Flowers enhance the garden with their color and fragrance. Many flowering plants can produce blossoms throughout the growing season if their cultural requirements are met. Among those requirements are essential nutrients for plant growth and development. Nutrients are added to garden soils primarily through fertilization. Either natural or synthetic fertilizers, or a combination of the two types, can be used to meet the nutrient needs of flowering plants.

Each year the number of species of flowering plants available for the home garden increases. Some plants have very specific soil pH and fertility requirements. Others can tolerate a wide range of levels. Limestone and fertilizer recommendations may have to be modified accordingly. It is always a wise idea to research the cultural requirements of plants before adding them to the landscape.

I. Soil pH, Limestone and Sulfur applications.

The soil pH refers to the measurement of soil acidity. A soil pH of 7.0 is considered neutral. Values less than 7.0 reflect acidic soil conditions while those above indicate alkalinity. The majority of flowering plants will grow within a soil pH range of 5.5 to 7.0 which is considered slightly acidic to neutral. The target pH for most flowering plants is 6.3. It would be lower for native wildflowers and ferns reflecting their adaptation to more acidic conditions.

Recommendations for ground limestone will be made if the soil pH needs to be increased. Limestone raises the soil pH, reduces soil acidity, increases the calcium and, in the case of dolomitic limestone, also increases the magnesium level in the soil. Ground limestone is generally used to correct acid soil conditions, although some gardeners prefer the less dusty pelletized limestone. Cost is the major difference between the two forms; application rates and soil reaction times are similar.

Limestone may be applied any time the ground is not frozen. Whenever possible, incorporate the ground limestone into the top 6 to 8 inches of soil. If more than 10 pounds of ground limestone per 100 square feet is recommended, and it can only be applied to the soil surface, a split application is suggested.

Occasionally the soil pH level is too high for the particular plants being grown and the soil test report will recommend appropriate amounts of sulfur or aluminum sulfate to lower it. Generally, it takes 6 to 9 months for the soil pH to change following either limestone or sulfur applications.

Note: One cup of limestone weighs about 3/4 lb.

II. Fertilizers

Fertilizer recommendations are based on soil test results and on the type of flowering plant being grown. Your soil test report will recommend varying amounts of several widely available fertilizer grades. The fertilizer grade is denoted by the three numbers on the front of a fertilizer container. These numbers refer to the percent by dry weight of total nitrogen (N), available phosphate (P₂O₅), and water soluble potassium (K₂O) contained in package of fertilizer. They are always listed in this same order. A fertilizer with an analysis of 5-10-5 would contain 5% N, 10% P₂O₅, and 5% K₂O.

Recommendations for flowering plants are for complete fertilizers, which are those that contain the macronutrients nitrogen, phosphorus, and potassium. These nutrients are required by plants in the largest amounts. Ideally, however, phosphorus (P) and potassium (K) should be applied only if their need is indicated by a soil test. Fertilizers other than those recommended, including various natural organic materials, can be used provided they supply nutrients in about the same amounts and ratios as the recommended fertilizer. For example, a 10-20-20 could be used in place of a 5-10-10 but only one half as much would be applied because it is twice as concentrated. Also when using natural organic fertilizers keep in mind that they are often lower in nutrient analysis and solubility than their synthetic counterparts. This means they may need to be applied at higher rates and greater attention should be paid to soil preparation during the initial stages of garden development.

In general, fertilizers formulated for flowering plants would contain amounts of nitrogen less than or equal to the amounts of phosphorus (i.e. 10-10-10 or 5-10-5). This is because phosphorus encourages flowering. Too much nitrogen will stimulate green leafy growth at the expense of flower production. Also, the recommendations are made for granular fertilizer formulations. These will generally supply nutrients to the plants for about 6 to 8 weeks. During periods of excessive rainfall or frequent irrigation, the nutrients may be leached out of the soil and fertilizer may need to be reapplied.

Some gardeners prefer to use water-soluble fertilizer formulations. Usually a concentrated powder or liquid fertilizer is mixed with water and applied to either the soil, or to both the soil and the plant’s foliage. Since the nutrients are in a soluble form, they too are subject to leaching. Because these nutrients are available for only a short period of time, the label of a water-soluble fertilizer will direct you to apply it at
more frequent intervals than when using a granular or time release formulation. In the flower garden it is useful for a quick boost or short-term nutrient relief. Most gardeners prefer products that do not have to be constantly reapplied. Always follow the directions on the label when using water-soluble fertilizers.

III. How and When to Fertilize

Use the grade of fertilizer (or equivalent) recommended on the enclosed soil test report at the times of year listed below for the type of flowering plants being grown. For new flower beds, work the fertilizer into the top 4 to 6 inches of soil before planting. For established plantings, spread the fertilizer evenly around the plants and lightly scratch it into the soil, then water thoroughly. If possible, pull back the mulch around plants so the fertilizer is applied to the soil and not on top of the mulch.

Fertilizer recommendations are given in increments of 100 square feet. Therefore, you need to determine the size of your garden before spreading the fertilizer. The length multiplied by the width of the garden will give you the total area. For instance a garden 5 feet wide and 10 feet across would cover 50 square feet. Often flower gardens are irregularly shaped. Just do your best to approximate the square footage.

Note: One cup of a granular synthetic fertilizer weighs about 1/2 pound.

A. Flowers (annuals, perennials, ornamental grass, bulbs)

1. Annuals - Apply fertilizer at the recommended rate during flower bed preparation. Make a second application at the same rate 6 to 8 weeks later. Annual selections that will continue blooming into fall may benefit from a third application at the same rate made in late August. Keep in mind that other cultural requirements aside from adequate nutrients must be met for plants to continue optimum growth.
2. Perennials and Ornamental Grasses (new plantings) - Apply fertilizer at the recommended rate during flower bed preparation. Make a second application at the same rate 6 to 8 weeks later.
3. Perennials and Ornamental Grasses (established) - Apply fertilizer at the recommended rate when growth resumes in the spring. Perennials with long lasting foliage or extended bloom periods may benefit from a second application at the same rate 6 to 8 weeks later.
4. Spring Flowering Bulbs - Apply fertilizer at the recommended rate as soon as new growth emerges in the spring. Also apply fertilizer at the same rate when preparing beds in late August or early September.
5. Summer Flowering Bulbs - Apply fertilizer at the recommended rate at planting time or, in the case of hardy summer flowering bulbs, when growth resumes in the spring. Make a second application at the same rate after flowering for plants with short flowering periods, such as gladioli. For plants with long flowering periods like dahlias and cannas, make a second fertilizer application at the same rate in mid-July.

B. Roses - Follow the instructions on the soil test report. Make separate applications of fertilizer at the recommended rate in May, June and July. Do not fertilize after mid-July as new growth may be encouraged. It most likely will not have time to harden off properly in the fall and will be very susceptible to winter kill.

C. Wildflowers - Wildflowers that are native to New England’s woodlands or meadows generally have low nutrient requirements. Apply the recommended amount of fertilizer once in the spring as new growth begins, or during bed preparation. Some wildflower species have very specific cultural requirements that may not be met with our more generalized recommendations. Gardeners may have to research the needs of individual species.

IV. IMPROVING THE PHYSICAL CONDITIONS OF VERY SANDY SOILS OR THOSE LOW IN ORGANIC MATTER

In both of these circumstances, additions of organic matter to the soil will be beneficial. Very sandy soils drain quickly and are well aerated but they retain only small amounts of water and nutrients. Adding organic matter will increase both the water and nutrient holding capacity of the soil. Organic matter additions will also moderate soil temperatures, encourage earthworm and other soil organism activity, increase soil nutrient levels, enhance the soil’s structure, and make it easier for you and your plant’s roots to penetrate the soil. Sources of organic matter include peat moss, leaf mold, well-rotted manure, bagged humus, grass clippings, or compost. The use of an organic mulch will also build up levels of soil organic matter as it decomposes as well as serving to reduce moisture loss and to suppress weeds.

If the soil organic matter content is listed on the soil test report as low, or if values determined by loss on ignition (a separate test) are less than 4 percent, additions of organic matter are recommended. Strive to maintain organic matter levels somewhere around 5 percent. Do this by incorporating 1 to 3 inches of a low-nutrient organic material such as peat moss or leaf mold and mixing it into the top 6 to 8 inches of
It is advisable to use a low-nutrient source of organic matter when one or more inches of the material is applied. Using large amounts of organic matter from sources high in nutrients such as some composts and manures, may create above optimum soil nutrient levels that can result in unhealthy plants and possible environmental contamination. Always retest your soil after compost or manure additions.

V. IMPROVING THE PHYSICAL CONDITIONS OF COMPACTED OR FINE-TEXTURED (SILT AND CLAY) SOILS

Soils that are compacted or made up primarily of fine-textured particles are difficult for gardeners to dig in, and plant roots to grow in. While soils high in silt and clay are not common in Connecticut, they are found in some locations. Generally these soils are also poorly drained and not well aerated. The key to managing these soils is to loosen them up and keep them from becoming compacted. Never work or walk on these soils when they are wet because they will become even more compacted and difficult to work. Put in stepping stones or permanent pathways to keep feet out of the garden. Mulches will keep the surface soil from crusting and compacting. Use a pitch fork, spade or tiller to loosen soil to a depth of 8 inches or more. Work in 1 to 3 inches of a low-nutrient organic material along with the recommended amounts of limestone and fertilizer. Double-digging, a labor intensive technique where the subsoil is also loosened, is another option. It is not recommended to add sand to soils high in clay. If the wrong size sand is used, soils may become brick-like and more impenetrable than before. Soils high in clay will retain more nutrients than sandy soils and may not have to be fertilized and limed as often.

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