

Integrated use of FYM and inorganic sources of nutrients in potato-radish crop sequence

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Received : Oct 2010 / Accepted : July 2011

Abstract Field experiments were conducted during 2005-06 and 2006-2007 at Central Potato Research Institute, Shimla on brown mid hill soils to investigate the role of FYM on phosphorus and potassium economy in potato-radish crop sequence under rainfed conditions. Eight manurial treatments consisted of different combinations of FYM and inorganic sources of phosphorus and potassium to potato crop whereas, succeeding radish crop received only N. The application of recommended dose of N along with 50% PK from inorganic fertilizers and rest from FYM (on K basis) in potato resulted in the highest concentration of nitrogen, phosphorus and potassium in leaves which consequently enhanced yields of potato (319 q/ha). This treatment also gave highest yield of following crop radish (192.9 q/ha). Therefore, for the higher productivity and better return of the potato-radish system, 25 to 50% of the recommended dose of P and K fertilizers can be replaced with FYM in the mid hills soils of Himachal Pradesh.

Introduction

Potato is one of the most important crops in the summer season in mid hill of Himachal Pradesh. Development of remunerative potato based cropping systems along with

system based manurial schedule is required to ensure stability of crop area, production and good returns to the farmers. Fertilizers constitute 15-20% costs of cultivation of potato. Fertilizer costs are rising every year, therefore, it is important to maximize use of locally available organic nutrient sources to maintain soil fertility and productivity. The use of inorganic fertilizer in conjunction with organic manures is essential for getting sustainable and profitable yield of potato based system in the mid hills of HP. Since, the application of inorganic fertilizers alone could not sustain the soil fertility and productivity under cropping sequences, the only way to realize the potential yield of crops on sustained basis is through the use of various sources of nutrients in integrated manner to make the system productivity profitable.

The problem of high fixation of applied phosphorus to unavailable form in acidic mid hills soils can partly be mitigated through use of FYM due to its buffering nature, which releases part of unavailable native P. However, low mineralization rate of these organic matters due to prevailing low temperature during crop growth period generally fails to satisfy the nitrogen requirement (Trehan *et al*, 2008). Therefore, recommended dose of N was applied to all the treatments except 100% organic treatment and absolute control. Since, organic sources have more residual effect than inorganic, succeeding crop is less likely to suffer due to lack of phosphorus and potassium. Potato-radish is one of the important emerging cropping systems in north western hills (Singh *et al*, 2008). However, the information on nutrient management in radish, based on residual effect of integrated nutrient sources in potato is not available. Keeping these points in view, field studies were conducted during 2005-06 and 2006-2007 on slightly acidic soil in mid hills of Shimla to investigate the role of integration of FYM and inorganic sources of nutrients on performance of potato and to evaluate these combinations with respect to subsequent radish crop.

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