

The Potential and Prospects for Improving Forages under Rubber in Malaysia

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Abstract

Sheep integration with rubber has great potential in Malaysia. However, animal productivity and income potential from sheep rearing is unattractive under the current management system. There is a need for improved forages which are capable of increasing sheep productivity. There is also scope for altering the conventional rubber planting system to a hedgerow format which would allow greater light penetration, particularly in mature plantations. Much research is still needed before definite recommendations can be put forward.

THE integration of sheep with plantation crops is relatively new in Malaysia but progress during the last five years has been encouraging. The Rubber Research Institute of Malaysia (RRIM) first conducted research on sheep integration under rubber in 1975 and substantial basic information has been gathered since that time (Tajuddin and Chong 1988).

The main problems in raising sheep under rubber are the poor animal productivity achieved due to low forage productivity and our poor understanding of how best to utilise native forages. This paper highlights some of the problems and constraints currently faced and suggests some prospects for the introduction of improved forages under rubber in Malaysia.

Area under Rubber

Malaysia is the world's leader in the rubber industry in terms of area planted and rubber produced. The total area cultivated with rubber in 1988 was 1.86 million ha (Peninsular Malaysia, Sabah and Sarawak). Smallholdings, of which the majority are less than 2 ha, represent 76.6% of the area in Peninsular Malaysia (Table 1).

Sheep Population

The sheep population in Malaysia in 1965 was only 37 000 head. However, there has been a phenomenal increase in population particularly in the period from 1980 to 1989 in which the population has increased from 59 000 to 168 200 head (Table 2).

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Table 1. Area under rubber in Malaysia (1988).

Region	Area (ha)
Peninsular Malaysia	
Estates	367 300
Smallholdings	1 205 100
	1 572 400
Sabah and Sarawak	288 300
Total	860 700

Source: Ministry of Primary Industries (1990).

At present, sheep integration with plantations occurs mainly under rubber and oil palm. Various government agencies and private estates carry out commercial projects rearing from a few hundred to more than a thousand sheep per project. The total number of sheep reared by government agencies and private estates under plantations was 74 000 head or 44% of the total sheep population in 1989 (Table 3).

Grazing Saves Weeding Cost

The remarkable interest in rearing sheep under rubber and oil palm is due mainly to the fact that sheep are used as an agent of biological weed control. Sheep graze on the naturalised undergrowth thereby reducing the cost of weeding. Weeding costs under rubber can be reduced by sheep grazing by 18-36% (Tajuddin et al. 1990). This can be achieved because 60-70% of the weeds present under rubber are palatable to sheep (Wan Mohamad 1978).

Table 2. Sheep population in Malaysia.

Year	No.
1965	3 000
1980	59 000
1985	78 000
1986	90 359
1987	128 383
1988	148 159
1989	168 200

Source: Ani Arope (1988) and Department of Veterinary Services (1990).

Table 3. Sheep population under rubber and oil palm (1989).

Sector	No.
Government agencies:	
RISDA	12 000
FELCRA	12 000
FELDA	12 000
RRIM	2 500
DVS	10 500
LKPP	4 000
SEDC	8 000
Private estates:	
Guthrie	8 000
Other estates	5 000
Total	74 000

Mutton Demand and Importation

Mutton (sheep and goat meat) is a high-priced meat acceptable to Malaysian consumers. The total demand in 1988 was estimated at 6740 t. However, the country produced only about 500 t and the remainder (6240 t or 93%) was imported at a cost of 23 million ringgit (Ahmad Mustaffa 1988). There is a very good market for locally produced mutton.

Potential of Sheep Integration

The plantation areas under rubber have great potential to be used for rearing sheep. It is estimated that 20% of the area under rubber can be integrated with sheep provided there are adequate productive ewes available to be used as basic stock. At a stocking rate of 3 sheep/ha, the total number that can be reared is approximately 1.08 million head. With this population, it can be estimated that the total annual production of mutton would be around 12 960 t (assuming 1.2 effective annual lamb production, 25 kg/head and 40% dressing percentage).

This would meet the annual domestic demand for mutton and there may be some surplus for export.

Present Constraints in Forage Utilisation

Although the potential for sheep production is good, there are several constraints, the major being in the areas of forage productivity and utilisation.

Under immature rubber (3-5 years), the standing dry matter yield of forage was estimated at around 1200 kg/ha and the theoretical stocking rate (at six grazing rounds per year) was estimated at 13 sheep/ha. However, in subsequent years under mature rubber, the standing dry matter yield declined sharply to only about 520 kg/ha and the theoretical stocking (at four grazing rounds per year) dropped to only 3.7 sheep/ha (Chee et al., these Proceedings).

The above situation leads to difficulty in stocking rate planning. The potential income and gross profit on a long-term basis is also not very encouraging. In the case of smallholders owning 2 ha, the potential gross profit per smallholder from rearing sheep under mature rubber is very low, estimated at around 257 ringgit/year (at 3.7 sheep/ha x 2 ha x 1.2 effective annual lamb production x 29 ringgit profit per lamb).

Thus there is a great need to increase the productivity of forages under mature rubber in order to increase the potential income of smallholders from sheep-rearing. An increase in forage supply means an increase in stocking rate and therefore an increase in the total number of sheep that can be reared per unit land area. This would lead to a higher income for smallholders.

Socio-economic Constraints in Improving Forage Supply

Improving the productivity and sustainability of forages under plantation crops is not as simple as it sounds. There are socio-economic constraints hindering this sort of development. The main constraints are:

- (1) high cost of establishment of forages compared to conventional legume covers planted under rubber;
- (2) improved forages may require a higher level of management and fertilizer application;
- (3) it may be difficult to obtain forage seed commercially and the price of seeds may be expensive;
- (4) smallholders and estate workers have poor knowledge of and experience in handling forages.

Prospects for Improvement of Forages

The prospects for improving forages under rubber are considered to be very good and their role in improving animal productivity and income is evident. However, there is a lot that needs to be done.

In the case of the conventional system of planting rubber at 6 x 3.7 m (450 trees/ha) or 9 x 2.5 m (444 trees/ha) spacings, shade-tolerant species of legumes and grasses are required to improve the productivity and sustainability of forages as the rubber matures. It may be possible, also, to move to a hedge-planting system of rubber of 22 x 2 x 3 m (450 trees/ha) in which the light penetration between the hedges is greatly increased and shade tolerance may be of lesser importance.

Desirable Characteristics of New Pasture Species

It may be asking too much to obtain all-purpose new pasture species that will meet all the requirements of sheep integration under rubber. Nevertheless, the desired characteristics of new pasture species are:

- (1) a combination of legumes and grasses;
- (2) quick early establishment for weed and erosion control;
- (3) high yield potential even when light transmission is as low as 20%;
- (4) ability to withstand grazing;
- (5) commercial seed production possible;
- (6) low maintenance and manuring requirements; and
- (7) non-competitiveness with rubber.

Management System of Improved Species

The suggested management system for conventionally planted rubber, taking into consideration the other requirements under rubber of rubber management, is:

- (1) plant the conventional species or a new legume mixture at the time of rubber establishment;
- (2) at the twentieth month after rubber establishment, spray out 2 m strips in the middle of the rubber interrows and plant the new pasture species (grass only, or legume + grass) on the sprayed strips; and
- (3) four months after pasture establishment, or when the rubber is two years old, commence grazing.

With this approach, it is postulated that the cost of establishment of the new pasture species will be minimised and the conventional establishment and maintenance of rubber will not be greatly upset. However, other aspects of forage management and utilisation such as manuring requirement, stocking rate and stocking methods need to be studied.

Scope of Future Research

Despite the suggestions posed in this paper, there are still many grey areas before the potential of improved forages under rubber can be achieved. The following research areas are suggested for consideration.

- (1) Establishment techniques for the planting of new species under conventional and hedge-planting systems of rubber;
- (2) development of manuring programs for the improved species;
- (3) study of strategic grazing method and stocking rate; and
- (4) investigation of supplementary feeding requirements.

Conclusions

It is evident that sheep integration under rubber in Malaysia has great potential. However, animal productivity and income potential from sheep-rearing is unattractive under the current management. There is a need to introduce improved forages under rubber in order to increase productivity and improve the sustainability of forages, especially under mature rubber. There is scope for altering the method of rubber-growing to a hedgerow planting system to increase forage yield. Much information is still needed before definite recommendations can be put forward. Thus it is necessary to continue systematic research in this area for the benefit of those involved in sheep integration under rubber or other plantation crops.

Acknowledgments

The authors wish to thank the Directors and Board Members of the Rubber Research Institute of Malaysia for their permission to present the paper and their support in the sheep integration project. The guidance of Dr Najib Lotfy bin Arshad, Head of the Project Development and Implementation Division is also greatly acknowledged. The efforts and dedication of the field staff of the Project Development and Implementation Division of the RRIM involved in the studies carried out are greatly appreciated. The support and cooperation given by the management of the Rubber Research Institute Experiment Station at Sg. Buloh, Selangor are greatly appreciated.

Last, but not least, we are indebted to ACIAR for financial and institutional support.

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