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Effect of Different Nitrogen and Potassium Rates on Agronomic Characters of Aloe indica

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ABSTRACT

A field study was conducted to investigate the growth of Aloe indica with different rates of nitrogen and potassium fertilizers at the Germplasm Centre, Department of Horticulture, Bangladesh Agricultural University. Treatments consisted of 0, 200 and 300 kg nitrogen/ha and 0, 100 and 200 kg potassium/ha. The rates of nitrogen and potassium had significant effect on the leaf production of Aloe indica when compared to control. Leaf yield of Aloe indica was highest at application of nitrogen at rate 200 kg/ha and potassium at rate 100 kg/ha. Leaf protein content was 12.71% higher at 200 kg N/ha and 8.47% higher at 300 kg N/ha compared to control. Potassium application at rate of 100 and 200 kg/ha produced 4.86 % and 8.51% higher leaf protein content than the control, respectively. It is recommended to apply nitrogen at rate 200 kg/ha and potassium at rate 100 kg/ha for leaf production of Aloe indica.

Key words: Aloe indica, chemical fertilizers, leaf nitrogen, protein content, potassium content

INTRODUCTION

The exudates of Aloe indica have been used for numerous medical and cosmetic applications since ancient times (Morton, 1961). Thus the cultivation of Aloe indica has acquired a great commercial importance for its medical products and cosmetics processing. However, information on agronomic management of A. indica is scarce. Soil and summer season climate of Bangladesh are congenial for the cultivation of some medicinal plants, including A. indica. Medicinal plant, in some cases, requires large quantity of readily available nutrients (Gupta and Shukla, 1997). As a result, there is a possibility to increase yield per unit area of medicinal plants if fertilizers are rationally applied.

Nitrogen fertilizer is the most critical for increasing crop production and has appropriately been recognized as the major element (Mukhopadhy et al., 1986). Nitrogen had the largest effect on yield and quality of medicinal plants than any other nutrients (Xin et al., 1997). Nitrogen also promotes vegetative growth and flower and fruit set of medicinal plants (Bose and Som, 1990). Meanwhile, potassium plays an important role in the development of reproductive parts of plants. Application of nitrogen as urea and potassium as muriate of potash (MoP) increased yield of onion (Levy, 1978). However, the effect of nitrogen and potassium on A. indica production is limited in Bangladesh. The objective of present study was to find out the optimum requirements of nitrogen and potassium for A. indica.

MATERIALS AND METHODS

The experimental was carried out in Bangladesh Agricultural University Experimental Farm (BAUEF) at 24°75′N and 90°50′E, 18 m above the sea level. The BAUEF belongs to the agro-ecological region of Old Brahmaputra Floodplain (AEZ-9) that occupies the Brahmaputra sediments, deposited before the river shifted to its present channel about 200 years ago (UNDP and FAO, 1988). The experimental field was a medium high land with silty clay loam texture having pH value of 6.5-7.0.

The soil was cultivated 20 days before planting with a tractor disc plough. It was further ploughed and cross-ploughed 6 times with the country plough each time followed by laddering. Triple super phosphate (TSP) and cowdung were applied at the rate 200 kg/ha and 10 t/ha, respectively, during the final land preparation. Weeds, rubbles and crop residues were removed from the land. The plots were prepared and drainage systems were made around individual plots.

The experiment was laid out in randomized complete block design (RCBD) with three replications/ blocks. Each block was divided into nine unit plots with block-to-block distance was 75 cm. Each plot (1m x 1 m) contained three plants. The distance between two plots was 50 cm. Treatments were three levels of nitrogen (0 kg, 200 kg, 300 kg N/ha) and three levels of potassium (0 kg, 100 kg, 200 kg K/ha). Nitrogen was applied as urea (46% N) and potassium as Muriate of Potash (MOP, 60% K).

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