

INTRODUCTION.

The difficulty frequently experienced in the tropics of maintaining a constant food supply for farm animals throughout the year, is often due to there being a dry spell of varying length in the annual climatic cycle. During this dry period natural vegetation loses much of its food value and palatability, and to keep the animal in good condition supplementary foods are desirable; supplements not always provided as evidenced by the deterioration of stock in the dry season.

Attempts on a limited scale have been made to provide a supply of forage for the dry season and some of them have been at least partially successful in localised areas, but on the whole tropical countries still suffer from a lack of forage during this period.

On irrigated land it is possible to maintain a supply of green fodder throughout the year, but the total area in which irrigation is possible is very limited, and from the economic aspect it may be a doubtful project as the relatively low prices for stock in the tropics demand a fodder produced at low cost. Nevertheless in some favoured areas this method is practised on a commercial basis and has been found economically sound.

Instead of depending on green fodder for the dry season, cereals could be grown and the grain fed, or concentrates such as cotton or linseed cake used. In the case of grain, however, it is usually uneconomic to feed it for meat or milk production, as it brings a higher return as such, and in the case of concentrates the difficulty of transport combined with the low prices for stock may not justify their use.

With a few exceptions, in most localities there is to be found a period of maximum growth, and this is certainly the case in the tropics where a dry season normally occurs. As stocking of a farm is based on the average production of fodder and not on the maximum production, there is at some period of the year a surplus of succulent food which is frequently wasted as

litter for stock pens, or allowed to reach too high a stage of maturity and so lose much of its nutrient value. If this surplus could be economically conserved regardless of weather conditions, with a minimum loss in nutrients, then the fodder problem in the dry season would be greatly simplified and it would eliminate the necessity to grow other crops or to irrigate.

In the temperate regions, to-day, the two principal methods used to preserve this surplus fodder are by drying and ensiling. Drying of the crop has been carried out in two ways. Firstly, by natural means and storing as hay, and secondly, by artificial heat and storing as dried grass.

The making of hay, although even under good conditions incurs marked losses in food value, is a desirable means of preservation, but it has distinct limitations, particularly in the insular tropics where climatic conditions militate against its effective manufacture. Drying grass by artificial means, on the other hand, yields a product of high food value independent of the climatic conditions, but the machinery necessary is costly and cumbersome and it is doubtful whether the dried product would keep under tropical conditions as it is hygroscopic.

Conserving the fresh succulent crop under conditions that preclude undesirable fermentation and keeping it conveniently and safely stored until such time as it may be required, i.e. ensiling, has become a very popular method of preserving the surplus fodder in temperate countries, and the final product (silage) may have as high food value as the original material ensiled and in some cases may be superior in digestibility (1 a). On the whole, the loss need not be very great when considered on a weight basis and can be kept well below 10 percent if the process is carried out properly. This method requires relatively little capital outlay and appears almost ideal, but the skill required and the lack of knowledge concerning its production in the tropics makes the risk of loss very high when attempted by an inexperienced farm community. Both these factors have been overcome in temperate

regions as a result of comprehensive fundamental and applied investigations, and with this in view the writer has attempted, in this paper, to investigate the conditions most suited to tropical regions from both an experimental and practical aspect in order that this desirable method of fodder conservation may be made easier for the tropical agriculturalist.