

Optimum dose of phosphorus and potassium for increased yield and quality in garlic under Akola condition

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ABSTRACT

The experiment was conducted during the year 2008-09 on Agrifound white variety of garlic to find out an optimum dose of phosphorus and potassium. The yield and yield attributing characters like bulb weight, size of bulb and cloves per bulb were found maximum with application of 125 kg phosphorus and 75 kg potassium ha⁻¹, respectively. While in present investigation an application 89.13 kg phosphorus and 67.66 kg Potassium ha⁻¹ was considered as economically optimum. The maximum benefit cost ratio was 1.12 and 1.22 with an application of 125 kg phosphorus 75 kg potassium ha⁻¹, respectively.

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INTRODUCTION

Garlic (*Allium sativum* L.) belongs to family Aliceac. It is most important spice crop used for flavoring and seasoning of vegetable dishes throughout the world and in preparing chutneys, pickles, etc. It has higher nutritive value than other bulb crops, nutrients play an important role in improving productivity and quality of garlic bulbs. Phosphorus stimulates early root growth and development and hastens maturity of crop. Potassium has crucial role in energy status of plant translocation and storage of assimilates and maintenance of tissue water relation. The judicious use of chemical fertilizers is one of the well known tool for the maximization of bulb yield through their proper, rational and optimum doses (Naidu *et al.*, 2000). The present investigation was therefore, conducted to find out the optimum dose of phosphorus and potassium for obtaining better yield of garlic.

MATERIALS AND METHODS

The present investigation was conducted at Main Garden, Department of Horticulture, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola. The experiment was laid out in a Factorial Randomized Design with four replications. Four levels of phosphorus (0, 75, 100 and 125 kg ha⁻¹) and potassium (0, 25, 50 and 75 kg ha⁻¹) were tested with nitrogen 100 kg ha⁻¹ as a common dose. The garlic variety Agrifound white (G-14) was used. The garlic cloves were planted at 10x10 cm spacing in flat bed of plot size 3x1 m dimension on dated 8th October, 2008.

FYM @25 t ha⁻¹ half dose of nitrogen in the form of urea, full dose of phosphorus in the form of single super phosphate and full dose of potassium in the form of murate of potash (as per treatment) to each plot were applied as basal dose at the time of planting. Remaining half dose of nitrogen was applied as a top dressing, after one month from the date of planting.

The observations on yield and yield attributing parameters were recorded at harvest.

Optimum dose :

Generally, the response to phosphorus and potassium is quadratic *i.e.* yield increases at increasing rate with increasing in phosphorus and potassium dose up to a certain level and at a decreasing rate with subsequent doses of phosphorus and potassium. At a particular level, yield approaches to plateau and further increase in phosphorus and potassium dose decreases the yield (Reddy and Reddy, 2002).

Estimation of physical optimum dose:

The physical optimum dose of phosphorus and potassium was worked out with the following quadratic equation as suggested by Gomez and Gomez (1984).

$$Y = a + b_1P + b_2K + b_3P^2 + b_4K^2 + b_5PK$$

where

Y = Yield (q ha⁻¹)

a = intercept