SYNOPSIS

Topic

Assessment of nutrient dynamics affected by different soil amendments in Green gram crop under field condition.

Dissertation report-1

In
partial fulfillment of the requirements for the award of degree of

MASTER OF SCIENCE
IN
(SOIL SCIENCE)
BY

Rubai Podder(Regis No:**11715380)**
Under the supervision of
Basanda G Momin

Department of soil science , School of Agriculture,

Lovely Professional University, Phagwara, India.
MAY, 2018

CERTIFICATE I

I hereby declare that the Synopsis entitled **"**Assessment of nutrient dynamics affected by different soil amendments in Green gram crop under field condition is an authentic record of my work and will be carried out at Lovely Professional University as requirement for the degree of **Master of Science** in the discipline of **Soil Science**, under the guidance of Basanda G Momin Assistant Professor, Department of Soil Science, School of Agriculture and no part of this synopsis has been submitted for any other degree and diploma.

Rubai Podder

(Registration No.11715380)

MSc Soil Science

CERTIFICATE II

This is to certify that synopsis titled **"**Assessment of nutrient dynamics affected by different soil amendments in Green gram crop under field condition.**"** submitted in partial fulfillment of the requirement for the award of degree of **Master of Science** in the discipline of **Soil Science,** is a research work and will be carried out by **Rubai Podder (Registration No. 11715380)** under my supervision and that no part of this synopsis has been submitted for any other degree or diploma.

(**Signature of Supervisor**)

Basanda G Momin

Assistant Professor (Soil Science)

INTRODUCTION

Pulses play a very important role in human diet as a source of protein because of their high protein content (20-30%). Green gram (Vigna radiata L.) is an excellent source of high quality protein. Among pulses it occupies prominent place and is growing popularly by virtue of the high nutritional value, short growth period, low cost production and adaptability in the off season. Green gram (Vigna radiata L.) is one of the most important legume crops. It enhances the soil fertility through nitrogen fixation with the help of symbiotic microbial association.

Objectives:

1. To compare the effects of different soil amendments on soil nutrient status and to identify particular amendment that leads to high yield in Green gram crop.
2. To correlate different soil parameters with the crop response.

Methodology :

The experiment will be conducted at the research field of Lovely Professional University, Phagwara situated geographically at 31°14'48.0"N Latitude and 75°41'45.0"E Longitude at 252 m above MSL which falls under central plain zone of agro climatic zones of Punjab. The soil samples from three different depths(0-15cm, 15-30cm and 30-45cm) were proposed to be collected, processed and analyzed for measurable soil parameters *viz*., pH, EC, organic C, Nitrogen, Phosphorous, Pottash, exchangeable bases, particle size distribution, bulk density, porosity etc. using the standard protocols (Black, 1965). The yield of soybean with respect to different amendments will be recorded. The data will be interpreted through statistical investigation (Panse and Sukhatme, 1961) and appropriate computations using software SPSS 16.0 version.

REVIEW AND LITERATURE

Abdul et.al (2012), evaluate the growth respose of mungbean [*Vigna radiata* (L.) Wilczek] cultivars subjected to different levels of applied N fertilizer. To achieve the aim, an experiment conducted in the experimental field of Agricultural Research Institute (ARI), Quetta. The soil of the study area was basic in reaction, salt free, medium textured having low organic matter & total N contents. Four different cultivars of mungbean viz., NM-92, NM-98, M-1, and NCM- 209 grown in kharif season for two consecutive years i.e., 2007 and 2008. Six different levels of N fertilizer applied @ zero, 20, 40, 60, 80 and 100 kg ha-1. While, a constant dose of P2O5 and K2O also applied to each N level (except control, zero). Urea fertilizer used as a source of N, while TSP and SOP as sources of P & K, respectively. The plot size kept as 2.40m2 (4x4x0.15), and arranged in a randomized complete block design (RCBD). Results showed that different fertilizer levels did significantly ($p<0.05$) influenced most of the growth attributes of the mungbean. Maximum days to flowering (48.25) and number of branches plant-1 (3.83) recorded for plants subjected to highest dose of applied N fertilizer viz., 100 kg ha-1. Similar responses toward added N fertilizer also noted for various cultivars of mungbean. Maximum days to flowering (47.72) and number of leaves plant-1 (5.86) recorded for NCM-209. Whereas, the maximum plant height (38.52 cm) number of branches plant-1 (3.72) obtained for mungbean cultivar M-1. The correlation coefficient (r) studies exibited that plant height (0.593), number of leaves plant-1 ($r=0.325$), number of branches plant-1 ($r=0.187$) and leaf area ($r=0.342$) significantly ($p<0.05$) and positively correlated with their grain yield (kg ha-1). However, days to 50% flowering ($r=-0.265$) are also significantly but negatively associated with their grain yield (kg ha-1). Thus based on correlation studies it could revealed that cultivars under cultivation displayed a wide range of variation for most of the mentioned growth traits and could be exploited in breeding programme to enrich the mungbean genetic treasure.

Halim et. al(2014) conducted an experiment to evaluate the effect of liming in the Himalayan Piedmont acid soil of Bangladesh on nutrient dynamics under different levels of lime in mungbean (Vigna radiate) field followed by T. Aman (transplanted rice) cultivation, during the period of December 2010 to October 2011. Five levels of lime were applied, viz, T1: control, T2: 1.0, T3: 1.5, T4: 2.0, T5: 2.5, ton lime ha-1. The pH of soils after liming was increased steadily with the increased rate of liming. The different treatments were showed up varying results where more plant nutrients became available by increasing the concentration of K, Ca, Mg, N, P, S, B, Cu and Mn; and slight decreased in the concentration of OM, Fe and Zn that make the soil environment favorable for plant growth.The changes of soil properties like pH, OM and some plant nutrients availability were significantly increased due to application of lime resulted in increased summer mungbean yield. The number of pods plant-1, number of seeds pod-1, 1000 seeds weight and grain yield were significantly affected by liming. The treatment T3 (1.5 t lime ha-1) produced Mungbean grain yield of 1.6 t ha-1 respectively which was

significantly greater than those found in T1, T2, T4 and T5 treatments. Thus, the application of 1.5 t lime ha-1 is recommended for the cultivation of summer mungbean and the desired soil pH (>6.5 but < 7.0), which increased availability of nutrients in the study area.The study revealed that liming increases soil pH as well as changes other chemical properties of soil, which is beneficial to sustain high yield and may be an important soil management tool for mungbean cultivation in acid piedmont soil in the North East Bangladesh where soil acidity is predominant.

Rajib et.al (2013) conducted to investigate the effect of *Rhizobium* inoculation with different nutrient sources on the nodulation and yield of greengram in Factorial RBD with three replications at Bidhan Chandra Krishi Viswavidyalaya on Gangetic alluvial soil of West Bengal during 2009 and 2010. The treatments comprised of two factors i.e. no seed inoculation and seed inoculation with *Rhizobium*, with five treatments like untreated control, application of (NPK @ 20:60:20 kg ha-1), rock phosphate for 60 kg P2O5 ha-1, vermicompost for 60 kg P2O5 ha-1 and SSP for 60 kg P2O5 ha-1. Result indicated that plots treated with *Rhizobium* seed inoculation positivel andsignificantly influenced the growth parameter, nodulation, seed and stalk yield of greengram and also bacterial population of the soil system. In case of fertilizer treatments application of recommended dose of NPK performed better than all other treatments. Numbers and weight of nodules increased highly due to NPK application. Seed and stalk yield was maximum under *Rhizobium* inoculation coupled with the application of recommended dose of NPK, closely followed by the treatment combinations of *Rhizobium* inoculation coupled with vermicompost.

Treatments

T1: Control

T2: RDF (Recommended Dose of Fertilizer, NPK; 80-100:50-60:30-40 Kg/ha)

T3: Vermicompost(5 tons/ha)

T4: Biofertilizer (Rhizobium @ 5g/Kg seed)

T5: 50% RDF + 75% Vermicompost + 75% Biofertilizer

T6: 50% RDF + 50% Vermicompost + 50% Biofertilizer

T7: 50% RDF + 25% Vermicompost + 25% Biofertilizers.

Layout of the experimental field:

T_1R_1	Sub irrigation channel	T_7R_2	Sub-irrigationchannel	T_6R_3
T_2R_1		T_3R_2		T_5R_3
T_3R_1		T_2R_2		T_4R_3
T_4R_1		T_1R_2		T_3R_3
T_5R_1		T_6R_2		T_2R_3
T_6R_1		T_5R_2		T_1R_3
T_7R_1		T_4R_2		T_7R_3
Main irrigation channel				

Design of the experiment: Randomized Block Design (RBD)

Plot Area: 244 m^2

Treatments: 7

Replication: 3

Total no. of Plots: 21

Total area of Plots: 244 m^2.

Variety: Green gram(var. SML 832)

REFERENCES

Abdul Kabir Khan Achakzai, Habibullah , Basharat Hussain Shah and Mirza Abdul Wahid. 2012. Effect of nitrogen fertilizer on the growth of mungbean [vigna radiata (l.) Wilczek] grown in quetta. Pak. J. Bot., 44(3): 981-987, 2012.

Black, C. A. 1965. *Methods of Soil Analysis*. Part I and II. American Society of Agronomy, Inc., Madison, Wisconsin, USA.

Darwish, OJ-I., Persand, N.a nd Martens, *D.C. 1995.* Effect of long-term application of animal manure an physical properties of three soils. *Pl. Soil. 176* : 289-295.

Md. Abdul Halim, Md. Noor-E-Alam Siddique, Bikash Chandra Sarker Md. Jahidul Islam, Md. Faruq Hossain and Md. Kamaruzzaman. 2014. Assessment of Nutrient Dynamics Affected By Different Levels of Lime in a Mungbean Field of the Old Himalayan Piedmont Soil in Bangladesh. *IOSR Journal of Agriculture and Veterinary Science (IOSR-JAVS).* Volume 7, PP 101-112.

Panse, V.G. and Sukhatme, P.V. 1961. Statistical methods for agricultural workers. 2nd edition, I. C. A. R., New Delhi.

Prasad, R. 1996. Cropping systems and sustainability of agricultrue. *Indian Farming* 46 : 39-45.

Rajib Kundu1, Jajati Mandal and Aparajita Majumder. 2013. Growth and Production Potential of Greengram (*Vigna radiata*) Influenced by *Rhizobium* Inoculation with Different Nutrient Sources. *International Journal of Agriculture, Environment & Biotechnology***.** 6(3): 344-350.