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Performance of baby corn varieties under varying planting geometry

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ABSTRACT

To find the best baby corn variety and geometry for the Southern Zone of Telangana, a field experiment was carried out at PJTSAU, Hyderabad in the winter of 2014–2015. The treatments were duplicated three times and were based on a randomized block design with a factorial approach. They included three different baby corn varieties ('30V92', 'Seed Tech-740' and 'VL-42') and four different planting geometries (45 cm × 15 cm, 45 cm × 20 cm, 60 cm × 10 cm and 60 cm × 15 cm). Experiment findings showed that VL-42 with 45 cm x 15 cm spacing produced 56% more baby corn than Seed Tech-740 with the same spacing. In contrast, VL-42 had the greatest cultivation costs when planted in a 60 cm × 10 cm grid, but the best net returns and benefit cost ratio when planted in a 45 cm x 15 cm grid. According to the research, VL-42, which has a population of 1,48,148 plants/ha, is a good choice for cultivating baby corn on sandy loam soils in Telangana's Southern Zone.

***Key words*:** Baby corn, Cob:corn ratio, Corn yield, Net returns, Plant population, Planting geometry

In India and across the globe, baby corn is the most often cultivated kind of corn for vegetable production. In the United States, Europe, and even certain parts of Asia, it is a popular cereal-vegetable combination. The Directorate of Economics and Statistics (2014) reports that India's 9.4 million hectares of maize crop yields 24.3 million metric tons of maize and a productivity of 2,583 kg per hectare. In comparison to grain corn, the growing time for baby corn may be cut in half, thanks to its medium plant type and the fact that it produces green ears 65–75 days after planting (Neginal, 2015). Its earlymaturity allows for more crop variety, higher annual crop intensity, and more financial reward for producers. Under irrigated conditions, one may harvest three to four crops in a cropping year, and the fodder quality is on par with maize fodder crop (Pandey et al., 2000). The urban population's penchant for baby corn is driving up its production potential, which bodes well for the rural population's ability to supplement their income in the face of rising food prices. Due to the growing demand for baby corn and farmers' desire for it,thestandard-The first author presented this work in 2015 (unpublished) as part of his Master of Science thesis to Professor Jayashankar at Telangana State Agricultural University in Hyderabad, Telangana.
use of agro-techniques to increase yields and, ultimately, farmers' incomes. The only way to boost production, given

the restricted space available for baby corn cultivation and the competition from other cereals and commercial crops, is to improve productivity via several management aspects. There is a need to find a short-duration cultivar that is well- suited to the southern area of Telangana. This cultivar should have a thin and upright structure, be able to fit into restricted row spacing, and produce more cobs per plant than the current kinds, most of which are imported from North India.Because maize has a poor tillering capacity, planting geometry variations impact its production more than any grass family member (Vega et al., 2001). In order to maximize yield, the plant population must make the most efficient use of the soil's nutrients, moisture, and light. Reducing production costs and increasing output are both achieved by determining the optimal plant density for a particular variety. Research on babycorn spacing requirements is lacking, in contrast to those of grain and fodder corn, which have clear requirements.

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pitted against 30V92, a single-cross hybrid, and Seed Tech-740, a double-cross hybrid. All of the treatments followed the same fertilizer schedule, which called for 180 kg/ha of nitrogen, 60 kg/ha of phosphorus, and 60 kg/ha of potassium. Phosphorus (DAP) and potassium (MOP) were administered at full dosages as a foundational treatment. The nitrogen,which was administered in three portions according to the timetable, was one-third N as basal, one-third N at 30 days after sowing (DAS), and the last 1/3rd N at 55 DAS. This wasdone after determining the percentage given by DAP.Atrazine, applied pre-emergence at a rate of 1.5 kg a.i./ha, was used to manage weeds. Within two or three days after silking, the cobs were harvested. While VL-42 was harvested at 55 DAS, 30V92 and Seed Tech-740 were harvested at 76 and 75 DAS, respectively. For every net plot of 3.6 m x 2.4m, the weight of cobs and corns was measured in tons and represented as tonnes/ha. The green fodder was collected when the cobs were removed from the plants, and its weight was recorded from the net plots. Cob yield and green biomassyield were used to calculate the net monetary return. Thecurrent market prices of 25/kg for cob and 1.5/kg for green fodder were taken into account. A valid conclusion was drawn by tabulating and statistically analyzing the observations acquired throughout the inquiry. For the conventional analysis of variance (ANOVA), the statistical programSPSS 17.0was used.

analyze the results of the treatments. Comparisons were made between treatment means using the least significant difference test, with a significance threshold of 5% ($P < 0.05$).According to Table 1, there was a notable difference in corn production among the three varieties of baby corn. In terms of yield, VL-42, 30V92, and SeedTech-740 were the most effective. The maize yield increased by 36% in VL-42 compared to 30V92 and by 27% in Seed Tech-740. The number of cobs per plant varied significantly across the cultivars, which explained the variation in yield (data not shown). The increased production was due to the much larger number of cobs per plant in the 'VL-42' variety. There were significant differences in baby corn yields across different planting geometries. A much greater maize yield was achieved using a planting geometry of 45 cm × 15 cm and 1,48,148 plants/ha, followed by a 90 cm × 10 cm and 1,66,666 plants/ha. The optimal degree of plant population management is essential for maximizing yield potential via enabling competition in inter- and intra-row spacing without reducing overall production, which may explain the observed increase in yield (Meena et al., 2017). As a general rule, cob production per plant drops as plant density rises, but this drop is more than offset by a rise in plant population; conversely, low plant population results in a high yield per plant. Cob and corn weight/plant dropped due to acute resource competition with increasing planting density; increasing plant number did not make up the difference. Table 2 shows that there was a significant interaction between types and planting geometry, with VL-42 producing 2.8 tons per hectare of maize when planted with a spacing of 45 cm × 15 cm.

Table 1. Corn yield, cob: corn ratio, green fodder yield and economics of baby corn varieties as influenced by varying planting geometry

Treatment	Corn yield (t/ha)	Cob: corn ratio	Green fodder yield (t/ha)	Cost of cultivation (× 10^3₹/ha)	Net return (× 10^3₹/ha)	Benefit: cost
Variety						
30V92	1.8	2.43	35.7	43.6	69.5	2.58
Seed Tech-740	1.6	2.51	28.5	38.3	68.7	2.78
VL-42	2.4	2.48	27.6	46.0	108.0	3.34
SEm±	0.3	0.01	0.5	-	0.9	-
CD (P=0.05)	0.8	0.03	1.4	-	2.8	-
Planting geometry						
45 cm × 15 cm	2.2	2.41	35.5	43.2	94.4	3.17
45 cm × 20 cm	1.8	2.50	24.7	42.1	74.0	2.75
60 cm × 10 cm	1.9	2.55	39.8	43.4	87.7	3.01
60 cm × 15 cm	1.8	2.49	22.4	42.1	71.9	2.69
SEm±	0.3	0.02	0.6	-	0.9	-
CD (P=0.05)	0.9	0.04	1.6	-	2.8	-
V × S Interaction						
SEm±	0.6	0.04	1.0	-	1.9	-
CD (P=0.05)	1.6	NS	2.8	-	5.6	-

NS, non-significant

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Tech 740' (Pandey *et al*., 2002). Significantly higher cob:corn ratio was observed with the spacing of 60 cm × 10 cm. Aravinth *etal*. (2011)also reported decrease in cob:corn ratio with the increasein plant population. Significantly higher green fodder yield was recorded in '30V92'. Taller plants coupled with more number of leaves (14.09) at harvest, higher leaf area index (5.27) and dry matter production (9.2 t/ha) resulted in significantly higher green fodder yield in '30V92' (Pandey *et al*., 2002). Significantly highergreen fodder yield wasobtained from the planting geometry of 60 cm × 10 cm. Higher green fodder yield with narrow planting geometryof 60 cm × 10 cm was due to higher number of plants/ha (1,66,666/ha). Similar finding was reported by Sobhana *et al*. (2012). 30V92 with planting geometry of 60 cm × 10 cm resulted significantly higher green fodder yield over VL 42 with the planting geometry of 60 cm × 15 cm (Table 2).Gross returns, net returns and benefit: cost ratiowere higher in 'VL-42'. Significantly higher cob yields ledto higher net returns in 'VL-42' (Sobhana *et al*., 2012). Among the planting geometries cost ofcultivation was highest for the spacing of 60 cm × 10 cm because of higher plant population and in turn higher seed rate. Net returns differed ignificantly among the varying planting geometry. Net eturns and benefit : cost ratio were higher with the planting geometry 45 cm × 15 cm whereas 60 cm
× 15 cm gave lower net returns. Significantly higher net returns and benefit–cost ratio was reported by Golada *et al*., 2013 with theplanting geometry of 45 cm × 15 cm dueto higher cob yield than other planting geometries. Net returns were higher in VL-42 (45 cm × 15 cm) whereas lower net return was noticed in Seed Tech 740 (60 cm × 15 cm) (Table 2).

On the basis of present study, it can be concluded that higher baby corn yield with higher net returns and benefit: cost ratio can be obtained from 'VL-42' with a spacing of45cm × 15 cm.

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