

**Effect Of Soyabean Cultivation On Soil Macronutrients****Mukundraj B. Patil and Vikas D. Ragole***

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Abstract

In order to study effect of soybean cultivation on soil macronutrients. Soybean was cultivated in July 2015. Soil was tested before sowing, at flowering stage and after harvesting of soybean. Soil was tested for N, P, K and CaCO_3 . It was found that amount of Nitrogen & potassium was declined after harvesting than pre sowing soil test while amount of phosphorous and CaCO_3 was declined which may be due to formation of non-soluble salts due to reaction between CaCO_3 and phosphorous compounds.

Keywords:- Soybean, Soil macronutrients, N,P,K, CaCO_3

Introduction

Soya bean [*Glycine max* (L) Merrill] is a leguminous crop and belongs to the family Leguminaceae with sub-family Papilionaceae. Soyabean is originated in china which is basically a pulse crop, soya bean is an grown in various inter / mixed and sequential cropping systems.

India ranks fifth in area and production of soya bean in the world after USA, Brazil, China and Argentina, Major soya bean growing states in India are Madhya Pradesh, Maharashtra, Gujarat and Rajasthan. Soya bean as Kharip crop sown in June-July and harvested by September October, Peak arrivals are from October November. It is also cultivated during Rabi as well as Summer season as an irrigated crop. In India area under cultivation during 2012-13 was 10.84 million hectares while production was 14.67 million tones^[1].

The Maharashtra state is one of the leading states in Soyabean production, it ranks second in the country in respect of production of soya bean. In Maharashtra area under cultivation during 2012-13 was 3.22 million hectares while production was 4.67 million tones^[1].

When the plants grow in the soil, then plants absorb nutrients from soil, which are essential for normal

growth. Thus resulting change in the constituents of soil nutrients, it may increase or decrease. Therefore attempts were made to study changes brought in major constituents or composition (N,P,K and CaCO_3) of soil due to soya bean cultivation.

Methods And Materials

To study the effect of soya bean cultivation on soil macronutrients seed were sowed in the well- prepared soil on 12th July 2015. Before sowing samples was taken from the depth of 2 feet from four corners of the field and sample was brought to the laboratory for soil testing. Likewise when plants were in flowering condition and after harvesting (4th Nov. 2015) soil sample were taken and brought in the laboratory for quantitative analysis of soil macro nutrients.

Soil sample were analyzed for Estimation of K, P, N and CaCO_3 . For Estimation of Potassium ammonium acetate^[2] method was employed. To estimate Phosphorus Olsen's method^[3] was used. For Nitrogen estimation alkaline permanganate method^[4] was employed while free CaCO_3 was estimated by simple titration method using standard NaOH^[5]. All the chemicals used for testing were of standard ER grade.

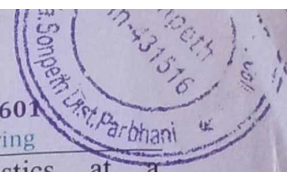
Result And Discussion

Table-1.- Table showing amount of soil macronutrients at different growth stages of soyabean.

Minerals Stage (kg/ha)	Nitrogen	Potassium	Phosphorous	Free CaCO_3
Before Sowing	255.8	1137.12	16.49	8.2
At flowering	260.21	892.64	15.49	9.2
After Harvest	250.40	845.60	17.98	10.4

Before sowing, nitrogen content of soil was 255.80 kg/ha which increased up to 260.21 kg/ha during flowering stage. It may be due to more atmospheric N_2 fixation by *Rhizobium* than N_2 requirement by the plants. After harvesting soil shows decrease in the N_2 content (250.4 kg/ha), It may be due to less N_2 fixation

and more demand by the plant for setting up of Pods and development of Seeds. Amount of Potassium inside the soil was decreased from 1137.1 kg/ha to 892.6 kg/ha during flowering and then 845.6 kg/ha after harvesting. Thus it is clear that Potassium requirement of the



Soyabean crop is large since from the early stage of development of the plant.

Total amount of phosphorous was decreased initially. After harvesting amount of phosphorous in the soil was increased (17.98) than it's initial amount (16.49 Kg/ha). The reason behind such increase in the amount of phosphorous was unidentified. from 16.49 kg/ha to 15.49 such decrease in phosphorous may be due to formation of less soluble compounds with Calcium.

Free CaCO_3 inside the soil was increased after cultivation of soybean initially it was 8.2 kg/hectare which was 9.2 at flowering stage while at the end of season it was 10.4 kg/ha. Such type of increase in the CaCO_3 may be due to accumulation of non soluble salts produced due to reaction with phosphorous compounds.

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