Effects of varieties and plant geometry on yield attributes and yield of summer greengram (*Vigna radiata* L.)


**ABSTRACT**

Planting of green gram at spacing of 30 x 10 cm produced significantly higher yield (688 kg ha⁻¹) than 45 x 7.5 cm and 60 x 5 cm. The yield components viz., mean number of pods plant⁻¹, number of seeds pod⁻¹, number of seeds plant⁻¹, seed yield plant⁻¹, test weight and yield were significantly influenced when crop was planted at 30 x 10 cm. Green gram variety BM-4 produced significantly higher yield (737 kg ha⁻¹) than BM-2002-01 (699 kg ha⁻¹), BPMR-145 (631 kg ha⁻¹) and Kopargaon (584 kg ha⁻¹).

**KEY WORDS**: Spacing, Varieties, Greengram, Yield, Yield attributes, *Vigna radiata* L.

The capacity of food legumes to fix atmospheric nitrogen, leaf shedding ability and also solubilize phosphorus in association with phosphobacteria and VAM make leguminous crop most effective nutrient recycling agents in nature, food legumes thus play a vital role in nutrient balance and in maintaining soil fertility.

Green gram (*Vigna radiata* L.) has attained its commercial importance in Indian agriculture and also in Maharashtra. The seed quality of summer produce is very superior as compared to *Kharif*. Hence, cultivation of summer crop provides good quality seed. The farmers usually grow mungbean without maintaining proper spacing. Row planting with appropriate spacing can help to ensure optimum plant population per unit area of mungbean, thereby increasing the yield.

Green gram in summer season can very well be introduced in cropping systems, at the same time it will give remunerative income to farmer. In general, seed produced in *Kharif* season get damaged due to continuous rains at the time of harvesting and availability of quality seed become the constrain. To overcome such situation summer green gram cultivation is best answer (Kumar et al., 2009).

**RESEARCH PROCEDURE**

A field experiment was conducted during summer season of 2009 at experimental farm of Department of Agronomy, Marathwada Krishi Vidyapeeth, Parbhani on medium black soil with soil pH 7.57, 0.42 kg ha⁻¹ available N, 202.60 kg ha⁻¹ available *P₂O₅* and 15.29 kg ha⁻¹ available *K₂O*. The experiment was laid out in split plot design with three replications. The treatments consisted of 12 combinations of three spacing (30 x 10 cm, 45 x 7.5 cm and 60 x 5 cm) as main plots and 4 varieties (BM-4, BM-2002-01, BPMR-145 and Kopargaon) as sub plots. The gross size was 6 x 3 m² and net plot sizes were 4.8 m x 2.0 m, 4.5 m x 2.25 m and 4.8 m x 2.0 m for 30 cm x 10 cm, 45 cm x 7.5 cm and 60 cm x 5 cm spacing, respectively. Sowing was done on 08th March, 2010. The crop was fertilized with 25 kg N + 50 kg *P₂O₅*. The recommended plant protection measures for the crop were followed.

**RESEARCH ANALYSIS AND REASONING**

The data on yield attributes and grain yield of greengram as influenced by different treatments are presented in Table 1.

**Effect of spacing**

The yield attributes and grain yield of greengram was influenced significantly due to different treatments of spacing.

Significantly more number of pods plant⁻¹ were recorded at the spacing of 30 cm x 10 cm than other spacing. The highest number of seeds pod⁻¹ was recorded...
at the spacing of 60 x 5 cm and it was significantly more
than other treatments of spacing. The highest number of
seeds plant\(^{-1}\) were recorded by spacing 30cm x 10 cm
and was at par with number of seeds plant\(^{-1}\) recorded at
the spacing of 45cm x 7.5 cm. The highest test weig ht
was recorded at the spacing of 30cm x 10 cm and was
significantly more than other treatments of spacing. The
grain yield of green gram was influenced significantly by
different treatments of plant spacing. The highest grain
yield of green gram was recorded at the spacing of 30cm
x 10 cm (688 kg ha\(^{-1}\)) and was at par with the grain yield
recorded at the spacing of 45cm x 7.5 cm (670 kg ha\(^{-1}\))
and significantly superior over the grain yield recorded at
the spacing of 60cm x 5.0 cm. The results are in li ne to
those reported by Prasad and Yadav (1990).

As regards to the seed yield plant\(^{-1}\), it was highest at
the spacing of 30cm x 10 cm and was significantly higher
over both the remaining treatments of spacing.

The data on harvest index indicated that, the highest
harvest index was recorded at the spacing of 30cm x 10
cm (29.18) and was significantly higher than the harvest
index recorded at the spacing of 45cm x 7.5 cm and 60cm
x 5 cm. Similar results were reported by Singh et al. (1993).

**Effects of varieties:**

The yield attributes and grain yield of greengram was
influenced significantly due to different varieties.
Significantly highest number of pods plant\(^{-1}\) than other
varieties were recorded by the variety BM-4. The highest
number of seed pod\(^{-1}\) (8.60) was recorded by the variety
Kopargaon and it was significantly more than other
varieties. The variety BM-4 produced significantly highest
number of seeds plant\(^{-1}\) and highest seed yield plant\(^{-1}\), it
was significantly superior over other varieties. The
varieties BM-2002-01 recorded highest test weight (41.17
g) which was significantly more than test weight recorded
by variety BM-4 (39.92 g), BPMR-145 (40.00 g) and
Kopargaon (39.80 g). Rezai and Hasanzadeh (1995) also
observed differences in yield attributing characters under
different varieties of green gram.

The yield of green gram was significantly influenced
by the different varieties. The variety BM-4 record ed
significantly highest grain yield (737 kg ha\(^{-1}\)) over other
varieties. Differential yield potential due to different green
gram varieties was reported by Cordoto (1973), Malik et al. (2006)

As regards to harvest index, the variety BM-4
recorded significantly higher (29.10) harvest index over
BPMR-145 and Kopargaon and was at par with BM-
2002-01), Malik et al. (2006), also observed differential
harvest indices in different green gram varieties.

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**Table 1:** Mean number of pods plant\(^{-1}\), number of seeds pod\(^{-1}\), number of seeds plant\(^{-1}\), seed yield plant\(^{-1}\) and test weight, grain yield and harvest index as influenced by various treatments

<table>
<thead>
<tr>
<th>Treatments</th>
<th>Number of pods plant(^{-1})</th>
<th>Number of seeds pod(^{-1})</th>
<th>Number of seeds plant(^{-1})</th>
<th>Seed yield plant(^{-1}) (g)</th>
<th>Test weight (g)</th>
<th>Yield (kg ha(^{-1}))</th>
<th>Harvest index(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Spacing</strong></td>
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<tr>
<td>S(_1) – 30 cm x 10 cm</td>
<td>10.92</td>
<td>6.66</td>
<td>66.99</td>
<td>2.92</td>
<td>40.88</td>
<td>688</td>
<td>29.18</td>
</tr>
<tr>
<td>S(_2) – 45 cm x 7.5 cm</td>
<td>9.25</td>
<td>7.08</td>
<td>66.15</td>
<td>2.64</td>
<td>40.10</td>
<td>670</td>
<td>27.58</td>
</tr>
<tr>
<td>S(_3) – 60 cm x 5 cm</td>
<td>8.35</td>
<td>7.98</td>
<td>64.50</td>
<td>2.80</td>
<td>39.69</td>
<td>630</td>
<td>27.12</td>
</tr>
<tr>
<td>S.E. ±</td>
<td>0.03</td>
<td>0.25</td>
<td>0.30</td>
<td>0.07</td>
<td>0.19</td>
<td>10.84</td>
<td>0.32</td>
</tr>
<tr>
<td>C.D. (P=0.05)</td>
<td>0.10</td>
<td>0.74</td>
<td>0.90</td>
<td>0.22</td>
<td>0.58</td>
<td>32.40</td>
<td>0.96</td>
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<tr>
<td><strong>Variety</strong></td>
<td></td>
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<tr>
<td>V(_1) – BM-4</td>
<td>11.60</td>
<td>6.47</td>
<td>75.00</td>
<td>2.97</td>
<td>39.92</td>
<td>737</td>
<td>29.10</td>
</tr>
<tr>
<td>V(_2) – BM-2002-01</td>
<td>9.03</td>
<td>6.80</td>
<td>64.01</td>
<td>2.66</td>
<td>40.00</td>
<td>631</td>
<td>27.27</td>
</tr>
<tr>
<td>V(_3) – BPMR-145</td>
<td>8.39</td>
<td>8.60</td>
<td>53.17</td>
<td>2.59</td>
<td>39.80</td>
<td>584</td>
<td>26.83</td>
</tr>
<tr>
<td>V(_4) – Kopargaon</td>
<td>0.02</td>
<td>0.23</td>
<td>0.50</td>
<td>0.08</td>
<td>0.27</td>
<td>29.63</td>
<td>0.42</td>
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<tr>
<td>C.D. (P=0.05)</td>
<td>0.06</td>
<td>0.69</td>
<td>1.50</td>
<td>0.25</td>
<td>0.81</td>
<td>78.89</td>
<td>1.26</td>
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<tr>
<td><strong>Interaction (S x V)</strong></td>
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</tr>
<tr>
<td>S.E. ±</td>
<td>0.06</td>
<td>0.43</td>
<td>0.80</td>
<td>0.15</td>
<td>0.46</td>
<td>42.72</td>
<td>0.75</td>
</tr>
<tr>
<td>C.D. (P=0.05)</td>
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<td>NS</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
</tr>
<tr>
<td>G. mean</td>
<td>9.51</td>
<td>7.26</td>
<td>65.55</td>
<td>2.79</td>
<td>40.10</td>
<td>662</td>
<td>27.90</td>
</tr>
</tbody>
</table>

NS=Non-significant
LITERATURE CITED


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