

## Topic Page: [Fertilizer](#)

Definition: **fertilizer** from *Processing Water, Wastewater, Residuals, and Excreta for Health and Environmental Protection: An Encyclopedic Dictionary*

Material usually containing nitrogen (N), phosphorus (P), and potassium (K), or NPK, added to soil to provide essential nutrients for plant growth, including organic fertilizers (e.g., farmyard manure, crop residue, compost, bonemeal, blood, fishmeal) and inorganic fertilizers in the form of chemical mixtures. Excessive use of fertilizers may cause water pollution (e.g., nitrates in groundwater). See *also* soil conditioner.



Summary Article: **fertilizer**

From *The Hutchinson Unabridged Encyclopedia with Atlas and Weather Guide*

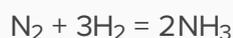
Image from: [Modern methods of fertilizing sometimes make use... in Green Food: An A-to-Z Guide](#)

Substance containing some or all of a range of about 20 chemical elements necessary for healthy plant growth, used to compensate for the deficiencies of poor or depleted soil. Fertilizers may be organic, for example farmyard manure, composts, bonemeal, blood, and fishmeal; or inorganic (synthetic or artificial), in the form of simple compounds, mainly of nitrogen, phosphate, and potash, which have been used on a very much increased scale since 1945. Compounds of nitrogen and phosphorus are of particular importance.

Elements in the soil are taken up through the roots of plants in solution, becoming part of the compounds forming the plant. If plants are allowed to die and decompose, these compounds return to the soil as part of a natural cycle, such as the nitrogen cycle. However, when crops are harvested the cycle is interrupted, the nutrients are not returned to the soil and are used up. Fertilizers replace these elements, increasing the yield of crops and enabling the soil to be farmed year after year.

Synthetic fertilizers consist of various combinations of salts, and supply plants with the elements that they need. Most fertilizers concentrate on supplying the necessary nitrogen (N), phosphorus (P), and potassium (K) and are called NPK fertilizers. They contain compounds such as ammonium nitrate ( $\text{NH}_4\text{NO}_3$ ); ammonium sulphate ( $(\text{NH}_4)_2\text{SO}_4$ ); potassium sulphate ( $\text{K}_2\text{SO}_4$ ); and ammonium phosphate ( $(\text{NH}_4)_3\text{PO}_4$ ).

Compounds of nitrogen are essential for plant growth, as nitrogen is needed for making proteins and so helps the development of healthy green leaves and strong stems. The proteins in plants are important foods for many animals. Although there is a plentiful supply of nitrogen in the air, plants are not able to use gaseous nitrogen and can only absorb nitrogen in the form of nitrates dissolved in soil water. The Haber process is an industrial method for converting nitrogen from the air into ammonia, a compound that plants can use (nitrogen fixation). In the Haber process, nitrogen and hydrogen are combined at a temperature of 350–500°C/660–930°F, a pressure of 80–200 atmospheres, and using a finely divided iron catalyst; the equation is:



Most of the ammonia is used to make fertilizers, such as ammonium nitrate and ammonium sulphate. Another major use of ammonia is to make nitric acid, which is also used to make fertilizers.

Nitrates and other fertilizers tend to be in excess of plant requirements and can be washed away by rainwater. This may cause various forms of pollution, including eutrophication, an excessive enrichment of lakes and rivers caused by nitrate pollution. Attention has turned to the modification of crop plants themselves. Plants of the legume family, including bean, clover, and lupin, live in symbiosis with bacteria located in root nodules, which fix nitrogen from the atmosphere. Research is now directed to producing a similar relationship between such bacteria and crops such as wheat.

## essays

Fertilizers

Process of producing sulphuric acid from sulphur

### **APA**

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fertilizer. (2018). In Helicon (Ed.), *The Hutchinson unabridged encyclopedia with atlas and weather guide*. Abington, UK: Helicon. Retrieved from <https://search.credoreference.com/content/topic/fertilizer>

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## APA

fertilizer. (2018). In Helicon (Ed.), *The Hutchinson unabridged encyclopedia with atlas and weather guide*. Abington, UK: Helicon. Retrieved from <https://search.credoreference.com/content/topic/fertilizer>

## Chicago

"fertilizer." In *The Hutchinson Unabridged Encyclopedia with Atlas and Weather Guide*, edited by Helicon. Helicon, 2018. <https://search.credoreference.com/content/topic/fertilizer>

## Harvard

fertilizer. (2018). In Helicon (Ed.), *The Hutchinson unabridged encyclopedia with atlas and weather guide*. [Online]. Abington: Helicon. Available from: <https://search.credoreference.com/content/topic/fertilizer> [Accessed 19 October 2019].

## MLA

"fertilizer." *The Hutchinson Unabridged Encyclopedia with Atlas and Weather Guide*, edited by Helicon, 2018. *Credo Reference*, <https://search.credoreference.com/content/topic/fertilizer>. Accessed 19 Oct. 2019.