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# Assessment of Green Gram Varieties for Better Yield in Nagapattinam District of Tamil Nadu

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## ABSTRACT

Green gram (*Vigna radiata*) is commonly known as Moong an important pulse crop in India and more than 70 per cent of world's green gram production comes from India. In Nagapattinam, farmers sow the moong after harvesting of rice crop during summer. The present study was conducted during summer of the year 2017 in three villages of Nagapattinam district to assess the suitable variety of green gram. Five farmers' field were randomly selected and sown two high yielding improved varieties of green gram namely CO 8 and LGG 460 with five replications with one check variety already grown by the farmers. The data like average plant height, number of branches, pods/plant, grain/pod, disease incidence (%), Synchronization, 100 seed weight and pod yield (q/ha) were recorded during investigation. Among all the varieties assessed, variety CO 8 proved to be the best with highest number of pods/plant (31.2) and minimum incidence of yellow mosaic disease of 4.2 per cent resulting in the highest yield of 7.35 q/ha followed by LGG 460 with disease incidence of 5.6 per cent , 28.3 pods/plant and yield of 6.95q/ ha. Hence, it was inferred that CO 8 variety of green gram proved better followed by LGG 460.

**Key Words***:* Extension gap, Green gram, Technology, Varieties, Yield.

## INTRODUCTION

In India, frequency of pulses consumption is much higher than any other source of protein, which indicates the importance of pulses in their daily food habits. Due to the cheapest source of protein, it is important to increase pulses production to increase balanced diet among the socially and economically backward classes. The cultivation of green gram in summer season is the special feature of Nagapattinam district, in which paddy is the major *kharif* and *rabi* crop and green gram covering in an area of 45,000 ha is grown mainly in paddy fallows during summer season immediately after the harvest of the paddy crop. These soils are usually highly fertile. Instead of leaving the fields fallow during the summer season, farmers utilize the residual moisture in the soil to grow green gram. Among the rabi crops green gram, reigning poor man's crop over the centuries and has potential to sustain food and nutritional security of the small and marginal farmers because of its short duration, faster growth and high nutritive values. But the yield levels are much lower than the normal season. Method of sowing was by broadcast the seeds.

The participatory rural appraisal study in the block revealed that the non availability of released variety suited to summer season, farmers were cultivating the local variety of green gram (ADT5) which was low yielding, susceptible to mungbean Yellow Mosaic Virus (YMV), leaf crinkling and powdery mildew diseases. For control of these pests and diseases farmers were using pesticides indiscriminately which has led to increased cost of cultivation. Several biotic, abiotic and socio-

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**Table 1. Details of practices in Nagapattinam district under OFT programme.**

| Sr. No | Cultural practice | Improved practice | Existing practice |
|---|---|---|---|
| 1. | Variety | CO 8, LGG 460 | Local |
| 2. | Land preparation | Ploughing and Levelling | Ploughing and Levelling |
| 3. | Pre emergent herbicide | Pendimethalin @2.5 l/ha | No herbicide |
| 4. | Seed rate | 12 kg/ha | 18 kg/ha |
| 5. | Seed treatment | Biofertilizers & Pseudomonas | No seed treatment |
| 6. | Fertilizer dose | Integrated nutrient management | Indiscriminate application |
| 7. | Foliar application of nutrient | TNAU pulse wonder @ 5 kg/ha | DAP 2 % Spray |
| 8. | Plant protection | IPM | Indiscriminate application |

economic constraints inhibit exploitation of the yield potential of green gram and these are needed to bead dressed. Crop growth and yield are limited through poor plant nutrition and uncertain water availability during the growth cycle. Inappropriate management may further reduce the fertility of soil. Therefore, it was considered to evaluate growth and yield parameters of two selected high yielding varieties of green gram in Nagapattinam district to identify the most suitable variety at the farmers field for higher income.

## MATERIALS AND METHODS

The present study was conducted on the clay loam soil during summer 2017 in three villages of Nagapattinam district. Ten farmers' field were randomly selected and sown two high yielding improved varieties of green gram namely CO 8 and LGG 460 in five replication with one check variety already grown by the farmers. The chemical fertilizer was applied through DAP, muriate of potash and urea as basal dose. The details of cultural practices were given in Table1.

The recommended weed control measures and irrigation were applied according to requirement of the crop. The data like average plant height, number of branches, pods/plant, grain/pod, disease incidence (%) , Synchronization, 100 seed weight and pod yield (q/ha) were recorded during investigation.

To estimate the technology gap, extension gap and technology index formula given by Samui *et al* (2000) was used.

**Table 2. Performance of Green gram varieties in farmers field.**

| Sr. No | Parameter | CO 8 | LGG 460 | ADT 3 (Check) | S.Ed. | C.D.(0.05) |
|---|---|---|---|---|---|---|
| 1. | Plant height | 45.72 | 42.6 | 40.9 | 0.64 | 2.08 |
| 2. | Number of branches per plant | 9.5 | 7.6 | 5.9 | 0.23 | 0.75 |
| 3. | Number of pods per plant | 31.2 | 28.3 | 16.5 | 0.71 | 2.31 |
| 4. | Number of grains per pod | 9.6 | 8.1 | 6.5 | 0.24 | 0.77 |
| 5. | Disease incidence | 4.2 | 5.6 | 29 | 0.10 | 0.31 |
| 6. | Yield (q/ha) | 7.35 | 6.95 | 4.36 | 11.55 | 37.72 |
| 7. | Synchronization | 80 | 62 | 40 | 1.28 | 4.19 |
| 8. | Aphid damage (%) | 5 | 9 | 10 | 1.28 | 4.19 |
| 9. | 100 seed weight | 3.75 | 3.42 | 3.20 | 0.49 | 1.59 |

**Table 3. Yield, technology gap, extension gap and technology index of green gram.**

| Name of Variety | Yield (q/ha.) | | | Per cent increase | Technology gap (q/ha) | Extension gap (q/ha) | Technology index (%) |
|---|---|---|---|---|---|---|---|
| | Potential yield (q/ha) | Improved practices | Farmers' Practice | | | | |
| | | Average | Average | | | | |
| CO 8 | 8.45 | 7.35 | 4.36 | 68.57 | 1.10 | 2.99 | 13.02 |
| LGG 460 | 13.75 | 6.95 | 4.36 | 59.40 | 6.80 | 2.59 | 49.45 |

## RESULTS AND DISCUSSION

The tallest plant height was recorded in variety CO 8 (45.72 cm) followed by LGG 460 (42.6 cm). The varieties CO 8 produced maximum number of branches per plant (9.5) followed by LGG 460 (7.6). The reason may be attributed to the genetic variability and varietal difference and environmental adaptability. Similar results were reported by Samant (2014) in green gram.

The variety CO 8 recorded maximum number of pods/plant (31.2) which was significantly higher with variety LGG 460 (28.3). The positive effect of phosphorus application on number of pods/plant might be due to better enzymatic activities which control flowering and pod formation (Kumar and Singh, 2014).The variety CO 8 recorded maximum number of grain/ pod (9.6) and significantly superior to LGG 460 (8.1). The reason may be attributed towards the genetic variability and grain size. Farmers' check variety had minimum grain/ pods (6.5). The data (Table2) showed that disease incidence (%) ranged between 4.2 to 5.6 per cent in two varieties whereas; the farmers' practice recorded 29 per cent.

The maximum yield of green gram was recorded in CO 8 which was significantly superior to LGG 460. However, CO 8 recorded highest yield in comparison to farmers' practice. Thus, the local variety/farmers'practice may be replaced with high yielding varieties because of higher productivity. Similar findings have been observed by Anuratha *et al* (2019). The technology gap ranged between 1.10 and 6.80 q/ha. The observed technology gap was due to various constraints such as soil fertility, availability of low moisture content and climatic hazards *etc.* Hence, to reduce the yield gap location specific recommendations for varieties, soil testing and timely sowing appears to be necessary. A value of 2.59 to 2.99 q/ha of extension gap was found during 2017. There is a need to decrease this wider extension gap through latest techniques.(Table 3). These findings were similar to the findings of Jain (2016) and Kushwah *et al* (2016). The technology index showed the suitability of varieties at farmer's field. Lower technology values indicated that feasibility of variety among the farmers is more.

The technology index ranged from 13.02 to 49.45 per cent. The finding was in accordance to

**Table 4. Yield and Economics of Green gram varieties.**

| Variety | Yield (q/ha) | Economics of Trials (Rs./ha) | | | |
|---|---|---|---|---|---|
| | | Gross cost | Gross income | Net income | B:C Ratio |
| CO 8 | 7.35 | 8805 | 23763 | 14958 | 2.69 |
| LGG 460 | 6.95 | 8600 | 20850 | 12250 | 2.59 |
| ADT 3 (Check) | 4.36 | 7075 | 17363 | 10288 | 2.45 |

finding of Sandhu and Dhaliwal (2016). The gross cost of cultivation was almost similar for all the two varieties. Market preference for CO8 was good and fetched higher price. The yield, net return and B: Cratio was higher in CO8 due to higher market price followed by LGG 460.

## CONCLUSION

The findings of the study revealed that cultivating CO 8 and LGG 460 in Cauvery delta districts like Nagapattinam district was more beneficial due to their yield contributing traits namely plant height, number of branches per plant, number of pods per plant, number of grains per pod , yield which were recorded more as compared to farmers choice variety i.e., ADT 3. The findings of the study concluded that the yield of CO 8 was significantly higher than other varieties with recommended package and practices of green gram. Thus, the farmer's practice variety may be replaced with high yielding variety like CO8 in Nagapattinam district of Tamil Nadu.

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