Live Stock in the Tropics.

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IN the old established agricultural countries of the North, the keeping of livestock and production of marketable animal products play just as important a part in the general economy of agriculture, as does the growing of crops. Here the importance of maintaining the humus or organic matter in the soil has long been understood. Consequently, in nearly all types of farming, stocks and crops are judiciously blended. Crops are consumed by stock and the manure returned to the land to maintain its fertility. Furthermore, the fertility of the soil can be maintained without recourse to heavy applications of purchased manures, and products such as straw, which might otherwise be of little or no value, can be profitably fed to stock, while the distribution of labour throughout the year is usually more uniform and economical. The point to be emphasized, however, is that under old and well established conditions of agriculture, the importance of the inter-relationship of crops and stock cannot be over-rated where the policy is to crop the land continuously, and at the same time to keep it in good heart.

Turning to the tropics, an entirely different state of affairs presents itself. Here, generally speaking, crop products are far more important than livestock, and with the exception of perhaps India and Rhodesia, little or nothing has been done to develop a livestock industry. Stock do exist in all tropical countries, but up to the present their development has been almost entirely along lines suitable for the production of working animals, and little attempt has been made to produce animals more suitable for milk or meat or wool. In some of the earlier developed tropical countries, such as Trinidad, the effect of soil exploitation are already manifest. Growing the same crop year after year, without adequately compensating the soil for the organic matter and mineral constituents removed, has resulted in the exhaustion of much of the land, and in the incidence of disease due both to lack of vigour in plants and the absence of rotations. When it is remembered that the breakdown and the utilization of humus is extremely rapid in tropical soils, the problem becomes more acute Hence any increase in the number of livestock with the consequent production of more organic manure is bound to be a step in the right direction. Under such conditions, and especially where systems of "one-cropping" are practised, any diversification of agriculture must prove advantageous.

It is not the writer's opinion or idea that animal industries, similar to those of the temperate zones might be established in the tropics. It is doubtful whether this is desirable, even were it possible. In the first place, cattle or livestock as a whole are less suited to tropical than to colder climates, and moreover the demand for meat and other animal products is less in the tropics. This is due to several causes, one of which is that many native races, such as the Buddhist and Brahmin population of India are vegetarians, and others are only small eaters of meat. It is also recognized by medical science that people living in the tropics require less

meat than those of colder countries. The chief point at issue is not so much the establishment of new industries, but the improvement and where desirable, increase in numbers of the already existing domestic animals of the tropics, which at present somewhat inadequately supply the needs of the population. For example, by scientific feeding and management, it would doubtless be possible to double the milk yield of many of the scrub cows, which are so common throughout the equatorial zones, without any appreciable increase in cost.

To those familiar with northern livestock, it would seem at first sight that all that is required is to import quantities of the improved breeds of the North and build up improved herds from them. This has often been done on a large scale, but in more cases than not, with disastrous results. It must be realized that immediate and complete reformation of livestock in the tropics can never be attained. For various reasons, the process must necessarily be a slow one, but provided the initial steps are based on sound and businesslike lines, there is little reason why, given time, satisfactory and desirable results should not be obtained. In the first place, it has been found by experience that only certain of the northern breeds of stock are in any way adapted to withstand tropical conditions, and even with these, there are often many difficulties to be overcome before they can be successfully established. Cattle from the north often fail to thrive in the tropics, and rapidly deteriorate or die from disease to which they are usually far more susceptible than the naturally more resistant and acclimatised native breeds. As a consequence, the attempt to grade up native cattle by the use of northern stock, lacking in vigour under tropical conditions has often ended in complete failure. Experimental work on a small scale has first to be done, and then, only those classes of livestock which have been proved by experience to give satisfactory results should be used on any extensive scale. The precaution of inoculating all imported sires against redwater disease before shipment, and the introduction of animals at an early age, when their natural resistance is high, would allow them to become acclimatised before service and possibly to acquire natural immunity, and might do much to reduce the present somewhat high death rate amongst bulls. It must be emphasized that where male animals are imported with the object of grading up native stock, only superior sires having desirable characteristics and of known ancestry and prepotency should be used. And even with the native cattle themselves, much improvement may be obtained by the ordinary methods of selective breeding, and by the avoidance of haphazard and undesirable matings which are at present so common.

There is a wide field open for research in the tropics, both in the sphere of organized breeding, scientific feeding, management and sanitation. With regard to feeding, the amazing strides and almost incredible results which have been obtained in the last few years in the science and economics of this important subject, by such men as James Mackintosh at Reading, and Boutflour in Wiltshire, tend to show that work in the tropics is sadly behind-hand in this respect. One of the stumbling blocks to progress in the science of feeding outside temperate countries at present, is the fact that little or nothing is known about the digestibility of some of the locally grown foods. But here again, important work in this connection has been initiated in India, and when conclusive results are obtained, they should give a great stimulus to the practice of systematic rationing. From the point of view of the availability of foodstuffs, in the matter of concentrates, the tropics are well supplied. Besides an abundance of foods rich in starch, foods of high protein and oil content such as pulse grains, cotton

seeds and coconut residues, etc., are easily obtained locally. In the case of green forage, while much of the grazing land may be of poor quality, it can easily be supplemented by soiling crops, cut and fed green. Elephant grass, Para grass, Guatemela grass, sugar-cane tops, sweet potato wines, green pulses, etc., could be utilised for this purpose. Silage from these materials could be made to tide over the period of the year when green stuff is scarce or unobtainable.

While, in many countries, local departments of agriculture are doing much to improve generally livestock by the establishment of Government Farms, where good stud stock are kept and are available for use on the native cattle, the process of grading up must necessarily be slow, unless supported by strong legislation. Only male animals licensed by the Government, after examination by a competent veterinary surgeon, should be allowed to be used for service. These animals, should be declared free from disease, and of sufficient quality to improve rather than grade the native herds. This might mean the enforcement of compulsory castration, and from the human point of view, only qualified men, certified as such, should be allowed to perform this operation, as native unskilled methods may often prove both crude and cruel. Inspectors empowered to inspect native stock, and to enforce proper sanitation, feeding and management in cases of obvious neglect would be required, and certain diseases would have to be made notifiable to the police. Government subsidies on really good sires have gone far towards producing some of the more famous breeds in temperate countries, and this is a practice which might well be emulated to advantage in the improvement of stock in the tropics.—*Tropical Agriculture.* Vol. IV. No. 11, November, 1927.