Artificial Manures for Roses[*]

By Richard W. Woosnam

PROBABLY the average Rose grower is less informed on the subject of manuring than on any other detail of successful culture. Too many are apt to shovel manures of which they know little on to soil of which they know less. The result may be anything. If the Roses are good the manure gets the credit, but if bad the blame is generally laid on the weather. It rarely occurs to the Rose grower that he may have applied the wrong manure at a wrong time to a soil totally unsuited to such treatment.

Everyone knows the novice who is under the impression that show blooms are produced by the application of some mysterious substance to the plants, the name of which is guarded with masonic secrecy. When he fails to discover the wonderful nostrum he frequently settles down to some proprietary mixture which claims to grow anything from a Rose to a radish—of course, at a price proportionate to the magnificence of the advertisement.

It is in the hope therefore of shedding some little light, for the beginner more especially, on the more common of what are known as artificial manures and on their application that the following notes are made.

In the first place, before putting on artificial manures the beds must be thoroughly well made and a good drainage secured. This is absolutely essential. A full $2\frac{1}{2}$ to 3 feet is the depth to which the soil should be dug, taking care to keep the lower spits in their proper place and not mixing them with the top soil. It is taken for granted also that a good stiff dressing

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of the best dung obtainable has been added when making the beds, putting it at about a foot below the surface. There are many reasons for making a bed in this way which need not be gone into here, but it is sufficient to say that the addition of artificial manures to soil that has not been properly cultivated is more likely to do harm than good. Further, it is important that there should be a sufficiency of lime present in the soil. This is a necessity, and it is more often in short supply than is suspected. So easily is lime acted on by the decomposing humus in the soil and carried down by the rain to the lower levels that it is not uncommon to have to add lime to land actually situated upon a chalk subsoil.

The manurial value of farmyard dung is low but, largely by reason of its mechanical effect, it is a sheet anchor to all Rose growers, and should always be employed when obtainable. In order to obtain the best results artificial manures should be regarded as supplementary, but when used on well-tilled beds they are most valuable. They are much more powerful than dung in their action, and care must be taken in using them.

The choice of artificial manures is influenced by the quality and variety of soil upon which they are to be used. For example, basic slag is preferred on heavy clays and spring dressings of superphosphates on light loams. The season of growth also has to be considered when giving artificial manures. For instance, if nitrate of soda is put on the beds too early in the year a quick, sappy growth is made which is very susceptible to late frosts, and is also easily attacked by the many diseases to which the Rose is prone.

Many of the substances which go to build up the growing plants are found already in sufficient supply in most soils, and apart from lime the only shortage likely to occur is in phosphates, nitrogen and potash. In order to produce a full crop the amount of each of these must not fall below a certain minimum. There may be an abundance of everything necessary for plant growth except in one essential constituent—it may be phosphoric acid, or nitrogen, or potash—but the shortage in this

one respect is sufficient to seriously prejudice the crop, whether it be Roses or anything else.

Where dung has been regularly applied sufficient potash will almost certainly be present. It is well to remember this just now, as practically all the potash salts have been hitherto imported from Germany, and in consequence they can only be bought at an almost prohibitive price. The ashes of the rubbish heap, which contain about 5 to 10 per cent of potash, may be used instead with much advantage. They should on no account be allowed to remain exposed to wet, as being easily soluble the most valuable portion is soon washed out.

Nitrogenous manures must be used with caution, but at certain times, as, for instance, about the middle of July after the main blooming is over, they are of considerable benefit when given in weak solution.

Phosphatic manures are of the greatest importance for Roses. They give vigour and promote freedom of bloom, and for both exhibition and garden varieties are essential.

The following are some of the most useful artificial manures. After applying them they should always be well hoed in, but care must be taken not to go too deep and thus injure the Rose roots. Choose showery weather, or give a good soaking of water to the beds both before and after application.

Phosphatic Manures

Superphosphate. A quick acting manure composed of mineral phosphate treated with sulphuric acid. The process renders a considerable part of the phosphate soluble in water, and its value depends almost entirely upon this. It should contain from 26 per cent to 36 per cent of soluble phosphate according to price. Apply in the spring about pruning time at the rate of 3 oz. per square yard.

Basic Slag. A slower acting fertilizer than the above. It is the finely ground slag from certain steel furnaces, and its value is determined by the fineness to which it is reduced. It should be guaranteed that 80 per cent will pass through a sieve of 9,600

meshes to the square inch. Basic slag consists partly of free lime, and no other liming need be employed where it is used. It is generally preferred on soils that are on the heavy side. Apply in the autumn at the rate of 4 oz. per square yard for top dressings. It may advantageously be added to the soil when planting, and as much as 1 lb. per square yard may be used.

Bone Dust. The powdered bones from glue works. Slow acting but excellent if liberally added to the soil when planting.

Nitrogenous Manures

Sulphate of Ammonia. A soluble fertilizer prepared from gas liquor and containing 20 per cent of nitrogen. This may be applied in the spring as a top dressing at the rate of 1 oz. per square yard, preferably about the time that the bloom buds are first visible.

Nitrate of Soda. A soluble salt dug from the large natural deposits in Chili and adjacent countries. It contains 15.5 per cent of nitrogen. The results from its use are immediate, but it is not retained by the soil quite so long as sulphate of ammonia. It is best given as a top dressing in the spring, using 1 oz. per square yard when the bloom buds have just appeared.

Potash Manures

Sulphate of Potash and Muriate of Potash. Both are soluble potash salts, and may be applied in the spring at the rate of ½ oz. per square yard.

Wood Ashes contain about 5 per cent to 10 per cent of potash in the form of carbonate. They are very easily soluble in water and may be applied in the spring, using 3 or 4 oz. per square yard.

Peaty and chalky soils are the most often deficient in potash.

Various Other Manures

Guano. This varies greatly according to whether it comes from deposits in the dry rainless belt, or from places where it

is more or less wet. The best Peruvian Guano is a rich complete manure, whereas the common kinds are of value only for the insoluble phosphates they contain. When buying, a guaranteed analysis should be insisted upon.

Bone Meal is unsteamed bones ground to a meal. It is slow acting, but contains nitrogen as well as insoluble phosphates. Bones may also be bought crushed in various grades, such as ½ inch and ¼ inch. In any size they are useful for mixing with the soil when planting, but in the larger sizes the return is very gradual and spread over some years.

Dissolved Bones. This is somewhat similar to superphosphate, except that instead of mineral phosphate bones have been used for treatment with sulphuric acid. It should be made with unsteamed bones, and then contains nitrogen as well as soluble phosphate.

Fish Guano is dried treated fish refuse ground to a meal. A good sample will contain about 8 per cent of nitrogen and 10 per cent of insoluble phosphates. It is a slow-acting manure, and is therefore best applied in the autumn.

Dried Blood contains about 10 per cent of nitrogen, and decomposes in the soil fairly quickly. It contains very little phosphate or potash, and must be used cautiously, as it tends to promote sappy growth.

Hoofs and Horns, Shoddy, &c. These are very slow acting indeed. They are rich in nitrogen, but their decomposition is altogether too gradual for most Rose growers. They may be used with advantage, however, when planting climbing Roses in more or less permanent positions. In these circumstances a phosphatic fertilizer should also be added, as, apart from their nitrogen, there is little manurial value in any of them.

The foregoing are the more ordinary artificial manures in use. There are in addition what are known as compound manures, some of which are described as "Special Rose" manure, and often bear a fancy name. Many of them are well balanced and of value, but there are others which are made up of material which is unsuitable and of little immediate use. When contemplating the purchase of a compound manure it is well

to remember that the fertilizers one would use as a spring top dressing are not the same as those to be selected for incorporating with the soil at planting time in the autumn. Also that the most suitable manure on one class of soil would very likely have to give place to others on a different staple. The price, too, of these "special" manures is nearly always far in excess of their unit value.

But little serious experimental work has been carried out in the matter of Rose manuring, though the general principles as applied to farm crops are adapted here also. Many important and highly interesting questions suggest themselves. As an example, "What is the effect of increasing quantities of magnesia on Roses?" It has recently been pretty well established that upon wheat lands the addition of magnesia is beneficial to the crop so long as it does not exceed the amount of lime present. Beyond that limit it has the reverse effect. There are soils in this country in which an excess of magnesia over lime occurs, and where the addition of the latter in sufficient quantity to redress this has had a very great effect. Does not this in all likelihood apply to Roses also?