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INTEGRATION OF CATTLE AND IMPROVED PASTURES UNDER COCONUTS IN SOUTHERN LUZON, PHILIPPINES

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Abstract

Results of two studies involving 1) grazing of Signalgrass (*Brachiaria decumbens*) pastures at different stocking and 2) cut-and-carry forages in smallholder farms for cattle under coconuts are presented. Grazing at 3 AU/ha and 2 AU/ha gave significantly higher LWG/ha ($P < 0.05$) over 1 AU/ha but highest financial return was obtained from 2 AU/ha. Productivity of cattle on cut-and-carry forages in small farms varies among farmers with better animal performance directly related to quantity and quality of feeds offered and industriousness of individual farmers. Both studies showed the benefits derived from integration of cattle with improved pastures under coconuts.

Keywords: Coconut, pasture, cattle, integration

Introduction

Coconut plays an important role in Philippine economy. The coconut industry earns an average of \$700 M export trade and contributes about 4% to the country's total merchandise export receipts. It is the top export earner on net basis considering that it is hundred percent local

product, unlike garments and electronic products which have large foreign components, wherein labor is the local component (Agustin 1996).

Coconut occupies 3.2×10^6 ha of the country's 30×10^6 ha and areas under coconuts are considered as one of the major land resources for the expansion of the livestock industry. While most of the coconut areas are covered by natural vegetation, there is considerable scope for pasture improvement to enable farmers to raise more animals and earn more income per unit of land.

In the sixties and the seventies, Guineagrass (*Panicum maximum*) and Paragrass (*Brachiaria mutica*) are the most common species grown under coconuts in the Philippines. However, there has been complaints from nut pickers and gatherers that when Guineagrass is allowed to grow tall they have difficulty looking for and picking the nuts, and they suffer from skin irritation and wounds from the hairs and sharp blades of the grass (Moog and Faylon 1990). Recent agronomic and palatability trials showed that Signalgrass and Humidicola exhibited high yield and good acceptability to cattle. In addition both species also showed higher DM yield in the dry season over Guineagrass and Paragrass. Napier was not popular in large coconut plantations for grazing, however it seems to be manageable in small farms where small patches are planted for cut-and-carry system. With majority of the coconut growers being small holders with an average farm size of 2.68 ha, most of them cannot survive on income derived from coconut alone (PCA 1988). Integrating livestock can augment their income from coconuts.

Material and Methods

This paper presents the results of two studies on grazing of Signalgrass pastures and on cut-and-carry forages in smallholder farms under coconuts conducted in Ligao

Farm Systems Development, Incorporated and in Baligang village, respectively, both in the province of Albay, Philippines.

Grazing trial on Signalgrass - Eleven hectares of land with established coconuts was cultivated and planted to Signalgrass. The area was divided into two blocks of 3 paddocks for the study of 3 stocking rates of 1, 2, and 3 animal units (AU) per ha. The paddocks carried equal cattle number, though having different areas. Grazing commenced one year after pasture establishment. Each paddock was divided into 4 sections and rotationally grazed observing a grazing period of 10 days and 30 days rest period. Cattle were weighed at monthly interval.

Cut-and-carry forages in smallholder farms - Six farms were selected in village Baligang, Camalig, Albay. Farmers meeting, seminars and study tour to Ligao Farms were conducted. Responsibilities of farmers of establishing pasture were emphasized while planting materials and technical assistance were provided. The choice of forage species to plant was left to the farmers themselves. All of the 6 farmers planted Napier (*Pennisetum purpureum*) but three of them also planted Signalgrass and Humidicola (*B. humidicola*) along with Napier mixed with Centrosema (*Centrosema pubescens*). Pastures were established as early as 18 months before forages were regularly harvested. Eleven Brahman cross cattle (5 steers and 6 heifers) were distributed at random, except for one received a steer and a heifer as loan. Five of the farms utilized their pastures on cut-and-carry system only, while one combined it with occasional grazing.

Results and Discussion

Cattle liveweight gains on Signalgrass at different stocking rates - Table 1 shows the liveweight gains of cattle on Signalgrass pastures under coconuts at different stocking rates. Results showed that total liveweight gain (LWG) per hectare was highest at 3 AU/ha with 390 kg followed by 2 AU/ha and 1 AU/ha with 316.2 and 179.5 kg, respectively. The difference in

LWG/ha between 2 AU/ha and 3 AU/ was not significant but that of 1 AU/ha was significantly lower compared to 2 AU/ha and 3 AU/ha (P 0.05) . However, in terms of financial return, the best stocking rate was 2 AU//ha. After deducting the costs of pasture establishment and maintenance of both pasture and cattle from the value of liveweight gains, it is estimated that an additional anual income of 8,500 pesos (US\$1 = 41 pesos) can be earned from 2 AU/ha compared to 4,500 pesos 1 AU/ha. At 3 AU/ha, 8,800 pesos can be earned but will require higher additional investment compared to 2 AU/ha. It was also observed that there were no reduction in yields of coconuts from any treatment.

With the results of the study the management of Ligao Farm expanded the area planted to Signalgrass, but lately has preference for Humidicola. In addition, the farm has set up and maintains a 3.5 ha demonstration area with Signalgrass which is grazed continuously at 2 AU/ha. The demonstration area is strategically located along the highway, and its prominence readily draws attention and generates interest among farmers. The demonstration area also provides the opportunities to bring farmers from neighborhood to the farm and show them the value of raising cattle with improved pastures under coconuts.

Liveweight gains of and income from cattle in smallholder farms - Table 2 shows the liveweight gains of cattle and income derived from raising cattle in small farms on cut-and-carry forages. Liveweight gain production varies among farmers. Liveweight gains and average daily gains per head ranged from 22 kg to 142 kg and 0.06 kg to 0.38 kg, respectively. Liveweight performance of cattle was directly related to feeding regimes of farmers. Farms 1 and 5 had the best animal performance attributed to corn bran and tree legumes (*Leucaena* and *Gliricidia*) supplementations, respectively. Though Farmer 5 had the smallest landholding of 1.5 ha, his animals performed best because he made sure that they were fed enough grasses and were given supplemental feeds. Animals of farmer 6 did better because of fodder tree supplementation in the

dry season. These observations indicate that good animal performance depended both on the amount and quality of feeds offered by farmers which incidentally also reflects the industriousness of individual farmers.

The relative income contribution of cattle in integrated livestock-coconut system with 2 head of cattle ranged from 7 to 28 percent, depending on farm size. Total farm income is directly related to farm size, but with only 2 head of cattle per farm, the proportion of income derived from cattle was higher in smaller farms. However, larger farms have better opportunities to raise more cattle than smaller farms. Both studies

showed overwhelming evidence that raising cattle under coconuts increases the productivity of coconut areas per unit of land as well as providing additional income to farmers, more so with improved pastures.

Considering the 3.2 M ha of coconut land in the Philippines, if one half of the area is used for raising cattle, about 3.2 M head could be raised (at a stocking rate of 2 head per ha). Assuming an average daily gain of 0.4 kg/head, 467 thousand tons of annual liveweight production can be obtained which is equivalent to 233.5 thousand tons of beef with an estimated value of 8.5 billion pesos.

One of the constraints to the integration of livestock under coconuts is that most coconut plantation owners are absentees who visit their farms only during nut harvest, thus, the coconut industry has been termed a “lazy man’s business”, exaggeratedly. But since the productivity of many coconut plantations is declining rapidly due to old age of the plants, the integration of livestock with improved pastures should be encouraged as one of the alternatives to improve land productivity.

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Table 1 - Mean liveweight gains of cattle grazing on Signalgrass pastures at different stocking rates (December 1991 to May 18, 1993)

Variables	Stocking Rate (A.U./ha)		
	1.0	2.0	3.0
No. of Animals	6	6	6
Grazing days (#)	533	533	533
Initial weight (kg)	164.2	165.6	164.7
Final weight (kg)	343.7	323.7	294.7
Average daily gain (kg)	0.34	0.30	0.24
Liveweight gain/head (kg)	179.5	158.1	130.0
Liveweight gain/ha (kg)	179.5 a	316.2 b	390.0b
Liveweight gain/ha/yr (kg)	124	219	263

Figures followed by same letters are not significantly different ($P>0.05$).

Table 2 - Liveweight gains of and income derived from cattle in smallholder coconut farms in village Baligang, Albay, Philippines (December 6, 1996 to December 10, 1997)

Farm No.	Area (ha)	Animal No. & Sex	LWG (kg)	ADG (kg)	Net Income (weight)		Contribution from Cattle (%)
					From Cattle	From Cattle & Coconut	
1	3.2	1 (M)	142	0.38	12,675	64,271	20
		2(F)	72 ¹	0.31			
2	7.0	3 (M)	72	0.19	9,385	114,101	7
		4 (F)	77	0.20			
3	2.0	5 (M)	55	0.15	5,565	23,445	24
		6 (F)	22	0.06			
4	4.0	7 (F)	52	0.14	3,015	80,484	4
5	1.5	8 (M)	142	0.38	12,785	47,1152	28
		9 (F)	77 ²	0.33			
6	3.0	10 (M)	118	0.32	11,965	77,386	16
		11 (F)	81	0.22			

^{1/}Until July 31, 1997, animals bred July 01, 1997

^{2/}Until July 31, 1997, animals bred July 10, 1997