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# EFFECT OF SOIL PROFILE MOISTURE LEVELS, SEED RATES AND ROW SPACINGS ON CHICKPEA YIELD

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ABSTRACT

Effect of initial soil profile moisture (100, 150 and 200 mm/m), seed rates (25, 40 and 55 kg/ha) and row spacings (30, 60 and 90 cm) on the performance of chickpea was studied. The soil moisture levels of 150 and 200 mm/m gave similar grain yield of chickpea but they were significantly better than 100 mm/m soil moisture level. The row spacings of 30 cm and 60 cm gave significantly higher grain yield than 90 cm row spacing. The 30 and 60 cm row spacings were, however, comparable. There was significant increase in the yield of chickpea with 40 kg seed/ha over 25 kg seed/ha. Seed rate higher than 40 kg/ha did not increase the yield significantly.

Chickpea (*Cicer arietinum* L.) is India's most important rabi season pulse crop grown mainly on conserved soil moisture. Row spacing and seed rate are important in the growth and the yield of crops raised on conserved soil moisture. Hence, studies were conducted to find the effect of different row spacings and seed rates at different initial soil profile moisture levels.

## MATERIAL AND METHODS

A field experiment was conducted on a loamy-sand soil at the Regional Research Station, Bawal of the Haryana Agricultural University (Haryana) during rabi seasons of 1979-80 to 1981-82. The soil of the experimental plots was slightly alkaline (pH 8.0), having low carbon (0.24%) and medium available P (21.8 kg $P_2 0_5$/ha) and K (242 kg $K_20$/ha). Basal applications of 25 kg N and 40 kg $P_20_5$/ha were done during the three years. The treatments consisted of three initial soil profile moisture levels (100, 150 and 200 mm/m), three seed rates (25, 40 and 55 kg seed/ha) and three row spacings (30, 60 and 90 cm). The treatments were replicated thrice in a split plot design with the soil profile moisture levels in the main plots and combinations of seed rates and row spacings in the sub-plots. Desired soil profile moisture levels were created by required quantity of water applied through pre-sowing irrigation. No post-sowing irrigation was given.

Chickpea variety H-208 was sown on 8 Nov, 3 Nov and 28 Oct; and harvested on 13 Apr, 5 Apr, and 7 Apr during 1979-80, 1980-81 and 1981-82, respectively.

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Similar results were reported by Chowdhary et al. (1971), Ram et al. (1973), Sen and Jana (1960) and Verma and Singh (1974). Higher grain yield at closer spacings may be attributed to the higher plant population (Table 1 ) and more number of pods/plant (Table 2).

**Effect of seed rates :**

During 1979-80 low seed rate of 25 kg/ha was significantly better than higher seed rates on account of higher number of pods/plant and higher number of grains/ pod. The soil moisture was not adequate for higher plant populations of 40 and 55 kg seed/ha. Well distributed winter rains in 1980-81 and 1981-82 resulted in significantly higher grain yield with higher seed rate of 40 kg/ha. Karwasra and Faroda (1979) have also obtained similar higher yield with higher seed rate. However, further increase of seed rate to 55 kg/ha was not of any significant advantage (Table 2).

**Interaction effect :**

The increase in yield with increasing soil moisture levels was significant upto 150 mm/m at all the seed rates (Table 3). The increase in yield was not observed for 55 kg seed/ha at 200 mm/m level. There was significant reduction in the grain yield with increasing row spacings at all the seed rates, except at 40 kg seed/ha where differences between 30 and 60 cm row spacings were non-significant. At 30 and 60 cm row spacings 40 kg seed/ha produced significantly more than 25 kg seed/ha. At 90 cm row spacing all the seed rates were at par.

Table 3. Interaction of seed rates with row spacings and moisture levels (1980-81) on yield (q/ha)

| Seed rates (kg/ha) | Moisture levels (mm/m) | | | Row spacings (cm) | | |
|---|---|---|---|---|---|---|
| | 100 | 150 | 200 | 30 | 60 | 90 |
| 25 | 7.56 | 11.78 | 12.83 | 12.34 | 11.10 | 8.73 |
| 40 | 11.63 | 13.17 | 14.09 | 14.90 | 15.24 | 8.76 |
| 55 | 11.84 | 14.62 | 13.82 | 15.89 | 15.79 | 8.61 |
| SEm ± | 0.42 | | | 0.38 | | |
| CD 5% | 1.32 | | | 1.21 | | |

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