et al., 2007).

Among different combinations of biofertilizers, seed inoculation with *Biomix* resulted in significantly higher gross returns, net returns and benefit: cost ratio as compared to other treatments. Seed inoculation with *Biomix* resulted in net returns of ₹36, 346.

Least value for gross returns was recorded in uninoculated treatment (₹47, 439).

Overall seed inoculation with biofertilizers resulted in higher gross returns, net returns and benefit: cost ratio. Higher B: C ratio in *Biomix* treatment is because of very less enhancement in cost of cultivation as compared to the control treatment. Similar results were recorded by Behera and Rautaray (2010), Yadav et al. (2011) and Yadav et al. (2014).

### CONCLUSION

Based on one year of study, it can be concluded that application of 100 % RDF in barley was found optimum in higher gross returns, net returns and benefit: cost ratio. Among different combinations of biofertilizers, seed inoculation with *Biomix* was found better in respect of gross returns, net returns and benefit: cost ratio.

### REFERENCES

- Behera, U. K., & Rautaray, S. K. (2010). Effect of biofertilizers & chemical fertilizers on productivity & quality parameters of durum wheat (*Triticum turgidum*) on a vertisol of central India. *Archives of Agronomy & Soil Science*, 56(1), 65-72.
- Chakrawarti, V. K., & Kushwaha, K. P. (2006). Effect of sowing time, nutrients concentration & uptake on yield maximization of barley (*Hordeum vulgare L.*). *Progressive Agriculture*, 6(2), 194-196.
- Sonawane, P. D., Rodge, R. G., & Attarde, D. R. (2007). Effect of fertilizer, biofertilizer, inter-cropping system on pearl millet under rainfed conditions. *Journal of Maharashtra Agricultural Universities*, 32(2), 176-178.
- Kumar, P. (2005). Effect of different nitrogen levels and biofertilizers strains on productivity and soil fertility in pearl millet-wheat cropping system. PhD thesis, Chaudhary Charan Singh Haryana Agricultural University, Hisar, Haryana.
- Yadav, D. D., Verma, C. K., Singh, B. P., & Shanker, S. (2011). Role of biofertilizers in relation to nitrogen levels on growth & yield of wheat (*Triticum aestivum L.*). *Crop Research*, 42(1,2&3), 23-26.
- Yadav, S. M., Singh, R., Kumar, H., Khan, N., Verma, S. P., Shweta, Yadav, B. K., & Kumar, S. (2014). Response of late sown wheat (*Triticum aestivum*) to FYM, biofertilizers & inorganic nitrogen alone and in different combinations. *Plant Archives*, 14(2), 1127-1129.