

DOLOMITE

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With the ever increasing interest in the prophylactic use of dolomite as a manure in tea growing, it has become necessary to give a more detailed guide for those wishing to apply dolomite. The opportunity will also be taken to clarify the naming of this manure, and to correct an error which has appeared in a widely circulated publication. Finally, it is hoped that this article may relieve some of the increasing burden of advisory queries.

"Dolomite", "dolomitic limestone", and "magnesian limestone" all mean more or less the same thing. Ordinary limestone is calcium carbonate, but when some of the calcium is replaced by magnesium the rock is termed "magnesian limestone". When sufficient calcium has been replaced the rock, which has by then changed its physical properties as well, becomes "dolomite".

"MgO" is merely a chemist's way of expressing the magnesium content of manures. The value of a magnesium manure depends on the percentage of MgO, and it is simply a question of equalling the price with the percentage of MgO to decide if the manure is economical. All magnesian manures should have the MgO content stated. Dolomite, of course, is not water soluble and the total MgO of the rock is the figure which expresses its agricultural value.

Dolomite, with an MgO content of at least 20 per cent., occurs as a mountain forming rock in several areas of Ceylon, and magnesian limestones, with variable MgO contents, are even more widespread. The high grade dolomite is so cheap to produce as a manure that there would be little point in considering working the low magnesian limestones.

Most of the dolomite is mechanically crushed, and the resulting manure has a mixture of particle sizes, including a lot of dust. From an agricultural point of view the dust is useful as a more rapidly acting fraction, but labourers have been known to complain of its irritant action on the eyes and nose. This is common to all dusts, and the crushed dolomite is quite harmless otherwise, either to humans or the tea bush. In these days of human allergy it is possible that an occasional individual may be found who is susceptible to the sharp dust particles.

Some dolomite is reduced to a powder by burning, followed by slaking with water. This is referred to as "burned, slaked, dolomite" as opposed to the "crushed dolomite" mentioned above. It is this process which has given rise to the entirely wrong use of the name "dolomite lime". It is true that this is the product formed when the rock is first burned, but burned lime is a dangerous, caustic, substance until it has been slaked with water.

Reputable manufacturers are, of course, alive to this danger and they ensure that the manure reaches the user in a perfectly safe form. In this form it is chemically rather similar to the "Limbox" slaked lime which, as is well known, is quite harmless.

Our greatest worry is that less scrupulous suppliers may sell burned dolomite which has not been properly slaked, in which case it could be as dangerous as some of the locally produced burned coral lime. Any superintendent who has been burned by this lime will not need to be told that if he uses burned, slaked, dolomite then the onus rests with him to see that the slaking is thorough.

One instance of burns from a badly produced manure, if it should ever happen, would give dolomite in general a bad name. For this reason the Institute has decided to announce a very strong preference for crushed dolomite.

This is not such a cautious attitude as it may seem, because, as stated in the opening paragraph, a very serious error has appeared in a publication which is widely read. This implies that coral lime and dolomite are one and the same, whereas in fact they are not.

Coral lime is made by burning coral and, apart from containing very little magnesium, it does often contain lumps of caustic lime capable of raising severe skin burns. Coral lime has no place in the treatment of magnesium deficiency.

To summarise the definition of dolomite, we may say that the manure should be guaranteed to contain a certain percentage of MgO, which allows the cost to be evaluated, and also to derive from dolomite rock. With the present position in Ceylon there is no excuse for anyone using a worthless product or exposing his labour force to the risk of caustic burns.

We make no apology for having gone to such lengths to define what dolomite is and is not, because we feel it is better to correct some of the mistakes in their early stages and to forestall others.

Method of application.—We can now discuss the application of dolomite, which is fortunately very simple. Bearing in mind that it is a very slow acting manure and that the aim is to give one large dressing to last for some years, we recommend a widely distributed broadcasting with no special cultivation. Weather conditions need not be taken into account.

We have suggested that pruning is a convenient time, as the rate of work will be greater without the impedance of the branches and the broadcasting will be more uniform. It also makes it easier to arrange an estate programme if fields automatically receive dolomite at a fixed stage in the cycle. More will be said about this later. Dolomite will not harm the bushes at any stage of growth, but it is obviously wise to persuade the labourers to keep it off the foliage as with other manures.

If in some districts pruning is done at a busy time of the year, then there is no objection to dolomite being applied, say, in the middle of a drought when work is often short, regardless of the pruning cycle.

Dolomite should not be mixed with the other manures in the bag, but there is no objection to the two manures being together on the ground at the same time. Cultivation could follow immediately and no loss of nitrogen to the atmosphere would occur.

If dolomite is applied several weeks before the other manures then it can safely be left lying on the surface until the next routine cultivation is due.

Dolomite has to have a separate application but this may be as simple as it possibly can be and may be timed entirely to suit the individual estate's convenience.

Rate of application and experimental warning.—Our original idea was that estates, at least in certain districts, might like to try experimental blocks or

fields under one application of 5 cwt. of dolomite per acre. It now seems that many estates are going to go ahead with an overall programme and are by-passing the experimental stage.

It is gratifying to see that there is so much faith in the Institute, but it would not be fair if we failed to remind those concerned that we consider the matter still in the experimental stage. Also, that if an area is not suffering from magnesium deficiency then there will be no benefit from the added magnesium. We may change our recommendations at any time, pending results from experiments, and there may be disappointment in some quarters if dolomite does not send the yields soaring.

We are certainly not going to discourage estates from using dolomite on any scale they may choose, subject to the soil acidity proving safe, because such widespread applications naturally increase our own opportunities for estimating the practical effects of dolomite. We would, however, stress that in the majority of soils, as far as we have been able to judge by an all too scanty survey of leaf deficiency symptoms, dolomite will be applied as an insurance measure. If superintendents will extend their faith in scientific research and accept this view, which after all is in the best interests of husbandry, then we shall not hesitate to encourage the general use of dolomite. Over optimistic hopes based on misconceptions of why dolomite is used could be the greatest enemy of this latest addition to the manuring programme. The preceding article on magnesium emphasises this outlook.

Soil pH.—Before applying 5 cwt. of dolomite per acre we have always warned superintendents to send soil samples for a pH check. If the pH is above 5.5 we are not at the moment prepared to recommend dolomite.

If an estate has limestone outcrops on or near the fields to be treated then there is a real danger of the pH being pushed too high, and those estates must contact us for special advice.

Normally, if one field only is to be treated, six separate samples taken from widely scattered points and from the top six inches will be sufficient. This does not appear to conform to the advice given in the *Tea Quarterly* for September 1955, page 112. The necessity for accuracy is not so great when deciding on the use of dolomite, and the limit set, 5.5, allows a very ample margin of safety. If the field is very sharply divided, say by a ridge or a ravine, then it would be better to treat each section as a separate field.

If all the pruned fields on an estate are to be treated then we suggest no more than three samples from each. This will give a total which, both in numbers and in distribution, offers a good basis for detecting any possible trend towards a too high pH.

The numbers of such samples which we are now receiving are on the increase and we can not cope with a very detailed sampling from every field. A suggestion offered by a visiting agent, which we have welcomed very warmly, is that his estates should be supplied with their own pH testing outfits. This is more satisfactory both from our aspect and that of the estate, as many more tests can be made and the results are available immediately.

The B.D.H. Barium Sulphate pH outfit is very cheap and perfectly simple to operate. Before an estate puts it into routine operation soils could be sent to the Institute, so that the pH value obtained by the barium sulphate method may be compared with that given by the more precise method we adopt.

Cost.—A question often asked concerns the relative cost of dolomite and Epsom salts as a source of magnesium. These two manures differ widely in their speed of action, but if the aim is to maintain the magnesium reserves in the soil then we may compare them directly on their magnesium content.

This is expressed as percentage MgO, and it will be found that the manures offered for sale have, for Epsom salts 16 per cent. MgO, and for dolomite, a minimum of 20 per cent. MgO.

Prices vary, but by weight Epsom salts is from two to two and half times as expensive as dolomite. It is only a matter of arithmetic to show that on an equivalent MgO basis, Epsom salts is thus between two and three times as expensive as dolomite.

Dolomite has to incur the cost of a separate, simple application, whereas Epsom salts is incorporated with the normal manure. Even allowing for this, which again varies widely, dolomite is still far cheaper. This, of course, is putting the comparison at its face value. Each manure has its own peculiarities and additional effects on both plant and soil, and until all these are sorted out by experiment an absolute comparison can not be hoped for. Our anticipation is that these additional factors will only shift the balance still more in favour of dolomite.