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SOIL TEST NOTES

**NOTE 11: Fertilizing Home
Vegetable Gardens**

FERTILIZER

Fertilizers composed of nitrogen, phosphorus, and potassium, such as a 5-10-10, are usually considered best for vegetable gardens. These figures represent the percentage of each element in the fertilizer. For example, a 5-10-10 fertilizer contains 5% nitrogen, 10% phosphorus (as P_2O_5), and 10% potassium (as K_2O).

The 5-10-10 fertilizer is a 1-2-2 ratio. An 8-16-16 fertilizer is also a 1-2-2 ratio, but it contains a greater percentage of each of the fertilizer elements. Smaller amounts of the 8-16-16 can be used in place of the 5-10-10. Other "complete" fertilizer ratios could be used, including a 1-1-1, which is commonly sold as 10-10-10 or 20-20-20.

In the spring, before planting, apply 2-3 lbs. of a low-analysis, complete fertilizer per 100 sq. ft. (such as 10-10-10 or 5-10-10). Scatter the fertilizer evenly over the soil surface and plow, rototill, or spade it into the top 3 to 4 inches of soil. This is known as a maintenance application - maintaining the soil fertility.

STARTER SOLUTIONS

Starter solutions are soluble, high-analysis fertilizers used at transplanting time. They help get plants started quickly and often increase yields. Farm and garden stores carry a number of commercial starter solutions. Sprinkle the fertilizer in a circle, 4 inches away from the stem or dissolve in water and then apply. Use no more than 1/8 lb. (1/4 cup) fertilizer per

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plant. If starting plants from seed, apply this fertilizer in a band about 2 inches to the side and below the row of seeds. Follow directions on the package for the rate to use with that particular fertilizer ratio.

SIDEDRESSING

Most garden vegetables, especially leafy vegetables, will benefit from a sidedressing with a nitrogen-carrying fertilizer. Apply to leafy vegetables after the plants are started, to peppers after the first fruits have set, to cole crops three weeks after transplanting, and to peas and beans after heavy bloom and set of pods. Some crops benefit from several applications. Apply to corn when plants are 12 to 15 inches tall and again one week after tassels appear. For tomatoes, apply 1 to 2 weeks before the first tomato ripens, 2 weeks after picking the first ripe tomato, and 1 month after picking the first ripe tomato. Root crops, such as sweet potatoes, carrots, beets, and turnips should not receive sidedressings of nitrogen. Excessive amounts of nitrogen will reduce yields and/or lower quality.

ORGANIC MATTER

The addition of organic matter will increase the nutrient and water-holding capacity of sandy soils and improve drainage and aeration of clay soils. As a general recommendation, add 1 to 1-1/2 bushels of well-rotted manure or compost per 100 sq. ft. (Poultry manure is very high in nitrogen and should be applied at no more than 1/2 bushel per 100 sq. ft.) Manures and compost are best applied in late fall, winter, or early spring and should be mixed into the soil.

MICRONUTRIENTS

All vegetables require additional nutrients for proper growth and development. These nutrients (manganese, copper, zinc, boron, iron and molybdenum) are required in very small quantities (thus the name "micronutrients") and sufficient amounts are present in almost all soils. The cole crops (cab-

bage, broccoli, cauliflower, and brussels sprouts) are an exception. They require additional boron, which can be supplied by adding 1-1/2 oz. (1 level tablespoon) of borax to 3 lbs. of mixed fertilizer to cover 100 sq. ft.

LIME

Liming is the addition of a calcium or calcium and magnesium compound to the soil to reduce acidity. Soils which are too acid are not productive because many required nutrients become unavailable to the plant's root system. Almost all Delaware soils are naturally acid. Acidity is measured by a pH reading, with 7 being neutral. Most plants grow best in slightly acid soils (pH 6 to 6.5). The amount of lime needed to correct soil acidity depends on the pH of the soil, the plant(s) to be grown, the kind of soil, and the amount of organic matter. All these have been taken into consideration in making the lime recommendation in this report. Adding lime when it is not needed can be just as damaging to vegetables as a lack of lime. When the soil pH is high, some nutrients also become unavailable.

Lime reacts slowly and penetrates the soil very slowly if left on the surface. Whenever possible, lime should be mixed with the soil by spading, plowing, or rototilling. Lime may be applied at any time, but fall is usually the most convenient time. Ground dolomitic limestone is the preferred source of lime for general home use. It contains both calcium and magnesium. Limestone containing only calcium is equally desirable if the soil test for magnesium is high or very high.

Keeping a record of when lime was applied will help avoid over-or under-liming. In general, about 50 lbs. of ground limestone per 1000 sq. ft. every three or four years will maintain the proper level for most crops and soils in Delaware.

ADDITIONAL INFORMATION

Additional information may be obtained from the University of Delaware Cooperative Extension Service offices in Newark, Dover, and Georgetown.