



## Original Research Article

# Yield and economic of finger millet (*Eleusine coracana* L. Gaertn) intercropping system

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## ABSTRACT

### Keywords

Intercropping;  
*Eleusine coracana*;  
finger millet;  
horsegram.

Finger millet (*Eleusine coracana* L. Gaertn) is grown in rainfed as well as dry region of India, growing of only cereals is not so much remunerative in present scenario of dry areas of agriculture to fulfill the diverse demand of consumers and rapid growing population. A field experiment was conducted during Kharif 2005 and 2006 and the experiment consisted of six different pulses and oilseeds viz., sesame, soybean, blackgram, horsegram, pigeonpea and niger. The plant height was comparatively higher (113.22 and 111.07 cm) in finger millet alone whereas lowest was recorded under finger millet + niger (92.63 and 90.48 cm). The maximum number of fingers (3.64 and 3.51), finger length (5.60 and 5.75 cm) and 1000 grain weight (6.35 and 6.37 g) were observed in sole finger millet, which was superior and at par with pigeonpea inter crop while lowest in finger millet+ niger cropping.

## Introduction

Finger millet (*Eleusine coracana* L. Gaertn) is one of the important rainfed as well as dry land crop, and is widely cultivated throughout country in dry tracks with fewer natural resources. Growing of only cereals is not so much remunerative in present scenario of agriculture to fulfill the diverse demand of consumers and rapid growing population. It is an urgent demand of incorporation the pulses and oilseeds in cereals production system. Intercropping of finger millet with different pulses and oilseeds have greater scope to utilize the land and other

resources to maximum extent. The productivity of the system can be enhanced by judicious selection of intercrop differing in duration and growth alone in many situations this is supported by Aravazhi *et al.*, (1997), Natarajan, (1992) and Sadashiv and Nemgouda, (2004).

## Materials and Methods

A field experiment was conducted under rainfed condition during Kharif 2005 and 2006 at SG College of Agriculture and

Research Station, Jagdalpur (C.G.). The experiment consisted of six different pulses and oilseed crop viz., sesame, soybean, blackgram, horsegram, pigeonpea and niger, besides finger millet as a sole crop (as control). The trial was laid out in a randomized block design with three replications and each gross plot of 6.0x5.0 m and net plot of 5.4x4.0m Finger millet cv. *Ratnagiri* was sown in four row after single row of intercrops which was sown simultaneously at 30 cm spacing. The varieties of intercrops were selection 5, JS 335, Pant U 4, BK 1, Asha and GA 10 for sesame, soybean, blackgram, horsegram, pigeonpea, and niger respectively fertilizer doses were calculated as base crop recommendation (50:20:20 kg NPK/ha) and nitrogen was applied in two splits as basal and 35 days after sowing while phosphorus and potash applied as basal. Cultural and plant protection measures were taken up as and when required. Observations were taken on five randomly selected plants in each plot in respect height, number of tillers/hill, number of fingers/hill, length of finger and 1000 grain weight. For economic analysis gross income, total operational cost net returns and B:C ratio was calculated.

## Results and Discussion

The growth of finger millet was found to be affected by the intercrops. The plant height was significantly lowered in all the intercrop treatments than the control (Table 1). The plant height was comparatively higher (113.22 and 111.07 cm) in finger millet and lowest was recorded when finger millet was intercropped with niger (92.63 and 90.48 cm) and at harvest. Similar results were also obtained by Kadalli *et al.*, (1989). The number of tillers/hill showed significant

difference due to the effect of treatments while the sole crop of finger millet recorded the highest number of tillers (2.37 and 2.12 in 2005 and 2006, respectively) was lowest in finger millet+niger (1.09 and 1.25) at harvest. Similar results were reported by Natrajan (1992) and Varghese *et al.* (1979). Number of fingers/ hill, finger length and 1000 grain weight differed significantly due to influence exerted by different treatments. The maximum number of fingers (3.64 and 3.51), finger length (5.60 and 5.75 cm) and 1000 grain weight (6.35 and 6.37 g) were observed in sole finger millet, which was superior and at par with pigeonpea inter crop while lowest in finger millet+niger cropping.

LER was recorded highest (1.66 and 5.69) when finger millet was intercropped with sesame in 4:1 ratio in both years (2005 and 2006) which was higher than sole crop of finger millet followed by intercropping black gram and horse gram in similar proportion. Whereas, ATER in 2005 and 2006 was found superior in finger millet + soybean (4:1) having value of 2.03 and 2.01 respectively, and intercropping with pigeon pea was just after the soybean because the coverage of the crops over land area is more due to larger leaf surface. In both, LER and ATER were found lower in sole crop of finger millet. Considering the economics of intercropping on finger millet with pigeon pea combination was found to be the best in obtaining highest net returns of Rs. 36444 and Rs 21384/ha in respective years. Further economics of different finger millet system was analyzed taking into account the prices prevailed to local market. The various returns obtained from different intercropping system was due to prevailing prices and relative advantage offered by crops like legumes which by

**Table.1** Plant height, no of tillers/hill, no of fingers/hills finger length and 1000 grain weight influenced by different inter cropping

Treatments	Plant height (CM)		No. of tillers/ hills		No of fingers/ hill		Finger length (CM)		1000 grain weight (g)	
	2005	2006	2005	2006	2005	2006	2005	2006	2005	2006
Finger millet	113.22	111.07	2.37	2.12	3.64	3.51	5.60	5.75	6.35	6.37
FM+ Sesame (4:1)	107.37	105.22	1.21	1.55	2.07	2.23	3.34	3.49	4.69	4.71
FM+ Soybean (4:1)	111.22	109.07	1.48	1.54	2.79	2.66	3.62	3.77	5.21	5.23
FM+ Blackgram (4:1)	97.40	95.25	1.93	2.02	2.56	2.43	3.94	4.09	5.48	5.50
FM+ Horse gram (4:1)	97.98	95.83	1.50	1.38	2.49	2.36	3.78	3.93	5.20	5.22
FM+ Pigeon pea (4:1)	101.17	99.02	1.45	1.35	3.24	3.11	4.76	4.95	5.73	5.75
FM+ NIger (4:1)	92.63	90.48	1.09	1.25	2.02	1.89	2.95	3.10	5.08	5.10
CD at 5%	14.23	10.25	0.45	0.15	0.42	0.45	0.95	0.81	0.85	0.74

**Table.2** Yield of finger millet and intercrops LER, ATER, Total biomass, Net returns and B:C ratio influenced by different intercropping system.

Treatments	LER		ATER		Total Biomass (q/ha)		NET returns (Rs)		B:C ratio	
	2005	2006	2005	2006	2005	2006	2005	2006	2005	2006
Finger millet (sole)	1.00	1.00	1.00	1.00	-	-	-	-	-	-
FM+ Sesame (4:1)	1.47 (1.66)	2.49 (5.69)	1.52 (1.80)	1.90 (3.11)	17.73	18.89	6017	8922	2.23	2.83
FM+ Soybean (4:1)	1.33 (1.26)	1.39 (1.43)	2.03 (3.62)	2.01 (3.54)	20.22	21.62	17819	9410	3.97	4.58
FM+ Blackgram (4:1)	1.41 (1.50)	1.41 (1.49)	1.37 (1.38)	1.37 (1.39)	19.74	21.58	13214	20680	3.41	2.40
FM+ Horse gram (4:1)	1.40 (1.47)	1.61 (2.10)	1.63 (2.16)	1.56 (1.94)	18.56	22.77	4302	14835	1.86	3.99
FM+ Pigeon pea (4:1)	1.38 (1.41)	1.20 (0.94)	1.82 (2.81)	1.85 (2.93)	20.57	17.64	36444	21384	6.43	4.79
FM+ Niger (4:1)	1.23 (1.02)	1.23 (1.01)	1.62 (2.13)	1.78 (2.68)	7.64	12.76	-120	870	0.97	1.19
CD at 5%	0.04	NS	0.45	0.08	1.56	2.25	-	-	-	-

\*Figures in parenthesis denote original values.

virtue of its contribution to soil might have been advantages for growth and development of finger millet. Hence, it is concluded that instead of sole finger millet under limited land resources, any one of intercropping except niger can be more profitable. The finger millet with intercropping recorded the best yield as compared to the sole in terms of monetary returns. The highest (20.57 and 17.64 q/ha) yield was recorded in finger millet + pigeon pea intercropping, followed by horse gram and black gram and minimum was in finger millet + niger intercropping.

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