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CHOOSING THE RIGHT LIMING MATERIAL

Clover hay on untreated vs. limed land at Wooster

Ohio Agricultural Experiment Station

Wooster, Ohio

CHOOSING THE RIGHT LIMING MATERIAL

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Numerous inquiries are coming to the Station asking which one of several liming materials available in a given locality is apt to be the best investment. The proper answer to these questions requires a knowledge of what factors enter into the value of a liming material, as well as of its price and the probable cost of hauling and applying.

In Ohio the law requires that all agricultural liming materials be guaranteed as to fineness and purity or "neutralizing power." Fineness is stated as the minimum percentage of the material that will pass thru screens having 4, 10, 50, and 100 meshes per linear inch. "Neutralizing power" refers to the combined percentages of all active ingredients calculated in terms of carbonate of lime.

In choosing between the raw limestones sold commercially in Ohio, one can safely disregard the matter of guaranteed neutralizing power since it varies from only a few points below to a few points above 100. Those running above 100 do so because they contain some magnesium carbonate. These are referred to as "dolomitic." Field and laboratory studies have shown that as the amount of magnesium carbonate contained in limestones increases, their rate of solution in the soil decreases. This reduction is sufficient to overcome the advantage of their higher neutralizing values.

FINENESS IS IMPORTANT

Fineness is the important factor in choosing between raw limestones. The finer particles in a ground stone are most rapidly soluble and hence most quickly effective. The coarser particles go into solution more slowly, but, of course, for this reason, can be expected to last. As between fine and coarse limestones, the former show their highest relative value when quick results are wanted, as when liming for spring grain with which clover is to be seeded. The coarser stones show their highest relative values when the liming is done some time in advance of the clover seeding. The finer a limestone is ground, the more it costs to produce it, and, as a rule, the higher its market price. It frequently happens, however, that one can buy, haul, and apply more actual fine material per dollar invested in coarse limestone than for the same amount spent for a finer product.

EQUIVALENT AMOUNTS OF LIMING MATERIALS

Kind of material	Approximate delivered price at Wooster	Total neutralizing power	Percentage of material passing thru 100 mesh seive	(1) If applied at least the season before legume seeding	(2) If applied at time of legume seeding
	Dol.		*Pct.*	*Lb.*	*Lb.*
Pulverized limestone, bulk	4.80	95–108	55–70	2,000	2,500
Pulverized limestone, bags	6.30				
Agricultural ground limestone	3.70	95–108	40–55	2,200	3,000
Agricultural limestone meal (fine)	2.30	95–108	30–40	2,450	3,350
Agricultural limestone meal (coarse)	2.30	95–108	20–30	2,850	4,350
Hydrated lime	9.50	135	100	1,380	1,600
Hydrated lime	9.50	170	100	1,090	1,260

In the case of hydrated limes, fineness may be disregarded since all the commercial brands are extremely fine. With such materials, the guaranteed neutralizing power is the measure of their value. It should be carefully considered since the hydrated limes sold in Ohio vary in neutralizing power from as low as 116 to as high as 170.

STUDIES HAVE BEEN MADE

During the last five years, the relation of fineness and composition of liming materials to their effectiveness in the soil has been carefully studied, both in field and laboratory investigations. The following table, showing the equivalent amounts of different commercial grades of limestone and hydrated lime, is based upon the results of this work. It should be noted that two columns of comparative values are shown. The first column refers to the more general situation where lime is applied to the wheat or corn crop at least one season before the legume is seeded. The second is intended to apply to situations where quick results are wanted, as for example when lime is applied to spring grain with which a legume is being seeded, or as a spring topdressing on winter wheat at the time the clover seed is sown. The actual amounts are proportionate rather than definite recommended applications per acre.

An example will illustrate the use of the table. Suppose one can purchase hydrated lime, neutralizing power 135, for $9.50 per ton and agricultural ground limestone at $3.70 per ton. Suppose it costs $1 per ton to get the material hauled, making the prices delivered to the farm $10.50 and $4.70, respectively. Let us assume that the lime is to be applied in the spring to oats seeded to clover. In column (2) we find that 1,600 pounds of hydrated lime, neutralizing power 135, is equivalent to 3,000 pounds of agricultural ground limestone. At $10.50 per ton, 1,600 pounds of hydrated lime would cost $8.40. At $4.70 per ton, 3,000 pounds of agricultural ground limestone would cost $7.05. On this basis the latter material would be the better investment.