

GENERAL INTRODUCTION

The problem of Grassland Improvement is one which is receiving increasing attention in the tropics as it is realised that grassland research will help to form a sound basis for dealing with the problems arising from the need for more balanced and intensive systems of agriculture, than at present exist. Stapledon (53) after a tour of Dominion grasslands stated: "It is our grasslands more than any single raw material of the Empire which call abroad for some well thought-out and well coordinated scheme of research and investigations in order that the maximum of new and valuable information may be obtained with the limited scientific resources at the disposal of the Empire".

*Bullington
page 73*

The need for improved pastures in tropical regions is closely linked with the requirements of expanding beef and dairy industries. Considerable work has already been done in most tropical colonies on the breeding, selecting, and grading up of livestock. However, it is impossible to produce good quality stock without good quality feed, and it is this fact which is one of the limiting factors of livestock improvement in the tropics. It is unfortunate therefore, that scientific investigations of tropical forage grass problems lags far behind the work done in temperate countries, so that pasture management is not so advanced in the tropics as in other parts of the world.

In Great Britain, ley farming provides a hopeful development for the future. Temporary pastures, alternating with arable crops, provide a cheap source of starch and protein for the livestock, and if properly managed serve to restore fertility to the land. Thus the ley is described as having two functions:-

- (1) a sward or animal function.
- (2) a sod or soil fertility function.

Scientific information on the value of a ley in the tropics is lacking, and different conditions make it unwise to generalise on the basis of temperate experiences. Tropical pasture improvement presents its own peculiar difficulties. Thus

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there is nothing equivalent to the highly productive grass-legume swards of temperate regions, owing to the absence of recognised suitable tropical species. Moreover, in countries where rainfall is seasonal, drought provides a big problem and may necessitate irrigation of pastures to ensure ~~an~~ adequate grazing in the dry season. Recently, however, Martin (32) working in Uganda, has obtained valuable information of the effect of a ley on soil fertility. He shows that certain grasses, such as Pennisetum purpureum and various Brachiaria species, have a profound and beneficial effect on soil crumb formation in two years. As a result of his work, Uganda has been the first colonial territory to adopt the principle of a grass ley for restoration of soil structure as a corner-stone in their land policy (2). It is necessary for each Colony (to thoroughly) investigate its own resources and pasture potentialities, for the most serious obstacle to the formulation of a balanced system of agriculture, based on the principles of alternate husbandry, is the lack of sufficient scientific data on which suitable rotations may be built.

The need for an organised scheme of grassland research in the West Indies has been recognised, and in the report on Agricultural Policy in Trinidad and Tobago for 1943 are recommendations for a study of the "effect of the grazing animal on forage and pasturage (the biotic factor)" and for the "introduction of promising forage grasses and legumes". These recommendations can be correlated with those of the West Indian Royal Commission 1938-39, who advocate an organised system of mixed farming to replace the present shifting cultivation of peasant farmers, necessitating: "investigations for the purpose of devising better peasant farming systems based on mixed farming and the complementary use of live-stock and crops".

A system of mixed farming necessitates the provision of a fodder crop for livestock, which in the West Indies is normally grass. This raises the vexed question of whether the best system of feeding stock is by grazing or soiling. As a result of the

lack of information which has existed in Trinidad on the possibilities of grazing fodder crops, combined with the fact that existing swards are extremely poor, and in many cases almost valueless, except as exercising grounds, agronomists have advocated the soilage system. It would appear, however, provided a suitable forage grass can be found, that grazing, although perhaps not so intensive as soiling, presents many advantages. It is a less expensive form of roughage, and at the same time ensures the direct return to the land of plant food as dung and urine. However, as Paterson (39) points out, the best solution will probably be a combination of pasture and fodder grass, one supplementing the other. Thus on a pasture farm an area of fodder grass would be put aside for the provision of fodder when grazing is below average, as for example in the dry season.

In Trinidad little attention has been paid in the past to the possibilities of improved grazings. Pastures are predominantly of Savannah grass, and *Paspalum* sour grass, with Bahama grass occurring on well drained limestone soils. Such pastures are very inferior, yielding little or no keep during the dry season, and are generally confined to marginal soils and waste lands. Hinds (25) in a survey of Trinidad grasses states that the agricultural value of the majority of Trinidad's 180 grass species is negligible. Indigenous types fall far below the standard of introduced species.

Preliminary pasture investigations in Trinidad should therefore take the following lines:-

(a) ecological studies of pasture succession and degeneration, with a view to determining the best systems of management to get maximum value from existing pastures.

(b) a study of the possible grazing value of species used at present for fodder purposes.

(c) the introduction of pasture grasses and legumes, which have been found to be promising in countries with similar climatic conditions; their establishment and trial on a field scale.

A suitable pasture grass must be :-

- (1) high yielding in nutrients and palatable to stock.
- (2) aggressive and persistent, with the ability to recover rapidly after defoliation by the grazing animal.
- (3) drought resisting and fairly productive in the dry season.
- (4) easy to establish and giving a good cover soon after planting.

In order to assess fully the value of potential pasture grasses, investigations should also include a study of their capacity to restore soil fertility and regenerate soil structure. Investigations of this type must of necessity extend over a period of years, but should ultimately produce satisfactory results, providing the necessary basis for the establishment of some system of ley farming for Trinidad, the extension of the dairy industry, and possibly the establishment of beef herds.