

Mixed Cropping of Water melon, Pearlmillet and Sorghum in the North West Gujarat

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Mixed cropping has been an important characteristic of traditional farming systems. More than 50% of the area under rainfed crops is put under some kind of mixed cropping in semi-arid tropics (Jodha 1979) as it provides an insurance mechanism against adverse environmental conditions in agroclimatically unstable regions. In the North-West agroclimatic zone of Gujarat, water melon (*Citrullus lanatus*) an arid crop thrives on residual moisture after harvesting of kharif crops and used as feed and food. Therefore, studies have been made to find out economics of growing water melon with pearlmillet and sorghum crops as mix cropping.

The field experiments in RBD were conducted at Agricultural Research Station, Bhachau, GAU during kharif seasons of 1984 to 1988. The crops were successfully harvested during 1984, 1985 and 1988. The soil was sandy loam, alkaline (pH 1:2.5, 7.7) medium in available N (0.0.0.19 %) and P (41 P₂O₅ ha⁻¹) and high in available K (255 Kg K₂O ha⁻¹). Pearlmillet Cv. BJ 104/GHB 27, Sorghum Cv. Gundari (local) for fodder purpose and water melon (*Citrullus lanatus*) were sown @ 3.75, 25 kg ha⁻¹ and two seeds per dibbles as per treatment (Table 1), respectively and replicated four times. Six tons FYM, 25 kg N and 12.5 kg P₂O₅ ha⁻¹ were

Table 1 Yield of sole and mixed crops (kg ha⁻¹)

Treatments	Produce	Kharif			Average
		1984	1985	1988	
T ₁ Water Melon alone (spacing at 1.8×0.5 m)	Water melon	643	212	345	400
T ₂ Pearlmillet alone (45 cm apart)	Pearlmillet - Grain	242	383	1819	815
	- Fodder	2119	1493	4445	2686
T ₃ Sorghum alone (45 cm apart)	Sorghum - Fodder	2240	2327	6111	3559
T ₄ One row of pearlmillet + water melon, after 2 rows of pearlmillet	Pearlmillet - Grain	302	263	1395	653
	- Fodder	2094	937	2847	1959
	water melon - Seed	407	158	287	284
T ₅ One row of pearlmillet + water melon, after 3 rows of pearlmillet	Pearlmillet - Grain	340	433	1537	770
	- Fodder	1987	1285	3403	2225
	water melon - Seed	393	91	208	231
T ₆ One row of pearlmillet + Water melon, after 4 rows of pearlmillet	Pearlmillet - Grain	224	415	1485	708
	- Fodder	2484	1736	3681	2634
	water melon - Seed	298	67	144	170
T ₇ One row of pearlmillet + water melon, after 2 rows of Sorghum	Sorghum - Fodder	1563	1493	5486	2847
	Water melon - Seed	741	146	247	378
T ₈ One row of pearlmillet + water melon, after 3 rows of Sorghum	Sorghum - Fodder	1615	1736	5208	2853
	water melon - Seed	567	155	344	355
T ₉ One row of pearlmillet + water melon, after 4 rows of Sorghum	Sorghum - Fodder	2135	2050	5417	3201
	water melon - Seed	603	157	253	338

Table 2 Incremental cost benefit ratio (ICBR) values for mixed crop on net realization basis

Treatments	Net realization (Rs ha ⁻¹)	Additional net realization (Rs ha ⁻¹) mixed crops	Total cost of cultivation (Rs ha ⁻¹)	Additional cost (Rs ha ⁻¹)	Gross ICBR	Net ICBR
T ₁	271	—	1044	—	—	—
T ₂	1165	—	1384	—	—	—
T ₃	920	—	1346	—	—	—
T ₄	1174	9	1712	328	1:0.03	—
T ₅	1421	256	1654	270	1:0.95	—
T ₆	1319	154	1600	216	1:0.71	—
T ₇	1185	265	1727	381	1:0.70	—
T ₈	1200	280	1745	399	1:0.70	—
T ₉	1461	541	1677	331	1:1.63	1:0

applied in all the plots. Fertilizer was not applied to the sole crop of water melon.

Water melon as mixed crop decreased the yield of pearl millet and sorghum in all the treatments and years. However, maximum average seed yield of water melon was obtained from sorghum + water melon mixed crops than that under the pearl millet + water melon mixed crops (Table 1).

The maximum net realization (Rs 1461 ha⁻¹) was obtained in treatment, one row of sorghum + water melon after four rows of sorghum crop (T₉) and the minimum net realization (Rs 1165 and 920 ha⁻¹) were obtained from sole crop of pearl millet (T₂) and sorghum (T₃), respectively (Table 2). The findings corroborate with Rao and Willey (1980). Mixed cropping of water melon with sorghum and pearl millet is comparatively more profitable than either of the sole crops. This is because water melon being a cover crop forms a discrete canopy than the

erect growing pearl millet and peaks up growth in the later season whereby utilises the antecedent moisture. Between the mixed crop of water melon with pearl millet and sorghum, the latter is more profitable because of the output of water melon is more with sorghum crop.

One row of sorghum + water melon after four rows of sorghum crop (T₉) was found highly remunerative than any other of the treatment based on the maximum net realisation and net incremental cost benefit ratio (ICBR) values (Table 2).

References

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(Received June 1990

Accepted June 1992)