

Summary and conclusions

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After discussing various areas which could support intensive animal industry, Prof Joubert pointed out that two additional ecological regions should not be overlooked. One of these areas — namely the Drakensberg grazing area — is a vast region and, from an animal industry point of view, can be extended even further by similar high-rainfall highveld areas to be found outside its borders. With a very favourable climate, a relatively high and reliable rainfall it would lend itself to the intensification of especially beef and mutton production and also dairying. One of the limiting factors, if not the most important, is the low level of soil fertility because with high yields and increased nutrition value, the other limiting factor namely, severe nutritional depression, can be remedied to a large extent. It would seem as if soil fertility and judicious and economic fertilization and/or manuring is a pre-requisite to this development.

The intensive and semi-intensive areas are obviously suitable for an intensified animal production programme but will not be considered in this discussion.

Subsequently, introduced by Prof Stielau we looked at the nutritional requirements of ruminants and whether they are influenced by the use of fertilizers on the plants consumed.

I think it is well-known and clear that the effects of fertilizers on the chemical composition of plants is usually not of great magnitude although some workers have established improvements in palatability (due to change in chemical composition obviously), carbohydrate and possibly protein content. In South Africa we have experience of the low nitrogen-protein levels of our natural veld as well as phosphorus and in some cases sodium, and have demonstrated an improvement in nutritive value through nitrogenous and phosphatic fertilizers.

The deficiencies and excesses of trace minerals, such as Co, Cu, Se, Mg, etc and their effect on livestock need not be considered for the time being. There seems to be general agreement that the main effect of fertilization is the increase in the *total* amount of *feed* produced and therefore also in the different important feed constituents.

The animal, like a crop, removes fertility from the soil but also puts something back in the form of excreta. Prof Roberts estimates that animals in the Republic produce about 68 million tonnes of manure and urine which, according to our calculations, is equivalent to 1,36 million tonnes N, 300 000 tonnes P and 2,36 million tonnes K of which $\frac{2}{3}$ of the N can be lost if manure dries on the veld. This is not a great amount under present low stocking rates in view of the fact that, according to Roberts, a national loss of R818 million worth of plant nutrients is sustained through erosion of topsoil only.

The beneficial effects of the organic matter in the manure are rapidly lost as a result of high temperatures. Dr Altona summarised the more important work done on the fertilization of grass. He referred to the work done by du Toit more than 30 years ago which revealed deficiencies in P and crude protein from 5 months to 12 months of the year.

Both earlier and recent work have demonstrated the considerable increase in dry matter production, carrying

capacity, palatability and possibly intake and digestibility, but also beef and milk production per hectare, mainly through the effect of nitrogen and also of P in some cases.

I find it disconcerting that the work of du Toit and his co-workers is still today the main reference for evaluating the chemical position of our natural veld — after 30 years! To have up-to-date information regarding this aspect on a *national scale* is as vital for animal production as pedological surveys are for crop production. Supplementary licks containing NPN, P and energy are today more often than not recommended on the basis of animal requirements and do often not consider the chemical composition of the natural veld.

Some aspects of pasture science are being investigated extensively but increased productivity and quality of the veld to support a growing animal industry has received but little attention. It has often been said that agriculture has been unable to gain access to the economic mainstream. It is also said — and it is true — that the development and production of the animal industry has not kept pace with crop production. The reason is quite obvious. Figures are often quoted that the animal population has remained static over the past 50 years. In this country, animal production is primarily dependent upon grass, and because production in the past had to be effected on, if anything, a deteriorating natural veld, increased animal production was dependent on improvement in animal husbandry practices and not on the improved nutritional environment as supplied by grasslands. From this point of view we cannot expect the animal population to increase because the population appears to be the limit that the veld can carry. If the same position were to be applied in crop production namely, that agronomic practices had improved but the nutritional status of the soils remain constant or deteriorated, we would probably only be reaping 15-25 bags of maize per hectare in a good season.

As Dr Altona concluded "One would expect that the most advanced achievements would have been made in the development and utilization of the veld — a natural asset (and primary production factor), but nothing is further from the truth — nothing has been done in practice to improve the quality of the veld. When the veld is given the same attention as arable crops are given, then a new and profitable area will be born in the livestock industry".

The natural veld is, and for a long time to come, will form the basis of certain branches of the animal industry — beef cattle, sheep and to a limited extent dairying. It is unlikely that, in the near future mainly as a result of price relationships, the intensive and semi-intensive areas will contribute greatly specially in the breeding and growing phases. At best, intensive large scale feedlots could be developed to put on a limited amount of mass and the required market finish.

The increase in production of natural veld and pastures will open up new problems for the animal and pasture scientist, the economist and the farmer. How is this increased production to be utilized efficiently so that maximum economic returns are possible? The increased vegetative production will not provide nutrients in the same ratios as required by the animals, nor will it be evenly distributed

through the year. Mr Lombard and Dr Altona have touched on certain of these problems.

We have to admit that our knowledge of the economic pasture-animal relationship is scant. How should the animal harvest the pasture? What is used annually and what should be used and at what times of the year? What is the effect of the animal on the pasture in the long and short term?

Poor management on costly high-producing pastures is more uneconomical than on ordinary pastures.

If my interpretation is correct, we just don't have the managerial know-how at present and in South Africa, under our particular conditions, this field seems to have been untouched.

Mr Chairman,

The animal industry finds itself in a state of inertia and despondency. Low wool prices, meat marketing problems and the low profitability of mediocre production systems on high priced land are taking their toll. As already explained, increases in beef production have been effected by breeding, selection, management, quicker turnover and supplementary feeding and not to any worthwhile degree by an improvement of the natural environment.

We are today faced by a further problem. The meat industry seems to be having its own troubles. The reasons for these problems and their possible solutions are irrelevant. In our efforts we must be careful that production systems evolving from intensification and the increase of production do not add to existing problems. If the market cannot handle livestock offered during the flush season under the present conditions how could it be handled when production during the flush season is stepped up by intensification and increased production in the high rainfall areas?

I feel very strongly that if the other factors hampering the industry are not first put right efforts directed at the biological factors will have little impact.

However, in planning for increased production of grass by the use of fertilizers we must attempt also to spread the production period over as long a period of the year as possible to try to obviate seasonal over-supplies. We must also — as Prof Joubert indicated — consider the effects of increased mutton and lamb production for an already over-supplied local and overseas market.

The cost of production of animal products as well as of other agricultural products is furthermore very important and must command our attention. We can intensify our operations and produce far more than we do today but at an increasing cost which neither the internal market nor adjoining territories will be able to afford.

Mr Chairman,

The Drakensberg grazing area plus other areas with a

rainfall of approx 650 mm or more support almost one-half of the white-owned cattle. The use of fertilizer could at least double the carrying capacity of these areas. In terms of cattle this would mean an additional conservative three million head.

The FSSA has started investigating problems of veld fertilization. At the moment this programme is in its infancy and we are involved in only a few trials, one of which is here in Natal in the Greytown district in which we have the welcome co-operation of Messrs Stock Owners'.

In view of the importance of the productivity and utilization of our veld and of resulting increased animal production, I would like to direct a request from this gathering to the Department of Agricultural Technical Services. My request is this — that the Department takes the initiative in planning and directing a co-ordinated programme of research aimed at increasing animal production on natural and artificial pastures by fertilization. This programme could be carried out at institutions and co-operatively on farms and would take into account the effective and economical utilization of veld and pasture by appropriate types and classes of livestock. Should the Department accede to this request, the FSSA and, I am sure, other organisations such as Stock Owners' will be able to find a basis to support the Department in order to give such a project the attention it would deserve.

VOTE OF THANKS

P FELLOWES

Mr Chairman,

As a farmer I should like to say a few words on behalf of the farmers who have attended this conference today.

I have been impressed by the sincere approach of the Fertilizer Society of South Africa toward this whole problem of livestock production from our veld and pastures. It is indeed a problem of national urgency and I was pleased to hear the Director of the Society pleading so pertinently for an overall and national research effort in this regard. In a gesture of co-ordination he has offered the resources of his Society and the fertilizer industry as a whole to be used by the Department of Agricultural Technical Services.

As a farmer — and I am sure Mr Sinclair will endorse my remarks — I can assure you that livestock farmers will be only too willing to co-operate in any way they can — perhaps in experiments, surveys, economic studies and the like.

Mr Chairman, congratulations on a most interesting and valuable day and thank you for inviting us.