Deficiency of lime in a soil is seldom seen in plants. However, under controlled experiments it shows up as short roots that turn black and die. Also, the growing points of new growth die and the leaves become wrinkled.

Two forms of limestone are available in Massachusetts. The calcic form ($CaCO_3$) is more soluble and brings about a faster pH change than does dolomitic ($CaMg(CO_3)_2$) limestone which contains a high percentage of magnesium. Where dolomitic limestone has been used continuously over a period of years and the magnesium content of the soil is very high, calcic limestone should be used. Where soil tests show a low test of magnesium then dolomitic limestone is preferable. Calcic limestone with 7-10% magnesium will also supply a good amount of magnesium when applied in ton lots to a soil.

Limestone can be applied any time of the year on soils to change the soil pH. It is best to thoroughly mix it into the soil to accomplish a uniform pH change of the soil solution. Where large amounts of limestone are applied (2 tons or more), a split application (before and after plowing) brings about a more uniform pH change in the topsoil. Thorough mixing of limestone in a very acid soil to bring about a pH change is a problem. Grassland areas should be limed in the fall or early spring of the year to get the lime leached into the soil. Lime-loving plants like alfalfa should be limed and the pH raised to 6.5 or 7.0 before seeding for best results in the establishment of this legume.

It should be noted that the 'Lime Requirement' of a soil is based on an acre furrow slice which means an acre of soil $6\ ^2/_3$ inches deep. If you are plowing your soil 9 inches deep you are going to need more limestone to bring about a desirable pH of the soil.

EVALUATION OF LIMING MATERIALS

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Tests are currently being conducted on behalf of the Pfizer Chemical Company to determine the agricultural merit of a kiln dust product that was previously a waste material. Similar to conventional agricultural limestone, the product is primarily calcium carbonate and calcium oxide. It is currently under test by the Department of Plant & Soil Sciences at the University of Massachusetts.

Experiments are underway using corn, alfalfa, winter rye, and turf, and are intended to determine its effects on soil acidity and plant growth. Initial results have been positive for the use of the kiln dust in agriculture.