THE FERTILIZATION OF LAWNS.

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A deep, fertile soil is a prime requisite for a good lawn. Farmers know that a soil must be well drained and well supplied with humus and plant food to produce large crops. Gardeners, likewise, have long known that the best garden soils are deep, well drained and rich. The average owner of a lawn has never given much thought to the idea that a lawn needs a good soil. Only too often the subsoil from the cellar has been graded around the house, together with brick bats, plaster and other debris from the building. Sometimes a thin coat of good soil has been applied over the surface. Under such conditions it is no wonder that the grass dies out and the weeds come in.

During recent years, much study has been given to the making of lawns or rather putting greens at country clubs. One of the best methods for building a putting green is to thoroughly tile drain the area, then dig up the soil about a foot deep and mix it, if it is clay, with 25 per cent manure and 25 per cent sand. If the soil is already sandy, the sand is not necessary. As manure is nearly always filled with noxious weed seeds, an additional surface of one inch is applied composed of half sand and half loam. To this surface inch the seed and fertilizers are applied.

The fertilizer used in preparing a new lawn should consist of four to five per cent ammonia, eight or ten per cent phosphoric acid and six to eight per cent potash. If such an analysis can not be obtained a good garden fertilizer may be used. About four pounds of fertilizer per ten foot square should be used to start a new lawn. Half as much may be used for renovating an old lawn.

Lawn Fertilizer Experiments.—In the spring of 1918 an experiment was started on the lawn directly north of the Experiment Station Building. Plots were laid out as follows: Untreated; limestone 3,000 pounds per acre; fertilizer 600 pounds per acre; limestone and fertilizer; chicken manue one ton per acre; chicken manure, limestone and fertilizer. The fertilizer contained six per cent nitrogen, eight per cent phosphoric acid and two per cent potash.

The limestone has never shown any results either without or with the fertilizer although the soil was somewhat acid and infested with red sorrel. The first season the fertilizer produced a luxuriant dark green lawn. This effect was noted to a less extent the second year, then is completely disappeared. The chicken manure, due to the fact that it was more or less lumpy, caused an uneven growth with dark green and light green spots of grass. These dark green spots persisted longer than the effect of the fertilizer. It was concluded that the fertilizer and manure effects were due entirely to the nitrogen in them, and that

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neither lime, phosphate, nor potash had produced any noticeable effect on this lawn.

In April, 1922, a second grass experiment was started on the lawn directly east of the Station Annex. Treatment was applied as follows:

1, untreated; 2, nitrate of soda, 150 pounds per acre; 3, ammonium sulphate, 100 pounds per acre; 4, dried muck, 3000 pounds per acre; 5, limestone, 3 tons per acre; 6, phosphate and potash; 7, PK plus nitrate of soda; 8, PK plus ammonium sulphate; 9, PK plus muck; 10, bone meal, 200 pounds per acre.

This experiment gave results comparable to the first. No appreciable effect could be noted from limestone, phosphate and potash or bone meal. The nitrate of soda and ammonium sulphate both produced a dark green luxuriant lawn the first season. Very little effect could be noted the second year or later. The ton and a half per acre application of muck, produced no effect. This is an interesting point as many humus preparations composed almost entirely of muck are sold for lawn fertilizers.

The results of these tests indicate that a lawn fertilizer should be high in available nitrogen. From greenhouse tests on nitrogenous materials it has been found that nitrate of soda and ammonium sulphate are the most quickly available of the nitrogenous materials on the market. Tankage is somewhat slower in availability but would produce a good effect on grass. Dried chicken and sheep manures are sold and as they contain available nitrogen they will do some good. The price of dried manures per unit of ammonia is so high that they do not do as much good per dollar invested as do fertilizers containing nitrate of soda and ammonium sulphate which are water soluble. If these soluble salts are used alone there is a possibility of causing injury by using too much or applying ununiformly. These materials should be applied only when the grass is dry.

Lawn experiments at the Rhode Island Experiment Station have shown that lime encourages dandelions and plantains. The use of ammonium sulphate tends to make the soil more acid. This discourages the above mentioned weeds. If acid resistant grasses are grown, such as red top, red fescue, and the bent grasses, very fine lawns may be grown with ammonium sulphate as a fertilizer. Nitrate of soda tends to reduce soil acidity and may be used on Kentucky blue grass lawns. On such a lawn greater care must be taken to keep out weeds. If any lawn is kept well fertilized so the grass grows luxuriantly there is less difficulty with weeds. While phosphate and potash have not shown any benefit on the Experiment Station lawn, it is no doubt true that there are many soils in the state that do need these fertilizers. For that reason, it is best to apply a complete fertilizer but it should by all means be one high in ammonia. Only on the most acid types of soil is it profitable to use lime. In this connection, it might be well to say that the average city water of different towns in Indiana contains lime, and on lawns that have been sprinkled for many years the lime content is high, and likewise the proportion of weeds is increasing. If nitrogenous fertilizers are used each year, the grass should get better and the weeds should diminish.