



Natural Plant Nutrients:

For Landscapes and Gardens...

Concerns about ecosystem contamination from runoff carrying nitrogen, phosphorus and other plant nutrients (eutrophication) has prompted many individuals to change the way they think about the use of lawn & garden fertilizers. Because these materials have been readily available, relatively low cost and fast-acting, there has been a tendency to “over-use” fertilizers in the landscape/garden. Many experts now theorize that the inappropriate use of these materials has contributed to the eutrophication process.



Nitrate and phosphorus (principle components of lawn and garden fertilizers) are among the most common contaminants. Increased levels of these nutrients in drinking water are linked to a number of health issues, including methemoglobinemia (also known as blue baby syndrome), as well as various types of cancer. Ecosystem threats include declines in fish and aquatic life populations related to depleted oxygen levels in streams, rivers, lakes and bays.

To help reduce the potential contamination of surface and groundwater resources, many landscape gardeners are now utilizing “natural” nutrient sources for landscape/garden plant materials. These include animal manure(s), plant compost, mulch, etc. The use of these nutrient “alternatives” has several benefits – including:

Promotes Soil Microorganisms:

One of the primary advantages of using natural sources of plant nutrients is that they promote an increase in soil-borne microorganisms (i.e. bacteria, fungi, nematodes, etc.). Many microorganisms are beneficial to plants and the environment – promoting water and nutrient uptake, as well as providing a natural defense against pest infestations. Microorganisms have many of the same requirements as higher-order plants (i.e. water, air, nutrients). Their growth/activity responds to temperature and other environmental factors, much the same as plants do.

Earth-Kind uses research-proven techniques to provide maximum gardening and landscape enjoyment while preserving and protecting our environment.

The objective of Earth-Kind is to combine the best of organic and traditional gardening and landscaping principles to create a new horticultural system based on real-world effectiveness and environmental responsibility.

The principal goals of Earth-Kind include:

- Water conservation
- The safe use and handling of fertilizers & pesticides
- Reduction of yard wastes entering urban landfills
- Landscaping for Energy Conservation

As your interest and knowledge in these areas grows you will have an increased awareness of the many programs, practices and activities that are Earth-Kind. Working together we can make a difference in conserving and protecting our valuable natural resources.



*For more information
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Provides Essential Plant Nutrients for Plant Growth: Microorganisms decompose or “breakdown” organic matter to obtain the nitrogen and other essential nutrients they require to live and grow. Most of the organic nitrogen is derived from the break-down of proteins/ amino acids (NH₂) that make up organic matter. Many plant-required micronutrients (Fe, Zn, Mn, Cu, B, Cl, Mo) are derived in much the same manner.

Landscape/garden plant materials respond to the essential plant nutrients released during the decomposition process the same way they respond to the addition of fertilizers. It should be noted that – when in short supply - microorganisms have the ability to “out compete” plants

for available nutrients - resulting in nutrient deficiencies. This condition often occurs when decomposition is occurring at a rapid rate or when organic matter is depleted.

Lowers Soil pH & Increases Nutrient Availability:

The use of natural sources of plant nutrients generally lowers soil pH. During the decomposition process, microorganisms cause the release of free hydrogen ions (H⁺) in to the soil solution - the greater the concentration of H⁺, the lower the pH. Optimum availability/solubility of most essential plant nutrients occurs at pH levels ranging from 6.0 – 6.5 (molybdenum is the notable exception).

Slow Release of Nutrients:

Compared to the use of most lawn and garden fertilizers, natural sources tend to have a slower and more consistent release rate. Since the process relies on microorganisms decomposing organic matter to provide nutrients, there are often similarities in the demand/supply for both plants and microorganisms. This has often been described as a more natural release of nutrients that plants can use. It should be noted however, that plants have peak periods of demand (i.e. spring) and slow/consistent supply may not be sufficient to meet the needs for new growth.

Improves Soil Aeration/Drainage/Water Holding Capacity:

Another important advantage of using natural sources of plant nutrients is that while these materials are providing the nitrogen, phosphorous, potassium, etc. required for plant growth, they are also contributing to the physical characteristics of the soil. Used appropriately these materials can assist in promoting optimum aeration, drainage and water holding capacity for plant growth.

NOTE: Not all soil-borne microorganisms are beneficial. Phythium, Rhizoctonia, Fusarium, Phytophthora and Thalaveopsis are common fungi that can cause severe root disease problems. Excessive soil moisture promotes the spread of these diseases. Since most organic material (i.e. manure, compost, mulch, etc.) tends to hold water, it is important to use these materials in such a manner (i.e., not too much) that creates an appropriate balance between water holding capacity and aeration/drainage.



Sources of Natural Plant Nutrients:

There are numerous sources of natural plant nutrients available for landscape/garden use. The most common include manures, plant-derive compost and mulches. Following is a brief overview of each.

Animal Manure and Sewage Sludge:

Organic materials such as animal manures and biosolids contain varying amounts of plant nutrients and can improve the biological, chemical, and physical properties of soils. There are, however, concerns associated with their use. Indiscriminate application of animal manures and human waste (sewage sludge) can create health hazards through the accumulation of heavy metals and pathogens in the soil.



Raw manures often contain ammonium and proteins from the original animal's digestive tract that can cause plant damage. These materials also contain many complex undigested compounds, pathogens, salts, etc. from animal feeds, that may not be beneficial to plants or soil microorganisms. Manures and biosolids are best used as a component of compost.

Composts:

Composts are an excellent source of plant nutrients while contributing to the aeration, drainage and water holding characteristics of the soil. These materials are frequently made from a range of materials including: grass clippings, leaves, yard wastes, ground organic matter, manures, sewage sludge, etc. In addition to the nutrient content, the distribution of particle sizes in compost is an important characteristic in determining its value/use in landscape/garden situations.

If a compost is not thoroughly decomposed before adding to a landscape/garden soil, there is an increased potential for nutrient deficiencies to occur. This is attributed to the ability of the microorganisms, breaking down the organic matter, to out compete plants for essential nutrients. Avoid adding raw compost to soils when possible.



Organic Mulches:

Organic mulches not only help conserve soil moisture, suppress weed growth and maintain uniform soil temperatures, they can also be a source of natural plant nutrients. As these surface-applied materials decompose, they release nitrogen, phosphorous, and other essential plant nutrients in to the soil. In addition, these materials can also contribute to the physical characteristics of the soil. Many landscape gardeners now rely on a "compost and mulch only" approach for providing the nutrients required for plant growth.

Natural Occurring Sources of Plant Nutrients:

In addition to organic sources of plant nutrients, there are several natural occurring mineral sources. These include: Rock Phosphate; Potassium Sulfate; Limestone; Gypsum; Dolomitic Limestone; Greensand; etc.

Conclusion:

Regardless of the source, all nutrient-containing materials can potentially contribute to the concentration of nitrate, phosphorous, etc. entering an ecosystem. Therefore, it is our responsibility to select, handle, apply and store these materials properly to help create a healthy and sustainable environment.

Definitions:

The application of supplemental plant nutrients to lawns, gardens and landscapes is a timely and complex topic. One of the greatest challenges in addressing this issue is defining the various types and sources of nutrients used in these situations. It is the responsibility of the Texas Feed and Fertilizer Control Service, under the Texas Agriculture Code - Texas Commercial Fertilizer Control Act, to regulate the labeling of materials sold and distributed for the purposes of supplying plant nutrients. The following are defined in chapter §65.00 of the Texas Administrative Code – Agriculture (CommercialFertilizerRules-rev-Sept-2007.pdf).

“Fertilizer material” means a solid or nonsolid substance or compound that contains an essential plant nutrient element in a form available to plants and is used primarily for its essential plant nutrient element content in promoting or stimulating growth of a plant or improving the quality of a crop or for compounding a mixed fertilizer. The term does not include the excreta of an animal, plant remains, or a mixture of those substances, for which no claim of essential plant nutrients is made.

“Specialty fertilizer” means a fertilizer distributed primarily for nonfarm use, including use on or in home gardens, lawns, shrubbery, flowers, golf courses, municipal parks, cemeteries, greenhouses, or nurseries. The term does not include the excreta of an animal, plant remains, or a mixture of those substances, for which no claim of essential plant nutrients is made.

“Inorganic Fertilizer” means a mineral, nutrient source containing less than 5.0% carbonaceous material.

“Natural. Material” means an animal, plant, or mineral - found solely in or produced solely by nature which have neither been mixed with any synthetic material nor changed from their initial physical state except by washing, air-drying, chopping, grinding, shredding, or pelleting and not changed in its chemical state except by biological degradation or chemical change initiated solely under normal conditions of aging, rainfall, sun-curing or sun-drying, composting, rotting, enzymatic or anaerobic bacterial action, or any combination thereof.

“Organic.” When applied to a product, to a compound, to a mixture of compounds or to a specific constituent used as an ingredient means that the claim of the product, compound, mixture of compounds or constituent to be organic has been allowed or allowed with restriction by the United States Department of Agriculture’s National Organic Program or the Texas Department of Agriculture’s Organic Certification Program. (Materials described as organic must still conform to the Texas Commercial Fertilizer Control Act if they are used in fertilizer.)



See the Earth Kind Web site for more ways to preserve and protect the environment...

<http://EarthKind.tamu.edu>