

# Growth and yield of Kabuli chickpea varieties as influenced by different spacing

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## ABSTRACT

A Field experiment was carried out during winter season of 2005 - 06 on chickpea (*Cicer arietinum* L.) to assess the growth and yield of Kabuli Chickpea in relation to variety (ICCV - 2, Virat, Vihar, and KAK - 2) and spacing (30 x 10 cm, 30 x 15 cm, 45 x 10 cm and 45 x 15 cm). The results revealed that the chickpea variety Virat recorded significantly higher seed yield of 1675 kg ha<sup>-1</sup> and it was found significantly superior over Vihar, ICCV - 2 and KAK -2. The significantly highest seed yield (1681 kg ha<sup>-1</sup>) was obtained by chickpea at closer spacing (30 x 10 cm) over rest of spacing. Though the number of pods, grain weight per plant and hundred seed weight were found maximum at wider spacing but it could not compensate the yield loss due to less plant population in wider spacing.

**Key words :** Kabuli chickpea, Spacing.

## INTRODUCTION

Chickpea [*Cicer arietinum* (L.)] is an important and popular nutritive pulse crop in India. In Maharashtra it ranks second, next to Pigeonpea in production and productivity. Research contribution regarding development of desi varieties was enough until last decades. The research on cultivar development of Kabuli chickpea is, however, meager. Kabuli chickpea receives better price in the market because of special demand of standard keteras for the preparation of attractive and delicious dishes like chana- masala and chana bhatora. Because of its special feature and great demand, there was an urgent need to develop high yielding, bold types of Kabuli chickpea. The efforts are, therefore, made to develop a kabuli chickpea variety and its optimum plant population. The area under cultivation of Kabuli Chickpea is increasing recently and no work on the agronomic aspect of chickpea has been done. Consequently, it is difficult to recommend better agronomic practices for higher yield. The agronomic practices viz., row-to-row spacing, plant to plant spacing and use of different varieties could increase the yield. Among all the factors row-to-row and plant-to-plant spacing is an important factor contributing to higher yield. It was felt necessary to study the growth and yield of different varieties of Kabuli type chickpea with different spacing.

## MATERIALS AND METHODS

A trial was conducted during winter (*rabi*) season of 2005 -06 at Agriculture College Farm, Latur (M.S.). The experiment was laid out in Factorial Randomized Block Design (FRBD) with three replications. The four varieties (ICCV - 2, Virat, Vihar and KAK - 2) and four

spacing (30 x 10 cm, 30 x 15 cm, 45 x 10 cm and 45 x 15 cm) were tried. The soil of experimental field was clayey with low availability of nitrogen, medium in available phosphorus and high in available potassium. The recommended dose of fertilizer was applied (25: 50: 0 NPK kg ha<sup>-1</sup>) as basal at the time of sowing. The seed of all varieties treated with *Rhizobium* strain before sowing. Other agronomical operations were carried out as per recommendation. The growth, yield attributes and yield were recorded at the time of harvest of crop.

## RESULTS AND DISCUSSION

### Growth and yield attributes:

The variety KAK - 2 produced the tallest plant (Table 1) and found significantly superior over ICCV - 2, Virat and Vihar. The spacing of 30 x 10 cm produced tallest plants as compared to the spacing 45 x 10 cm and 45 x 15 cm. However, it was at par with 30 x 15 cm spacing in respect of plant height. Singh *et al.* (1993) also reported that narrow spacing produced tallest chickpea plants indicated competition. The variety Virat produced the maximum mean number of branches and found significantly superior over ICCV - 2, Vihar and KAK - 2. The spacing 45 x 15 cm recorded significantly higher number of branches as compared to the spacing of 30 x 10 cm. However, the spacing 30x10cm produced less number of braches as compared to other spacing.

The variety ICCV - 2 produced significantly more number of pods per plant than Virat, Vihar and KAK - 2. The significantly lowest number of pods per plant was observed in KAK - 2, with the spacings 30 x 10 cm, 30 x 15 cm, and 45 x 10 cm. The significantly lowest number of pods per plant was observed at 30 x 10 cm spacing.

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**Table 1: Growth and Yield attributing characteristics of chickpea varieties as Influenced by different spacing**

Treatment	Plant height (cm)	No. of branches plant <sup>-1</sup>	No. of pods plant <sup>-1</sup>	Weight of grain plant <sup>-1</sup>	100 seed weight (g)	Seed yield (kg ha <sup>-1</sup> )
<b>Varieties</b>						
ICCV - 2	40.48	5.12	30.19	7.39	24.25	1347
Virat	41.17	6.70	25.70	9.37	36.25	1675
Vihar	42.98	6.21	23.96	8.55	35.30	1514
KAK - 2	50.02	6.17	18.02	6.98	38.42	1211
S.E ±	0.75	0.13	0.39	0.23	0.31	26
CD (0.05)	2.19	0.40	1.15	0.67	0.91	77
<b>Spacing (cm)</b>						
30 x 10	45.58	5.70	19.57	6.21	32.25	1681
30 x 15	44.37	6.17	23.90	7.91	34.00	1413
45 x 10	43.12	6.04	23.42	7.70	33.45	1392
45 x 15	42.15	6.30	30.98	10.47	34.52	1260
S.E ±	0.75	0.13	0.39	0.23	0.31	26
CD (0.05)	2.19	0.40	1.16	0.67	0.91	77
<b>Interaction</b>						
S.E ±	1.51	0.27	0.79	0.47	0.63	53
C.D. (0.05)	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.
General mean	43.73	6.05	24.47	8.07	33.55	1437

NS - Non significant

Similar, results were also reported by Singh *et al.* (1998).

The variety Virat produced the highest grain weight per plant and found significantly superior over ICCV - 2, Vihar and KAK-2. The lowest grain weight per plant recorded by KAK - 2. The spacing of 45 x15 cm was recorded significantly higher grain weight per plant over rest of spacing. The lowest grain weight per plant was produced by the spacing 30 x 10 cm.

The variety KAK - 2 produced significantly highest hundred seed weight as compared to ICCV - 2, Vihar and Virat. The second highest position in recording hundred seed weight of chickpea was acquired by Virat. The lowest hundred seed weight was recorded by the ICCV - 2. The spacing 45 x 15 cm produced significantly highest hundred seed weight over spacing (45 x 15 cm and 30 x 10 cm). However, it was at par with 30 x 15 cm spacing. The lowest hundred seed weight was recorded by 30 x 10 cm spacing.

### Chickpea seed yield:

#### Varieties:

The variety Virat produced highest seed yield (1675 kg ha<sup>-1</sup>) and it was found significantly superior over Vihar (1514 kg ha<sup>-1</sup>). ICCV - 2 (1347 kg ha<sup>-1</sup>) and KAK - 2 (1211 kg ha<sup>-1</sup>). The higher seed yield of Virat might be due to better contribution of yield contributing characters like hundred seed weight, grain weight per plant and number of pods per plant as compared to Vihar, KAK - 2

and ICCV - 2.

#### Spacing:

The maximum seed yield (1681 kg ha<sup>-1</sup>) was obtained by sowing the chickpea crop at 30 x 10 cm spacing and it was found significantly superior over rest of the spacing. The second highest position in seed yield of chickpea was acquired by sowing of the chickpea at 30 x 15 cm (1413 kg ha<sup>-1</sup>) and it was found significantly higher over 45 x 15 cm spacing. The significantly lowest seed yield of chickpea (1260 kg ha<sup>-1</sup>) was observed at wider spacing (45 x 15 cm). Though number of pods per plant was found maximum, but it could not compensate the yield loss because of less population. These results are in agreement with the results reported by Shaikh and Mungse (1998) and Trivedi and Vyas (2000). From the above data it is concluded that sowing of chickpea variety Virat with spacing 30 x 10 cm can obtain the higher grain yield of chickpea.

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