

# Feeding Urban Summer Soils for Maximum Crop Production and Soil Health

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In our very temperate and somewhat “tropical” Mid-Atlantic region, summer crops are put to the test. Most organic growers prefer not to use synthetic chemical fertilizers in their urban gardens. What fertilizer is recommended in the summer growing months if you are an “organic” grower? Good compost! A solution of fish emulsion and liquid seaweed, used as a soil drench or sprayed on the leaves of plants, is also acceptable. One very good reason for feeding summer soils with “slow-release” organic amendments is that these products are slow to leach out of the soil, if managed correctly. Also, research shows that plants that are grown this way attract fewer pests and have higher yields. One of the keys to becoming a better crop producer is a good understanding about the composition of organic fertilizers that are used to feed plants and soil. Since we are in close proximity to streams and rivers that empty into the Chesapeake Bay, it is a good urban agricultural practice to use fertilizers that are of a slow release nature. This gives plants time to uptake these nutrients rather than these nutrients leaching beyond the plant root zone, where uptake is less likely.

## SIX SOIL SUFFICIENT SUPER SUPPLEMENTS

The next time you are in your local garden supply center, pick up a bag or bottle of fertilizer. You will notice three numbers connected with hyphens on the label—for example, 6-2-0, 10-10-10 or 0-5-2. These numbers are the fertilizer’s NPK ratio, which tells you the percentages of nitrogen, phosphorus (in the form of phosphate) and potassium (as potash) contained in that fertilizer.

Nitrogen, phosphorus, potassium, calcium, magnesium and sulfur are the big six and most important nutrients that hungry crops are looking for. There are other important nutrients called “trace elements” which are crucial, but they are needed in only small amounts. There are quite a few more sources of amendments for some of these elements; however, these six soil amendments offer the least probability of contamination.

### NITROGEN

If it weren’t for nitrogen, the green lush growth of most plants would be absent. As the nutrient that is probably familiar to most gardeners, it helps to form plant proteins. Nitrogen is also essential for the production of chlorophyll, which is the heart of photosynthesis. A good supply of nitrogen stimulates root growth and development, as well as the uptake of other nutrients.



#### Sources

**Compost:** Apply a 1-inch layer of compost to your garden beds in the spring. If your soils are sandy, you can add 2-3 inches. Remember: all compost is not created equal; it depends on how it was created.

**Fish meal:** Fish meal, which is dried and ground fish scrapes, contains many important trace minerals needed by plants. Trace minerals are only needed in very small amounts by most plants. Fish meal breaks down slowly, and lasts about 6-8 months in the soil. Fish and seaweed emulsion is a liquefied form of the amendment. This solution can be used as a soil drench or a foliar (leaf) applied amendment.

**Organic cottonseed meal (5-2-1):** Cottonseed meal is the residual organic waste after the processing of cottonseed oil.

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**Organic alfalfa meal (3-2-2):** Alfalfa is a leguminous, nitrogen-containing plant with a good balanced NPK ratio; a great all-purpose fertilizer with trace elements.

**Organic soybean meal (6-1.5-2):** The same goes for this soybean-based amendment.

## PHOSPHORUS

The P of the N-P-K formulation is phosphorus. Phosphorus, a critical element, is responsible for photosynthesis, plant maturity, healthy roots and energy transfers within the plant. Phosphorous is unique in that its negative charge can combine with two positively charged elements, calcium and iron, which tend to capture phosphorus and render it unavailable to plants. Phosphorus is released when organic matter is broken down, and is not very mobile in the soil stratum. It must be incorporated into the soil and not just broadcast on the soil surface.

Two popular, natural and organic sources of this amendment are rock phosphate (0-3-0) and colloidal or “soft” rock phosphate. Both of these sources work best when soil is teeming with microbial life. They work very well in the acidic soils of the mid-Atlantic and southeast regions of the United States. Rock phosphate is a mined material, and colloidal (soft) rock phosphate is the run-off of washed rock phosphate. Colloidal rock phosphate is considered a by-product, but it is more readily available to plants than the hard rock phosphates which are slowly absorbed, due to the larger particle size.



## POTASSIUM

Potassium is the third most likely element, after nitrogen and phosphorus, to limit plant productivity. Unlike phosphorus (or sulfur and to a larger extent, nitrogen), potassium is present in the soil solution only as a positively charged element. It remains in solution after being absorbed, flows through plants, and helps with sugar movement within the plant, plant immunity and leaf surface pore opening and closing.

Excellent natural and organic sources of this soil amendment are:

Greensand (0-0-1). Also known as glauconite, greensand comes from a 70-80 million year old marine deposit in New Jersey. Another safe source of potassium is kelp meal. This is basically seaweed which is dried and ground to be used as a soil amendment. This sea product is excellent for stimulating earthworm populations and soil microbes.

Calcium, magnesium and sulfur are often thought of as “secondary elements.” These three elements, like nitrogen, phosphorus and potassium, are considered “macronutrients.” Plants and soils may not need an abundance of these elements, but they are extremely important.

## CALCIUM

The ability of a soil to supply this element is intimately tied to soil acidity. Calcium helps to stabilize soil pH. It is a very important element for soil structure, microbial activity and cell building in the plant. It also acts to regulate the availability of other nutrients and helps to build plant proteins. Calcium is a highly mobile element, and is leached rapidly out of soils containing low levels of organic matter. It is added to soils for two reasons: to raise soil pH, and to address a soil deficiency, as determined by a soil test. All calcium amendments come in the form of limestone.

There are two main kinds of limestone used in organic agriculture, dolomitic and calcitic. There is another form called “hydrated” or “slaked” which is not preferred by organic producers. Dolomitic limestone contains magnesium and calcium. Use this type if your soil test recommends an amendment of only magnesium to your soil. Calcitic limestone (calcium carbonate) contains very little or no magnesium. Both dolomitic and calcitic limestone will boost the calcium levels in your soil gradually, and slowly raise the soil pH at the same time. Sometimes calcitic lime might be difficult to locate in the Washington metropolitan area because it is mined in the Midwest. You can substitute oyster shell lime, which is a local product. Try to use all of the calcium amendments in a granular or pelleted form; these are easier to apply than powders.

## GYPSUM

Gypsum (calcium sulfate) is a great source of calcium and sulfur. This amendment does not raise the soil pH in the same manner as dolomitic or calcitic limestone. Although it can improve the texture of some heavy soils, only use it if recommended by a soil test. Also, gypsum can be used to address issues caused by excess sodium in soils.



## REFERENCES

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