of decaying organic matter is practically indispensable. It is the source of nitrogen; the acids liberated in its decay make available the important ash materials which would otherwise be useless; it warms the soil; increases its capacity to hold water needed to dissolve the plant food; and improves its physical condition. Without the presence of organic matter and the associated germ life and the proper conditions for their action, a soil cannot produce its best results, no matter how rich it may be in all the essential constituents of plant growth.

LIME.

Line materials not only furnish calcium, which is essential for the growth of crops, but they have the power of improving the mechanical condition of both sands and clays. This they do by binding the materials more firmly together. In the case of sands, lime thus renders them more compact and improves their water-holding power. With clays, the tenacity of which is largely due to thfineness of the particles, the lime causes the fine particles to adhere to one another, and these aggregations make the soil act like one composed of larger particles. Hence, it improves the mechanical condition, renders the soil more easily enltirated and it is better aerated. Frost and humus also improve the physical state of sticky, impervious soils; but lime is possibly the most potent agency, and it is certainly the agency most readily controlled by the farmer.

Lime also corrects, or neutralizes, the acid which naturally forms in soils, especially those rich in decaying organic matter. Experience and investigation show that many of the soils of this Province are gradually being depleted of their natural supply of lime, leaving them in an acid or "sour" state, which is detrimental to the development of many crops, and absolutely prevents the growth of alfalfa, clover, or the plants of the leguminous family in general.

Lime materials are also necessary for the useful and beneficial bacteria and other organisms of the soil. They supply these organisms with the element calcium, which appears to be just as essential a food constituent for them as it is for the higher plants. Furthermore, in improving the physical state of the soil, lime produces good air and moisture conditions which are so essential to the well-being of these organisms upon whose activity the availability of the plant food in the soil so largely depends. Thus it will be seen that decaying organic matter and lime are very important constituents of soils. In fact, their presence is fundamental. Without these the soil is practically useless no matter how much other plant food may be present. In one sense it may be correct to speak of the soil as a reservoir of plant food, to be drawn on for the growth of successive crops, but it i: equally correct to regard it as a busy, complex manufacturing establishment in which all the various parts must work together under proper conditions to bring the store of plant food into a form available to plants. To bring this about is the object of cultivation.

LOSSES OF PLANT FOOD BY LEACHING.

These combined agencies, while beneficial, are destructive unless means are taken to prevent loss by drainage. They tend to bring nitrogen, lime, magnesis, potash, etc., into a soluble form, which, unless taken up by plants, is lost in the drainage water. As proof of this, we have the familiar fact that water taken from underground drains or from wells is "hard" because of the lime which it