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EFFECT OF VARYING LEVEL OF NITROGEN ON GROWTH AND YIELD OF OKRA GROWN IN COAL ASH AMENDED SOIL

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ABSTRACT

A pot experiment was conducted during rabi season in the net house of the experimental farm of Department of Botany, Aligarh Muslim University, Aligarh to study the comparative effect of two doses of basal nitrogen (50 and 100 kg N ha⁻¹) on the performance of *Abelmoschus esculentus* L. grown in two levels of coal ash (F₂₀ and F₄₀) amended soil. So, low doses of these two waste products are beneficial for growth and yield.

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INTRODUCTION

Coal is a major source of energy to run industries in developing countries including India. Large quantities of oxides of sulphur, nitrogen, carbon and particulate air pollutants are generated during coal combustion (Hesketh, 1973).

MATERIALS AND METHODS

The randomized block pot Experiment was conducted in the net house of the Department to study the comparative effect of two levels of nitrogen (N₅₀ and N₁₀₀) and two levels of coal ash (F₂₀ and F₄₀). The coal ash used in study was procured from Harduaganj Thermal Power Plant situated about 15 km away in the North East of Aligarh Muslim University Campus. Plant sampling was done on 45 days, 75 days and 105 days after sowing. The leaf number was recorded at vegetative, flowering and fruiting stages. At fruiting stage, yield parameters (number of fruits per plant, number of buds per plant and fresh weight to fruit) were also recorded.

RESULTS

In general, all the growth and yield characteristics of Okra were increased with F₂₀ N₅₀ application, as is evident from

increased leaf number at the three sampling stages. F₂₀ N₅₀ increased the leaf number by 38.14%, 26.67% and 30.14% at vegetative, Flowering and fruiting stages respectively. Regarding the yield characteristics, F₂₀ N₅₀ combination proved beneficial and recorded an increase of 12.71% in bud number, 66.67% in fruit number and 67.03% in fruit weight at fruiting stage.

DISCUSSION

The fertilizer is proved beneficial for most of the growth and yield parameters. Nitrogen plays an important role in stimulating the growth of stem and leaves. This increased nutrient concentration increased growth, leaf number and leaf area by increasing cell size and number (Devlin and Witham, 1986). Potassium is an activator of many enzymes essential for photosynthesis and respiration and it also activates enzymes needed for the synthesis of starch and protein. It is a major contributor to the osmotic potential of cells and therefore to their turgor pressure (Salisbury and Ross, 2001). Application of fly ash in soil acts as a soil modifier and micro-fertilizer to improve productivity of soil (Sarangi *et al.*, 2001). Addition of fly ash tends to decrease bulk density with increasing level of fly ash (Upadhyay *et al.*, 2008). Deposition of fly ash on land affects the soil properties because it is enriched with trace elements which reduces bulk density of soil and ultimately increases water holding capacity of clay soil (Kene *et al.*, 1991). Based on the findings it may be

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concluded that the arka anamica variety of Okra can be recommended to local farmers for the cultivation under 20% coal ash and 50kg N ha⁻¹.

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