

SUGGESTIONS ABOUT SOIL ANALYSIS.

By J. H. STOLLER.

A farmer should know what the principal constituents of any soil are, and in what proportions they are present. Such general information may often be helpful to him in judging the suitability of a soil for a particular crop. It will also aid him in determining what fertilizers, if any, are needed to bring the soil up to the required standard.

Different kinds of soils are 'sandy,' 'clayey,' 'loamy' and 'mucky.' A 'sandy' soil is one in which silicon oxide (sand) is the chief constituent. Every soil must contain silica in abundant quantity to be a source of food for the common cultivated plants. As is well known, the straw of the cereal plants consists largely of silica—wheat straw, for example, containing 65 per cent. of this element. In all ordinary soils it is present in the form of fine sand. A sandy soil is not poor because it contains much sand, but because other needed elements are lacking.

A 'clayey' soil is one in which alumina abounds. This also exists as an oxide, consisting of the chemical elements aluminum and oxygen. It is alumina which gives to soil the physical properties of coherency and plasticity and makes it a matrix for holding the elements of plant food. With excess of water soils abounding in alumina become soft and highly plastic, but are not easily washed away. When water is lacking they stiffen into firm clays. But while the value of alumina is thus primarily in the mechanical properties it imparts to the soil, the quantity in which it is present in a given soil has strong indicative value as to its fertility. Alumina is generally associated with other substances, as magnesia, potash and iron, needful for the growth of plants. A perfect soil is stated to contain about 6 per cent. of alumina, and when present in this proportion it affords evidence that the minor elements of plant-food are not lacking.

A 'loamy' soil is one which in its physical qualities is intermediate between sandy and clayey soils. When dry it is loose and porous, and when wet, sticky and plastic. In composition it consists partly of clay and partly of other substances, usually including carbonate of lime. The prevailing soil in sections where limestones is the country rock is a loam, unless geological agencies have operated to remove or cover up the original soil. Usually loamy soils are rich in plant-food,

do, of a mixture of the various soil constituents. An ideal soil, it is said, should contain about 6 per cent. of lime.

By a 'mucky' soil is meant one which contains a good deal of organic matter, derived from vegetable decomposition. The term may include ordinary mold or humus, which forms a thin surface layer on all virgin soils. A true muck is found only in localities which were once swamps. It is of a black or dark color, due to its carbonaceous composition, and, of course, is very rich in food-matter which should be present in a perfect soil and is said to be about 10 per cent. of the whole.

Mention may also be made of 'alluvial' or valley-bottom soils. These have been formed by the accumulation of matter deposited from the water of the river in past ages when the present valley bottom was the bed of the river. Such soils are well known to be very fertile.

We may now consider how soils may be tested for their leading constituents, and how the relative proportions of each to the whole may be estimated.

For silica. Of the soil to be studied weigh a definite quantity, say eight ounces. Put it in a vessel of water, as a glass jar holding two or three quarts, and stir thoroughly. Then allow to stand; the sand will soon settle at the bottom. Then pour off the water and weigh the sediment; its ratio to eight ounces is the approximate percentage of silica in the soil.

For alumina. Allow the muddy water poured off from the sand to stand for a day. The sediment falls to the bottom and when the water, now almost clear, is poured off it will be found that what remains is plastic, showing it to consist largely of alumina. After it has become dry weigh it. Then place it in a vessel, as an iron spoon, and heat till it takes fire; after it ceases to burn weigh what remains. The ratio of this weight to the eight ounces indicates the proportion of alumina in the soil.

For organic matter. It was the organic matter of the soil that took fire and burned in the experiment just described. The difference between the weight of the sediment before being burned and the weight of what remained after burning is the weight of organic matter; the proportion to the whole may be determined as before.

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Growing Onions.

This crop was formerly regarded as a profitable one, and large quantities were grown in some localities. Within the past few years the onion maggot has proved to be a great pest to the onion, and many fields have been greatly injured or wholly destroyed, so that some farmers have become in a measure discouraged, and do not attempt to grow them as formerly. In some localities a mildew has injured this crop to a considerable extent. Notwithstanding these drawbacks, as a rule a good crop can be secured when all the conditions are favourable. The onion requires a rather light, loamy soil made mellow by plough or spade. Formerly it was the rule to grow them on the same land many years in succession, but many of the best growers have abandoned this practice, and now change about every second or third year.

The land should be heavily manured with well rotted dressing, with wood ashes if it can be had, all of which should be turned under. The land should then be well raked over and made smooth, and as free as possible from lumps. The seed should be sown as early as possible after the soil is suitable to work. Sow in drills about fourteen to sixteen inches apart, and put the seed about half an inch deep. This work can be done with a seed sower, and the seed should be sown quite thickly so as to allow for some loss by insects. If there are too many plants left it will not be difficult to remove them, but if the land has been thoroughly enriched they may be left pretty near together—say an inch apart. No weeds should be allowed to grow. The work of keeping them down can be mostly done with a scuffle hoe, and very rapidly too.

There are many varieties, but one of the best, if not the very best, is the Danvers yellow, a variety that is largely cultivated in Essex county and has sold well in Boston market. The large red and silver skin are sorts that do well and find a ready market, but still we give the preference to the Danvers. These varieties should yield under good cultivation six to eight hundred bushels to the acre, and sell from seventy-five cents to a dollar a bushel. We know of nothing that can be used that will effectually prevent the ravages of the maggot or mildew. One must take the chances. We know of few more profitable crops than the onion.

HOW TO TELL A HORSE'S AGE.—The Southern Planter has the following, which our readers may be interested in verifying: "The other day we met a gentleman from Alabama, who gave us a piece of information about ascertaining the age of a horse after it has passed the ninth year, which was quite new to us, and will be, we are sure, to most of our readers. It is this: After the horse is nine years old a wrinkle comes in the eyelid, at the upper corner of the lower lid, and every year thereafter is added one well defined wrinkle for each year."