RESEARCH PAPER International Journal of Agricultural Sciences, Vol. 7 Issue 1 (January, 2011) : 129-132

Effect of sulphur and zinc on nutrient uptake and yield of soybean

DHANASHREE PABLE* AND D.B. PATIL
Department of Soil Science and Agricultural Chemistry, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, AKOLA, (M.S.) INDIA (Email – dspable@ rediffmail.com)

ABSTRACT

The field experiment was conducted to study the effect of sulphur and zinc on nutrient uptake and yield of soybean var. JS 335 crop on vertisol during year *Kharif* 2009. The different doses of sulphur were applied singly with recommended dose of fertilizer and along with constant dose of zinc also. Results indicated that application of 30 kg S ha^{-1} and 2.5 kg Zn ha^{-1} with fertilizer dose of 30:75:0 kg NPK ha^{-1} recorded higher grain yield and straw yield. Total uptake of nutrients and micronutrients was recorded significantly highest in same treatment after harvest of crop.

Pable, Dhanashree and Patil, D.B. (2011). Effect of sulphur and zinc on nutrient uptake and yield of soybean. *Internat. J. agric. Sci.*, **7**(1): 129-132.

Key words : Sulphur, Zinc, Yield, Nutrient uptake, Vertisol, Soybean

INTRODUCTION

Soybean (*Glycine max* L. merill) is a well-known oilseed and pulse crop. It is the richest and cheapest source of high quality proteins, minerals, vitamins, and fats. Soybean is called as miracle, Golden Bean of 21st century mainly due to its high protein (40%), oil (20%) content, and now making headway in Indian Agriculture. It is called as Gold of Soil due to its various qualities such as ease in cultivation, less requirement of fertilizer and labour. With adoption of intensive farming the farmers have shifted from using organic to inorganic high analysis to S free fertilizer leading to move widespread and more intense S-deficiency in Indian soils (Krishnamurti and Mothan, 1996). Micronutrients have assumed increasing in crop production under modern agriculture. Increased yield through intensive cultivation with high yielding crop varieties. Use of chemically pure NPK fertilizer free from micronutrients as contaminant restricted recycling of organic wastes in soil are dominant factors contributing towards accelerated exhaustion of micronutrients from soil in general and zinc in particular. At several places normal yield of crops should not be achieved despite judicious application of nitrogen, phosphorus and potassium due to the micronutrient deficiency in soils. The distribution of zinc found more in roots and it is taken up by plant in Zn^{2+} form, uptake is done by root as well as foliar spray (Nandanwar *et al.*, 2007). In years to come the deficiency problem of micronutrients will go on intensifying, the land has to be cultivated more intensively to produce extra food, fibre, fuel, fodder, fruits etc. to meet the requirements of increasing population. Keeping this in view, the present investigation was undertaken to study the effect of sulphur and zinc on nutrient uptake and yield of soybean.

MATERIALS AND METHODS

The present investigation was conducted at Agriculture Research Station (ARS), Washim, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola during *Kharif*, 2009. The experimental soil was montmorillonite, hyperthermic, family of Typic Haplusterts. The initial status of soil having pH 8.07 and Ec 0.17 dSm^{-1} which was moderately alkaline in nature and low in organic carbon (5.86 g kg^{-1}) , low in available nitrogen (153.15 kg ha^{-1}), medium in phosphorus (14.56 kg ha^{-1}), high in potassium (369.14 kg ha^{-1}) and medium in sulphur (14.62 kg ha^{-1}) . Whereas it was deficient in Zn (0.45 ppm) and Fe (1.51ppm) while sufficient level of Cu (0.27 ppm) and Mn (2.13 ppm). The experiment was laid out in Randomized Block Design with soybean crop. The seven treatments with three replications applied to experimental field. Where treatment T_1 (control), T_2 (10 kg S ha^{-1}+ RDF), T_3 (20 kg S ha^{-1}+ RDF), T_4 (30 kg S ha^{-1}+ RDF), T_5 (2.5 kg Zn ha^{-1} +10 kg S ha^{-1}+RDF), T_6 (2.5 kg Zn ha^{-1} +20 kg S ha^{-1}+RDF), T_7 (2.5 kg Zn ha^{-1} +30 kg S ha^{-1}+RDF) was taken randomly in 21 plots. Soil sample (0 - 15 cm depth) were taken from entire field and analyzed for various physicochemical properties in order to asses the initial fertility status of the soil while the plant samples were collected at harvest. The samples were air dried and subsequently oven dried at 60^0C. The treatment wise samples were ground by using Willey grinding machine. Zinc was applied in the form of zinc sulphate and sulphur

* Author for correspondence.