# Multi Bloom Technology In Black Gram

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**Abstract - The crop is sown and fertilizer is applied as per the recommendation for irrigated crop. The top dressing will be done on 40 to 45 days after sowing. Top dressing of nitrogen is done with an extra dose of 25 to 35 kg/ha through urea. Since pulses are indeterminate growth habit and continue to produce new flushes. The crop complete its first flush of matured pods during 60 to 65 day. Further their second new flush are produced within 20 to 25 days therefore two flushes of pods can be harvested at a time within short duration.**

**Key word; Top dressing, pods, excess nitrogen**

## I. INTRODUCTION

*GENERAL*

In India generally leguminous crops are cultivated without the application of fertilizers especially nitrogenous, however, during initial growth stages these plants do depend on the available soil nitrogen till the symbiotic fixation system becomes efficient to meet their nitrogen requirement. The source of different macro as well as micro nutrients including nitrogen and sulphur has created deficiencies of these nutrients in the soils. The deficiency of these nutrients in the soils limits the growth and yield of various leguminous crops including black gram, indicating the need of their application. Nitrogen is an important nutrient which is required by plants. It increases growth and development of all living tissues and protein content in pulses.

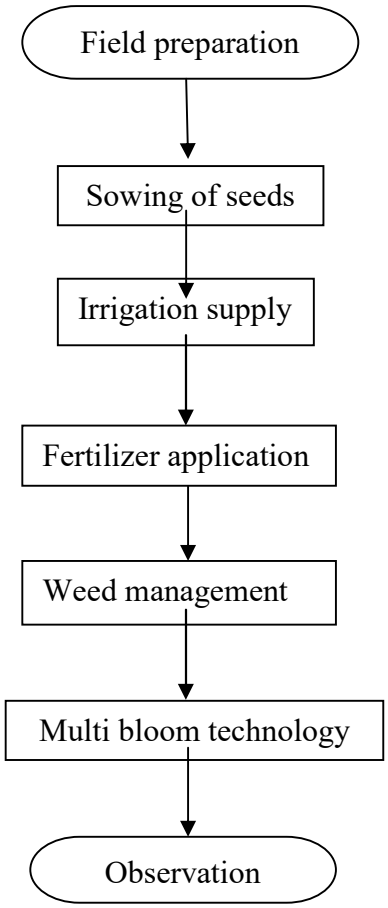
Through the application of nitrogen the crop yield, pod quantity, number of leaf and pod length are can be increased. Due to the excess application of nitrogen in black gram the yield can be harvested twice. Optimal nitrogen fertilization is essential for achieving grain yield and quality targets and results in maximum economic return. The sources of nitrogen, phosphorus, potassium and sulphur were urea, single super phosphate, murate of potash and gypsum respectively. All recommended cultural practices were adopted to raise the crop. Observations on various growth, Nodulation and yield related attributes were recorded.

Flower and pod formation being the major sink during the reproductive phase. Little attention has been paid to exploit maximum N use efficiency and productivity of black gram through judicious application of N. This beneficial effects of different levels of N alone and in combination with variety on plant height, leaf area development, yield and yield contributing characters of black gram. The information on the nature of combination among different morphological and yield attributes to choose a suitable selection criteria for predicting the grain yield of black gram. The higher grain yield of black gram is associated with significantly superior yield attributes. Slow rate of dry matter accumulation during pre-flowering phase, on-set of leaf senescence during the period of pod development and low partitioning efficiency of assimilates to grain are identified as the main physiological constraints for increasing yield. Adequate supply of N may minimize the yield reduction through reduced those constraints. Leaf area is made up of the total green lamina are of emerged leaves greater leaf area is necessary to have superior yield and yield components in grain legumes.

*OBJECTIVES*

- To improve the quantity of pods.
- To increase the growth of crop and production is high in less duration.
- To produce chlorophyll.

## II. METHODOLOGY




III. METHODOLOGY FLOW CHART

*BIOMETRIC OBSERVATION*

*FIELD PREPARATION OF BLACK GRAM*

While preparing the land, the first operation should be done by a soil turning plough and the subsequent two ploughing should be done by a country plough or cultivator.

Every ploughing should be followed by planking. Soil should be friable and weed free. It should be well drained and leveled so that water does not stagnate in the field.

**Field details**

Size of plot ; 12x16ft (0.001783 ha)
Type of soil ; black soil
Spacing ; 30X10 cm
Seed rate ; 20kg/ha
Sowing type ; line sowings

**Ploughing**

Ploughing is the primary tillage operations, which is performed to cut, break and invert the soil partially or completely suitable for sowing seeds.

**Crop detail**

Crop name ; black gram ( *Vigna mungo L.*)
Variety ; vamban 4
Seed treatment ; thiram
Season ; june - july
Germination ; 5-7 days
Flowering ; 30-45 days
Matured ; 60-65 days

Seed treatment will protect the seedlings from seed borne pathogens, root-rot and seedlings diseases.

## IV.SOWING SEEDS

Remove all discoloured seeds and use only normal coloured seeds (black coloured in black gram).

Selection of seed

Seed should be free from insect, pest and diseases. It should be free from any inert matter i.e. dust particles, weed seeds etc.

Seeds should be viable and genetically pure.

Method of sowing

Sowing should be done in line sowing. The application of fertilizers and seed sowing at a time. Seeds should not be sown more than 5 to 6 cm in depth.

Time of sowing

In summer sowing should be done from third weed of Feb. to First week of april.

Seed treatment

Treat the seed with Thiram @ 2g/kg of seed 24 hours before sowing (or) Pseudomonas fluorescens @ 10 g/kg seed. Bio control agents are compatible with bio fertilizers. First treat the seeds with bio control agents and then with Rhizobium. Fungicides and bio control agents are incompatible. Seed treatment will protect the seedlings from seed borne pathogens, root-rot and seedlings diseases.

Germination

Germination is the process by which an organism grows from a seed or similar structure. The most common example of germination is the sprouting of a seedling from a seed of an angiosperm or gymnosperm.

Germination take places 3 to 4 days after sowing. Life irrigation should be done after 3$^{rd}$ day of sowing.

WATER MANAGEMENT

The crop should get irrigation at an interval of 10-15 days. From flowering to pod development stage, there is need of sufficient moisture in the field.

Irrigate immediately after sowing, followed by life irrigation on the third day. Irrigate at intervals of 7to 10 days depending upon soil and climatic conditions. Flowering and pod formation stages are critical periods when irrigation is a must.

Fertilizer application

Rice fallow crops, Apply 2% of DAP at 15$^{th}$ day after sowing.Once at flowering and another at 15 days there after flowering.

Urea

Urea 20 g/litre once at flowering and another at 15 days there after sowing.

44.59 g N in 3 equal splits on 30, 45 and 60 days after sowing for 192ft.

Diammonium phosphate (DAP)

water-soluble ammonium phosphate salts (dissolves quickly in soil)

Once at flowering and another at 15 days there after flowering.

WEED MANAGEMENT

For the irrigated blackgram PE isoprotwron @ 0.5 kg ha-1 followed by one hand weeding on 30 DAS.

One or two hand weeding should be done up to 40 days of sowing depending upon the weed intensity. Weeds can be controlled by the use of herbicides i.e. Fluchloralin (Basalin) 1 kg a.i./ha in 800-1000 litres of water as pre-planting application.

DISEASE AND PEST MANAGEMENT

Diseases

Anthracnose: *Colletotrichum lindemuthianum (Sacc. & Magnus) Briosi & Cavara.*

Bacterial leaf blight: *Xanthomonas phaseoli Dowson.*

Cercospora leaf spot: *Cercospora canescens.*

Powdery mildew: *Erysiphe polygoni.*

Root rot and leaf blight: *Rhizoctonia solani J.G. Kühn.*

Rust: *Uromyces phaseoli G. Winter (Pucciniales: Pucciniaceae).*

Macrophomina blight: *Macrophomina phaseolina (Tassi) Goid*.

Yellow mosaic disease: *Mungbean yellow mosaic virus.*

Leaf crinkle disease: *Leaf crinkle virus.*

Insect pests

Pod borer: *Helicoverpa armigera Hubner (Lepidoptera: Noctuidae)*

Spotted pod borer: *Maruca vitrata Geyer (Lepidoptera: Pyralidae)*

Spiny pod borer: *Etiella zinckenella Treitschke (Lepidoptera: Pyralidae)*

Blue butterfly: *Lampides boeticus Linnaeus (Lepidoptera: Lycaenidae)*
Grass blue butterfly: *Euchrysops cnejus Fabricius (Lepidoptera: Lycaenidae)*
Bihar hairy caterpillar: *Spilosoma obliqua Walker (Lepidoptera: Arctiidae)*
Stem fly: *Ophiomyia phaseoli Tryon (Diptera: Agromyzidae)*

Nematodes

Cyst nematode: *Heterodera cajani Koshi (Tylenchida: Heteroderidae)*
Root knot nematode: *Meloidogyne incognita (Tylenchida: Heteroderidae)*

MULTI BLOOM TECHNOLOGY

pulses are indeterminate growth habit and continue to produce new flashes the top dressing will be done on 40-45 days after sowing.

Apply fertilizer before sowing on irrigated land
25 kg N + 50 kg $P_2O_5$ + 20 kg $k_2O$ + 20 kg S /ha
+
25 kg N/ha in 3 equal splits on 30, 45, and 60 days after sowing
+
2% DAP apply on 45 and 60 days after sowing.

Excess Foliage Growth

One of the main actions of nitrogen is increasing chlorophyll production; this process is done by creating bigger leaf structures with larger surface areas for the photosynthesizing pigment. Energy for flower growth is redirected to foliage proliferation, so plants may not even produce their necessary reproductive organs during the growing season.

Nitrogen in plants

Healthy plants often contain 3 to 4 percent nitrogen in their above-ground tissues. This is a much higher concentration compared to other nutrients. Carbon, hydrogen and oxygen, nutrients that don't play a significant role in most soil fertility management programs, are the only other nutrients present in higher concentrations.

Nitrogen is so vital because it is a major component of chlorophyll, the compound by which plants use sunlight energy to produce sugars from water and carbon dioxide (i.e., photosynthesis). It is also a major component of amino acids, the building blocks of proteins. Without proteins, plants wither and die. Some proteins act as structural units in plant cells while others act as enzymes, making possible many of the biochemical reactions on which life is based. Nitrogen is a component of energy-transfer compounds, such as ATP (adenosine triphosphate). ATP allows cells to conserve and use the energy released in metabolism. Finally, nitrogen is a significant component of nucleic acids such as DNA, the genetic material that allows cells (and eventually whole plants) to grow and reproduce. Without nitrogen, there would be no life as we know it. Nitrogen is essential for crops to achieve optimum yields. A critical component of amino acids in protein, it also increases protein content of plants directly.

Natural sources of soil nitrogen

The nitrogen in soil that might eventually be used by plants has two sources: nitrogen- containing minerals and the vast storehouse of nitrogen in the atmosphere. The nitrogen in soil minerals is released as the mineral decomposes. This process is generally quite slow, and contributes only slightly to nitrogen nutrition on most soils. On soils containing large quantities of $NH_4^+$-rich clays (either naturally occurring or developed by fixation of $NH_4^+$ added as fertilizer), however, nitrogen supplied by the mineral fraction may be significant in some years.

Atmospheric nitrogen is a major source of nitrogen in soils. In the atmosphere, it exists in the very inert $N_2$ form and must be converted before it becomes useful in the soil.

Advantage of multi bloom technology

It is responsible for vigorous growth and the development of a dense.
High yield in less duration.
Important key nutrient element for plants.

OBSERVATION

GROWTH ATTRIBUTES

Different parameters of growth attributes such as count of the leaf, length of the leaf, breath of the leaf, height of the plant, flower, pod count and pod length present in the plant was recorded at $15^{th}$ DAS, $25^{th}$ DAS, $35^{th}$ DAS, $45^{th}$ DAS,$55^{th}$ DAS and $65^{th}$ DAS.

WEED GROWTH

The weeds were counted at 15, 30, 45 and 60 days after the treatment application

Harvesting

Harvesting is generally be two to five hand pickings at weekly intervals and is the most expensive single operation in growing black gram.

Harvesting before the maturity of crop, usually result in lower yields, higher proportion of immature seeds, poor grain quality and more chances of infestation during storage.

## IV. RESULT AND DISCUSSION

*GROWTH ATTRIBUTES*

The average leaf length, leaf breadth, plant height and pod length of the crop are randomly selected plant was measured with a measuring scale and results were expressed in centimetres. The length, leaf breadth, plant height and pod length of selected plants was recorded at 15 DAS, 25 DAS, 35 DAS, 45 DAS, 55DAS and 65 DAS.

| **DAS** | **15** | **25** | **35** | **45** | **55** | **65** |
|---|---|---|---|---|---|---|
| **Leaf length (cm)** | 5.2 | 5.3 | 5.6 | 7.5 | 7.8 | 8 |
| **Leaf breadth (cm)** | 1.7 | 2.9 | 4 | 5.1 | 5.8 | 6.3 |
| **Plant height (cm)** | 7.6 | 10 | 12.9 | 17 | 20 | 24 |
| **Pod length (cm)** | - | - | - | 6.5 | 6.7 | 7.1 |

CROP WITH MULTIBLOOM

| DAS | 15 | 25 | 35 | 45 | 55 | 65 |
|---|---|---|---|---|---|---|
| Leaf count | 2 | 5 | 13 | 18 | 26 | 30 |
| Flower | - | - | 3 | 5 | - | - |
| Pod count | - | - | - | 13 | 18 | 18 |

CROP WITH MULTIBLOOM

WEEDS

Broad leaf

Horse purslane: *Trianthema portulacastrum L. (Aizoaceae)*

Pigweed: *Amaranthus viridis Hook F. (Amaranthaceae)*

Grasses

Barnyard grass: *Echinocloa crusgalli (L.) Beauv. And Jungle rice E. Colona (L.) Beauv. (Poaceae)*

7th DAY GROWTH

15th DAY GROWTH

25th DAY GROWTH

35th DAY GROWTH

45th DAY GROWTH

55th DAY GROWTH

MULTI BLOOM GERMINATION

60th DAY GROWTH

## V. CONCLUSION

In pattukottai block of Tanjore district for black gram is cultivated in alluvial soil and it rich in organic matter and nutrients. In our project, we cultivate the black gram in black soil which is poor in nutrients. The growth and yield of the black gram without the application of nutrients is less. So the growth and yield of black gram can be increased

by the application of more amount of nitrogen. Adequate supply of N may minimize the yield reduction through reduced those constraints. Leaf area is made up of the total green lamina are of emerged leaves greater leaf area is necessary to have superior yield and yield components in grain legumes. The nitrogen increases the dry matter and protein percentage of the grain as well as methionine and triptophen contents in seed with increases of levels of applied nitrogen. The yield can be harvested twice within a short duration. The leaf are index of black gram with multi bloom technology (27.15) is higher than the black gram with out multi bloom technology (19.39). The leaf length, leaf breadth, plant height and pod length have better growth in multi bloom technology and leaf count, number of flowers and pod count have faster growth in multi bloom technology while compare with the black gram with out multi bloom technology.

REFERENCES

[1] Akram-Lodhi, A.H. and C. Kay, 2009. Peasants and Globalization: Political Economy, Rural Transformation and the Agrarian Question. New York: Routledge.
[2] Ali,M.H.,M.M. Haque and B. Belton, 2013. 'Striped Catfish (Pangasianodon hypophthalmus, Sauvage, 1878) Aquaculture in Bangladesh: An Overview'. Aquaculture Research, 44 (6): 950–65.
[3] Anh, P.T., C. Kroeze, S.R. Bush and A.P. Mol, 2010. 'Water Pollution by Pangasius Production in the Mekong Delta,
[4] Aquaculture, 358–9: 196–204. Belton, B. and S.R. Bush, 2014. 'Beyond Net Deficits: New Priorities for an Aquacultural Geography'.
[5] Asia'. In Revisiting Rural Places: Pathways to Poverty and Prosperity in Southeast Asia, eds J. Rigg and P. Vandergeest, 1–24. Vancouver, BC: UBC Press/Singapore: NIS Press. Scoones, I., 2009. 'Livelihoods Perspectives and Rural Development'. The Journal of Peasant Studies, 36 (1): 171–96.
[6] Barney, K., 2004. 'Re-encountering Resistance: Plantation Activism and Smallholder Production in Thailand and Sarawak, Malaysia'. Asia Pacific Viewpoint, 45 (3): 325–39.
[7] Baumol, W. and Oates, W. The Theory of Environment at Pohcy, 2nd Ed., Cambridge University Press, Cambridge, 1988
[8] Belton, B. and A. Azad, 2012. Belton, B., D.C. Little and L.X. Sinh, 2011a. 'The Social Relations of Catfish Production in Vietnam'. Geoforum, 42 (5): 567–77.
[9] Belton, B., I.J.M. van Asseldonk and S.H. Thilsted, 2014b. 'Faltering Fisheries and Ascendant Aquaculture: Implications for Food and Nutrition Security in Bangladesh'. Food Policy, 44: 77–87.
[10] Belton, B., M.A.R. Hossain and S.H. Thilsted, in press. 'Labour, Identity and Wellbeing in Bangladesh's Dried Fish Value