



Effect of varieties and integrated nutrient management techniques on growth, productivity, quality and economics of barley (*Hordeum vulgare* L.)

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Abstract : A field experiment was conducted at Punjab Agricultural University, Ludhiana during for two consecutive years (2007-08 to 2008-09) to study the effect of integrated nutrient management on growth, productivity, quality and economics of barley. The experimental site (30° 56' N, 75° 52' E; 247 m ASL), was having deep alluvial loamy sand, low in organic carbon (3.4 g C kg⁻¹) and slightly alkaline (pH 7.5). The region has a sub-tropical climate having cool and dry winters during the crop season. The experiment was conducted in factorial randomized block design with two cultivars of barley (DWRUB 52 and RD 2552) and integrated nutrient management treatments [RDF (90 kg N, 30 kg P₂O₅ and 20 kg K₂O/ha), 75 per cent RDF + FYM (5t/ha), 50 per cent RDF + FYM (5t/ha), 75 per cent RDF + FYM (5t/ha) + biofertilizer, 50 per cent RDF + FYM (5t/ha) + biofertilizer, 100 per cent fertilizer through FYM + biofertilizer and absolute control] with three replications. The grains per ear were significantly higher in RD 2552 than DWRUB 52. Both the varieties *i.e.* DWRUB 52 and RD 2552 recorded the similar grain yield and economics. All nutrient management techniques recorded significantly higher grain yield than absolute control. The highest productivity was recorded in 75 per cent RDF + FYM in 2007-08 and in 75 per cent RDF + FYM + biofertilizer in 2008-09 which was statistically at par with RDF and 75 per cent RDF + FYM + biofertilizer in 2007 and 75 per cent RDF + FYM treatments in 2008-09 but significantly higher than rest of the treatments. These manures along with RDF also helped in increasing the DTPA-extractable Zn, Cu, Fe and Mn in the soil. The highest gross returns, net returns, and B:C ratio were recorded in 75 per cent RDF + FYM treatment in 2007-09 and in 75 per cent RDF + FYM + biofertilizer treatment in 2007-09. It might be due to higher grain yield and lower variable costs recorded in these treatments.

Key Words : Barley malt varieties, Bio fertilizer, Economics integrated nutrient management, Productivity, Quality

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INTRODUCTION

Barley (*Hordeum vulgare* L.) is an important cereal crop after wheat, rice and maize in the world and third important cereal crop after rice and wheat in India. It can be cultivated successfully in areas where less irrigation water is available. It grows successfully in a wider range of climate compared to other cereals. Under Punjab conditions, as grain crop, its potential is less as compared to wheat crop but it performs well under rainfed conditions. Barley is superior to wheat with respect to some minerals and fibre contents. Barley contains water soluble fibre (betaglucons) and oil compound

(tocotrinol) which are found to be effective in lowering cholesterol level of blood. The crop is sown with minimum care and management under residual moisture. This crop has potential due its increased industrial demand due to use of malt for preparation of beer. As the increased use of fertilizer has already pose a threat to the human and animal life, the increased use of nitrogenous fertilizers may increase the nitrate content in the underground water which may ultimately affect the animal and human life. Continuous application of nitrogenous fertilizers has depleted soil organic matter, resulting in inherent loss of native soil N, available P, available K and lower production (Srivastava, 1998; Behera *et al.*, 2007).