



FACT SHEET 4.4

UNDERSTANDING FERTILIZER AND SOIL AMENDMENT TYPES

Most plants require 17 essential elements or nutrients for growth and overall plant health. Three of these (carbon, hydrogen and oxygen) can be obtained from air and water through the process of photosynthesis, however, the remaining 14 elements are derived from soils. Of these, Nitrogen (N), Phosphorus (P), and Potassium (K) are most often limiting from a crop production standpoint and require management through the addition of fertilizers, compost or other amendments to soil. The best way to determine your soil's nutrient needs is to test your soil annually.

If your test reveals that your soil needs additional nutrients, recommendations are usually provided on the quantity of nutrients to add. There are different types of soil amendments and fertilizers that can be considered, and while the nutrients will generally be processed the same way, there are several other factors that should be considered. Here we provide a description of the two most common categories of fertilizers to help you understand why fertilizers are not created equal and how your selection may provide additional benefits to your plants while reducing impacts to the environment.

FERTILIZERS VS. SOIL AMENDMENTS

We often hear the words fertilizer and soil amendment used interchangeably. Throw in the terms compost and manure and you have yourself a confusing mix of gardening terms. Fertilizers and soil amendments have two different jobs. Fertilizer is meant to feed plants – generally with one or more of the 17 essential plant nutrients. A soil amendment is used to improve the condition or structure of soil. This might be increased water retention, aeration or drainage – all making a better environment for plant roots and for soil microorganisms to thrive. Examples include compost, animal manures, worm castings, fall leaves, gypsum, straw and grass clippings. Keep in mind that some organic soil amendments such as compost and animal manure can also add nutrients to your soil and are considered to be both a fertilizer and a soil amendment.



ORGANIC OR NATURAL FERTILIZER

Organic or natural fertilizers are typically derived from plant or animal waste or powdered minerals, with minimal processing and are more likely to originate from renewable and sustainable resources. These types of fertilizers are naturally broken down over time by microorganisms found in your soil, making nutrients available over a longer period of time as opposed to all at once. Since organic or natural fertilizers need to be broken down, they can also improve the overall structure of your soil and help support microorganisms. The 'slow release' of nutrients provided with organic fertilizers can help eliminate the need for multiple applications and reduce the chances of overfertilizing plants. Compost and manure can contain a wide variety of other beneficial microbes that can also help to control plant pathogens, resulting in hardier plants.

Pros

- Environmentally friendly since often originating from renewable and sustainable sources
- Improves soil structure by promoting microorganism growth
- Slow release, less likely to "burn" grass and to runoff into waterbodies
- Often fewer applications are needed due to 'slow release' quality

Cons

- Due to slow release, may not "release" fertilizers when you want
- Generally tied to soil temperature, so effectiveness may be limited during cooler months
- Can be more expensive

CAUTION!

Just because a product is natural or organic doesn't mean it can't become a source of water pollution. Correct application techniques are essential in helping to ensure the protection of nearby surface waters.

CHEMICAL OR SYNTHETIC FERTILIZERS

Chemical or synthetic fertilizers are typically manufactured or man-made compounds, such as from by-products of the petroleum industry. Examples include ammonium nitrate, ammonium phosphate, superphosphate, and potassium sulfate. Although they are occasionally made from organic sources, they are generally water soluble, releasing nutrients to plants very quickly rather than over time. Unlike organic fertilizers, chemical or synthetic fertilizers don't support microbiological life in the soil and can actually kill off beneficial microorganisms. These types of fertilizers generally don't provide any benefit to the soil structure or overall soil health, and typically don't contain trace elements needed by plants that can become depleted after repeated plantings. While there are some synthetic slow-release fertilizers on the market, some research has found that synthetic fertilizers can contribute to a soil chemistry that discourages the natural microorganisms important to healthy soil and plant health.

Pros

- Immediate release of fertilizer, become effective quickly
- Relatively inexpensive
- Exact and consistent makeup since chemically manufactured

Cons

- Non-environmentally friendly
- Generally does not improve soil structure and can cause toxic buildup of chemicals
- Can harm microorganisms
- Don't always contain necessary soil micronutrients



QUICK RELEASE VS. SLOW RELEASE FERTILIZERS

Quick release or fast acting fertilizers are often water soluble chemicals that provide plants with immediate access to nutrients. Quick release fertilizers are usually made from synthetic material, and because they are water soluble, can easily leach into groundwater and surface runoff. Because of this they require repeated applications and as a result, become a threat to water quality. Slow release fertilizers are water insoluble and release nutrients over time making only small amounts of nutrients available at a time but over a longer period of time. Slow release fertilizers are often made from natural products and some can also contain synthetic materials.

Hobby farming with water quality in mind requires you to select and apply fertilizers and soil amendments with care. You will need to take into consideration a number of factors based on your specific site, soil and plant needs. The recommended choice is to use natural products for fertilizers and soil amendments. Overall, natural products tend to support healthy soil microorganisms while releasing nutrients a little at a time. These often can be produced right on your hobby farm in the case of compost and/or animal manure and should be considered a long-term investment in the health of your plants, soil and water resources.



WATER QUALITY BENEFIT

Natural fertilizers and soil amendments tend to pose fewer threats to water quality as long as they are applied correctly. However, even natural products can become a water quality problem if applied incorrectly or too much is used.

