EFFECT OF APPLICATIONS OF FINE LIMESTONE:
I. THE YIELD AND NITROGEN CONTENT OF SWEET CLOVER AND ALFALFA GROWN ON SHELBY LOAM AND CLINTON SILT LOAM

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There are many reports of experiments which show large increases in the yields of general farm crops due to the addition of limestone to soils varying widely in acidity. The general conclusion has been reached that the best results could only be obtained by a complete neutralization of the acidity of the surface soil and that this was essential for a permanent soil fertility.

Recently, however, some investigators (1, 3, 8, 9) have found that by drilling small amounts of fine limestone with certain legume seeds on some acid soils yields were obtained which were similar to those secured by broadcasting large amounts of limestone. In 1927, McCool (8) obtained the first results on drilling fine limestone in the row with legume seeds on acid soils. The soil receiving 750 pounds of finely ground limestone in the row yielded as much alfalfa as those soils receiving larger amounts of limestone applied broadcast. Several years later as a result of more experiments (9), he concluded that 550 pounds of fine limestone drilled in the row with the seed was as satisfactory for the growth of alfalfa and sweet clover as 3 tons of limestone applied broadcast. McCool took a conservative attitude with respect to putting this method of applying limestone into practice since the soils used in the experiment responded differently to this method of application.

Albrecht (1) found that by drilling 500 pounds of fine limestone in the row with the seed on Gerald silt loam, yields of sweet clover were obtained which were as large as those secured by heavy applications of quarry-run limestone. Successful results have also been reported by farmer cooperators (1) in many parts of Missouri by drilling fine limestone with red clover, sweet clover, and alfalfa on various soil types having different degrees of acidity.

It is fairly well established now that certain legumes, when fine limestone is drilled with the seed, do grow satisfactorily on some acid soils. Previous investigators have found legumes to respond differently on different soils when limestone was applied in the row. Since the practice of drilling small amounts of fine limestone with legume seeds on acid soils to promote the growth of legumes is becoming a more common practice, it seemed worth while to make such a study on some of the acid soils common to Iowa. This investigation was planned and a greenhouse and laboratory study made of the effects of fine limestone applied in the row with sweet clover and alfalfa seed.