

Studies on Multiple Cropping Systems in Gardenland

SP. PALANIAPPAN¹, D.R. THIRUNAVUKKARASU² and E. SUBBIAH³

The results of three years experiment on cropping systems in garden land revealed that the system, cotton-sorghum-Ragi, gave the maximum net income, highest net return per rupee invested and greater employment opportunities in garden land with assured water supply under Coimbatore conditions. Sorghum - fodder maize - cotton system may be adopted in places where fodder requirement is high and water supply is limited.

Multiple cropping, an intensive land use programme with more than two crops a year, is a relay race without any pause. It is the only method for increasing food production in our country and means of absorbing the additional man power to solve rural unemployment. The most important natural resources, adequate solar energy and favourable weather conditions throughout the year, which our country is endowed with, can be fully exploited for multiple cropping systems and rural income can be enhanced.

Bains *et al.* (1972) reported that Maize-Potato—Wheat—Moong rotation gave the highest per day grain and protein production of 38.5 and 6.69 kg/ha respectively. Randhawa (1970) observed that Cabbage+Raddish—Tomato+Onion—Cauliflower+Spinach gave an annual net return of Rs. 12710/ha. With a view to develop a profitable multiple cropping system under gardenland conditions of Coimbatore tract, this study was undertaken.

MATERIALS AND METHODS

Cropping systems studied at Tamil Nadu Agricultural University, Coimbatore in the experiment are given in Table I. The experiment was laid out for a period of three years (1973-76) in a compact block of 1000 m² with the plot size of 25 x 40 m for each system. The soil was of a clay loam type with pH 7.8 and E.C. of 0.4 m.mohs/cm. The fertility level was medium with regard to available N and P, and high with regard to available K. The management practices including fertilizer application for each crop in the systems were followed as per the package of practices recommended by the Tamil Nadu Agricultural University. No organic manures were applied. Total income was worked out based on the prevailing market price of the produce for each system. One woman was taken as 0.6 man day for the purpose of calculating man days per year under employment potential. The results obtained in the study are discussed below.

1-3. Department of Agronomy, Tamil Nadu Agricultural University, Coimbatore - 641003.

TABLE I. Details of cropping systems adopted

System	Crop	Variety	Season	Field duration in days	Total field duration (days)
I	Cotton	MCU.5	August - February	167	299
	Bhendi	Pusa Savani*	August - October	60	
	Cotton	MCU.7	February - July	132	
II	Maize	Ganga-5	August - November	100	324
	Wheat	Kalyansona	November - February	92	
	Cotton	MCU.7	February - July	132	
III	Sorghum	CSH.5	August - November	105	292
	Fodder-maize	Local	November - January	55	
	Cotton	MCU.7	February - July	132	
IV	Cotton	MCU.5	August - February	167	347
	Sorghum	CSH.5	February - May	102	
	Ragi	CO.10	June - August	75	

* Bhendi raised as intercrop in cotton.

RESULTS AND DISCUSSION

It can be seen from Table II that the system IV (Cotton-Sorghum-Ragi) was in the field for 374 days and thus, occupied the land for a major period of time leaving only a small gap for preparing the field. This system also has given the maximum net income of Rs. 7096/ha/year and the net return per rupee invested was Rs. 2.15. In sequence IV (Cotton-Sorghum-Ragi) gramaxone at 2 lit/ha was sprayed as a defoliant on cotton before the last picking and all the remaining kapas in the plants started bursting uniformly after the defoliation. Hence the harvesting and pulling out of cotton plants were completed 10 days in advance. After the harvest of sorghum, the field was

prepared and 20 days old ragi seedlings, already raised in nursery, were transplanted in the field. Again, gramaxone at 2 lit/ha was sprayed for drying ragi stubbles after harvesting ragi. Cotton was sown in ragi stubbles without any preparatory cultivation and this saved both expenditure and about a week's time on preparatory cultivation for cotton. (In the case of first system (Cotton+Bhendi-Cotton) the field was left fallow for 66 days and the land was not effectively used. Also, there was a progressive decrease in the yield of cotton in course of time. This could be attributed to the fact that cotton followed cotton and the area of nutrient foraging by the crop was the same. This would have resulted in poor uptake of nutrients. Also, there would have been

TABLE II. Yield and Economics of Cropping Systems Adopted (Mean of three years)

	System I	System II	System III	System IV
Yield of I Crop (kg/ha)	1277 (Kapas)	2960	4130	1493 (Kapas)
Yield of II Crop (kg/ha)	915 (Vegetable)	1230	19000 (Fodder)	3526
Yield of III Crop (kg/ha)	1354	1483 (Kapas)	1510 (Kapas)	3300
Total duration in days	299	324	292	347
Total yield in (kg/ha)	3546	5673	24640 (incl fodder)	8319
Per day production (kg/ha)	8.8 (Kapas)	18.2 (grain) +4.6 (Kapas)	14.14 (grain) +5.16 (Kapas)	4.3 (Kapas) +19.7 (grain)
Total income (Rs./ha)	11483	11413	11441	13266
Total expenditure (Rs./ha)	6075	6375	5837	6170
Net income (Rs./ha)	5408	5038	5604	7096
Income/rupee invested	1.89	1.79	1.96	2.15
Employment potential				
Man days/Year	311	289	258	311
Pair days/Year	50	55	29	61

some build up of pests and diseases since the host crop remained in the field more or less continuously. The trend was almost similar in the case of II and III systems.) The second highest net return of Rs. 5604/ha was obtained in the III system (Sorghum-fodder maize-cotton) with a net return of Rs. 1.96 per rupee invested. In the case of maize-cotton system, the net income was only Rs. 5038/ha/year.

These cropping systems provide more employment opportunities throughout the year by absorbing additional man power. As indicated in Table II the sequences I and IV provide greater employment opportunities. Though the quantum of labour employed in both

the systems was about the same, system IV gave employment opportunities spread over a period of 350 days as against 299 days in system I. Thus, system IV would keep the farmer and his family engaged and provide additional employment for rural labour throughout the year and thereby pave the way for augmenting their income.

REFERENCES

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