

# PDF - INVESTIGATION OF THE EFFECT OF PHOSPHORUS LEVEL ON THE GRAIN YIELD AND YIELD COMPONENTS OF SOYBEAN - researchcub.info

## CHAPTER ONE

### 1.0 INTRODUCTION

Soybean [*Glycine max* (L.) Merrill] is a member of the Fabaceae family, rich in nutrients. Soybean is not only seen as an oil plant but also used for various purposes. Among grain legumes, soybean is an economically important crop that is grown in diverse environments throughout the world. Its adaptation to tropical and subtropical regions is still involving extensive breeding work. To use land continuously for crop cultivation, incorporating organic and inorganic fertilizers to soil would provide multiple benefits for improving the chemical and physical status of the soil which results in improved crop yield (Ferguson *et al.*, 2006).

Both organic and inorganic fertilizers are sources of mineral elements, which plants require for effective growth and development (Ferguson *et al.*, 2006). Essential mineral elements are required in optimum amounts and are classified into micro and macro nutrients. Nitrogen, phosphorus, and potassium have great effects in plant growth and development. Their deficiencies or excesses result in marked effects on the growth and yield of crops. Nitrogen is a chlorophyll component, and it promotes vegetative growth and green colouration of foliage. Phosphorus plays a major role in photosynthesis, respiration, energy storage, cell division, and maturation. According to Fageria *et al.*, (1995) large quantity of P fertilizer may be required for successful soybean production. Potassium is important in plant metabolism, protein synthesis, and chlorophyll development. The most important crop nutrients in agricultural systems are nitrogen (N), phosphorus (P), and potassium (K) (Chiezey 2001). Most compound fertilizers will contain three elements essential for plant growth: NPK which stands for nitrogen (promotes leaf growth), phosphorus (root, flower, and fruit), and potassium (stem and root growth and protein analysis). Soybean nitrogen (N) requirements are met in a complex manner, as this crop is capable of utilizing both soil N (mostly in the form of nitrate) and atmospheric N (through symbiotic nitrogen fixation) (Kakare *et al.*, 2002).

The use of fertilizer is considered to be one of the most important factors to increase crop yield. Legumes require P for adequate growth and N fixation and their effectiveness in soil improvement can be hindered by P deficiency (Giller and Cadisch, 1995). Phosphorous has been shown to be an essential element, and its application has been shown to be important for growth, development, and yield of soybean (Kakare *et al.*, 2002). Phosphorus deficiency is probably one of the greatest constraints for agriculture. Fageria *et al.*, (1995) had earlier reported that large quantity of P fertilizer may be required for successful soybean production.

### 1.1 Objective

The objective of this work is to investigate the effect of phosphorus level on the grain yield and yield components of soybean.

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