

FERTILIZERS AND PRODUCTIVITY

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During the afternoons we shall be touring St Coombs and inspecting some of our fertilizer experiments, with the opportunity of discussing specific points on the spot. In the short time at my disposal now, I propose to emphasize one or two matters which will show you our present trends of thought — and action — on fertilizer usage.

Quality, in the broadest sense, is an aspect of tea production of the greatest importance, and the question has often been asked — “Can quality be influenced by fertilizer levels or nutrients ratios?” To-date detailed manufacturing tests by my colleagues suggest that, with one exception, any such influence by extremes of fertilizer treatment is negligible. The exception is that, again on the St Coombs experiments, bushes receiving no nitrogen sometimes produce a slightly better tea. However, yields are certain to fall so much under these conditions that no one would be able to consider that fertilizer regime as a deliberate means of improving financial returns. We shall continue with these investigations as our newer experiments settle down, but we do feel that quality is a matter to be influenced far more by, for example, standards of plucking and technology, than by fertilizer.

My main concern would thus be to determine how fertilizer can best be used to support the maximum economic yield per acre. Plant growth reacts to nutrient supply in a well-known manner, expressed by biologists as the Law of Diminishing Returns. This, is of course, familiar to most or all of us, but we shall do well to give it some attention here. An implication of this principle is that as fertilizer levels are raised the probable return of crop for each additional unit of fertilizer will fall. At the same time, rising levels of crop per unit area will lower the cost of production. We have to provide whatever scientific guidance we can to help estates to work out their balance between these opposing trends. Our own experiments will give us a broad measure of the crop to be expected from different levels of fertilizer, and that information will be passed on to you. I think you will be surprised to see the great variation in the results from different experiments: I hope so because that will help to encourage estates to run their own experiments; comparison between two or more levels of fertilizer. In that way you can do what the scientist can never do — assess more precisely the policy which, under your own conditions, is likely to give you the best returns. This will apply equally to estates which want to know how intensively they can manage selected areas, and to estates forced to reduce expenditure and in doubt about how far and in what way they dare reduce it.

I believe that, in recent years, the idea of experimenting by estates has been gaining ground and with our present staff we should be able to give the technical assistance necessary. At the same time we shall be fully engaged in our own intensive programme of much more complex experiments.

A problem which we are starting to tackle, once the simpler, basic experiments have been established, is the familiar one of deciding when to time fertilizer application in relation both to season and to the stage of development in the pruning cycle. It is unwise to rely too much on past experience to answer this problem, as fertilizer policy, pruning and plucking have all changed so much over comparatively recent years. No one anticipates early results from experiments which obviously involve interactions between several cultural operations, but it is essential to get these investigations started as soon as possible. Nitrogen will be the nutrient most deeply

involved, as it is clear that the effect of an application is rather short-lived. Estates in a financial position which limits the purchase of fertilizer, will naturally wish to make the greatest use of the most expensive nutrient, nitrogen, by applying it at the most appropriate times. Estates indulging in intensive culture of selected areas will have another reason to scrutinize the efficiency of application of their nitrogenous fertilizer.

By this I refer to the fact that all common fertilizers, I think it is safe to say, impose their own effects on soil and crop. They are not merely passive carriers of specified plant nutrients. Their effects on soil conditions, plant growth, and the efficiency of each other are complex in the extreme. Some effects may be beneficial, others may be harmful. Scientists, as you know, rarely seem to be content to leave things as they are ; a habit which sometimes reduces our friends in the Industry to despair. This is not, or should not be, due to a desire for change merely for the sake of change. In this instance it is due rather to our knowledge that complications can arise, even from continued adoption of fertilizer practices which appear to have served well in the past. We have a responsibility to the Industry in that we should try to foresee and forestall trouble. We anticipate marked changes in the use of individual fertilizers, and their proportions, which will be advised over the next few years, and we want you to accept those changes in the right spirit.

Of all the fertilizer nutrients, we have always tended to concentrate on nitrogen. This most certainly does not mean that other nutrients are to be neglected, whatever adjustments we may suggest from time to time. We are already in an era of nitrogen levels, in estate practice, which are high by any standard. There is reason to believe that on some good-jat seedling tea and on the higher yielding clones, nitrogen levels between 200 and 500 lb N per acre per annum will be accepted as routine. At these levels, year after year, we could expect considerable effects on soil conditions and bush nutrition, especially if sulphate of ammonia were to continue as the source of nitrogen. As you know very well, we have been searching for a nitrogenous fertilizer which could be an acceptable substitute. The choice is very limited, and none of the fertilizers which plantation agriculture could afford is perfect. It has very recently been decided as government policy, to manufacture urea in Ceylon, and over the next few years it will be substituted gradually for sulphate of ammonia. Our experiments, already in being under varied conditions will soon show us how to make the best of the urea. We are given to understand that the cost per unit of nitrogen will be attractive compared to sulphate of ammonia. We are in touch with the fertilizer Technologists to try to achieve a technique of formulation, which will give granules of even better handling properties than have been produced in recent years. And the urea fertilizer now available is much easier to handle than batches which were supplied several years ago. There should be no need to be unduly concerned on this point. For chemical reasons, we anticipate less undesirable side reactions in the soil from urea than from sulphate of ammonia, but we do appreciate that there may be a need to be more careful about weather conditions at the time of application.

This is the briefest of introductions to some of our ideas on future trends in fertilizer policy. No doubt there will be problems in shaping fertilizer programmes to the widely varying conditions and economic requirements of estates, but at least we can now be confident that our advice will more and more be based on findings from a comprehensive scheme of experiments.