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Studies on integrated organic farming system for small and marginal farmers of Kalyana-Karnataka region under Dryland condition

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Abstract

A field experiment was conducted on performance of integrated organic farming system over conventional farmers practice system for one hectare area at Organic Farming Research Institute farm, UAS, Raichur, Karnataka for six successive years of 2014-15 to 2020-21 under rainfed conditions in deep black soils to explore the productivity and profitability under rainfed condition. Among the system evaluated integrated farming system has recorded higher average net returns (Rs. 79,923) and benefit cost ratio (3.30) with net monthly income (Rs. 6,660) over the conventional method. The productivity and profitability under the practice of integrated organic farming system records higher net, gross return with lesser cost of cultivation when compared to conventional farmers practice.

Keywords: Integrated, organic, system, Kalyana-Karnataka, dryland condition

Introduction

In the present scenario the demand and supply for food has changed due to higher population and the shift of people in the cropping pattern. The per capita availability of land is decreasing day by day because of increasing the population. So, in order to meet out the requirement of demand we need to produce more quantity by maintaining the quality. By adopting the integrated organic farming system requiring lesser space, time and recycling of farm wastes as which ensures higher productivity of the system is the option which left out for us. The practice of cash return farming will improve the economic condition of the farmers. Integrated Farming Systems (IFS) is a set of interrelated agro-economic activities where the components interact in a particular agrarian setting. The main thrust is to minimize risks and increase profitability and quality of the produce. Around 90-95 percent of nutritional requirements are self-supplied through resource recycling, which curtails the cost of cultivation and increases profit margins and employment. This system includes dairy, poultry, goat rearing and fruit trees with dominant cropping systems in order to judicious use of inputs and natural resources to provide the regular income and employment to small and marginal farmers.

In Kalyan Karnataka region, majority of the farmers holds less than 2 hectare of land, these farmers generally practice conventional farming by adopting mono cropping of Redgram, where they need to produce continuous reliable and balanced supply of food as well as cash for basic needs and recurrent farm expenditure. So, there is need to develop suitable integrated farming system for farmers to avoid the crop loss, and to generate employment generation. Integrated organic farming system lead the way to increase the production of the small farmers. Multi enterprise farming has the chance to decrease the production cost by synergetic recycling of product of various components to provide the income and employment. Keeping the view, an experiment was conducted at Organic Farming Research Institute, UAS, Raichur to study the comparison between the conventional crop alone system and integrated organic farming system under rainfed situation.

Materials and Methods

Field Experiments were conducted at Organic Farming Research Institute experimental research block, UAS, Raichur during 2014-15- to 2020-21 to study the productivity and profitability of Integrated Organic Farming System and conventional system (crop alone). The Organic Farming Research Institute, UAS, Raichur, is situated in North-Eastern Dry Zone (Zone-2) of Karnataka state with an altitude of 300-460 meters above the mean sea level. The soil was deep black with a pH of 8.32.

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The average available N, P and K were 60.2, 25.4 and 141.5 kg ha⁻¹, respectively. The experiment consists of growing of field crops for one hectare (conventional method) and integrated organic farming system (IOFS) with different components. The IOFS model consisting of one hectare land holding with the components *viz.*, Crop and Cropping sequence (9000 m²), Livestock (300 m²), Farm pond (300 m²), Composting unit, storage (250 m²) and Farmhouse (150 m²) as represented in Fig.1. In the experimental site all along the border planting of Anjan grass on the bunds and creeping vegetables on the fence were planted. Between the segments with improved varieties of Drumstick, Curry leaf, Gauva, Custard apple, Sesbania, Jamun and fodder crops were planted. On the border of land we have planted Glyricidia a rich source of nutrient as green leaf manure.

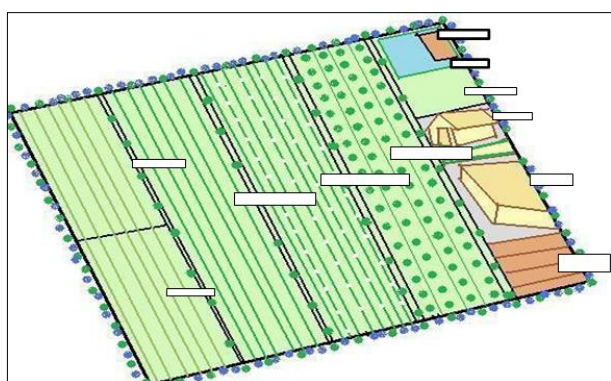


Fig 1: IOFS model for north eastern dry zone of Karnataka under rainfed eco-system (1.0 ha block)

Results and Discussion

The establishment of IFS model was initiated in the year 2010-11 in 1.0 ha area under rainfed condition with conventional system. The conversion of the IFS under organic was started in 2014-15. Productivity and profitability of IOFS (Integrated Organic Farming System) has been studied for the last six years and is compared with base crop as Redgram and this technology was included in UAS, Raichur organic package of practice.

The pooled data indicated that the net profit (Rs.79,923/ha) and B:C ratio (3.33) from the IOFS system was recorded higher than conventional (crop alone) system of net profit (Rs.34,481 /ha) and B:C ratio (3.02). The net monthly income per month (Rs. 6,660) was recorded higher as against conventional system (Rs. 2,873). The maximum contribution towards net returns (30.0%) was seen with Live Stock component followed by crop component (18.00%) (Table 1). Similar results were reported by Ugwumba *et al.* (2010) [5], Singh *et al.* (2009) [4] and Ortega *et al.* (2009) [2]. Higher net income generated during third year compared to first and second year due to proper recycling of farm resources each other through use of vermicompost and FYM contributed to good returns. These results are in accordance with Channabasavanna *et al.* (2009) [1] he stated that IFS approach recorded 26.3 and 32.3 per cent higher productivity and profitability respectively over conventional system in rice ecosystem. The results indicated IFS become more profitable during perennial years compared to single year. Among enterprises studied animal components recorded higher net income than crop and cropping sequences.

Table 1: Comparative performance of crop alone and integrated farming system under organic condition in Rainfed ecosystem

Economic Parameters	Conventional	IOFS							Pooled
	Crop alone (Redgram)	1 st year (2014-15)	2 nd year (2015-16)	3 rd year (2016-17)	4 th year (2017-18)	5 th year (2018-19)	6 th year (2019-20)	7 th year (2020-21)	
Total income (Rs. ha ⁻¹)	51550	92563	123854	126426	109221	120475	117840	108785	114166
Total Expenditure (Rs. ha ⁻¹)	17069	31500	36155	35750	31850	33500	30850	40100	34244
Net profit (Rs. ha ⁻¹)	34481	63313	87699	90676	77371	86975	86990	68685	79923
B:C ratio	3.02	2.94	3.42	3.54	3.43	3.60	3.81	2.71	3.33
Net income/month (Rs. ha ⁻¹)	2873	5276	7308	7556	6448	7248	6378	5724	6660

Conclusion

It is clear from the above results that IOFS method for rainfed situations enhances productivity, profitability and nutritional security of the farmers and sustains soil productivity through recycling of organic sources of nutrients from the enterprises involved. In this system, animals are reared on agricultural waste and animal power is used for agricultural operation. The most notable advantage of utilizing low-cost/no-cost material at the farm level for recycling is that it will certainly reduce the production cost and ultimately improve the farm income considerably.

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