

**SYNOPSIS ON  
Dissertation-II  
(AGR 690)**

**“Evaluation of Mungbean variety performance by  
growing in different nutrient level and sowing method”**

Submitted To  
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## **CERTIFICATE**

This is to certified that this synopsis entitled — “Evaluation of mungbean variety performance by growing in different nutrient level and sowing method” submitted in partial fulfilment of requirements fir degree – Master of Science in Agronomy by **Jaskirat Singh, Registration no. 11615314** to Department of Agronomy, School of Agriculture, Lovely Professional University, has been formulated and finalized by the student himself on the subject.

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## DECLARATION

I hereby declare that the project work entitled — “Evaluation of mungbean variety performance by growing in different nutrient level and sowing method” is an authentic record of my work carried at **Lovely Professional University** as requirements of Project work for the award of degree -Master of Science in Agronomy, under the guidance of **Dr. Madakemohekar Anant Hanumant**, Assistant Professor, School of Agriculture, Lovely Professional University, Phagwara, Punjab, India.

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## Introduction

The mungbean (*Vigna Radiata* L.) also called mung, moong and green gram in India and mungo in the Philippines. Among the pulses, green gram is one of the most important and extensively cultivated crop in India, which is cultivated in arid and semi-arid regions. It is a leguminous pulse crop, which are high in protein, easily digestible, and consumed as food easily digested, and consumed as food. In a symbiotic relationship with specific soil rhizobia, root nodules develop on mungbeans in which atmospheric nitrogen is converted to forms available to the mungbean plant. It contains about 2.5% protein, 1.3% fat, 3.5 minerals, 4.1% fibers and 56.7% carbohydrates.

The mungbean is native to the North eastern India-Burma region of Asia. Its progenitor species is unknown. The closest wild relative is believed to be *Vigna Aadcicaa* var. *6Wtu.obata* (Roxb) Verdc., which may be found growing in wastelands of eastern India. The mungbean is cultivated most extensively in the India-Burma-Thailand region of southeastern Asia, but it is also grown in Iran, Pakistan, Vietnam, Peoples Republic of China, the Philippines, Republic of China, Malaysia, Indonesia, and adjacent countries and islands of southeastern Asia and the South Pacific. In early days the mungbean was carried from Asia by Oriental emigrants, or by traders, to the Middle East, Africa, Latin and South America, and Australia. Although it never became a major commercial crop in any of these areas, commercial production is found in northwestern Peru; Oklahoma and Texas in the U.S.A.; and in local areas of Africa, Australia, the Caribbean, and the Middle East.

Green gram is an important pulse crop in India and believed to be originated from India. Similar to the leguminous pulses, green gram, enriches soil nitrogen content. It is grown mostly in Asian region traditionally while its cultivation has spread to Africa and Americas relatively in the recent times. More than 70% of world's green gram production comes from India. India is the world's largest producer as well as consumer of green gram. It produces about 1.5 to 2.0 million tons of Mung annually from about 3 to 4 million hectares of area, with an average productivity of 500kg per hectare. Green gram output accounts for about 10-12% of total pulse production in the country. Mung production in the country is largely concentrated in five states viz, Rajasthan, Maharashtra, Andhra Pradesh, Gujarat and Bihar. These five states together contribute for about 70% of total Mung production in the country. There is a distinct change in production pattern of Mung across states. Traditionally Rajasthan, Maharashtra, Andhra Pradesh are major Mung producing states. But there is significant rise in production from other states in recent years particularly, from Tamil Nadu, Uttar Pradesh and Gujarat. Nevertheless, production remained volatile across the years with respect to most of the states. As per the latest available estimates, Rajasthan, Maharashtra occupies the first two positions, contributing over 45%. Andhra Pradesh contributes about 10% while together Gujarat and Bihar account for about 13% of total production in the country.

Compost is one of the most promising manure in our country which provides an opportunity to uptake nutrient by plant for a long term, though the compost farming is now a days getting popularity. The recycling of compost needs to be done in a manner that will not only improve soil physical, chemical and biological properties but also minimise environmental risks.

## Review of literature

**Muhammad tariq et al., (2001)** conducted an experiment to determine the effect of phosphorus and potassium application on growth and yield of mungbean. Plant height and number of branches per plant were significantly increased by phosphorus and potassium application. Number of pods per plant, number of seeds per pod, 1000-seed weight and grain yields were also increased significantly by application of phosphorus and potassium along with nitrogen. Application of  $P_2O_5$  and  $K_2O$  each @ 70 kg per ha along with N application @ 30 kg per ha produced highest grain yield of 876.32 per ha.

**Riaz Ahmad et al., (2003)** conducted an experiment to determine the Response of three mungbean cultivars (NM-98, NM-36-13-1-2 and NM-46-7-2) to three fertilizer levels viz. 50-0-0, 50-100-0 and 50-100-50 kg NPK ha<sup>-1</sup> was studied during the autumn, 2001. The experiment was conducted at Agronomic Research Area, University of Agriculture, Faisalabad. The results led to the conclusion that mungbean cultivar NM-46-7-2 applied 50- 100 kg NP kg ha<sup>-1</sup> produced more number of grains plant<sup>-1</sup>, 1000-seed weight, grain yield and grain protein content than the other cultivars under study.

**M. Asghar Malik et al., (2003)** conducted an experiment to determine the effect of varying levels of nitrogen (0, 25 and 50 kg ha<sup>-1</sup>) and phosphorus (0, 50, 75 and 100 kg ha<sup>-1</sup>) on the yield and quality of mungbean (*Vigna radiata* L.) cultivar NM-98 during the year 2001. Although plant population was not affected significantly but various growth and yield components were significantly affected by varying levels of nitrogen and phosphorus. A fertilizer combination of 25-75 kg NP ha<sup>-1</sup> resulted in maximum seed yield (1112.96 kg ha<sup>-1</sup>). Maximum protein content (25.6%) were obtained from plots fertilized @ 50-75 kg NP ha<sup>-1</sup> followed by protein content of 25.1% obtained from plots fertilized @ 25-75 kg NP ha<sup>-1</sup>. Highest net income (Rs. 21374.9) was also obtained by applying N and P @ 25 and 75 kg NP ha<sup>-1</sup>.

**M. Z. Beg and Sohrab Ahmad (2012)** conducted an experiment on Foliar application of Potassium on moong bean at the time of flowering at half and full basal fertilizer doses in different concentrations was applied and it was found that the treatment T where 1.00 kg. Potassium / ha was applied as foliar spray showed best result. It enhanced almost all the vegetative and yield characteristics of moong bean at both the basal fertilizer doses. In this way a little amount of Potassium used as foliar spray at the time of flowering when the plant required maximum nutrients can enhance the productivity and save a large amount of fertilizers.

**Razieh et al., (2012)** conducted an experiment to determine the effect of foliar spraying of Bio-organic fertilizers and urea on root and vegetative growth of mung bean (*Vigna radiata* L.) in a greenhouse condition. The experiment was conducted with four replications in Randomized Complete Design with ten treatments (Urea, Nitroxin, Amino acid, Green hum, Biocrop L- 45, Nutriman N24 and Mas Raiz, cattle manure, water and control). Results showed that all traits were significantly affected by treatments except the number of second roots. Foliar application of urea and

organic manure substantially improved the plant height, leaf area, shoot and root dry weights, root and shoot length, volume and number of roots. Similarly shoot and leave number and nodules root were also improved by the foliar spraying of Green hum and Amino acid, respectively. While the lowest nodules root was observed in plants treated by nutriman N24 and urea. This improved growth of mainly due to nutrient availability in bio-organic fertilizer and uptake by plants.

**Ezzat .M. Abd El Lateef et al., (2012)** conducted an experiment to study the effect of soil and foliar fertilization of mungbean. The first set included the effect of late foliar applied N or K under different levels of phosphatic fertilization on mungbean yield and chemical constituents. Mungbean (*Vigna radiata (L) Wilczek*) var. Kawmy-1 was fertilized with 0,19,38,57 and 76 Kg P205 ha<sup>-1</sup> at sowing. Foliar applied N was sprayed as 1 % urea solution and K was applied as potassium sulphate 36% K20 solution; both N and K sprays were carried out at early pod formation stage. The second set of experiments aimed to study the effect of micronutrient application when combined with urea. The foliar applied treatments were urea (1%); and four key micronutrients; i.e. Fe (0.5%); Zn (0.1%); Mn (0.2%) and CuSO<sub>4</sub> (0.05%). Micronutrient treatments were sprayed either alone or combined with urea at early pod formation. The obtained results showed that P fertilization significantly increased mungbean pod weight per plant, 100-seed weight, yield per plant and per hectare compared with the untreated control. Mungbean seed yield per hectare showed more response to foliar applied N than that with K. The best seed yield per hectare was reported from the combined effect of 76 Kg P205 ha<sup>-1</sup> and foliar spraying with N. Protein percentage in mungbean seeds was not affected by either soil or foliar applications and ranged between 20.6 to 22.9%. However, protein yield kg ha<sup>-1</sup> significantly increased when the plants were fertilized with 76 Kg P205 ha<sup>-1</sup> and foliar sprayed with N. It could be concluded from this study that mungbean productivity responds to combined soil application of P at 57 Kg P205 ha<sup>-1</sup> and late foliar applied N at early pod formation stage. Foliar spray of urea combined with Fe or Zn may increase seed yield and improve the quality of seeds.

**Eman azadi et al., (2013)** conducted an experiment to evaluate and determine the appropriate nitrogen fertilization the morphological characteristics and seedyield of mungbean three cultivars. In this study, different levels of nitrogen fertilizer (control, 50, 100, 150 kg/ha urea) as sub-plots and three mungbean cultivars (Partow, Gohar, locally) was considered as the main factor. The result of analysis variance on morphological characteristics on seed yield showed that between different cultivar in the eyes of first pod height and seed yield were significant at 5% level probability. In addition, between different amounts of nitrogen fertilizer for stem diameter and number of node and seed yield showed significantly different. Interaction between urea fertilizer and cultivars, number of nodes and seed yield were significant effect at 1% and 5% level probability. The highest seed yield of 8.9 grams per square meter and the number of sub-branches with (1.5) and the height of the first pod from ground level with (25.51 cm) and stem diameter (1.13 cm) and number of nodes (8.28 pcs) and pod length (7.5 cm) was obtained at 150 kg/ha urea. Between different amount of nitrogen fertilizer, 150 kg/ha urea, showed higher values than the other. In this experiment, 150 kg/ha nitrogen fertilizer with partow cultivar (V1) is the most appropriate treatment and suitable for the region.

## **OBJECTIVES**

- 1.To study the effect of fertilizer and compost on the yield.
- 2.To compare the effect of by combining fertilizer and compost with different type of sowing method.
- 3.To identify the best combination of fertilizers or compost .

## **Material and Methods**

### **Technical program of work**

Location of the experiment:

Experiment will be conducted at the field of Lovely Professional University, Phagwara situated geographically at 31°14'48.0"N 75°41'45.0"E and 252 m above sea level. It falls under central plain zone of agro climatic zones of Punjab.

### **Brief Introduction about work:**

- o **Crop** : Moongbean
- o **Period of work** : 2017-18
- o **Design of Experiment** : Factorial
- o **Topic Under Discussion** : Evaluation of moongbean variety performance by growing in different nutrient level and sowing method.
- o **Sowing Method** : Sowing will be done at flat bed,raised bed and ridges.

### **Treatments:**

T1: AR1 = NPK

AR2 = Compost

AR3= Compost + spraying

T2: BR1= NPK

BR2= Compost

BR3= Compost + spraying

T3: CR1= NPK

CR2= Compost

CR3= Compost + spraying



## Research Methodology

	Flat	Raised	Ridges
<b>R1</b>	<b>T1- AR1</b>	<b>T2- AR1</b>	<b>T3- AR1</b>
	<b>T1- BR1</b>	<b>T2- BR1</b>	<b>T3- BR1</b>
	<b>T1- CR1</b>	<b>T2- CR1</b>	<b>T3- CR1</b>
<b>R2</b>	<b>T1- AR2</b>	<b>T2- AR2</b>	<b>T3- AR2</b>
	<b>T1- BR2</b>	<b>T2- BR2</b>	<b>T3- BR2</b>
	<b>T1- CR2</b>	<b>T2- CR2</b>	<b>T3- CR2</b>
<b>R3</b>	<b>T1- AR3</b>	<b>T2- AR3</b>	<b>T3- AR3</b>
	<b>T1- BR3</b>	<b>T2- BR3</b>	<b>T3- BR3</b>
	<b>T1- CR3</b>	<b>T2- CR3</b>	<b>T3- CR3</b>

Where,

R1 = Replication 1

R2 = Replication 2

R3 = Replication 3

Plot Area: main plot = 10X4

Sub plot = 3X3

Treatments: 9

Replication: 3

Total no. of Plots: 27

Total area of Plots: 396 m<sup>2</sup>. approx.

Variety:

Seed Rate: kg/ acre

## Observations to be record

### a) Soil Parameters Soil

1. Soil EC
2. Soil PH
3. N,P,K content of soil (kg/ha)
4. Organic Carbon (%)
5. Organic matter (%)

### b) Growth parameters

1. Plant height (cm)
2. No. of green leaves per plant (Number/plant)
3. Stem girth per plant (cm)
4. Leaf area per plant (cm)
5. Dry matter production (g)

## EXPECTED OUTCOMES

The experiment will be conducted at the Lovely Professional University, School of Agriculture, near experimental farm of Phagwara, Punjab. By the use of different nutrients and sowing methods, it is expected that they will enhance the growth and yield of mungbean. Application of different fertilizers will affect not only the economics of mungbean but also the physical, chemical and biological properties of soil.

## PROPOSED WORK WITH TIMELINE

1. **Time of sowing:** Mid-august
2. **Spacing:** R \* R = 60 cm, P \* P = 20 cm
3. **First Hoeing:** 15 Days after sowing
4. **Irrigation:** 2-3 irrigations or as per the soil conditions.

### Harvesting:

When the leaves and the pods are fully dry. When the pods are fully matured then the crop is ready for harvesting.

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