V

FERTILIZERS

The most important elements that it is necessary to apply to the soil in the form of fertilizer are nitrogen, phosphorus, and potash.

Nitrogen greatly stimulates the production of leaves, and an excess of it applied to crops grown for their fruit or roots is undesirable. It is contained in all the animal manures, associated with other fertilizing elements, and in a practically pure state in nitrate of soda.

Phosphorus is a valuable and necessary fertilizer which has a great influence on the production of fruits and seeds. It is found in greater or less quantities in animal manures, and in bone meal. Phosphatic rock that has been treated with acid is another important source of phosphorus.

Potash. The rôle of potash in the soil is similar to that of phosphoric acid. It is con-
FERTILIZERS

cidered to be a valuable fertilizer for all crops that are grown for their roots. It occurs in animal manures and in wood ashes. Muriate of potash and kainite contain potash in a more concentrated form, but are difficult to obtain at present.

All of these three elements must be present in the soil for the production of healthy crops.

It is generally conceded that the best all-round fertilizer for plants is decayed barnyard or stable manure. It not only adds fertility to the soil, but by its decay it helps to make the mineral particles soluble and thus available as plant foods. As already indicated, it also improves the physical condition of the soil, making sandy soils more retentive of moisture, and rendering clay soils more porous. When applied in the spring it should be decayed or partly decayed, as in this condition it is immediately available for the use of the crop. If it is put on the ground in the fall, fresh manure may be used and plowed under. By the time that the planting season arrives it will be sufficiently decayed. If there is no objection on the score of appearances, stable manure, either fresh or decayed, may be applied in the form of a thin mulch (a layer on the surface of the ground) at any time when the plants are
WAR GARDENS

growing. The fertility is gradually washed down into the soil by rain, and a loose covering of this kind is of additional advantage in that it helps to prevent the loss of water from the soil by evaporation. This mulch must not be worked into the soil so that it comes in contact with the plant roots, but should be left on the surface until it is dug under the following fall or spring. Discretion must be exercised in its use. Root crops, that are already growing luxuriantly, such as beets or carrots, or crops that are grown for their fruit, such as beans and tomatoes, would probably be harmed by a surface dressing of this kind. Barn-yard manure is rich in nitrogen, which is a great stimulant of leaf growth. If it is applied too freely to the crops just mentioned it is likely to result in an excessive crop of leaves at the expense of roots or fruit.

A dressing of stable manure two or three inches thick all over the plot or at the rate of from three to five hundred pounds to a plot twenty by twenty feet is about the right quantity to use when the ground is dug or plowed.

Sheep manure is perhaps the next in importance of the organic manures and is more concentrated than barn-yard or stable ma-
FERTILIZERS

ure. It can be applied at the rate of forty pounds to four hundred square feet. It is better to spread it over the surface immediately after the ground has been broken up, and thoroughly mix it with the surface soil by means of a rake or harrow.

Hen manure is still more concentrated and should be used in the same way, or as a top-dressing after the crops have started their growth. Twenty pounds to four hundred square feet is a suitable amount to apply. To facilitate its distribution it should be mixed with dry earth and kept in a dry place for a few weeks before it is desired to apply it.

Of the so-called chemical fertilizers, those that are sold by seedsmen as "complete" fertilizers are the best for the amateur to buy. These at the present time are usually made up in the proportion of 5 per cent. nitrogen, 8 per cent. phosphorus, and 1 per cent. potash. Use twelve pounds to four hundred square feet.

All of the preceding are "complete" fertilizers containing nitrogen, phosphorus, and potash in varying proportions. If they are used in combination the quantities must be reduced.

Bone meal is a fertilizer which contains phosphorus and nitrogen. In some of its
forms it is rather slow acting and sometimes does not become fully available for the use of the crop until the year succeeding its application. Use twelve pounds to four hundred square feet.

_Nitrate of soda_ is the quickest-acting fertilizer that we have and is very valuable for stimulating the growth of plants early in the spring, when the nitrogen content of the soil is usually low. It is especially suitable for those crops that are grown for their leaves, such as spinach, lettuce, and cabbage. Great care must be exercised in the use of this fertilizer, as an overdose will injure or kill the plants. As it is very soluble, it should not be applied until the plants are up and ready to use it, otherwise much of it will be washed out of the soil and wasted. It should be sprinkled on the surface of the soil, first crushing the lumps, and then mixed in with a hoe or cultivator. An ounce to each square yard, applied at intervals of about three weeks, until the crops have a good start, is the right proportion to use. It is impossible to lay too much emphasis on the necessity for care in the use of this fertilizer. It must not be allowed to come in contact with the leaves of the crop, or it will cause them to burn and turn brown. Generally speaking, it is not a
FERTILIZERS

good fertilizer to use on root or fruit crops, although it can be used to good advantage in helping young plants of tomato, cucumber, muskmelon, etc., to get a start just after they have been planted out. Its use later in the season is likely to result in the production of leaves at the expense of fruit.

Wood ashes contain potash and lime. This fertilizer is a valuable dressing for heavy, clayey soils, as it improves their physical condition. It is good for root crops, such as beets, carrots, radishes, etc. Use twenty pounds to four hundred square feet.

It is best to apply all concentrated fertilizers as surface dressings, and then harrow or rake them into the soil, rather than to plow or dig them under.

If it so happens that the soil is not very fertile and there is only a limited quantity of fertilizer available, it is a good plan, instead of spreading it all over the plot, to apply it only in close proximity to the hills or drills in which the plants are growing.

It is important to remember that the greatest good can only be obtained from chemical fertilizers when the soil is plentifully supplied with humus.