

in different places, and more centres are seeking help for the conduct of such exhibitions.

If an exhibition of this kind becomes an annual event in several centres in the same taluk there may possibly arise a sense of competition among different centres and the progress may become more rapid.

Health week, Baby show, Educational, Industrial (Rural) and Agricultural Exhibitions can all be held in the same place at the same time. This should certainly add to the utility and grandeur of the occasion attracting more people. I would even go to the extent of suggesting that such a show may last for two or three days with instructive lectures and useful programmes for demonstration and competition, besides a few items of varietal entertainments to break the monotony of its business aspect. Radio sets can come handy for a part of such entertainments.

The last but not the least is the question of finance. It often happens that the enthusiastic worker in a village is a poor man and the villagers are themselves poor. It was therefore necessary at the outset to admit exhibits free of charge into the stall and the amount collected as local subscription was necessarily small. It is however gratifying to say that they contributed their utmost in cash, thereby providing funds for awarding prizes. The kind support given to it by the President and Secretary, Palghat Agricultural Association, was a substantial help.

I would suggest that this may be accepted as one of the lines of work for which financial grant may be made by the Government on the recommendation of the Departmental Officers. Such help may be required in the initial stages until the organisations build up their own finances. I commend these results of this exhibition to the workers assembled here and invite their valuable criticisms and remarks indicating how further improvements can be effected in the programme.

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## GREEN GRASS\*

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Grass is the most important item in this world on which civilisation depends. Without grass there will be no cattle and sheep and no humus for the soil to enable crops to grow; even among crops, it is the grass family that yields the most important food materials for man-kind.

In spite of the fact that this country has seen many civilisations and had comparative peace for well over a century, it is remarkable that very little work has been done on grasses. There has been one continuous war with the Forest Department for facilities for grazing and of late, certain forests were handed over to the Panchayats and the grazing fees have been halved.

\* Paper read at the Twentyseventh College Day and Conference, July 1938.

But, do these solve the grass problem of this country? The only answer to it is in the negative.

Despite the fact that this civilisation depends on the cattle and grass of the country, one does not find much work being done on the grass on which the cattle depend. There are of course stray cases of individual effort, but there is, as yet, no band of workers devoting their undivided attention to grasses alone. There is an urgent necessity for a bold outlook on this problem and there is work for a considerable number of scientists or tackling various problems that await solution.

The most important requirement of our grasslands is that they should provide keep throughout the year. There should be certain types of herbage which should not only withstand the drought periods, but must also be able to withstand much of the gross misuse of pastures such as grazing them continuously throughout the year or grazing the same area precisely at the same time each year. By such misuse the composition of the herbage must necessarily be adversely affected. Examples of such misuse could be seen by a visit to any of the so-called grazing areas round about the villages. In order to minimise this profligate usage, there should be mixed farming and control over the animals with regard to the kind of species and the numbers. This can only be done when there is a change of outlook in the method of farming, by which, there will be conservation of fodder and introduction of short leys in the rotation. There is evidence of this in Coimbatore district with regard to *Kolukkattai* grass (*Pennisetum cenchroides*) and in the Telugu districts the *Pillipesara* (*Phaseolus trilobus*) but this is not enough.

By conservation of fodder, I mean not only straw, hay and silage, but also dried young grass. We not only misuse pastures by continuous grazing, but also waste considerable quantities of grass which can be converted into silage and artificial dried grass. Though Dr. N. C. Wright has passed this subject lightly, I am very anxious as to the future of this aspect of the question. My personal experiments, with artificial dried grass, show that it is possible to manufacture young dried grass, of a very high quality, which nearly approaches the quality of linseed cake. The method of drying adopted by me was no doubt very simple and capable of much improvement, but I maintain that in the monsoon periods when there is heavy rainfall and the growth of grass is quick large quantities of dried grass cakes can be manufactured. These can be conserved for many years and transported to areas where there is scarcity.

The next important factor in the pasture is the composition of herbage. For the grazing animal and for the soil, legumes are essential. It is frequently mentioned that our grazing areas do not contain legumes. This is not quite true. For instance, there are several indigofera. (*Indigofera enneaphylla*, Linn; *Indigofera viscosa* Lamk) which can be tried to meet our requirements. When the pasture problem is tackled systematically, there is

no doubt, there will be other legumes in addition to the useful grasses which will be discovered in this country.

The next important point is the management of grasslands. Unless grasslands are cultivated periodically, at least once in 20 years, so that the land gets a chance to recover, we are misusing the grasslands. In addition to cultivation, there is the problem of manuring.

The last, but not the least important problem regarding pastures, is the seed. All other things being under control, if the quality of the seed is not taken into account, there will be no good pasture. This stage, in this country, can be reached when all our grasslands are classified according to regions, the botanical composition and the various other factors are studied from the point of view of the grazing animal.

There is just another important point I should like to mention. One of the important problems is erosion in the tropical countries particularly where torrential rains wash away large quantities of the agriculturist's capital in the form of loose soil. If it were possible to have green grass as an important part of the rotation, in addition to proper fencing and planting of trees, more of this national capital can be conserved.

I now hope that I have said enough to create that bold outlook in our agricultural practice and that we shall be able to do some useful work along the lines I have so inadequately discussed.

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## EXTRACTS

*Plant Physiology and Agriculture.*\* by H. R. Barnell. (Low Temperature Research Station).

The problems of satisfying increased demands for plant products, or of raising the returns on a particular crop to a profitable level, resolve themselves into the question of "Yield". The yield of a plant may be the whole mass of plant produced, its fruit, its seed, its stem or its roots or some part of any of these, or appendages. Yield is determined by hereditary constitution and by the conditions under which the plant has been grown; it can be regarded as the integration of the metabolic processes concerned in growth and development until the harvesting period is reached. It follows that before the factors determining yield can be analysed with any exactitude it is necessary that our knowledge of the fundamental problems of plant metabolism should be greatly increased; only then may the effect of variation in any one environmental factor on the life of the plant be forecast with assurance. The only way, in fact, in which the ideal of providing a plant with the most favourable environment for producing its maximum yield can be attained, is by the study of metabolic processes and their reactions to varying external factors. Until this information is available we cannot even suggest a value for the maximum yield of a particular crop and hence we have no fixed standard by which to assess the "efficiency" of present day systems of cultivation. Of new systems introduced today it can only be said that they are improvements or otherwise on past systems.

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\* Extracts reprinted from *Tropical Agriculture* 15 p. 123, 1938.