CARIBBEAN FOOD CROPS SOCIETY

27

Twenty Seventh Annual Meeting 1991

DOMINICA

Vol. XXVII

INNOVATIONS IN INTENSIVE SHEEP PRODUCTION IN TOBAGO

P. Collins and M. J. Keens-Dumas

CARDI, Tobago, and
Blenheim Sheep Multiplication Project
Tobago House of Assembly

ABSTRACT

The design of a slatted floor sheep pen suitable for small farmers is described. This pen, which has been demonstrated at the Blenheim Sheep Multiplication and Research Project in Tobago, has gained wide acceptance in the farming community. The choice of forages and other aspects of management associated with its use are described.

INTRODUCTION

Although the idea of using slatted floor pens for livestock is not new, the demonstration of a pen incorporating this feature at the Blenheim Sheep Multiplication and Research Project (BMMRP) in Tobago has been instrumental in increasing the interest in sheep production by small farmers.

Farmers, many of whom are part time, have readily seen the advantages of this pen which include: security from praedial larceny and dog attack; health benefits such as reduced endo-parasite burdens and decreased mortality rates; increased growth rates due to restricted energy usage.

The "Blenheim-type" Slatted Floor Pen.

The main features of this type of pen, shown in Figure 1, are the following:

A slatted floor: 2.5 cm laths are used with a spacing of 1.5 cm between them for weaners and fatteners or 1.9 cm for adults. The slats are on (5 cm x 10 cm) joists which should be no more than 76 cm apart to ensure the strength of the floor.

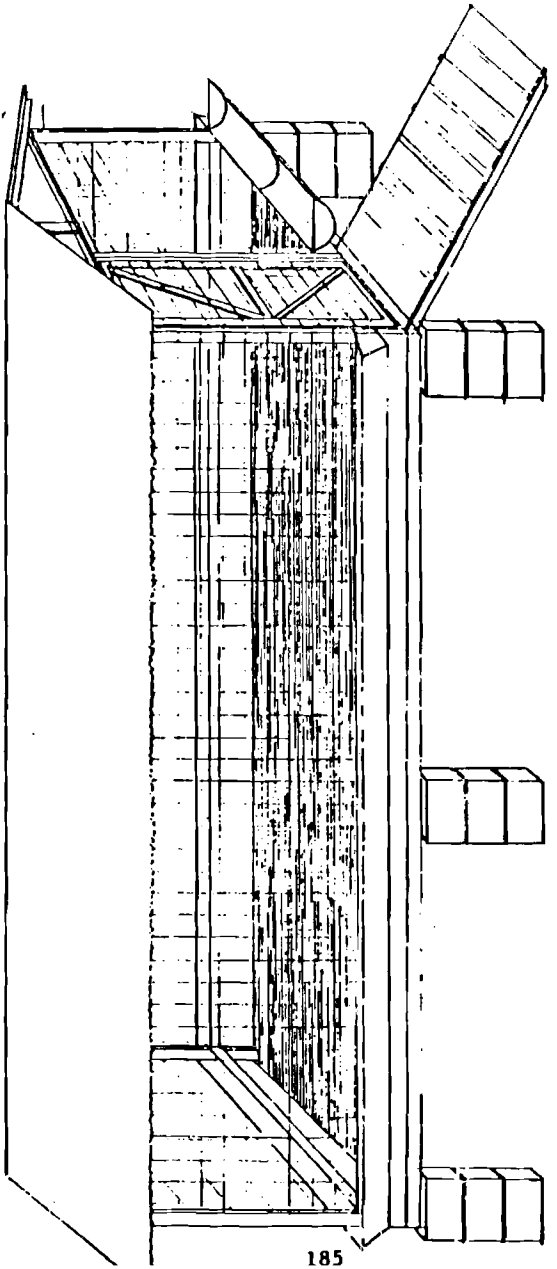
Floor space of $0.4m^2$/animal is provided for adult sheep or lambs which would be grown to market weight.

Feeding troughs are placed along the outside length of the pen and watering troughs outside the ends of the pen with the sheep having access through the sides.

Security is provided by covering the sides of the pen with $15cm^2$ welded steel mesh (BRC).

The pen is usually roofed with galvanized iron but any other weatherproof material could be used.

gure 1. The "Blenheim-type" slatted floor sheep pen (drawing by C.L. Archer).



The pen is at least 0.6 m high and positioned on a slope in order to facilitate drainage and removal of dung from below using simple hand-held scrapers.

There is a non-skid ramp with a maximum gradient of 1:2.5.

Such a pen ($18m^2$) has been in use as a demonstration at the BSMRP since 1988 (Keens-Dumas, 1990) and to date 25 farmers are known to have invested in this system. It is estimated that about half of these have begun sheep production with this pen and half have intensified an already existing system. A survey designed primarily to define current use of forages was conducted under a European Development Fund (EDF)-funded project in March of this year. Fifty-eight farmers were randomly selected out of a total of 160 for interviews. Of these, 17 used the "Blenheim-type" pen. The size of these pens ranged from 9.3 to 145 m^2 and they could hold between 20 and 360 animals.

The Choice of Forages.

Information form the EDF survey (Table 1) indicates that farmers using the slatted floor system are making more use of improved erect grasses than other farmers, even though only two of them have forage choppers. Eleven of the 17 made use of roadside forages. Farmers using all types of systems appear to be aware of the value of gliricidia and a slightly higher percent age of farmers with slatted floor pens have begun to use leucaena. Other local trees such as manjack (Cordia collococca) and hog plum (Spondias mombin) are occasionally used. Crop residues are only used in 24 per cent of slatted floor pen systems, and only by 10 per cent using other systems.

Table 1. Current use of forages and other feed for sheep production in Tobago.

Type of feed	Slattered floor system (%)	Other systems (%)
Grasses		
Elephant (Pennisetum purpureum)	87	63
Guinea (Panicum maximum)	80	60
Pangola (Digitaria decumbens)	33	42
African star (Cynodon sp.)	2	8
Unimproved	38	43
Legumes		
Gliricidia	80	78
Leucaena	18	10
Unidentified	14	28
Other feeds	100	79

Source: Survey conducted in March 1991.

All intensive sheep producers and most of the others, however, still use a combination of feeds which includes expensive concentrates. Urgent attention, therefore, needs to be paid to increasing the quantity and quality of forages and the use of indigenous feeds in order to replace this dependence on concentrates and improve financial returns.

For several years farmers have been assisted with pasture improvement by CARDI (originally through EDF funding) and the Division of Agriculture, Tobago House of Assembly. This activity has gained momentum with an increased interest in sheep production, particularly intensive sheep production. Grass germplasm has been brought in from Antigua and more recently from the Sugarcane Feeds Centre (SFC) in Trinidad. These are being multiplied at three main sites for distribution to farmers.

The forages which are being established in many slatted floor systems, with preliminary observations on their usefulness in the local situation, are described here.

Grasses.

Local elephant grass (Pennisetum purpureum): One of the main advantages of elephant grass is that it is already so widely distributed that planting material is readily available. It is also nutritionally adequate, once properly managed, having 7.9 per cent crude protein at 6 weeks (Walmsley et al., 1978).

Taiwangrass (Pennisetum purpureum): Taiwan is an elephant grass selection with a wide pH tolerance (García, 1990). It provides more vegetative material than the local variety. It is less stemmy and does not flower under local conditions. It should maintain its nutritive value and be easier to manage as a chopping grass than local elephantgrass.

Kinggrass (P. purpureum x P. typhoides): Establishment and vegetative regrowth of Kinggrass, even under dry season conditions, are impressive. It looks very similar to Taiwangrass but the leaves are hairy. This does not appear to affect palatability but has caused some discomfort to those cutting the grass. Analyses done in Cuba (Xande et al., 1985 , quoted by García, 1990) show that crude protein (5.1-6.0 per cent, wet season; 5.2-8.0 per cent, dry season) and dry matter (13.7-23.8 per cent) values tend to be low. Our observations indicate that total biomass production, particularly in the dry season, would compensate to some extent for low quality.

Pennisetum hybrid (P. purpureum x P. americanum): The structure of the P. purpureum x P. americanum hybrid grass makes it attractive. Small stems make it easier to chop in the field with less waste at the pen if no chopper is available. The leaves tend to spread laterally, keeping weed competition down. Nutritional values of this grass are good. In Trinidad, crude protein levels of 5-15 per cent and dry matter levels of 16-26 per cent are reported (García, 1990). Unfortunately this hybrid flowers easily under stress and under short-day conditions. Optimum production of vegetative material is only obtained between about May and October in Trinidad and Tobago.

Chrysopogon: This grass continues to hold a place in the selection program because of its excellent drought resistance, a growth habit that makes it suitable for soil conservation, and its convenient propagation by seed. It has the disadvantages of lower palatability than other grasses and a low nutrient content crude protein values of between 4.5 and 6.1 per cent over three cuttings were reported in India although this value went up to 9.0 per cent just before flowering (Göhl, 1981).

Forage Legumes.

Gliricidia: This legume is abundant in Tobago. Farmers are encouraged to manage this by cutting back in October or November to maximize production through the dry season. Although palatability problems have been encountered elsewhere, none have been reported in Tobago.

Leucaena: This is used more on government stations than on private farms at present partly because of the presence of gliricidia as an alternative. Establishment has proved difficult unless weeds and bachacs (Atta sp.) are stringently controlled.

Vining legumes: A Macroptilium atropurpureum/Teramnus/Glycine mix has been used. This needs very careful management under grazing conditions but has excellent persistence in cut and carry systems.

Production Costs.

Capital costs for this system include the pen itself (about TT$200/$m^2$ for the materials) and pasture establishment with associated fencing and irrigation, if possible. Forage choppers should be used but are proving difficult to acquire. The only forage chopper being retailed locally costs about TT$16,000. A few farmers are attempting, with difficulty, to import their own at about half that price or are trying to make cheaper models, for example by modifying a lawn mower.

Data on the major variable costs derived from a batch of 44 fattener lambs grown at the demonstration site (BSMRP) are given in Table 2. The lambs were four-way crosses resulting from various combinations of West African, Barbados Blackbelly, Persian Blackhead, and Virgin Islands White. They were reared from weaning at approximately 2 months old, to market at approximately 10 months. Market prices and labor costs have been estimated as if for a private farmer.

Elephant grass was chopped and fed on an ad lib. basis with concentrates (dairy ration) at a rate of between 0.22 and 0.45 kg/day depending on the size of the animal. This diet was supplemented occasionally with gliricidia.

These data in Table 2 indicate that satisfactory returns would be obtained using this system (TT$82/animal) especially taking into consideration the fact that the animals were sold after the optimum date and that it should be possible to produce two batches per year. Savings were made on health care as only two wormings were required--monthly worming is a

Table 2. Costs and returns for rearing sheep (fatteners) using a slatted floor system in Tobago.

	TT$*
Variable costs	
Total cost of lambs (308 kg @ $8.80/kg)	2,713
Cost of concentrate (0.22 kg/animal/day for 4 mths 0.45 kg/animal/day for 4 mths)	3,538
Cost of medicines	85
Labor	
Feeding (10md @ $60/day)	600
Cleaning (6md @ $60/day)	360
Cut and chop grass 15md $60/day)	900
Deworm (1/2 md @ $60/day)	30
Total variable costs	8,226
Returns	
Sales (1,347 kg @ $8.80/kg)	11,855
Net returns (variable costs - sales)	3,629
Return/animal	82

*US$1.00 = TT$4.25

common practice in other systems. Since labor costs are about the same whatever the number of animals in the pen, keeping the highest number of animals possible should maximize returns. It must be emphasized that some benefits cannot be given a monetary value, such as security and the ease of management.

These figures highlight the fact that the major cost is concentrate feed which indicates the need for technology transfer relating to more productive use of legumes, other forages, and indigenous feeds. To this end, farmers are being encouraged to make the most productive use of any land which is available to them. But in some cases land may be a constraint even for forage bank establishment because at least 0.12 ha of forage bank under irrigation is required to maintain about 50 sheep (Paterson et al., 1988). However, some farmers are using this system with much less land than this and even if some forages are established, for them the use of roadside forages and purchases concentrates will remain a way of life.

CONCLUSIONS

Sheep production in Tobago has increased and will continue to do so in response to a high market demand. To some extent, development has preceded research. The need to supply forages rapidly has meant that grasses have been selected on the basis of preliminary observations. Further analysis of quality and performance under different management regimes is required. Sheep farmers are eager to establish grass forages but more guidance is needed in the managmeent of forage banks, especially the legume component. These areas will be addressed as part of two recently-initiated regional projects--the EDF-funded Sheep and Goat Improvement Project and the Canadian International Development Agency (CIDA)--funded Sheep Production and Marketing Project.

REFERENCES

García, G.W. 1990. Cultivated forages at the Sugarcane Feeds Centre. A paper given at a Continuing Education Programme in Agricultural Technology (CEPAT) course, Trinidad, July 1990 (unpublished).

Göhl, B. 1981. Tropical feeds. FAO Animal Production and Health Series No. 12. FAO, Rome.

Keens-Dumas, M.J. 1990. Slatted floors--A different approach to intensive lamb rearing in Tobago. Factsheet No. 2. Division of Agriculture, Forestry and Marine Affairs. Tobago House of Assembly.

Paterson, R.T., Keoghan, J.M., and Proverbs, G.A. 1988. Forage-based grazing systems for drier parts of the Caribbean region. CARDI, St. Augustine, Trinidad.

Walmsley, D., Sargeant, V.A.L., and Dookeran, M. 1978. Effect of fertilizers on growth and composition of elephantgrass (Pennisetum purpureum) in Tobago, West Indies. Trop. Agric. Trinidad 55: 329-334.

ACKNOWLEDGEMENTS

This paper draws on discussions with many people. Particular thanks are due to Dr. G. García, (UWI), Mr. C. L. Archer, (CARDI), and Mr. K. Alfred, (BSMRP) for their contributions.