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IMPACT OF FERTILIZERS APPLICATION ON SEED GERMINATION AND SEEDLING GROWTH OF *VIGNA RADIATA*

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ABSTRACT

Currently, a real challenge for the workers in the agricultural research field is to stop or reduce the use of expensive agrochemicals/ chemical fertilizers which are hazardous to the environment as well as human health. Present study was aimed to improve the growth and obtain optimum yield of *Vigna* crop with eco-friendly, non-toxic way and to reduce the use of agrochemical/chemical fertilizer application in agricultural activities.

A pot experiment was conducted to study the effect of chemical fertilizer (DAP) and biofertilizer (*Rhizobium* strain) separately and in combination on seed germination and seedling growth (at 30 days) based on morphological parameters such as seedling length (cm), fresh weight (g), dry weight (g) and leaf area (cm)² of *Vigna radiata* (L.) Wilczek. After one month (30 Days) observations, it was found that seedling length, fresh and dry weights and leaf area were maximum in T₄ and minimum in T₁₅, T₇ and T₈ favored improved seedling length and leaf area whereas T₇, T₈, and T₉ favored improved fresh and dry weights as compared to control.

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KEY WORDS : Biofertilizer, DAP, Germination, Seedling, *Vigna* crop.

Introduction

Today, fertilizer has become essential to modern agricultural practices to get more yield to feed the growing population. Fertilizers are designed to supplement the nutrients already present in the soil. Biofertilizer is a substance which contains living microorganisms, have emerged as a highly potent alternative to chemical fertilizers due to their eco-friendly, easy to apply, non-toxic and cost effective nature. Biofertilizers and biopesticides propose a sustainable solution to the reduction in the use of chemical fertilizers while meeting the demands of growing population. The use of biofertilizers and biopesticides in place of chemicals is likely has the potential to improve human health. Biofertilizers increase the effectiveness of chemical fertilizers by using a carrier material on which microbes are mounted².

In the present study, the experimental crop *Vigna radiata* (L.) Wilczek, also known as Mung bean, belonging to the family fabaceae is grown primarily for its protein rich edible seeds

Materials and Methods

Present study was carried out to observe seed germination and seedling growth of *V. radiata* influenced by fertilizer application under department of Botany at Dayanand Vedic College (Orai), Bundelkhand region (U.P.), India during kharif season of year 2016. In pot culture, used chemical fertilizer was DAP (Diammonium Phosphate), biofertilizer (BF) was *Rhizobium* strain and experimental crop was mung bean (*Vigna radiata* L. Wilczek, var. sweta) belong to fabaceae family which is a short seasonal, annual, self-fertilized herb crop. *Rhizobia* are soil bacteria that fix atmospheric nitrogen after becoming established inside root nodules of legumes.

The study was carried out in a Randomized Complete Block Design with sixteen treatments as T₁, T₂, T₃, T₄, T₅, T₆, T₇, T₈, T₉, T₁₀, T₁₁, T₁₂, T₁₃, T₁₄ and T₁₅ with a control i.e. T₀ in three replications (Table-1). Trial poly pots (10 inches) were filled with prepared soil treated with fertilizers. Undamaged healthy seeds of experimental crop were selected for the study. Before sowing, seeds were first surface sterilized with 0.1% HgCl₂ for two minutes and thoroughly washed with distilled water. Then,

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