

common red clover and turning it in the second year. Clover not only supplies the needed humus, but has the effect of introducing nitrogen into the soil from the air, and since nitrogenous forms of fertilisers are the most expensive, it is so much saved to the orchardist. The best plan is to buy commercial fertilisers separately, that is, not a mixed fertiliser, as the farmer can then apply them in the proportions he wishes. It is, of course, difficult, perhaps impossible, to say what constituents the soil is deficient in; but ordinarily, a fertiliser containing one and one-half to two per cent. of nitrogen, seven to nine per cent. of available phosphoric acid, ten to twelve per cent. of potash, will give excellent results when applied to orchard land in quantity ranging from 400 to 600 pounds per acre, but if a crop of clover has been turned in the nitrogen can be omitted. Prof. Skutt, in a lecture at the annual meeting of the Nova Scotia Fruit Growers' Association, in February, 1899, thus describes the functions of the three principal elements of plant food, nitrogen, phosphoric acid and potash, viz.:—

"Nitrogen is an essential for plant life. Its function, more particularly, is to promote leaf growth. Leaves are very necessary to the well-being of the tree, as they serve the purpose of both mouth and stomach. The fruit also contains a certain amount of nitrogen. It is chiefly, however, for the development of the leaf, without which a good crop of well-formed apples is not obtainable. Trees, in common with all plants, take their nitrogen from the soil in the form of nitrates—compounds formed by various influences and under certain conditions from the nitrogenous organic (vegetable) matter in the soil. The process is known as nitrification, and is brought about by the agency of minute organisms (always present in the soil) when the soil is in good tilth, warm and moist.

"Phosphoric acid is contained in the mineral part (ash) of the woody tissue in wood and leaves, as well as in the fruits and seeds. It is not only necessary for growth, but seems to have a special value in the maturation or ripening both of the wood and fruit.

"Potash: This, of all the mineral constituents, is the most important for fruit trees, both large and small. The well-being of the tree largely depends upon an abundant supply of soil potash in an available condition. It forms by far the greater portion of the 'ash' of the wood and leaves, and approximately one-half of that of the fruit."

Lime is not a fertiliser in the strict sense of the term, its functions being chiefly in the liberating of plant food, which is already in the soil but in unavailable forms, and also in the improvement of the conditions of clay and hard, refractory soils. Prof. Skutt says of it:—

"Lime is not so necessary for apple and pear trees as it is for the stone fruits, but it is, nevertheless, a valuable constituent for the orchard soil, for trees grown upon limestone soil are found to be sturdy, strong stock and to have a vigorous growth. Lime acts in two ways, mechanically and chemically. It serves directly in furnishing nourishment for the growth of the tree; it serves indirectly in the liberation of locked-up plant food, more especially of the potash. It does most useful work in improving the texture of both heavy clay and light soils. It is usually, however, on the former that it is especially needed."