LIME-MAGNESIA RATIOS IN DOLOMITIC LIMESTONES AS INFLUENCING SOLUTION AND SOIL REACTIONS

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The Great Appalachian Valley is seamed with alternate streaks of high-calcic and dolomitic limestones. The relative values of these two types of stone and the reactions induced by them in the soil are therefore of special interest in this region.

When limestones and dolomites of comparable neutralizing values are subjected to solubility tests, the high-calcic rocks dissolve more readily in the several mineral and organic acids. In the practice of liming, this difference in speed of disintegration apparently has no economic significance for general rotations, since finely ground incorporations of both types of rock are readily disintegrated by those soils that have sufficient fixing power. But the soil that has absorbed limestone is a system different from the one that was derived from soil plus dolomite.

For many years there existed some uncertainty as to the value of the high-magnesic and dolomitic limestones and even a prejudice against their use for soil liming. Magnesium was considered a substance that should be used with caution, if at all. This attitude was probably due to the conclusions that had been drawn from some of the many lime-magnesia ratio studies that followed the promulgation of Loew's hypothesis. In most of these studies, pot cultures in particular, magnesium was added by means of the hydrated precipitated carbonate. This material has characteristic properties that are entirely different from those possessed by the magnesium carbonate of the natural high-magnesic rocks. The soil reactions induced by ground dolomitic limestone cannot be determined by means of analogies that are based upon the substitution of equivalent amounts of calcium and magnesium added in caustic forms, or as precipitated carbonates.

Agronomic studies at the Tennessee Station have shown that dolomitic limestones and high-calcic rocks have equal value for general rotations. The 15-year studies of the New Jersey Station also indicate full equality, and in some instances superiority, for the dolomitic materials.

The results of Garner and those of Moss showed that dolomitic limestone may be used to insure adequate quantities of...