Original Research Article

Baby corn based intercropping system in enhancing the growth and production of winter season baby corn in Chhattisgarh plains

Abstract

An experiment was carried out during winter season (*rabi*)for a period of two years 2019-20 and 2020-21on Instructional cum Research Farm,Indira Gandhi Krishi Vishwavidyalay, Raipur (C.G.) with the objective to enhance the production ofbaby corn through intercropping.The experiment ~~laid~~ was laid out in randomized block design (RBD) with eight treatmentconsisting of sole and paired row baby corn along with a combination of various legumes. The treatments wereT1 : sole baby corn (45 x 20 cm), T2 : paired row baby corn (30/60 cm) T3 : sole fenugreek (30 x 10 cm), T4 : sole pea (30 x 20 cm), T5 : sole cowpea (30 x 20 cm) T6 : paired row baby corn + pea (2:2), T7 : paired row baby corn + fenugreek (2:2) and T8 : paired row baby corn + cowpea (2:2).The resultof the experiment was concluded that growth attributes was highest under the treatment of T6: paired row baby corn + pea which was closely followed by T8: paired row baby corn + cowpea. Also, T6: paired row baby corn + pea maximized the baby corn cob and fodder yield and therefore pea proved to be a valuable intercrop with baby corn in enhancing production of baby corn.

~~Keywords :~~Keywords: baby corn, cob yield, fodder yield, intercropping, legumes, RBD

Introduction

Baby corn (*Zea mays* L.) is the unfertilized young cob of the corn which is mainly used for vegetables and soup. Baby corn is dehusked immature maize ear, harvested within 2-3 days of silking but prior to fertilization (Pandey *et al*., 1998). The valuable size of baby corn is 6-11 cm length and 1-1.5 cm diameter with regular row/ovule arrangement. Generally, creamish - yellow to very light - yellow colored baby corn is top most priority to the consumer (Pal, 2011). Corn is starchy in nature due to its carbohydrate content, but baby corn constitutes non-starchy one. It appends several health benefits as it is highly nutritive crop having capacity to convert more nutrients to food (Yasu, 2016). It contains folic acid, vitamin A, B, C, phosphorus, calcium and

zinc which is used as supplements in various preparations such as vegetable, salad, soup, pickle, kheer, murabba, chutney and ~~manchurian~~manchurian foods. The nutritive value of Baby corn; 100 g of baby corn consists of 89.1% moisture, 0.2 g fat, 1.9 g protein, 8.2 mg carbohydrate, 0.06 g ash, 28.0 mg calcium, 86.0 mg phosphorus, 11.0 mg ascorbic acid (Das *et al*., 2009).

The *rabi* season is generally dominated by crops like wheat/chickpea/safflower / vegetable/pulse crops. In order to feed the growing population, there is an alarming rate to enhance the productivity per unit area ~~per~~and per unit time which can be excelled by enhancing the cropping intensity especially under irrigated area to fulfill the optimum food requirement of the country. Corn is the most popular crop among the farmers in the state, however baby corn may also be adopted by farmers to raise their farm income and standard of living.Intercropping system is believed to enhance production per unit land in same ~~area per unit~~ time. Baby corn is a wide spaced crop however, possibility for introduction of inter row crops could be more income fetching. Verge of crop combination is applicable to maximize the utilization of growth resources per unit area and to improve the yield as well as to keep the soil in fruitful conditions (Shennan, 2008). Hence, sustainable productivity of crops is the need of the hour in the present context of Indian farming. So, we must explore every possibility for crop intensification with sustainable nutrition management for achieving the sustainability.

METHODS AND MATERIALS

The experiments were conducted at Instructional cum Research Farm of Indira Gandhi Krishi Vishwavidyalaya, Raipur (C.G.), India. The ~~Instructional cum Research~~ Farm is situated at 2I^{0}4'N latitude, 8I ^{0}39'E longitude and 298 m altitude from the sea level. The region falls under the eastern plateau and hill region (Ago-climatic zone-7) of India.

The soil of the experimental field was *Vertisol*. The soil was neutral and ~~in reaction.T~~the available nitrogen, phosphorus and potassium content were low, ~~medium~~medium, and high, respectively.Baby corn G5414 hybrid, Green pea variety Dhanya green pearl, Cowpea variety Ankur Gomati and fenugreek variety Meghna were taken as test crop during the course of investigations.

~~Detasseling,~~Detasseling is an important practice in baby corn production. It was done immediately after the appearance of the tassel to avoid pollination and fertilization. Detasseling

was done by holding the tassels firmly with hand and giving an upward jerk. This operation is necessary for getting good quality baby corn.Harvesting of baby corn was done after 3 – 4 days of silk emergence. Harvesting was done manually treatment wise by removing the cobs from the plants. In all there was 3 pickings at an interval of 1-–3 days for complete removal of cobs. Harvesting was usually done in the morning when moisture percentage was high and temperature was low.

Result

Growth attributes

The intercropping with different pulses had a significant effect on the growth attributes of baby corn. This was marked by a gradual increase in plant height, number of leaves, leaf area and LAI and dry matter accumulation plant^{-1}. Treatment T6: paired row baby corn + pea ~~produced significantly~~significantly produced the taller plants and higher number of leaves in ~~comparision~~comparison with the other treatments. Also the other growth attributes *viz*., leaf area palnt^{-1}, Leaf Area Index and dry matter accumulation plant^{-1} were highly significant with the treatment ~~of~~ T6. ~~: paired row baby corn + pea.~~ The treatment ~~of~~ T8: paired row baby corn + cowpea and the treatment ~~of~~T2: paired row baby corn was statistically at par to T6 ~~: paired row baby corn + pea~~ and was significantly superior over other treatments. The treatment ~~of~~ T1 ~~–: solebaby corn~~ was found to be inferior with the least growth attributes i.e. plant height, number of leaves plant^{-1}, leaf area plant^{-1}, LAI and dry matter accumulation. This seems possible due to proper allocation of space with optimum plant population combined with increased plant height provided more number of nodes and thus more number of leaves were generated under the treatment ~~of~~ T6.~~: paired row baby corn + pea,~~ T8 ~~: paired row baby corn + cowpea~~and T2. ~~: paired row baby corn.~~ Similarly, higher leaf area plant^{-1} and LAI were as a result of optimum utilization of growth resources due to proper space allocated for individual plants. The dry matter increased due to the cumulative effect of growth attributing features like plant height, number of leaves, leaf area which plays a very important role in proper growth of plant and thereby increasing dry matter. Leaf area index and dry matter of baby corn plant were highly correlated with the coefficient of 0.87 (Graph 1). Crop Growth Rate in general increased with the plant growth with the advancement of crop age ~~upto~~up to 60 DAS and declined thereafter. The similar findings have been also reported by Singh et al. (2000), Ennin et al. (2002), Eskandari and Ghanbari (2009) and Hekmat (2016).The treatment ~~of~~ T6 ~~: paired row baby corn + pea~~ resulted

in more number ~~of baby~~of baby cobs per plant with higher cob length and cob weight plant^{-1} and was at par to treatment T8~~. : paired row baby corn + cowpea~~ and T2~~. : paired row baby corn.~~Whereas the yield of intercrops like pea, cowpea and fenugreek were found to be superior in their sole planting as compared to intercrop treatments as the plant population under optimal condition leads to increase in yield~~. (~~ Mohan, *et al*.~~(~~2018~~;)~~, Mohan, *et al*.~~(~~2021).

CONCLUSION

~~From the above study,it~~It could be concluded that baby corn is a good crop for ~~chattisgarh~~Chhattisgarh plains and when sowingin winter season, baby corn in paired row along with pea as intercrop could be a beneficial practice for achieving the sustainability and profitability in Chhattisgarh plain regions.

Table 1: Growth attributes of baby corn as influenced by different intercrop

Treatment	Plant height (cm)	LAI	DMA (g plant^{-1})
T1: Sole baby corn	202.21	4.54	144.6
T2 : paired row baby corn	205.8	4.69	154.2
T6 : paired row baby corn + pea	210.4	5.14	157.3
T7 : paired row baby corn + fenugreek	203.9	4.71	149.3
T8: paired row baby corn + cowpea	206.3	5.07	156.3
SEm±	1.56	0.13	1.58
CD (P = 0.05)	5.10	0.44	5.14

Graph 1: Correlation between LAI and dry matter accumulation plant^{-1}

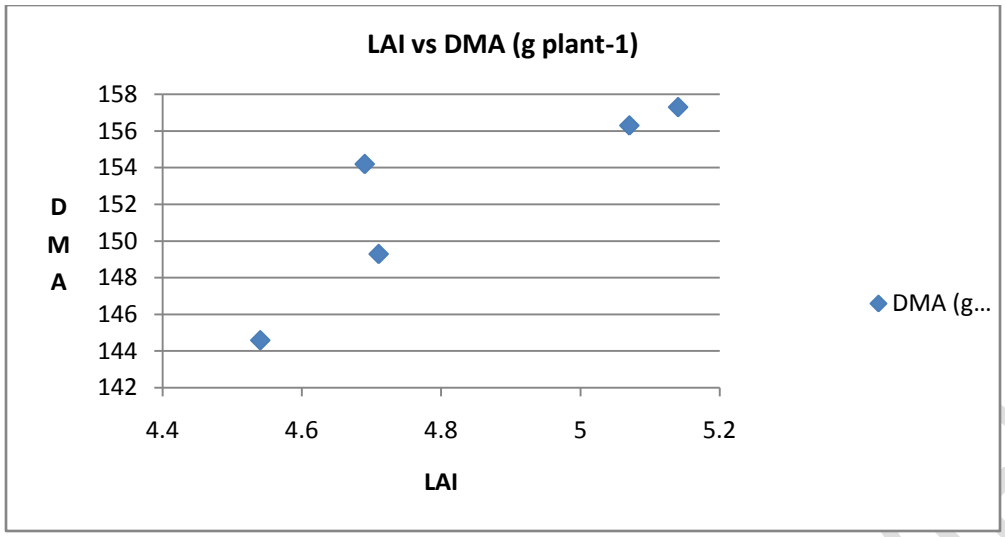

Table2 :yield attributes and yield of baby corn as influenced by different intercrop

Treatment	Cob length (cm)	Cob weight (g)	Baby corn cob yield (t ha^{-1})
T1: Sole baby corn	7.72	11.21	1.60
T2 : paired row baby corn	8.15	12.40	1.79
T6 : paired row baby corn + pea	8.80	13.69	1.92
T7 : paired row baby corn + fenugreek	8.03	11.72	1.63
T8: paired row baby corn + cowpea	8.51	12.49	1.85
SEm±	0.22	0.54	0.81
CD (P = 0.05)	0.71	1.76	0.26

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