INTRODUCTION

A certain amount of work has been done on grasses at the Imperial College of Tropical Agriculture (I.C.T.A.) by past students and the information is all scattered in several project reports. The main reason for this resume is to collect together in one volume the mass of information obtained, and the following projects have been selected for this purpose:-

1. "The cropping qualities of certain Tropical Fodder grasses"
   (Emp. J. of Exp. Agric. 4; 1936, 6 - 16)
2. "Further Experiments with cultivated Tropical Fodder Crops"
   (Emp. J. of Exp. Agric.6; 1938, 323 - 340)
3. "The influence of time of cutting on the growth, yield, and composition of Tropical Fodder Grasses, Pennisetum purpureum - Elephant grass. (J. of Agric. Sci. 23; 1933, 615 -641)
4. "Growth, yield and composition of certain Tropical Fodders"
   Elephant Grass . . Pennisetum purpureum
   Guatemala Grass . . Tripsacum laxum
   Uba Cane . . . . . Saccharum sinense var Uba
   (J. Agric. Sci. 23; 1935, 369 - 394)
5. "Dried Grass concentrates in the Tropics."
   (Trop. Agriculture XV; 1938. 267 - 270)
6. Guyadeen, K.D. 1948/49
   The Propagation and Management of Some tropical Grass & Legume Forage.
7. Horrell, C.R., 1953
   The effect of H_2SO_4 treatment on the Germinability of various tropical grasses - a preliminary experiment.
8. Tuley, P.
   Percentage germination of Seven tropical grasses harvested at monthly intervals under Trinidad conditions - Nov. 1953 - April, 1954.
9. Mulholland, R., 1952/53
   Investigation on the Propagation & Growth of Indigenous and other grasses.
10. Evans, C.P. 1953/54
    Preliminary Investigations on Seed viability, Storage and Growth of potentially useful grasses under Trinidad conditions.

The first five were all carried out by D.D. Paterson.

Description of soils, climatic conditions, trials, experiments and actual experimental procedure have been left out of the text because these are available in the original reports and papers. Mention, however, is made of some of these only when they serve to explain, support, confirm or invalidate conclusions and inferences drawn from experimental results and observations.

Botanical description of the grasses is also ommitted because this is readily available in standard textbooks on grasses and also in some of the projects. The behaviour of some of the grasses under ICTA conditions is given. Grasses are dealt with singly and arrangement of collected information is based on a line following the species from seed to seed or from planting to seed, where root setts or stem cuttings are used for propagation. There is however a deviation from this plan in handling the following seven grass species, work on which was mainly carried out by the late D.D. Paterson of I.C.T.A.

1. Axonopus compressus Beauv
2. Brachiaria mutica
3. Panicum maximum
4. Pennisetum purpureum
5. Saccharum sinense var Uba
6. Saccharum sinense var Co. 213
   i.e. Coimbatore Cane
7. Tripsacum laxum

For purposes of easy comparison of their perfomances under more or less identical experimental conditions, these grasses are discussed under the actual experiments carried out. In other words brief descriptions of the experiments are given and the behaviour of these grasses discussed. Additional information resulting from projects of other workers on the same grasses is included.

Pennisetum pedicellatum and Pennisetum polystachyon were described as Gold Coast and I.C.T.A. strains of Pennisetum pedicellatum by Evans. The two have been identified and classified by Kew. The I.C.T.A. strain is Pennisetum polystachyon and the Gold Coast strain Pennisetum pedicellatum.

Work on these two species of Pennisetum is reviewed simultaneously mentioning differences where they occur, otherwise statements and conclusions drawn from results apply equally to both.

The two species show a distinct difference in the descriptions of inflorescence, other differences such as "darker green leaf colour" of Pennisetum polystachyon, length of flower stalk, etc., are only a matter of degree, and these may be altered by environmental influences such as soil fertility and trace element deficiency.

Reactions or responses to certain agronomic treatments, for example, cutting, manuring etc., are, where the information is available recorded. An important aspect of this work concerns SEEDS AND SEED TREATMENT. It is known that in general the quality of tropical grass seeds is poor, the proportion of "full" as opposed to "empty" glumes is low and consequently percentage germination is poor in addition to it being irregular and slow. Horrell, Tuley, Mulholland and Evans have built up a mass of information on seeds as a result of their investigations on seed production, germination, storage, and dormancy in seeds.

It is observed that some information is missing on certain aspects of tropical grass establishment, growth and development and that some experimental results give no indication of definite trends. Several of the experiments and trials would therefore require to be repeated in order to confirm or reject some hitherto achieved results, and also to supply missing relevant information.

Throughout this work suggestions are made as regards the need to repeat some of these experiments upon which no reliance could be placed, due to the fact that there were no replications or that operations involved in the experiments were not identical nor were they simultaneously carried out. Such irregularities in experimentation were not due to the incompetance of the workers, they were simply the dictates of circumstances. For example seeds were not initially obtained in sufficiently large quantities to allow germination and seed treatment trials to be carried out simultaneously. Mulholland had to sow seeds of Dichanthium caricosum which had been Dry Heat treated in April and the water soaked seeds in January. The results of the two experiments could not be compared for several reasons:- the seeds were of different ages and climatic conditions were certainly different for January and April.

However, certain results do give clear indications of the effects of the treatments. The main achievement of this work is that a more or less complete picture has been built up of each grass species and indications are given in cases where there is the need to supply missing information on the propagation, establishment, growth and development, seed production, storage, pre-germination treatment and response to certain agronomic practices as affected by seasons of the year.

Yield figures for many of the grass species listed below are not available, Figures for eight grass species have been obtained from a yield trial carriedd out in 1954 - 1955 by Mr. K.M.L. Matthews, and these appear under the respective species.

The Thesis of Mr. Matthews " A study of selected dry forage grasses in relation to growth, yields at varying periods of maturity and persistence" - is not included in the bibliography because it is in the course of preparation.

The plot size was small (1/104 acre), cutting was over a period of 18 weeks, from mid-October 1954 to mid-February 1955, and herbage was cut at three cropping intervals, 3 weekly, 6 weekly and 9 weekly.

It should be borne in mind that all the selected works, excluding those of Paterson, were carried out during part of the academic year, October to June, so that a greater part of the work came under Dry Season conditions, the Dry Season being January to May as far as projects go. Reports on establishment, growth rates, quality of herbage and recovery after cutting in most cases are consequently not encouraging.

A list of all grasses in the text is to be found on a separate sheet at the end of this introduction.