

## CHAPTER V

### LIME AND ITS USE

THE greatly increased use of lime by American farmers in recent years is one of the most striking facts in the agriculture of the day. The use of this substance on most soils in the eastern half of the United States is necessary if one wishes to grow alfalfa, and it is very efficient in promoting the growth of red clover. To a much less but to an appreciable extent, it is helpful to most of the ordinary farm crops such as corn, wheat, and most legumes.

In former times botanists and agriculturists called certain plants, found commonly in calcareous soils, lime-lovers or calciphiles; while other plants such as rhododendrons, which rarely thrive in the presence of lime, were called lime-haters or calciphobes. Most plants show no such marked relation to lime. However, calcareous soils are noted for their fertility, that is, their ability to produce large yields of ordinary farm crops.

In recent times the idea has prevailed largely that lime acts mainly in an indirect way, through its alkalinity. Most soils in humid regions are acid according to certain tests, but by the addition of lime they become neutral or slightly alkaline. It is this acid or alkaline condition which is held to be the important factor in affecting plants.

One effect of lime about which there is ample proof is that it greatly stimulates the activity of the nitrifying bacteria in the soil, and thus provides more nitrogen for growing plants. It is doubtless on this account that the effects of lime are always most marked on soils rich in humus and always slight on soils poor in vegetable matter.

Practically it matters but little whether lime acts directly or indirectly in its effects on plants. So far as the turf plants are concerned, experiments show that but few are much affected by its use. Kentucky Blue-grass is greatly stimulated by lime, White Clover and Bermuda-grass considerably. The bents and the fescues are not much affected by lime on most soils, and this is also true of many other turf grasses. The relative indifference of Creeping Bent, Rhode Island Bent, and Red Fescue to lime deserves especial comment, because these

three are the most important putting-green grasses in the North. As putting-greens must of necessity be kept highly fertilized, there is no object in using lime to increase nitrification in the soil. Use of lime, however, does stimulate any Blue-grass or White Clover that may be in the green, and there is ample evidence to show that it tends to encourage several of the troublesome weeds. For these reasons, the use of lime on putting-greens composed of the above grasses is probably not advantageous except in rare cases. The slightly more vigorous growth which lime may induce does not compensate for the undoubted increase of weed trouble.

On the fairways there is no reason to doubt the excellent effects of lime where the turf is composed largely or mainly of Blue-grass and White Clover, or in the South of Bermuda-grass. If, however, the turf is composed of Redtop, Creeping Bent, or Red Fescue, lime is not necessary, and its use cannot be expected to show satisfactory results.

It is a common belief that the presence of certain plants indicates a sour condition of the soil and the need of applying lime. Sheep sorrel is perhaps the commonest weed that is supposed to indicate acidity, but it seems probable that this

idea is based on the acid taste of its leaves. At any rate, sheep sorrel thrives well in soils rich in lime. Mosses and lichens in the turf are also supposed to indicate the need of lime, but when the evidence is weighed it is not very satisfactory.

It must be admitted that there is yet too small a body of data about the effect of lime on each kind of grass turf to warrant final conclusions. In most cases it would pay greenkeepers to test the effect of lime on a small plot of turf before using it largely. The instances are probably rare on golf courses where lime has had any serious detrimental effects, but on the other hand it is doubtful whether any really beneficial effects have been secured except with Kentucky Blue-grass and Bermuda-grass.