EXTENSIVE experiments have been conducted on acid soils to determine the effects upon plant growth of various amounts of limestone having different degrees of fineness. It is quite generally accepted that the finer the limestone is ground the more quickly it neutralizes the soil acidity. Previous investigations have also quite clearly shown that the largest yields of legumes have been secured where the lime requirement of the soil had been met. Some recent work, however, seems to indicate that it is not necessary to meet the full lime requirement of a soil in order to secure crop yields comparable to those obtained on fully limed soils.

Fellers (2) found that small amounts of limestone were nearly as effective as larger amounts in raising the protein content of soybeans. Alfalfa grown on soils ranging in pH from 3.0 to 7.1 was reported by Joffe (5) to increase gradually in nitrogen content with the corresponding decreases in the hydrogen-ion concentration. Parker and Truog (8) advanced the theory that the amount of calcium absorbed by the plants is proportional to the protein formed.

In a series of greenhouse experiments Fred and Graul (3) concluded that broadcasting small amounts of limestone is far more economical than making large applications. White (10) observed that the calcium content of clover and sorrel was highest where the maximum amount of limestone was applied and that both calcium and nitrogen in the two crops were higher when grown on an alkaline soil than on an acid soil.

In studying the effects of inoculation and liming on alfalfa grown on Grundy silt loam, Walker and Brown (9) secured the largest increases in yields on the plats where sufficient limestone had been applied to correct the soil acidity. The greatest amount of protein produced per acre was obtained as a result of liming and inoculation.

In some recent work carried out at the Iowa Agricultural Experiment Station (6), it was found that soils receiving limestone applied broadcast in amounts equivalent to the lime requirement of the soil produced highly significantly greater yields of sweet clover and alfalfa than the same soils receiving 500 pounds of fine limestone applied in the row. The nitrogen content of the plants showed an even greater difference in favor of the fully limed soils.

McCool (7) and Albrecht (1) concluded that about 500 pounds of fine limestone applied in the row with the legume seeds supported plant growth which was comparable to that secured where larger amounts were used.

Rather than to apply 500 pounds of fine limestone drilled in the row on acid soils regardless of the lime requirement of the soil, it seemed

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2Teaching fellow in Soils and Head of Department of Agronomy, respectively. Acknowledgments are gratefully made to Dr. D. W. Thorne for assistance given during the course of this work and to Dr. F. B. Smith for reading the manuscript.
3Figures in parenthesis refer to “Literature Cited”. p. 988.