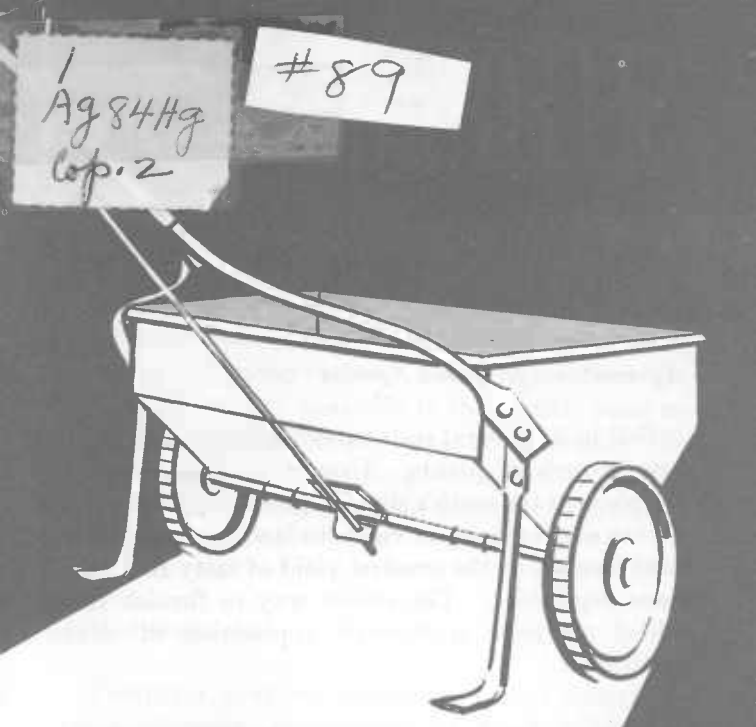


SELECTING FERTILIZERS

for lawns and gardens

Home and Garden Bulletin No. 89
U.S. DEPARTMENT OF AGRICULTURE

SELECTING FERTILIZERS *for lawns and gardens*

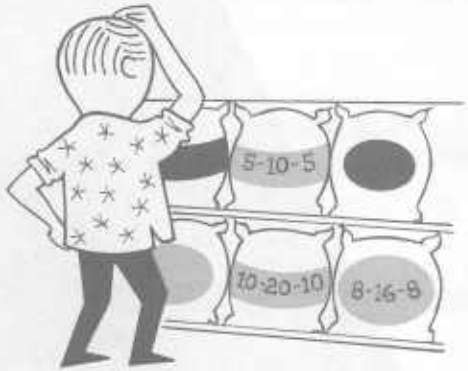
Prepared by Soil and Water Conservation Research Division, Agricultural Research Service

Soil in its natural state rarely is fertile enough for best growth of plants. Usually it is necessary to supplement the earth's store of plant nutrients before we can obtain the most vigorous lawn, the most abundant flowers, or the greatest yield of tasty and nutritious vegetables. The easiest way to furnish these added nutrients is through application of mixed fertilizers.

FERTILIZER RECOMMENDATIONS

What fertilizer should you use? And how much should you apply? These questions are best answered by specialists at your State agricultural experiment station. These specialists will test a sample of your soil and recommend a program of liming and fertilizing for your plants.

Some States perform this service free of charge for State residents; others charge a small fee. For information regarding soil tests—how much they cost, how to take samples, and where to send them—consult your county agricultural agent. His office generally is located at the county seat.



MANAGING YOUR SOIL

Fertilizer application is only one step in effective soil management. For best growth of lawns, vegetables, and ornamentals, you should also provide the proper soil acidity, soil structure, and soil moisture.

You can adjust soil acidity by applying liming or acidifying materials. You can improve or maintain soil structure by working the soil properly and by incorporating organic matter into the soil. You can control soil moisture by improving drainage, by irrigating, and, where practical, by applying mulches.

For information on these essential steps, consult your county agricultural agent or refer to State extension or USDA publications dealing with the crops or ornamentals that you wish to grow.

Publications of your State extension service and the U.S. Department of Agriculture also are sources of information regarding kinds and amounts of fertilizer to use. Fertilizer manufacturers, too, generally supply guides for the use of their products.

Even after you have obtained recommendations for a program of fertilizer application, you may have difficulty in selecting a fertilizer from the many kinds that are available.

FERTILIZER MATERIALS

Garden-supply stores offer for sale a wide variety of materials for fertilizing lawns and gardens. Some of these products are considerably more expensive than others. They vary in price because of—

- Nutrient content. Products containing a high percentage of plant nutrients cost more per pound than those containing a small percentage of nutrients.
- Ingredients. Products containing slowly avail-

able forms of nitrogen cost more per pound than those containing quickly available forms.

- Form. Pelleted, or granular fertilizers, and soluble fertilizer concentrates cost more than powdered fertilizers.
- Added materials. Products containing added trace elements or pesticides cost more than plain fertilizers.
- Package size. Fertilizer in a small container costs more per pound than the same product in a large container.

Are the expensive products worth the extra price? After considering their advantages over the less expensive fertilizers, you may decide that they are. Or you may decide that the least expensive fertilizer is satisfactory for your needs.

Nutrient Content

Manufacturers of mixed fertilizers are required by law to state on the container the guaranteed content of primary nutrients. These primary nutrients are nitrogen, phosphoric oxide, and potash.

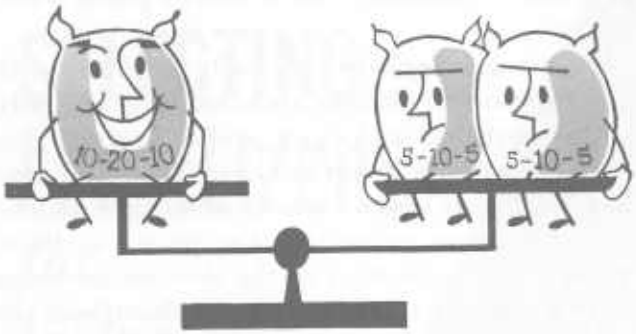
The primary-nutrient content of a fertilizer mixture is indicated by its *grade*—a series of three numbers separated by dashes. The numbers show the percentage of nitrogen, phosphoric oxide, and potash, in that order, contained in the mixture. For example, a mixture with the grade 5–10–5 contains 5 percent of available nitrogen, 10 percent of available phosphoric oxide, and 5 percent of available potash.

Because nitrogen, phosphorus, and potassium are used by plants in large amounts, these nutrients are likely to be deficient in the soil. When you buy a fertilizer, therefore, you generally buy it for its content of these materials.

The relative proportions of primary nutrients in a fertilizer mixture determine the suitability of the mixture for specific soils and plants. Lawn fertilizers, for example, usually are highest in their proportion of nitrogen. Fertilizers for use on vegetables may be highest in their proportion of phosphoric oxide. It usually is wasteful, and may even be harmful, to use the wrong type of fertilizer. Follow recommendations closely.

Specialty fertilizers—manufactured in grades usually suitable for use on a specific kind of plant—are available for most garden applications. These specialty fertilizers include products for lawns, tomatoes, and azaleas and other acid-soil plants. Usually they are satisfactory for use according to directions on their labels, but they usually cost more than ordinary farm fertilizers of the same grades.

Fertilizers of several grades may contain the same proportions of primary nutrients. For example, 5–10–5 and 6–12–6 are both composed of one part of nitrogen, two parts of phosphoric oxide, and one part of potash, though 6–12–6 contains the higher percentage of these nutrients.



Fertilizers having the same proportions of primary nutrients generally can be used interchangeably. It usually is only necessary to alter the rate of application so the desired amounts of primary nutrients are applied to the area being fertilized.

Frequently the price per pound of the nutrients in fertilizer mixtures containing a high percentage of nutrients may be lower than the price per pound of nutrients in fertilizer mixtures containing a lower percentage. For example, 1 pound of 10–20–10 contains the same amount of nutrients as 2 pounds of 5–10–5, yet an 80-pound bag of 10–20–10 may cost only one-third more than an 80-pound bag of 5–10–5.

For greatest economy, buy fertilizer for its weight of nutrients, not for its total weight.

Ingredients

Nitrogen is the most expensive component of a fertilizer mixture. Slowly available forms of nitrogen—urea-form and other organic sources—are more expensive than quickly available forms. Therefore, the more nitrogen a mixture contains—especially slowly available forms of nitrogen—the more expensive the mixture is.

Before plants can utilize nitrogen from a fertilizer mixture, the nitrogen-source material must be soluble. The more expensive forms of nitrogen must break down into soluble forms—nitrates, or, in some cases, ammonia—before they can be used by plants. They breakdown slowly and release nitrogen to the plants over a long period of time. Less expensive forms of fertilizer nitrogen are already in available form; they can be used by plants immediately.

Fruits and vegetables properly fertilized with quickly available nitrogen are as healthful and tasty as those fertilized with slowly available forms. Because of their slow rate of breakdown, however, urea-form and other organic sources of nitrogen may be more convenient to use than the quickly available forms. One application of the slow-release forms of nitrogen may nourish the plants throughout the growing season, whereas several applications of quickly available forms may be necessary.

Form

Most ordinary farm fertilizers are powdered materials. Fertilizer mixtures also are available in the form of granules, or pellets, and as concentrates that must be dissolved in water before application. The pelleted fertilizers and the concentrates are more expensive than the powdered materials. However, they may be more convenient for you to use.

Powdered fertilizers—most ordinary farm fertilizers—may be objectionable to use because they are too dusty, particularly on a windy day. They may become damp and may cake and fail to feed evenly through the fertilizer spreader. And they may stick to plant foliage, damaging the foliage.

Pelleted fertilizers are not as dusty and they do not cake as readily as powdered fertilizers. They flow readily through fertilizer spreaders, and they roll off the plant foliage, reducing danger of fertilizer burn.

Fertilizer concentrates, mixed with water, can be applied by garden hose through use of a relatively inexpensive mixing device. Being liquid, these fertilizers are readily available to the plants; some nutrients are absorbed by the leaves of the plants. Because the materials are diluted considerably in application, there is little danger of damage to the foliage.

Added Materials

Fertilizer mixtures containing added materials—trace elements, insecticides, or weed killers—are offered for sale by many garden-supply stores. These added materials usually cost more when bought as components of combination products than they do when bought separately.

Combinations of materials may be more convenient to use than single materials—only one application is necessary—but they may be ineffective or even harmful; their misuse can kill desirable plants or make the soil unproductive. The best guide to the use of combination materials is this: Apply them only on the recommendation of your State agricultural experiment station.

Trace Elements.—Trace elements—more properly, micronutrients—are essential to the growth of plants but are needed only in very small amounts. Known micronutrients are iron, manganese, zinc, copper, molybdenum, boron, and chlorine. There may be others.

Do not apply trace elements routinely. Plants need tiny amounts of these elements, but an overabundance of them may be toxic to plants. Apply trace elements only if they are recommended by your county agricultural agent or your State agricultural experiment station.

Insecticides and Weed Killers.—Fertilizer-insecticide combinations and fertilizer-weed killer combinations generally are designed for use on lawns. These combinations may be satisfactory to use if—

- The season for applying fertilizer and the season for applying the pesticide are the same.
- The nutrient content and the pesticide concentration of the combination are adjusted so that each component is applied at the proper rate.

Usually, fertilizers and pesticides are best applied separately.

Package Size

As with most other products, fertilizers cost more per pound in small packages than they do in large packages. Packaging costs account for much of the expense of fertilizer merchandizing.

Paying the higher rate for small packages of fertilizer may be justified if you need only a small amount, if the ease of handling smaller packages is sufficiently advantageous, or if storage of large packages is a problem.

For greatest economy, determine the total amount of each kind of fertilizer that you need for one season, then buy this amount in the largest available packages.

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