

Fertilizer's Value Independent of Odor

Notwithstanding the odor of a fertilizer has little or nothing to do with its food value for the plant, there is still a large percentage of farmers and greenkeepers who regard it as an important factor to consider when buying fertilizers.

The National Fertilizer Association during the past summer conducted a survey in which over 48,000 farmers were personally and uniformly interviewed on the subject of fertilizers. These farmers were located in 34 states, including all those east of the Mississippi River, and Minnesota, Iowa, Missouri, Arkansas, Louisiana, Kansas, Oklahoma, and Texas. The results of this survey are reported in *The Fertilizer Review* of January, 1929.

It was found that 26 out of 100 farmers considered odor an important factor, 19 per cent considered size of bag important, and 14 per cent expressed a preference for color. To quote from the *Review*:

"It is pointed out by the Association that modern high-analysis fertilizer that has been shown by experiment stations to produce the most profit for farmers is very likely to be practically odorless. In fact, some of the new fertilizer materials, such as nitrogen that is fixed from the air, resemble sugar. Likewise, color has little to do with the effectiveness of commercial fertilizer in increasing the yield of a crop, hastening its maturity, improving its quality, or in making labor put on it more effective in growing a satisfactory crop.

"The Association also points out that those farmers who say they rely on their noses for determining quality got the habit when fertilizers were made largely of waste products. However, much of the fertilizer now on the market contains mostly straight chemical materials that have practically no odor. Therefore the farmer who trusts his nose in buying fertilizer is likely to find that his olfactory organ is not a capable judge of the most important factor, which is the ability of a complete fertilizer containing nitrogen, phosphoric acid and potash to feed a crop so as to increase the yield per acre and thereby lower the cost of production per unit to a minimum."

Fine Clay Particles Govern Fertilizer Needs of Soil

One of the reasons why even the wisest experts in the fertilizer field advise farmers and greenkeepers to make small-scale experiments on their own land, when this is possible, instead of launching into heavy purchases of untested fertilizers, is explained by Mr. P. L. Gile, of the United States Department of Agriculture.

"The soil," he says, "does more to fertilizer than was dreamed of in the old fertilizer philosophy. Soil is not to be regarded as a receptacle which merely holds fertilizer until it is needed by the crop. It seems that the soil as well as the plant has an 'appetite' or affinity for fertilizers. As soon as the fertilizers are applied, the soil starts changing the materials that have been prepared carefully by the fertilizer manufacturer, and what the crop gets is largely affected by the activities within the soil.

"Exact knowledge of the reactions between soils and fertilizer materials will help improve fertilizer practice. At the present time more is known of the net results than of the reactions themselves. It seems

probable, judging by many experiments, that the very fine clay material of the soil, usually called 'colloid,' is responsible for most of the changes that take place in fertilizers. The larger soil particles are comparatively inert. The colloidal material shows little affinity for chloride, sulphate, and nitrate; hence these fertilizer constituents are subject to considerable losses in regions where the rainfall is heavy. On the other hand, reactions take place between the colloids and other (basic) fertilizer constituents, such as sodium, potassium, and ammonium. If the colloid takes up some of the potassium of a fertilizer, it releases to the soil water an equivalent quantity of one of its own constituents, usually calcium or magnesium.

"The fact that there is an exchange of constituents between fertilizers and the soil colloidal material explains why a change in fertilizer treatment is sometimes beneficial. If a soil is fertilized for a series of years with a single fertilizer, the clay or colloidal material may become loaded with a single constituent and have less of other elements to release to crops. Soils on which crops are likely to develop nutritional disturbances following too heavy applications of lime or fertilizers (sometimes called 'weak' soils) seem to be those which contain a small quantity of colloid, or a colloid of low exchange capacity. The so-called 'strong' soils, on the other hand, seem to be those which contain colloids that insure a high capacity for exchange."

Caring for Trees on the Golf Course

Golf courses are at first generally blessed with an abundance of handsome forest trees. As the virgin underbrush is cleared from the woods to make room for fairways and putting greens, the trees, however, are robbed of the natural layer of decomposing vegetation which is the source of their food and water. Fertilization and irrigation must be resorted to in most cases if these native trees are to be retained in locations where the turf is kept cut short, as on fairways and tees and near putting greens. Often subirrigation is necessary to save trees in such locations, and it has been practiced successfully on some courses. Where subirrigation is impracticable or not deemed necessary, additional surface water beneath the trees can and should be applied. Soil beneath a tree is generally drier than soil in the open, due to the double draught on the moisture supply by the tree and the surface vegetation, and also to the interception by the branches of the natural rainfall coming from showers. There is also a double draught on soil nutrients beneath trees, and for this reason additional fertilization is called for in such locations. On the golf course this additional fertilization can perhaps best be attained by more frequent application of fertilizers under the trees. Of greater value perhaps are top-dressing with compost and, in early winter, spreading a mulch of thoroughly rotted animal manure on the ground over the spread of the roots of the tree. This mulch should be allowed to remain on the ground over the winter. Any residue that may remain the following spring may be raked away if it is deemed objectionable. Trees must also be kept pruned if they are expected to thrive. Dead branches should be carefully removed to make room for new growth and to prevent the spread of decay. No annual budget of a golf club is complete unless it includes an item to cover tree surgery, tree replacement, and general care of the trees.