

Scientific Feeding of Garden Plants

Vegetable Life Cannot Flourish Without Certain Elements Drawn From the Soil; Fertilizers Are Intended to Supplement the Natural Supply of These Elements and Make Them Available.



School children planting rose bushes, February 22.

By Professor A. L. Knisely, Oregon Agricultural College.

There are known to exist and the scientist recognizes about 77 or 78 different elements or simple substances. These elements are not all necessary, but a certain few are indispensable to plant growth. The elements which are necessary and without which plants cannot flourish are known as the plant-food elements. Authorities differ as to the number of elements which are essential for plant growth—some give nine or 10, others 12 and even 14. At the very outside, of all the elements known to exist, only 13 or 14 are necessary for plant growth.

The food-plants are as follows: Carbon, hydrogen, oxygen, nitrogen, sulphur, phosphorus, chlorine, potassium, calcium, iron, magnesium, silicon, sodium and manganese.

Some authorities question the necessity of manganese and sodium.

The Woody Elements. Carbon, hydrogen and oxygen make up the largest part of the woody structure of the plant, the carbohydrates and organic acids.

Nitrogen, sulphur and also carbon, hydrogen and oxygen are necessary for the development of the protoplasmic compounds in the plant.

Phosphorus—This element in the plant exists in the form of phosphates and is found in all parts of the plant. It seems to have something to do with the development of the protoplasmic substances in plants. Much phosphorus seems to be necessary and it accumulates in the seed of plants.

Chlorine—The exact function of this element in plants is not definitely known. It is supposed by some authorities to have something to do with the translocation of starch from the leaf to other parts of the plant.

The Starch Element. Potassium—Compounds of this element are quite widely distributed in the various parts of the plant. They seem to be necessary for the formation and translocation of starch in the plant. Potash is always found in large quantities in the ash of plants.

Calcium seems to be necessary for the growth of the cell structure, that is, for the formation of cellulose out of starch which has been formed in the leaves.

Iron—Experiments have proven that iron in some form is absolutely necessary for the development of chlorophyll which is the green coloring matter in the leaves of plants. In the absence of iron the leaves become yellow and even die, due to the non-development of the chlorophyll elements in the plant.

Minor Elements. Magnesium—This element seems to take part in the development of chlorophyll in plants, and also has something to do with the translocation of protoplasmic bodies in the plant.

Silicon—It is still a mooted question as to whether this element is necessary for the development of chlorophyll. It was supposed that this element gave stiffness and strength to the stems of plants but this belief is being discarded. It is believed by some that silicon helps in the development and formation of seeds.

Sodium and Manganese—These elements are not supposed to perform any necessary function in the growth of plants, even though they have generally been classed with the plant food elements. Manganese is many times and sodium always, found present in the ash of plants.

Sodium Less Expensive. Sodium is very much cheaper than potassium, and there has been much discussion as to the use of sodium instead of potassium compounds for plants. Sodium cannot be used instead of, or to replace, any of the potash which is required for the normal development of the plant.

Of all the foregoing elements of plant-food, only three or four are included when the subject of fertilizers is considered. These are nitrogen, phosphoric acid, potash, and sometimes lime (calcium oxide). The remaining plant-food elements are usually present in such abundance that they are not even discussed.

Classification of Fertilizers. Fertilizers may be complete or incomplete; direct or indirect.

A complete fertilizer is one that contains each of the three elements of plant-food, nitrogen, phosphoric acid and potash.

An incomplete fertilizer is one that contains only one or two of the three elements, nitrogen, phosphoric acid and potash.

A direct fertilizer is one that contains any or all of the three plant-food elements, nitrogen, phosphoric acid and potash. A direct fertilizer is used for the plant-food which it contains.

An indirect fertilizer is one that does not contain nitrogen, phosphoric acid or potash. An indirect fertilizer is not applied for the purpose of adding plant-food to the soil, but in order to make some of the plant-food already in the soil more available. The chief indirect fertilizers are land-plaster, lime and common salt.

Land plaster, gypsum or calcium sulphate. These are different names for the same compound. Gypsum or land plaster is nothing more than the sulphate of lime rock which has been ground exceedingly fine.

Quicklime and calcium carbonate. When limestone is burned the resulting product is calcium oxide or quicklime, sometimes called stone lime. When exposed to the air it becomes air slaked and is then calcium carbonate or carbonate of lime.

Stimulating Plant Growth. In the use of fertilizing materials, nitrogen tends to stimulate leaf growth. An abundance of nitrogen in the soil is indicated by rank luxuriant growth and dark green foliage. Too much nitrogen on vines, shrubs and trees causes a too rapid growth of wood. The wood thus formed is rather tender, soft and does not ripen properly and is often injured by the winter weather. An excessive use of nitrogen stimulates leaf and wood growth at the expense of fruit.

Phosphoric acid and potash have more to do with the development of fruit buds, fruit and seed; they also produce a more normal development of the parts of the plant, the parts are firmer, the wood ripens better and is more hardy.

Better a weedy garden than no garden at all.

Another cause of overwork in the garden is the desire to have at once an absolutely finished garden. Take time—take the remainder of your life to work it out. Don't start with a fully developed plan on paper as the garden experts are always telling us. Let your garden grow from year to year, and change things to suit yourself as your mind changes, which will be about every year. Gradually your ideal will become realized, radical changes will become fewer and you can hope to pass the sunny hours of old age at a garden that to you is perfect because of its associations with past years.

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(Salem Bureau of The Journal.) Salem, Or., March 9.—Plans and maps of the dam and canal known as the north canal diversion in connection with the Central Oregon Irrigation company's Carey act project near Bend have been filed with the state engineer for his approval. This dam and short feeder canal comprise an important key to the entire project, much of which is already under irrigation.

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1 pkt. Corn, Golden West, 1 pkt. Peas, Dwarf Telephone \$.20
2 pkts. Beans, 1 Pencil Pod Bk. 1 New Stringless \$.20
1 oz. Spinach, 1 pkt. Cucumber, 1 Davis Perfect \$.20
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1 pkt. Parsnip, 1 pkt. Garden Cress \$.10
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2 pkts. Radish, 1 White Icicle, 1 Chatter \$.20
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