

THIS COPY
DO NOT REMOVE

LIME FOR MICHIGAN SOILS



LINKS IN PROFITABLE FARMING

EXTENSION DIVISION
R. J. BALDWIN, Director
MICHIGAN STATE COLLEGE
OF AGRICULTURE AND APPLIED SCIENCE

LIME FOR MICHIGAN SOILS

C. E. MILLAR

Clover failures are increasing in Michigan, and this fact clearly shows the necessity of using lime to correct the sour condition of the soil. When alfalfa or sweet clover is seeded, the need for lime is even greater.

The growing of legumes is an important factor in the maintenance of soil fertility, and **legumes need lime**. Many other crops also are benefited by the application of lime to sour soils. Some crops may be benefited by supplying, as a plant food, calcium and magnesium, both of which are found in variable quantities in all forms of lime.

Does My Soil Need Lime

The failure of clover, alfalfa, or sweet clover seedings indicates a need for lime as does also the growth of sorrel. To make sure regarding the matter, a direct soil test should be made with Soiltex which may be procured from your county agricultural agent or from the Soils Department of Michigan State College for 25 cents. Some time should be spent in learning how to make soil tests and how to take samples for testing before making your final field tests.

The Soiltex method of testing soil for acidity is very simple and anyone can use it, but the testing cannot be done carelessly, if correct results are to be obtained. Directions for using Soiltex are included in every outfit. These directions should be carefully followed.

Taking Soil Samples

In taking a sample of soil for testing for lime requirement, use a clean shovel and dig down from five to seven inches, leaving one side of the hole straight. Then shave off a thin slice of soil from the straight side, mix it thoroughly, and use it for testing.

TEST THE SUBSOIL: The subsoil should be tested, since the depth to which the roots have to go to reach lime makes a great difference in the growth of legumes. Dig down from 20 to 30 inches and test the soil at that depth. Two or three tests should be made on each type of soil found in the field, and both the surface and subsoils should be tested.

Forms of Lime

The two forms of lime in general use for correcting soil acidity in Michigan are carbonates and hydrated lime.

I. Carbonates:

(a) Limestone: Three limestone products are offered for sale, medium, fine, and very finely ground limestone. All three grades have given excellent results. The limestone should be ground so

that practically all will pass through a 10 mesh screen and at least one-third pass an 80 mesh screen. The coarser the limestone, the slower it becomes dissolved. However, some limestones dissolve sooner than others. The medium ground material, having the fineness described above is sold under the name of limestone meal. It contains a sufficient supply of fine material to give satisfactory results and is lower priced than finer ground limestone.

(b) Marl: Marl can be secured in many sections of Michigan at a very low cost, and it is quite easily obtained. This form of lime is very satisfactory. Because of the variation in purity it should always be tested. Send samples to your county agent or to the Soils Department, Michigan State College, for testing. Before much time and money is spent on making marl available at any location, the depth of marl and extent of the bed should be determined. Marl is usually applied with a manure spreader or an end-gate spreader.



The difference in growth of sweet clover in foreground and background testifies to the importance of supplying lime to sour soil.

(c) Sugar Factory Lime: This form usually contains from 80 to 85 per cent of lime carbonate, on a dry basis. Considering moisture and other impurities it contains about 50 per cent lime carbonate. It is in much the same condition as marl and should be used similarly. Sugar factory lime also contains small amounts of plant food elements but not enough to be of particular value.

(d) Wood Ashes: Wood ashes are occasionally obtainable. Unleached wood ashes contain about 50 per cent calcium carbonate, and leached wood ashes about 40 per cent. Unleached wood ashes may also contain as high as 5 per cent potash and 2.5 per cent phosphoric acid.

2. Hydrated Lime:

Sometimes called agricultural lime. The neutralizing power, or power to correct sourness in soils, varies with different grades. The neutralizing value is printed on the bag. To correct as much

acidity as two tons of high grade limestone will require approximately 3,000 pounds of hydrated lime with a neutralizing power of 135 per cent, or 2,600 pounds of hydrated lime with a neutralizing power of 151 per cent, or 2,400 pounds of hydrated lime with a neutralizing power of 170 per cent. In order to get as much lime applied to the soil, it usually costs much more to lime an acre with hydrated lime than with limestone. Hydrated lime is in a good mechanical condition and is readily available, but because of its cost there is a tendency for farmers to use too small amounts. If lime is present in the soil at a shallow depth, a light application of hydrated lime or ground limestone may give temporary results, but it will not last as long in the soil as a normal application of limestone.

Consider the Cost Per Acre

Field experiments show that either two tons of pulverized limestone or limestone meal will give approximately the same results as one and one-half tons of hydrated lime with a neutralizing value of 135 per cent, or five yards of marl or sugar factory lime. Obtain the price of each and determine which form is most economical to use. The cost will vary in different sections of the State.

Time and Rate of Applying Lime

Lime should be applied well in advance of the legume since it takes some time for the lime to correct the soil acidity. Applying lime while fitting the soil for the crop preceding the legume is a good practice and liming a year in advance of seeding gives satisfaction. Applying the lime two or three years before seeding to the legume has given good results, even applying it on sod to be plowed for a cultivated crop which in turn is followed by one or two grain crops in one of which a legume is seeded has proved successful. One may be successful by seeding almost immediately after liming, but it is certain that a great many failures result from this practice.

Don't guess at the rate of application. Use the amount indicated by the Soiltest test. Soils differ so much as to their lime requirements that no standard application can be given.

Methods of Applying Lime

Two-wheeled spreaders, end-gate spreaders of both the simplex type and the fan type, manure spreaders, and spreading by hand with a shovel are successful methods of applying lime now being used. Any way to get the lime evenly spread, at the required rate, is satisfactory. The Simplex spreader may be made at home. Anyone desiring plans may secure them by writing the Agricultural Engineering Department, Michigan State College.

Lime Does Not Replace Fertilizers

Lime is applied to soil primarily to correct soil acidity. Fertilizers are used to supply plant food. Fertilizers will not give best results on soils which are deficient in lime. The acid condition should first be corrected. It will then be more profitable to use suitable fertilizers.