



ISSN (E): 2277-7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2023; 12(4): 1929-1931
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www.thepharmajournal.com
Received: 28-02-2023
Accepted: 30-03-2023

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Effect of organic manure on growth of black gram (*Vigna mungo* L.)

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Abstract

Background: A field experiment was conducted to know the effect of organic manure on growth and yield of black gram 2023. The experiment was laid out in a RBD (Randomized block design) consisting of ten treatments with 3 replications. Treatments included were three levels of fish extract (5 ml, 15 ml, 25ml/ ltr water) and three levels of neem spray (20 ml, 25 ml, 35 ml/ ltr water). The statistical analysis indicated that growth was significantly influenced with application of fish extract and neem spray. The characters plant height, number of branches per plant, first flowering, number of nodules and number of leaves per plant, exhibited best results with the treatment T9. Present investigation, therefore, indicated better response of the plants towards application of Fish meal 25 ml/ltr water + Neem spray 35 ml/ltr water which was found to be most remunerative with regard to their growth of black gram.

Keywords: Neem spray, fish extract, black gram

Introduction

The scientific name of the black gram is *Vigna mungo*. It belongs to the family Leguminosae also called as legume family. Black gram is rich in proteins, it contains 45% of protein content and for every 100 grams of black gram there is 23 grams of protein. The chromosome number of the black gram is 22. The black gram is originated in south Asia. It is of tropical region and it is also rich in iron, ca (calcium), mg (magnesium).

Pulses play an important role in atmospheric nitrogen fixation, it fixes the atmospheric nitrogen into root nodules and also increases the soil condition. India is the largest producer of black gram in the world. Black gram is majorly grown in Madhya Pradesh, Uttar Pradesh, Rajasthan, Maharashtra, Andhra Pradesh. 31 hectares of land area is used for the cultivation of pulses.

The productivity range of black gram is from 398-707 kg/ha. Black gram can be grown in both kharif and rabi seasons. The black gram yields for about 7-8 quintals (700-800 kg) in 1acre of field. The temperature optimum for black gram is 25-35 °C but it can tolerate up to 42 °C.

Benefits of fish meal

1. Fish meal provides nutrients such as nitrogen phosphorous and potassium.
2. It also provides vitamins and minerals such as iron and calcium in low amounts.
3. Fish meal provides food for micro bacteria present in the soil and it improves the growth of the plant.
4. It works as an important fertilizer and also improves the soil fertility.
5. Fish meal improves the germination % of the crop and pod formation.

Benefits of neem ginger Kashayam

1. Neem works as an organic pesticide (control of pest).
2. It provides various nutrients to the plants.
3. Neem reduces alkalinity in the soil.
4. It also improves soil fertility as it has many antifungal and antibacterial properties.

Material and Methods

The experiment was conducted to know the Effect of Organic Manure on Growth and Yield of Black Gram (*Vigna mungo* L.) was carried out at Crop research field, Ideal college of arts and sciences (Kakinada), Affiliated by Adikavi Nannaya University, Andhra Pradesh, during 2023. The experiment was laid out in a RBD (Randomized block design) consisting of ten treatments with 3 replications, with the treatment combinations T1 - Fish extract 5 ml/ltr water + Neem

spray 20 ml/ltr water, T2 - Fish extract 5 ml/ltr water + Neem spray 25 ml/ltr water, T3 - Fish extract 5 ml/ltr water + Neem spray 35 ml/ltr water, T4 - Fish extract 15 ml/ltr water + Neem spray 20 ml/ltr water, T5 - Fish extract 15 ml/ltr water + Neem spray 25 ml/ltr water, T6 - Fish extract 15 ml/ltr water + Neem spray 30 ml/ltr water, T7 - fish extract 25 ml/ltr + Neem spray 35 ml/ltr water, T8 - fish extract 25 ml/ltr + Neem spray 35 ml/ltr water, T9 - fish extract 25 ml/ltr + Neem spray 35 ml/ltr water, T10 - control.

Preparation of neem ginger kashayam

Ingredients

1. Neem leaves (4.5 kg)
2. Water (10 litres)
3. Ginger (1 kg)

Preparation

1. Take 10 litres of water and boil it.
2. Add 4.5 kgs of neem leaves to the boiling water.
3. Add 500 g of crushed ginger during boiling at 100° for 2 hours.
4. Keep boiling the 10 litres of solution until it becomes 8 litres.
5. Add another 500 g of chopped ginger to the luke warm solution.
6. Fill the solution in an air tight container and keep it safely.

Preparation of fish meal Ingredients

1. Fish waste (2 kg)
2. Jaggery (1.5 kg)

Preparation

1. Take 2kgs of rotten fish waste.
2. Add 1kg of crushed black jaggery for every 5 minutes of continuous stirring in clockwise direction.
3. Keep the container air tight.
4. Stir the mixture every morning in clockwise direction for

1 week.

5. Add 500 g of jaggery to the mixture and leave it for 2 days, for every 10 lit of water mix 200 ml of fishmeal and spray.

Results and Discussion

Parameters

The perusal of data indicate that plant height measured at different growth stages (i.e., 40 DAS) was influenced markedly by the application of different levels of neem spray and fish extract, though, numerical increase in plant height was recorded in dose dependent manner. The maximum value of plant height (41.00 cm) and number of branches per plant (16.00) were recorded with the application of highest level of fish extract 25 ml/ltr + Neem spray 35 ml/ltr water (T9) and the lowest value in this regard plant height (29.00 cm) and branches (9.00) were recorded in control (T0), The recorded data clearly indicates that each level of neem spray had significant influence on this parameter. Earliness was observed in number of days to fifty per cent flowering. However, minimum number of days to fifty percent flowering (37.00) was observed in (T9) fish extract 25 ml/ltr + Neem spray 35 ml/ltr water and maximum number of days (45.00) recorded in T10 (control). The recorded data indicated that each level of neem spray and fish extract had markedly influence on number of leaves per plant. It was found to be increased with the increasing fish extract levels in a dose dependent manner. The maximum number of leaves per plant (21.00) was recorded with the highest level of (T9) fish extract 25 ml/ltr + Neem spray 35 ml/ltr water and minimum value (14.00) in this regard was recorded in the control plot T10 (control). A closer review of data revealed that application of organics markedly influenced on number of nodules which increased sequentially with enhanced of neem spray levels. The highest level (T9) fish extract 25 ml/ltr + Neem spray 35 ml/ltr water recorded maximum (117.05) whereas, the lowest value in this regard (95.00) was observed in T10 (control).

Table 1: Effect of Organic Manure and their combination on growth of black gram

Treatments	Plant Height (40DAS)	Number of Branches (AT 40 DAS)	Days to first flowering	Number of leaves per plant	Number of nodules per plant
T1	29.00	9.00	43.00	14.00	99.00
T2	33.00	10.00	42.90	16.00	100.00
T3	33.70	10.00	41.60	16.00	100.00
T4	34.30	11.20	40.00	17.00	103.30
T5	36.00	13.00	38.00	18.00	107.00
T6	36.00	13.50	38.50	18.00	109.15
T7	37.50	14.00	38.90	19.00	111.00
T8	40.10	15.70	37.20	21.00	115.31
T9	41.00	16.00	37.00	21.00	117.05
T10	29.00	9.00	45.00	14.00	95.00
F test	S	S	S	S	S
SE. m	0.42	0.20	0.71	0.35	1.24
C.D	1.26	0.59	2.12	1.05	3.70

Discussions

Neem oil, the most important extract of neem tree, is widely used worldwide for pest control activities (Benelli & Pavela, 2018) [1]. Neem oil is a better pesticide due to its repellent, insecticidal, nematocidal, bactericidal, and fungicidal activities (Pascoli *et al.*, 2019) [3]. The oil contains around 300 biologically active compounds, most notably azadirachtin - a triterpene (Chandramohan *et al.*, 2016) [2]. The existence of

terpenoid, limonoids, and volatile sulphur containing compounds makes Azadirachtin oil as a complex oil.

Conclusion

From the present investigation concluded that among all the treatments considered the treatment with fish extract 25 ml/ltr + Neem spray 35 ml/ltr water resulted into maximum increase in vegetative and reproductive growth of black gram. It may,

therefore, be concluded on the basis of the present findings that the application of fish extract 25 ml/ltr + Neem spray 35 ml/ltr water along with the basal application of farm yard manure resulted in better germination.

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