

INTRODUCTION

This project was carried out as part of the Imperial College of Tropical Agriculture grassland research programme, and consists essentially of an investigation of the vegetative and floral characteristics of six selected grass species. A botanical description is given of each species, together with a short review of relevant literature. In addition two micro plot fertilizer experiments were conducted using five of the selected grasses. The response of the various species to nitrogen was investigated by developmental studies, cutting and weighing the herbage etc. These investigations were carried out at the Imperial College of Tropical Agriculture Old Farm, the soil being described as a sandy loam deficient in all the major plant nutrients and with a slightly acid reaction (Matthews 1954).

The need for grassland research has now become a vital necessity in tropical agriculture, as in most tropical countries the bush fallow associated with shifting cultivation is no longer possible due to increase of population on the land available, and the consequent increase in the acreage of cash and food crops. Thus it has become imperative that a periodical grass cover should be incorporated in a crop rotation which would induce the recovery of soil structure, and provide an opportunity for the accumulation of organic matter. Artificially established pastures offer the best means of replacing the fallow without throwing the land out of cultivation as shown in experimental work by Martin (1944) and Hewitt (1949).

The primary aim of the majority of grassland research workers in the various tropical countries, is that of obtaining grass species suitable for temporary pastures. Edwards (1954) has stated four requirements for such a species, these are a) palatability b) ease of eradication, c) good seeding properties d) ability to thrive under intensive management.

Only a few of the grasses so far tested by Edwards in East Africa conform to all these criteria, and most of those considered unsuitable have been discarded on account of failure to satisfy the last two requirements. These difficulties have also been encountered in the Imperial College of Tropical Agriculture research programme, as few of the species imported from other tropical countries set viable seed in Trinidad. The necessity for a grass species to set viable seed is open to controversy, and investigations are now proceeding at the Imperial College to ascertain whether short term leys can be economically established by vegetative propagation. In East Africa and Southern Rhodesia (1952) it is probable that some advance may be made in native agriculture by the use of grasses dependent upon vegetative propagation. The view is held in these countries however, that a grass species destined to attain importance in any development programme must be capable of eventually providing a commercial seed supply. From the viewpoint of the grassland research worker, there is always the danger that grasses dependent upon vegetative propagation will remain indefinitely at the stage of small plots, instead of attaining a place in farming practice through commercial channels.

The importance of an ecological approach to grassland problems in the tropics has now become evident from the experience gained in past years. Plant communities are determined mainly by moisture and temperature conditions associated with the elevation and aspect of the land, in the tropics these environmental conditions are far more strongly contrasted than is usually the case in temperate regions. The range of environmental conditions in which a plant can be successfully grown can be somewhat increased by cultivation, and in this connection it must be emphasised that by the use of fire and rotational grazing etc; man can change the flora of a natural grassland. However, experience has shown that most indigenous

grass species are best adapted within the range of the major plant communities where they occur naturally. Some species have been successful in adapting themselves in the natural vegetation more widely than others, and have become common to more than one plant community. The ability of such species to succeed in different communities has led to the development of ecotypes or geographical strains. In the case of grasses these strains provide grassland research workers with a wealth of plant material for selection purposes.

In East Africa, due to the failure of imported grass species to adapt themselves or thrive under different environmental conditions, it has become evident that future plant selection should be confined to the indigenous flora. Although the trial of exotic species still continues in these territories, the most successful trials have been attained using local indigenous material. The Nzoia strain of Chloris gayana Kunth is an outstanding example of a grass developed by these means.

In Trinidad, however, few of the grass species indigenous to the West Indies which are likely to be suitable for ley farming e.g. Savannah grass (Axonopus compressus Beauv), Bermuda grass (Cynodon dactylon Pers) etc, have shown any agricultural value. In consequence a policy of importing numerous species from other tropical countries has been adopted, but it is already evident that several grasses which have been proved promising for drier tropical countries are unsuitable for conditions in Trinidad.