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Improved pastures for meat and milk production

(Script of a slide presentation)

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Introduction

Animal production in the Caribbean, inclusive of sheep, goats and dairy cattle, has for too long depended on concentrate feeds. Most of the region's farmers consider forages solely as a source of roughage for their livestock, whereas Australian and New Zealand farmers have long relied on forages to provide most of the nutrients for meat and milk production. This concept is not new to the region, however. Jamaican farmers have relied for many years on their grass pastures for economical meat and milk production. The challenge we face now is to encourage farmers to make greater and better use of the available improved grasses and legumes. In this way, animal productivity can be improved (Proverbs, 1986). Native grasses, overgrazing, poor weed control and lack of proper management, characterise most local pastures, resulting in reduced milk and meat output per animal and per hectare. In any animal production enterprise, the need to establish high quality improved pastures cannot be over-emphasised.

Fertilizer

After the land is prepared, the pasture is planted either from seed, or from vegetative material and is subsequently managed so as to stimulate maximum growth of highly palatable material. A pure grass or grass/legume pasture must be treated as a crop, hence fertilizer application becomes necessary to maintain high yields. Since nitrogen is generally the most limiting of the essential plant nutrients, five 55 kg bags of sulphate of ammonia are applied per hectare. A well established grass/legume pasture would require about half this amount. One 55 kg bag of muriate of potash is applied twice a year per hectare, at the beginning of the rainy season and again towards the end. On some dairy farms, manure is collected in slurry tanks and spread onto the fields. Manure can also be used in large biogas digesters to produce energy and the residual material used as a fertilizer. The material is safe and non-toxic even when applied in the dry season.

Improved species

In the wet season, native grasses will provide sufficient nutrients to meet maintenance requirements. However, during the dry season, the native grasses are the first to stop growing and to die back. Even the quality of the best of the introduced improved grasses falls to levels which can no longer support maximum animal production unless irrigation is available (Paterson et al, 1986). Several improved species of grasses have been introduced to the region. These include Transvala, Bambatsi, Dwarf elephant, Green panic, Klein, African star, and Coastcross 1. The last two have been extensively used in pasture establishment in Barbados. If the crude protein content of the total diet falls below 7 percent, the animals on pasture will begin to

lose weight. At this time, pasture protein supplementation is needed to prevent a drop in production or weight loss. Protein can be supplied from commercial concentrates, or from agricultural by-products such as cotton seed. However, the most economical way of supplying this protein is from forage legumes (Paterson et al, 1986).

Legumes

Legumes can be incorporated into the pasture system in several ways. They can be sown in with the grasses to form associated pastures, for year-round grazing. Ideally suited for this purpose are the twining legumes Siratro, Glycine and Teramnus. The legume used should make up 25-30 percent of the total forage component. After the grass has been planted and has just begun to establish itself, then the legume seeds are planted. This method has brought the best results under our conditions. Legumes can also be saved for use only in the dry season either as pure stands (protein banks) or associated with highly productive grasses (protein energy banks). The shrub legume *Leucaena leucocephala* is ideally suited for protein and protein - energy banks. *Leucaena* will yield anywhere between 2-20 tonnes per hectare dry matter per year depending upon climatic conditions. *Leucaena* can be sown directly into the soil using freshly harvested seed or propagated in nurseries and transplanted at about 20-30 cm high. Stored *Leucaena* seed has to be scarified for the seed to germinate. The seeds are immersed in water at 80°C for 3 minutes and then planted. Germination occurs in 3-7 days and after 8-10 weeks, the seedlings are ready for transplanting. CARDI Cunningham *Leucaena* is the variety recommended for protein and protein-energy banks (Proverbs 1985). The plant is shrubby and is ideally suited for grazing animals. It must however, be pruned periodically so that it does not grow out of reach of the animals. The giant types are ideal for erosion control on steep slopes and for live fence posts. They are planted along the periphery of the field and in 3 years the fence can be attached. With proper pruning they will provide shade and a fodder reserve for dry season feeding. There are several giant types, K67, K28 and K8. K8 is the variety most widely recommended for Barbados. Forage of both K8 and Cunningham *Leucaena* can be cut and stored as silage for dry season feeding.

Dry season feeding

Molasses is used as an inexpensive energy source during the dry season. Molasses and legume protein encourage the animals to consume greater quantities of the poorer quality grasses during the dry season, thereby promoting weight gains and maintaining milk production. At Springhead Farm, St James, Barbados, 22 Jamaica Red calves were kept for 86 days on 10 acres of Coast cross 1. They were removed in the height of the dry season and allowed to graze a fresh Coastcross 1 pasture. After 30 days they were weighed and weight gains were of the order of 0.7 kg per day. The practice of using molasses goes a long way in alleviating seasonal variation in production. Once the rains come, the pastures grow vigorously and there is plenty of forage available, to the extent that the animals cannot utilize all of it. This is the time to conserve the excess, either as silage or hay for dry season feeding. Again the practice of conserving in times of plenty for feeding in time of scarcity helps to eliminate seasonal variation in production.

Forage conservation

Silage: Silage making is a difficult process for the small scale, non mechanised farmer. To make good quality silage requires equipment and storage facilities. The forage to be ensiled is harvested, and chopped into pieces 2.5 -5 cm long and then compacted using a tractor. During the compaction process, molasses is sprayed on at a rate of 46 kg per tonne of wilted forage material. This enhances the ensiling process. Sorghum or sorghum hybrids such as sordan, are ideal forages for ensiling. They will provide five or more cuts per year and can also be fed as green chop both in the dry and wet season. During the height of the dry season, when the soil cracks, most of the improved drought tolerant grasses lose their productivity and in many instances are reduced to standing hay. On the other hand, sordan remains green and will continue growing, thereby producing a higher quality forage.

Hay: Hay making is another method of forage conservation. With native grasses, a good quality hay can only be obtained when the pastures are very young. This is also the time of highest rainfall when it is difficult to dry the cut material. Most of the improved grasses, on the other hand, have much finer stems and will dry easier during the rainy season. They also maintain their quality for a longer period. With improved grasses, there is reduced time between cutting and baling as opposed to native grasses. You can get many more cuts per year with an improved pasture than you can with a native pasture. The best hay is made from swards of grass and legume. The legume content will ensure a higher protein forage. However the twining tropical legumes now in use do not cut as well as alfalfa, but work is being done at tropical research centres to find ways of getting around this problem. Hay is generally made using tractor-drawn cutters and balers. The grass is cut and left to dry, after which it is windrowed and baled. Traditional methods leave the bales strewn on the ground. They then have to be collected and stored. A hay baler with a chute allows the bales to be placed directly into a trailer, which effectively saves time and labour.

Conclusion

High quality hay and silage are the products of well managed improved pastures, which are able to sustain consistently high levels of animal output. The road to improved pastures can be paved with introduced forage species, or alternatively by oversowing native pastures with legumes. This is one method of increasing the productivity of native pastures. At every stage, quality assessment is necessary. Forage samples are taken from pastures periodically for nutrient analysis, and also from silage and hay. If animal production is to be economically viable it must be considered as a business. Only in this way can we hope to develop the potential that exists in the Caribbean for various animal production enterprises.

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