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Short Communication

Effect of Sowing Method, Plant Population and Nitrogen Level on Yield of Cumin (*Cuminum cyminum*)

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Cumin (*Cuminum cyminum* L.) is a condiment which is generally used for flavouring purposes, and has medicinal value. Cumin yields are influenced considerably by plant population. In general, seeding of cumin is done by broadcasting method which results in non-uniform population. Scientific information on suitable method of sowing is lacking. Choudhary and Gupta (1991) reported cumin response to nitrogen fertilization. Present study looks into the influence of plant density, method of sowing and nitrogen level on cumin production.

The field experiment was conducted on loamy sand soil during the winter seasons of 1989-90 and 1990-91. The soil was alkaline (pH 8.0), poor in organic carbon (0.254%), low in available P (8.9 kg ha^{-1}) and high in available K (236 kg ha^{-1}). The treatments comprised 2 sowing methods (broadcast, rows 30 cm apart), 3 plant densities (5 x 10^5 plants ha^{-1}, 7.5 x 10^5 plants ha^{-1}, 10 x 10^5 plants ha^{-1}), and 3 levels of N (0, 20, 40 kg ha^{-1}). The experiment was laid out in randomized block design with 3 replications. A fertilizer dose of 8.7 kg P ha^{-1} and N, as per treatments, was uniformly applied. Whole amount of P, and half the dose of N, as per treatment, was drilled at the sowing time, and the remaining half of N was top-dressed at 35 days after sowing. Cumin cv. RZ 19 was seeded on the 25th November 1989 and 1990. The crops were harvested on the 16th March 1990 and 1991, respectively.

Seed yield of cumin was influenced by sowing methods (Table 1). Line sowing gave significantly higher number of branches, umbels and umbellates per plant and consequently produced significantly higher seed yield compared to broadcast sowing (660 kg ha^{-1}). This might be due to uniform space available for the plant growth and development, while there was no systematic plant arrangement in broadcast sowing. Higher plant densities (7.5 and 10 x 10^5 plants ha^{-1}) adversely affected the growth (branches $plant^{-1}$), and yield attributes (umbels, umbellates $plant^{-1}$ and 1000 seed weight), compared to the lower plant densities of 5 x 10^5 ha^{-1} (Table 1). This behaviour of plant population could be attributed to competition among the plant communities for resources like nutrients, space and moisture. Contrary to the higher values of yield attributes at lower plant density (5 x 10^5 ha^{-1}), there was no significant variation in seed yield among the plant density treatments because of more

Table 1. Effect of plant densities, sowing methods and nitrogen levels on yield and yield attributes of cumin (mean of 2 years)

Treatments	Branches plant^{-1}	Umbels plant^{-1}	Umbellates plant^{-1}	1000 seed weight (g)	Seed yield (kg ha^{-1})
Sowing methods					
Broadcast	5.4	16.1	80.8	4.95	660
Line (30 cm)	5.9	18.1	85.9	5.02	754
CD (P=0.05)	0.4	1.8	3.6	NS	70
Plant density (x 10^5 plants ha^{-1})					
5.0	6.0	19.2	86.4	5.20	693
7.5	5.3	16.7	82.0	4.90	707
10.0	5.3	15.4	81.7	4.88	721
CD (P=0.05)	0.6	2.2	4.2	0.26	NS
N levels (kg ha^{-1})					
0	4.7	15.3	78.1	5.09	599
20	5.7	18.3	86.6	4.98	756
40	6.2	17.8	85.3	4.89	766
CD (P = 0.05)	0.6	2.2	4.2	NS	84

number of plants per unit area in higher plant population plots.

Application of N improved the growth and yield attributes (Table 1). Branches plant^{-1}, umbels and unbellates plant^{-1} increased significantly with increase in the level of N from 0 to 20 kg ha^{-1}. This obviously appears to be a direct consequence of increased N availability for growth and development of plant. Similar effects of N in increasing the branches, umbels and umbellates plant^{-1} were also reported by Choudhary and Gupta (1991). Nitrogen at 20 kg ha^{-1} gave significantly higher seed yield of cumin compared to control. Nitrogen application in the present study led to an increase in seed yield of 26.6% over control (599 kg ha^{-1}). Jangir and Singh (1996) also reported similar results.

It is concluded from the two year study that line sowing (30 cm apart) is better than broadcast sowing in cumin. It responds upto 20 kg N ha^{-1} and appropriate plant density is 5 x 10^5 plants ha^{-1} for the cumin growing areas of Rajasthan.

References

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