Agri. Res. J. Kerala, 1975, 13 (2)

A NOTE ON THE CHEMICAL AND MECHANICAL COMPOSITION OF GROUND DOLOMITIC LIMESTONE DISTRIBUTED IN KERALA

As the majority of the soils of Kerala are acidic in reaction liming has become a regular practice in the cultural operations in the State, especially for rice. In view of the soil deficiency with respect to both calcium and magnesium attempts were made in the sixties to popularise ground dolomitic limestone by distributing it at subsidised rates through contractors. The initial specifications for the material so distributed was that it should contain a minimum of 60% $CaCO_3$ and 15% $MgCO_3$ and that 80% of it should pass through a 60 mesh sieve and 100% through 40 mesh. The specifications regarding the particle size were afterwards changed such that 100% was required to pass through a 20 mesh sieve and 30% was to pass through a 100 mesh sieve. A more detailed analysis of fifteen samples of dolomitic limestone distributed in North Kerala during 1967-68 was carried out by the A. O. A. C. (1960) methods to obtain a fuller picture of the chemical and mechanical composition of these samples and the results are presented in Tables 1 and 2.

All the above samples conform to the specified chemical composition, the $CaCO_3$ content varying from 62.5 to 77.5 per cent with an average of 69.6 per cent and the $MgCO_3$ content varying from 15.0 to 29.0 per cent with an average of 21.2 per cent. The range in the neutralizing values was from 84.6 to 101 2 per cent, the average being 94.9 per cent.

Disregarding the few samples which contain less than 1 per cent of particles passing through a 20 mesh sieve all the above samples have conformed to the specifications regarding the particle size distribution. Particles of size in the range of 20-60, 60-100 and less than 100 mesh are in the range of 31.3 (o 52.9 per cent, 12.0 to 22.5 per cent and 30.8 to 52.8 per cent with averages of 42 8, 17.0 and 40.3 per cent respectively.

The usefulness of a liming meterial for agricultural purposes depends on its neutralizing value, its Ca:Mg ratio and its mechanical composition. In the case of the samples studied the average neutralizing value or $CaCO_3$ eqivalency is 94.9 per cent which should be considered as quite satisfactory. As for the Ca:Mg ratio, Thome (1930) concluded that it is desirable to have Calcium in excess of Magnesium although for some crops a ratio of 1 : 1 was found to be more effective. According to Thompson (1952) the average humid region soils have a Ca:Mg ratio of 5 : 1 and it is desirable to use liming materials of a

Table 1

The chemical character of dolomitic limestone distributed in Kerala

Sl. No.	Locality	Neutralizing value %	Ca CO_3 %	Mg CO_3 %
1	Kadirur	93.3	66.2	22.8
2	Pazhayangadi	95.5	71.0	20.6
3	Kasaragod	91.3	64.4	22.6
4	Panlhalayini	96.0	77.5	15.5
5	Vengara	93.0	65.0	23.5
6	Kozhikode	95 9	74.1	18.3
7	Manjeri	92 9	75.0	15.0
8	Irikkur	101.2	75.fi	21.5
9	Kuthuparamba	97.8	65.0	27.6
10	Trithala	94.1	68.4	21.6
11	Mankada	92.0	71.8	17.0
12	Ottapalam	100.8	70.6	25.4
13	Kollengode	97.5	72.0	21.4
14	Mannarghat	97.0	62.5	29.0
15	Wandoor	84.6	65.0	16.5
	Average	94.9	69.6	21.2

Ca:Mg ratio close to this value for agricultural purposes. All the samples included in the present study have Calcium much in excess of Magnesium which is to be considered as suitable for Kerala soils. Worthen and Aldrich (1956) have pointed out that all material passing through a 50 mesh screen should be considered to be of full value and 20-50 mesh material of half value. Crediting 20-100 mesh material with 50% effectiveness and 100 mesh material with 100% effectiveness the present samples have an average efficiency value 70.1%

Table 2

The mechanical composition of ground dolomitic limestone distributed *in* Kerala

Sl. No.	Locality	Retained on 20 mesh	Particle size 20-60 mesh	60 100 mesh	Passing through 100 mesh
			Per cent		
1	Kadirur	0.5	46.0	20.3	33.2
2	Pazhayangadi	0.4	40.0	22.5	37.1
3	Kasaragod	0.0	46.6	15.7	37.7
4	Panthalayini	0.5	46.0	16.3	37.2
5	Vengara	0.0	43.3	20.3	36.4
6	Kozhikode	0.3	43.1	164	40.2
7	Manjeri	0.3	50.9	12.0	36.8
8	Irikkur	0.0	44.0	17.2	38.8
9	Kuthuparamba	0.0	31.3	15.9	52.8
10	Trithala	0.0	34.2	14.3	51.5
11	Mankada	0.0	52.9	16.3	30.8
12	Ottapalam	0.0	41.3	15.9	42.8
13	Kollengode	0.0	39.6	17.3	43.1
14	Mannarghat	0.0	35.9	16.0	48 1
15	Wandoor	0.0	44.6	17.9	37.5
	Average	0.I	42.6	17.0	40.3

The product of the neutralising value and the efficiency may be called the 'Neutralization efficiency value' which in the present case works out to 66.5 per cent. In this calculation it is evident that pure, 100 mesh calcium carbonate is considered as having a neutralization efficiency value of 100 per cent. Insisting upon a minimum neutralization efficiency value of 60 or 65 per cent it will be possible to evaluate and fix the prices of all liming materials on the basis of both their chemical and mechanical composition.

സംഗ്രഹം

ഉത്തര കേരളത്തിൽ 1967–68 ൽ വിതരണം ചെയ്ത ഡോളോമയിറ്റിന്റെ രാസികവും ഭൌതികവുമായ ഘടനയുടെ rawsTcniaorrwsroi'lcoi ചുണ്ണാമ്പു പദാർത്ഥങ്ങൾക്കു് വിലയിടുവാനുള്ള ഒരു മാർഗ്ഗം നിർദ്ദേശിച്ചിരിക്കുന്നു. ചുണ്ണാമ്പു പദാർത്ഥങ്ങളുടെ രാസിക ഘടനയിൽ നിന്നും അതിന്റെ നിർവ്വീര്യീകരണ മൂല്യം കണക്കാക്കാം. 100 മെഷ് വലയിൽ കൂടി കടക്കുന്ന ചുണ്ണാമ്പു പദാർത്ഥത്തിനു് 100 ശതമാനം കാര്യക്ഷമതയും 20–100 മെഷ് വലയിൽ കൂടി കടക്കുന്ന ഭാഗത്തിനു് 50% കാര്യക്ഷമതയും ഉള്ളതായി സങ്കല്പിച്ചാൽ ഭൌതിക ഘടനയുടെ അടിസ്ഥാനത്തിൽ ഒരു "കാര്യക്ഷമതാമൂല്യം" കണക്കാക്കാവുന്നതാണു്. നിർവ്വീരികരണമൂല്യത്തെ കാര്യക്ഷമതാമൂല്യം കൊണ്ടു് ഗുണിച്ചാൽ നിർവ്വീര്യ കാര്യക്ഷമതാമൂല്യം കിട്ടും. ഉത്തര കേരളത്തിൽ വിതരണം ചെയ്യപ്പെട്ട ഡോളമയിറ്റിനു് ശരാശരി 66.5% നിർവ്വീരീകരണ കാര്യക്ഷമതാമൂല്യം ഉണ്ടായിരുന്നു. രാസിക ഘടനയും ഭൌതിക ഘടനയും കൂടി കണക്കിലെടുത്തു് ചുണ്ണാമ്പു പദാർത്ഥങ്ങൾ 60–65% നിർവ്വീരീകരണ കാര്യക്ഷമതാ മൂല്യം ഉണ്ടായിരിക്കണമെന്നു് നിർദ്ദേശിക്കാവുന്നതാണു്.

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(M. S. *received:* 20-2-1975)