

Impact of Different Levels of Fertilizers on Growth Components of Two *Vigna* Species

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Received November 9, 2020; Revised January 29, 2021; Accepted February 17, 2021

Cite This Paper in the following Citation Styles

(a): [1] Supriya Dixit, R. K. Gupta, "Impact of Different Levels of Fertilizers on Growth Components of Two *Vigna* Species," *Advances in Zoology and Botany*, Vol. 9, No. 4, pp. 83 - 90, 2021. DOI: 10.13189/azb.2021.090402.

(b): Supriya Dixit, R. K. Gupta (2021). *Impact of Different Levels of Fertilizers on Growth Components of Two Vigna Species*. *Advances in Zoology and Botany*, 9(4), 83 - 90. DOI: 10.13189/azb.2021.090402.

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Abstract Fertilizers are widely used by farmers in agricultural practices in form of chemical fertilizer, organic fertilizer and biofertilizer, supplying plants with nutrients for their optimal growth and production. In the beginning, farmers were delighted to get improved yield in agriculture, but gradually, chemical fertilizers began to show their ill impacts such as polluting water basins and leaching out, killing microorganisms and helpful insects, and also decreasing soil fertility. Biofertilizers, on the other hand, refer to articles containing live or latent microbes which help boost fertility of soil by either solubilizing phosphorus, fixing atmospheric nitrogen, decomposing organic waste or stimulating growth of plant through the synthesis of growth-promoting substances. A study was carried out to examine the impact of fertilizers (PSB and DAP) application on growth components of *Vigna radiata* and *V. mungo*. As a result, overall maximum value of experimental parameters such as seed germination percentage, root length, shoot length, fresh and dry weight of stem, chlorophyll content, phosphorus content, potassium content, nitrogen content as well as crude protein content were found with combined application of both fertilizers as compared to the control in both *Vigna* crops. Therefore, it was concluded that the application of biofertilizer with chemical fertilizer showed higher value for experimental parameters as compared to the control and also their single fertilizer treatments in both *Vigna* crops. The main purpose of the study was to look for the best fertilizer level either single or in combination of chemical fertilizer and biofertilizer, which could be applied to the experimental crops to obtain their enhanced growth components in addition to keeping sustainable and safe environment due to the reduction or minimize the use of

chemical fertilizers.

Keywords DAP, PSB, Growth Components, *Vigna radiata* and *V. mungo*

1. Introduction

Plants whether cultivated on the field or in a jar, utilize the inorganic minerals for their nourishment. Mineral elements as nitrogen (N), phosphorus (P) and potassium (K) are needed in large amount, which are most likely to be in short supply in agricultural soils. Besides this, both nitrogen and phosphorus are essential nutrients of nearly all the biochemical substances that make existence possible for plants. Farmers inoculate the agricultural lands with different kinds of fertilizers to secure a preferable crop yield. Fertilizers serve as catalyst for optimal growth and production of plants. The usage of chemical fertilizers with large varieties of seeds and irrigation improves the agricultural productivity and helps to achieve food grain self-sufficiency [28]. Many experiments have shown that the usage of phosphorus fertilizers typically has a significant effect on crop yield as its reduction restricts plant reaction to certain nutrients [2]. But gradually chemical fertilizers begin to show their ill impacts such as polluting water basins and leaching out, killing microorganisms and helpful insects, rendering the crop more perceptible to disease invasions and decreasing soil fertility. Apart from this, application of biofertilizers to the soil improves the biomass that makes up all sorts of beneficial bacteria and fungi. So many microorganisms

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