

Effect of Row spacing and Phosphorus Levels on Blackgram (*Vigna mungo* var *radiata* Hepper)*

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Field experiments were conducted in *kharif* seasons of 1976 and 1979 at the College of Agriculture Farm, Rewa with T9 blackgram. Three row-spacings (30, 45 and 60 cm as main plot treatments) were tried with four levels of P (0, 25, 50 and 75 kg/ha P_2O_5 as sub-plot treatments). The yield and yield-attributing characters, including root-nodulation, were favourably influenced by wider row-spacings and higher P levels. A row spacing of 30 cm and 75 kg P_2O_5 /ha were found optimum for sandy-loam soil for blackgram. For the clay-loam soil, this crop needs 45 cm spacing and 50 kg P_2O_5 /ha.

Blackgram variety, T-9, has been reported to be a profitable summer catch crop for Madhya Pradesh (Singh & Singh 1973). Because of its ability to mature in 85 to 90 days and to produce 9 q/ha, maximum benefit can be derived from this variety in multiple-cropping and dry-farming programmes of the Vindhya region of the state. The variety is being grown extensively in Rewa tract. Therefore, an appropriate row-spacing and P level have to be determined in order to achieve maximum return. Hence this study was undertaken.

MATERIAL AND METHODS

The experiment was laid out in the *kharif* seasons of 1976 and 1979 in two different sites, having a sandy-loam and clay-loam soil respectively, in the College Farm. The available N, P and K in sandy-loam soil were 315,

11, 174 kg/ha and in clay-loam soil was 374, 40, 198 kg/ha. There was adequate rainfall in both the years (962 mm in 1976 and 460mm in 1979). Three row-spacings (30, 45 and 60 cm as main plot treatments) were tried with four levels of P (0, 25, 50 and 75 kg/ha as sub-plot treatments) in a split-plot design replicated four times. A basal dose of 20 kg N/ha and 20 kg K_2O /ha was applied uniformly along with the scheduled levels of P in furrows 30, 45 and 60 cm apart. Sowing was done in the furrows in July and harvested in October. The plant to plant distance was maintained at 10 cm by thinning. The plant growth characters were studied after 30, 40, 50 and 60 days. Nodulation was studied 40 days after sowing.

RESULTS AND DISCUSSION

Plant height decreased with increase in row spacing from 30 to 60cm

* Part of M.Sc. thesis submitted by the first author to the JNKVV, Jabalpur.
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and with the increasing levels of P up to 75 kg/ha (Table). Number of root nodules per plant was also increased with the increasing spacing and P levels. The beneficial effect of wider spacing was significant in the year 1979 in almost all the characters studied except in the case of plant height. The P effect was significant in many of the characters studied in both the years. The number of pods per plant and the test weight was increased with the increase in spacing and P levels.

The effect of spacing was significant on grain yield only in 1979. 45cm spacing proved better than 30 cm and 60 cm spacings. The yield obtained under 30 and 60 cm spacing was almost similar. Under wider spacing the yield loss caused by lower plant population per unit area was by compensated by improved yield attributes. The number of pods per plant and test-weight were improved contributing to higher grain yield under wider spacing.

The increasing levels of P upto 50 kg/ha in clay-loam soil and upto

75 kg/ha in sandy-loam soil increased the grain yield significantly. The lack of response to 75 kg/ha in clay-loam soil was due to higher reserve of this nutrient (40 Kg/ha) in this soil. From the results, it appears that 30 cm spacing and 75 kg P_2O_5 /ha are required for sandy-loam soil and for clay-loam soil, 50 kg P_2O_5 /ha is sufficient. These findings are in accordance with the results of Singh and Khatri (1972), Singh and Singh (1973) and Singh and Saxena (1975).

The authors are highly thankful to Dr. R.C. Pande, Head of Agronomy Section College of Agriculture, Rewa, for rendering necessary facilities for the conduct of research.

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TABLE: Growth and yield components and yield of blackgram (T₉)

| Treatments | Plant Height (cm) | | Nodule number | Pods/plant | Testweight | Grain yield (q/ha) | |
|----------------------------------|-------------------|------|---------------|------------|------------|--------------------|------|
| | 1976 | 1979 | plant 1979 | 1979 | (g) 1979 | 1976 | 1979 |
| Row-spacing (cm) | | | | | | | |
| 30 | 75.2 | 40.2 | 16.9 | 22.5 | 37.15 | 7.01 | 7.27 |
| 45 | 69.3 | 35.9 | 17.0 | 35.6 | 37.40 | 6.78 | 8.08 |
| 60 | 65.5 | 35.6 | 17.3 | 39.3 | 37.40 | 6.21 | 7.19 |
| C.D. (5%) | NS | 1.05 | 0.41 | 1.49 | 0.17 | NS | 0.56 |
| Phosphorus levels (kg/ha) | | | | | | | |
| 0 | 58.0 | 29.4 | 11.1 | 24.8 | 37.00 | 5.72 | 6.60 |
| 25 | 67.2 | 36.6 | 15.6 | 33.8 | 37.23 | 6.34 | 7.38 |
| 50 | 73.5 | 40.4 | 17.8 | 34.9 | 37.43 | 6.95 | 80.3 |
| 75 | 81.4 | 42.5 | 23.9 | 36.4 | 37.60 | 7.65 | 3.06 |
| C.D. (5%) | 4.77 | 0.82 | 0.33 | 1.51 | 0.20 | 0.54 | 0.59 |

Note: The remaining data of 1976 were not significant.