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Comparison of cow and sheep integrated farming system under coconut

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Abstract

Coconut based Integrated Cropping System (IFS) involving cow and sheep were conducted separately at Horticulture Research and Extension centre, Arsikere. The results obtained were compared to assess the best model which gives maximum net return. IFS (cow) model recorded the highest average nut yield per palm per year (100.82) whereas IFS (sheep) model recorded the lowest average nut yield per palm per year (88.93). Economic comparison of both the model revealed that IFS (Cow) has produced the maximum average gross return of Rs. 3,21,513/ Unit and highest average net return of Rs. 2,28,595/ Unit with benefit cost ratio of 3.96. Compared to IFS (sheep) which has recorded minimum average gross return of Rs. 1,44,006/Unit and lowest average net return of Rs. 1,08,488/Unit with benefit cost ratio of 4.00. Hence it is concluded that coconut based Integrated Cropping System involving cow is more economical and sustainable.

Keywords: Coconut, integrated cropping system (IFS), benefit: cost ratio

Introduction

Coconut has the status of a plantation crop worldwide. India stands third in coconut production with better productivity of nuts per hectare (kalidas *et al.*, 2014) ^[5]. In India states like Kerala, Tamil Nadu and Karnataka have secured a top position by holding over two-third of the production in the country. Marginal and small farmers started to adopt alternative farming system which integrates agriculture and subsidiary enterprises to make farming more profitable and sustainable (Ramrao *et al.* 2005; Radha *et al.* 2000) ^[8, 7]. The Integrated farming System is currently recognized as the most viable strategy in enhancing agricultural production and farm income. Optimum utilization of farm resources and on-farm generation of organic manures to minimise chemical fertilizers and generation of employment opportunities around the year are the other major benefits of the Integrated Farming System. Integrated Farming System can enhance the yield from the unit area and bring about a considerable hike in farm income. With this broad objective the investigation was under taken to compare the performance two Integrated Farming System (cow and sheep) models, so that farmers can choose between the models to maximize their production and profitability.

Materials and Methods

Coconut-livestock (cow and sheep) based Integrated Farming System was conducted at Horticulture Research and Extension Centre, Arsikere during 2013 to 2021 and 2014 to 2021 respectively. In old coconut garden (Arsikere Tall) in an area of 0.40 ha with the different set of treatments. The recommended package of practice was adopted for application of manure and fertilizers and all the required inorganic and organic manures were applied in two equal split during May-June and September-October months. The produces were harvested as and when ready and the mean was calculated. Five cows (HF-Holstein Friesian) are used for the milching purpose and twenty sheep's are allowed to graze on fodder crops. The cost of labour, fertilizer, crop and livestock maintenance, plant protection measures and other miscellaneous overhead charges were treated as input cost of respective year. The returns (output) were computed in terms of rupees by combining the weighted average yield of different years under consideration with weighed average market prices prevailed during respective years. Coconut lots auction happens four times a year and individual nut price will be calculated by dividing the auctioned lot price by number of nuts per lot. Results of both IFS (cow and sheep) models are than compared to know the performance and efficacy.

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Results and Discussions

Yield comparison between Integrated Farming System of cow and sheep model presented in Table 1. With respect to average number of leaves on the crown IFS (cow) has recorded marginally more number of leaves on the crown (30.53) whereas, the IFS (sheep) recorded marginally less number of leaves on the crown (30.44). Marginal increase was recorded in average number of bunches per palm per year (12.53) in IFS (sheep) than (12.51) IFS (cow). With respect to average number of buttons per palm per year IFS (cow) recorded the highest number of buttons per palm per year (241.10) whereas, the lowest number of buttons (216.08) per palm per year was recorded in IFS (sheep). Regarding observations recorded with respect to average nut yield per palm per year highest nut yield (100.82) was recorded in IFS (cow) and the lowest nut yield per palm per year was recorded (88.93) in IFS (sheep). Highest Average copra content (148) gram per nut and copra yield (15.04) kilogram per palm was in IFS (cow) and the lowest Average copra content (130.93) gram per nut and copra yield (13.09) kilogram per palm was recorded in IFS (sheep). With respect to average oil content marginally high oil content (67.46) percent was recorded in IFS (sheep) whereas lowest oil content (67.00) h was recorded in IFS (cow). Average oil yield kilogram per palm (10.03) was recorded highest in IFS (cow) and the lowest oil yield kilogram per palm (9.06) was recorded in IFS (sheep). It is evident from the data that, overall yield parameters of both the Integrated Farming System model did not differ significantly. Marginal Increase in the coconut yield may be

attributed to application of inorganic fertilizers combined with organic manure. Similar findings are been reported by many workers (Palaniswami *et al.*, 2007; Upahdyay *et al.*, 2009; Krishnakumar and Mhaeswarappa, 2010; Mhaeswarappa *et al.*, 2011)^[1, 2, 3, 4].

Economics

The economics of both the IFS (cow and sheep) model were analyzed in the terms of average cost of production, gross return, net return and benefit cost ratio and presented in Table 2.

The highest average cost of production Rs. 95,963/ Unit was recorded in IFS (cow) and the lowest average cost of production Rs. 35,518/ Unit was recorded in IFS (sheep). The maximum average gross return obtained in IFS (cow) is Rs. 3,21,513/ Unit. Whereas minimum average gross return of Rs. 1,44,005/ Unit was obtained in IFS (sheep). With respect to average net return IFS (cow) recorded highest net return of Rs. 2,28,595/ Unit in comparison with IFS (sheep) which has recorded lowest average net return of Rs. 1,08,488/ Unit. Benefit cost ratio was also calculated for both the models where IFS (sheep) recorded highest of 4.00 whereas IFS (cow) recorded the lowest of 3.69. Even though marginal difference was noticed with respect to benefit cost ratio of both the models but the efficacy of the model entirely depends on the actual net returns received by the model. Similar findings were also reported by many studies (Swarnam *et al.*, 2016)^[6].

Table 1: Yield comparison between Integrated Farming System of cow and sheep under coconut

Parameters	IFS (Cow)									
	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	Average
No. leaves on the crown	31.10	30.10	30.40	31.10	30.00	30.20	30.40	30.50	31.00	30.53
No. bunches / palm/ year	12.10	125.00	12.00	12.50	12.50	12.60	12.70	12.70	13.50	12.51
No. buttons / palm / year	236.70	229.20	230.20	235.50	238.40	245.20	248.90	250.80	255.00	241.10
Nut yield/palm/ year	101.80	94.70	95.20	98.00	97.50	102.22	100.80	108.20	109.00	100.82
Copra content (gm/nut)	146.30	146.11	146.20	148.00	149.00	150.20	150.60	150.90	150.80	148.67
Copra yield/ palm (kg)	14.89	14.31	13.91	14.50	14.52	15.35	15.18	16.32	16.43	15.04
Oil content (%)	65.80	66.44	66.50	67.30	67.00	67.50	67.50	67.50	67.50	67.00
Oil yield/ palm (Kg)	9.80	9.50	9.25	9.61	9.55	10.26	10.26	11.01	11.09	10.03
Parameters	IFS (Sheep)									
No. leaves on the crown	-	29.70	29.90	30.00	29.90	30.50	31.00	31.00	31.50	30.44
No. bunches / palm/ year	-	12.20	12.20	12.30	12.20	12.50	12.90	12.90	13.00	12.53
No. buttons / palm/ year	-	207.50	210.50	205.80	208.60	214.80	225.30	225.30	230.80	216.08
Nut yield/ palm/ year	-	85.70	86.30	88.50	88.60	88.20	89.40	89.40	95.30	88.93
Copra content (gm/nut)	-	146.20	147.20	145.50	14.80	144.20	149.60	149.60	150.30	130.93
Copra yield/ palm (kg)	-	12.53	12.70	12.87	12.82	12.70	13.37	13.37	14.32	13.09
Oil content (%)	-	66.90	67.00	67.90	67.60	67.50	67.60	67.60	67.60	67.46
Oil yield/ palm (Kg)	-	8.40	8.50	9.61	9.64	8.57	9.03	9.03	9.68	9.06

Table 2: Comparison of economics between Integrated Farming System of cow and sheep under coconut

	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	Average
IFS (cow)										
Cost of production (Rs)	132200	116800	121300	126100	71700	71000	76500	76800	71263	95963
Gross Returns (Rs)	217520	242628	250473	393680	320751	358510	373196	400108	336753	321513
Net returns (Rs)	85320	125828	129173	267580	276451	287510	296696	323308	265490	228595
B.C Ratio	1.65	2.08	2.06	3.12	4.47	5.05	4.88	5.21	4.73	3.69
IFS (sheep)										
Cost of production (Rs)	-	34700	30500	36200	30440	37000	34300	37000	44000	35518
Gross Returns (Rs)	-	86886	97624	136520	147710	159420	117444	163034	243403	144005
Net returns (Rs)	-	52186	67124	100320	117270	122420	83144	126034	199403	108488
B.C Ratio	-	2.50	3.20	3.77	4.85	4.31	3.42	4.41	5.53	4.00

Conclusion

The comparison of both the IFS (cow and sheep) models revealed that the IFS (cow) model is more remunerative since it provides highest net return (Rs. 2,28,595/ Unit) than the IFS (sheep) model (Rs. 1,08,488/ Unit). But cost of production (Rs. 95,963/ Unit) is also high when compared to IFS (sheep) model (Rs. 35,518/ Unit).

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