WHY MAGNESIUM?

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Perhaps, before we answer our title, we should ask yet another question—What is magnesium? What is this substance that we should concern ourselves with it in practical agriculture?

As far as can be deduced from the latest developments of scientific research all crop plants demand various proportions of at least fifteen distinct elements for growth, or for existence at all. No one element is more important than the others, in so far as the complete absence of one leads to the death of the plant.

Nitrogen, phosphorus and potassium are three of the fifteen. Air and water provide three more:—carbon, hydrogen and oxygen. What of the other nine?

Magnesium is one of these, an essential plant food, no more and no less. It is indeed unfortunate that certain medicinal derivatives of magnesium should be well known for their dramatic effects on humans, but, as far as plants are concerned, magnesium is merely part of the normal food supply which the plant is continuously attempting to draw from the soil and air. The most distinctive feature of crop plants is the green pigment in the leaf, chlorophyll, which substance is essential for the operation of the initial stages of manufacture of the various organic compounds which will eventually be built up into new plant tissues. Without delving into technical details, chlorophyll contains magnesium. Without magnesium it ceases to exist as an active substance.

That is only one of the functions of magnesium in the plant, but enough has been said to show why we are concerned with this element in plant nutrition, and it only remains to be shown why we should be concerned with it in evaluating a practical manure mixture. The two aspects are not always identical, since manuring need not necessarily attempt to supply all the essential plant foods. Manuring should aim to ensure a sufficient reserve of those nutrients which the soil and the air cannot itself supply to the crop in the amounts required, and it should be an integral part of any sound agricultural system to try to manure in such a way as to maintain soil conditions in the best possible state. Trouble should be met well before half-way.

Our interest in magnesium lies primarily in the former of these two, since the signs of a soil shortage of magnesium are already shown by tea bushes in many districts. We believe that these symptoms can be in evidence for quite a while before the bush begins to show a falling off in crop, and this fact should be accepted gratefully as giving a chance to forestall trouble. It is easier to cure magnesium deficiency in its early stages than when it has become severe.

This is mainly due to an interaction between magnesium and potash in the soil, and we will take this opportunity of correcting a false impression which is in circulation. At the 1955 Conference we drew a picture of another agricultural crop which had run into difficulty through not using magnesium until the deficiency had become severe, and we mentioned that this had been aggravated by the excessive use of potash. Unfortunately this remark, true though it is, has been seized upon in certain quarters and used as an argument in favour of reducing the present rates of potash manuring in Ceylon tea.

The argument hinges on the definition of "excessive". In the manure mixtures used for the other crop potash was proportionately many times higher than it is in T.R.I. 500, and no one who studies the actual figures could ever say that T.R.I. 500 could be classed as a potash rich manure. This is not the place to discuss the level of potash manuring except to say that the Institute is confident that present day practice and experiments will confirm its suspicions that the proportion of potash in T.R.I. 500 may well need to be increased, and not decreased.

The charge of high potash in present day manures being the cause, or a contributory cause, of magensium deficiency in Ceylon tea is completely without foundation and is misleading.

It is dangerously misleading because it has led to the suggestion to cut down the potash rate in an attempt to stave off the onset of magnesium deficiency. Both chemically and agriculturally this would prove to be a foolhardy policy and the Institute condemns it without reservation. Analogies are useful as long as they are not taken too literally, and the following example will serve to give a general picture of our attitude. Nowadays we do not attempt to cure the diabetic patient by eliminating all sugar from his diet; instead regular doses of the accessory factor insulin are given so as to enable the patient to make proper use of his normal sugar intake. Similarly magnesium deficiency must be cured and prevented by using magnesium manures as a regular feature of the manuring programme.

There is still a tendency to regard manures simply in terms of the crop which they will produce, and to equate them with the net profit at the end of the financial year, but we prefer to remember that the soil requires manuring as much as the plant and that it is dangerous to ignore the changes in soil conditions which go on continuously while we pay too much attention to the account books. There can be few crops as long term as tea and it would be as well to consider manuring in the same light. In fact, a revival of the old fashioned word "husbandry" might be worth while to put things into perspective.

Magnesium manuring should be regarded in Ceylon tea in general as an insurance measure, since only in a few small areas does the deficiency appear to have reached a serious stage. Whether or not estates take this attitude is their concern, but we strongly recommend them to do so, especially as the price to pay is very small in comparison with the prosperity of the tea industry today. It seems as though this view is being accepted at an increasing rate and, as we shall not have results from field experiments for some time, we have decided to give a guide to estates on the understanding that we may modify the suggestions as and when practical results make it necessary. The following article on dolomite represents our present views.