Improving Your Soil For Beautiful Plants

Soil isn't just the ground beneath your feet; it is a living community of micro-organisms, nutrients, minerals, water and oxygen. By creating good, nutritious soil in your beds, you will be able to grow healthy, vigorous plants so your landscape will look it's best.

FORDE NURSERY Landscaping & Garden Center

Knowing your soil type…

Clay soils have small particles that hold together in a tight mass. If your soil sticks to your shovel when wet, or if it becomes rock hard and refuses to absorb water when dry, you've got mostly clay soil. Clay can be very fertile but has poor drainage and is hard for roots to penetrate.

Sandy soils have large particles that do not hold together well. If water endlessly disappears into your soil, or if it is very easy to dig when wet or dry, you've got mostly sandy soil. Sand tends to be of low fertility, and offers little resistance to spreading roots. Most soils are a mixture of particles with the dominant size being its type.

Loam describes a near-perfect soil that has lots of organic matter, enough sand to be easy to dig in, but sufficient clay to provide fertility and solid anchorage for plants.

Knowing your soil pH…

Each plant species is adapted to specific acidic, neutral, or alkaline soil conditions. When ailing plants fail to respond to fertilizer applications, usually this important acid-alkaline relationship (soil pH) is out of balance. The pH scale runs from 0 to 14. 7 is neutral, values below 7 are acid, and those above 7 are alkaline. Many plant nutrients are not available when the pH is too alkaline or too acidic, therefore it is best to have a pH around 7. Most of the soils in the Great Falls area are alkaline. A soil test should be done to determine the exact pH of your soil.

To make soils more acidic add sulfur or gypsum (see product information). In some extreme cases of alkaline soil, you may need to plant in raised beds with alternate soil.

To make soils less acidic add lime, however acidic soils are extremely rare in our area and lime probably would not ever be needed.

Creating fertile soils…

Most soils in the Great Falls area are not naturally fertile, but they can be improved to make plants perform well. Fertile soils, which are dark in color because they contain a lot of organic matter, help to create healthy plants which are far more resistant to pests and disease. When fully decomposed, organic matter becomes humus, which is a form that plants can use. Examples of humus are compost and peat moss. Adding humus to your soils will help plants to grow faster and more beautifully. You can add humus to soils at any time, remember that it doesn't last forever so add humus yearly.

EKO Compost

EKO Compost is produced in Missoula, Montana and is made from green and brown wood products (leaves, limbs, lawn clippings, wood chips, Christmas trees) and biosolids. Every batch of EKO compost is rigorously tested to ensure that it meets and exceeds all process and product standards.

Benefits of adding EKO Compost to your soils:

- Improves soil structure by lightening heavy clay soils, increasing its drainage. It acts as a sponge in sandy soils, allowing greater water-holding capacity. It improves the tilth, or work ability, of most soil, and reduces soil erosion.
- Improves nutrient availability and provides both macro and micronutrients that are slow-released. In many cases, a compost addition yearly can eliminate the need for fertilizers.
- Neutralizes and buffers soil pH, thus lowering the pH of alkaline soils and increasing the pH of acid soils. This is important since many plant nutrients are not available when the pH is too high or too low.
- Improves soil biological activity by stimulating most of the fungi, bacteria, and arthropods the soil needs to do its many jobs. In depleted soils, compost can slowly introduce a full complement of active, beneficial soil microbes. It is shown to help suppress soil-born diseases.
- Reduces transplant shock. Plant survival is often improved with the addition of finished compost at planting. This is particularly true in lower fertility, lighter, droughty soils.

Recommended applications of EKO Compost:

- When planting trees and shrubs, mix it with the excavated soil as you pack it around the root ball.
- Improve the soil over an entire planting area by spading or rototilling 2-4" of compost in 6" to 12" deep, depending on your soil type.
- Cultivate it into the surface of the soil around older plants that can use a fertility boost.
- Improve your existing lawn by core aerating, and adding compost about 1/2 inch deep. Drag with a screen or rake and water heavily. This can be done annually, or as needed.
- To establish a lawn add 1-2" of compost and till in. Then seed or sod. A dusting of compost as a final cover over seeded lawns helps retain moisture and eliminates the need for straw mulch. Keep moist.
- Use as a mulch to suppress weeds, increase moisture retention and add nutrients. Application depth should be 2-3 inches.

Sunshine Peat Moss

Peat moss is partially decomposed sphagnum moss. Its large cell structure enables it to absorb air and water like a sponge. Although peat moss does not contain nutrients, it adsorbs nutrients added to or present in the soil releasing them over time, as the plants require.

Benefits of adding Peat Moss to your soils:

- It has a reliable pH (3.4 to 4.8), which helps to acidify your soil.
- It retains up to 20 times its weight in moisture, and releases water slowly as plants need it.
- It allows proper root growth by loosening and aerating heavy, clay soils and helps to bind sandy soil, retaining moisture and nutrients.
- It reduces leaching of nutrients in or added to the soil, releasing them over time. This saves on fertilizer.
- It protects soil from hardening and adds organic material to your soil.
- Peat moss decomposes slowly over several years compared to compost, which typically decomposes within one year.
- It is environmentally friendly and free of insects, weeds, seeds, salts and chemicals, and represents good value (bale compression means you get approximately two bales in one!).

Recommended applications of Peat Moss:

- For new beds, dig or till two inches of peat moss into the top six or eight inches of soil. We recommend that you also add compost for nutrients.
- Hand dig peat moss into existing flower or vegetable beds. Be careful not to disturb plant roots. Dig one-inch of peat moss into the top six inches of soil to condition the area for existing plants or new transplants.
- Add peat moss to existing lawns by "top dressing" (adding a thin layer of peat moss) to the top of the lawn, gradually conditioning the soil. If you wish, supplement peat moss with an equal portion of well-shifted compost, which adds nutrients.
- To really improve existing lawns, core aerate the lawn, and then apply a top dressing of peat moss (¼ to ½ inch). Aeration removes plugs of soil from the lawn, loosening compacted areas and promoting deeper grass root growth. The best time of year to aerate is mid-spring (after the ground is reasonably dry) and early fall.
- For seeding a new lawn, dig or rototill two inches of peat moss into the top six inches of soil. Spread your seed, water and top dress with a ¼ to ½ inch layer of peat moss. Water lightly and keep moist.

Correcting pH, sodium and drainage problems…
Most soils in the Great Falls area are heavy clay and alkaline. This creates many problems for plants, such as poor drainage and lack of nutrient availability. Saline soils are also a problem, especially the Sun Prairie area. Some plants are adapted to these conditions, but ornamental plants will benefit by adding the products listed below.

CAL-SUL® Pelletized Gypsum

Adding gypsum to clay soils will greatly improve water and air penetration, promote root growth and improve plant vigor. • Follow annual soil test recommendations. When not available follow these guidelines. When possible incorporate gypsum into top 2" of soil.

Benefits of adding Gypsum to your soil:

Helps improve soil structure allowing air and water to penetrate soil.
Gypsum can improve heavy clay soil structure and remove sodium from sodic and saline-sodic soils.
Supplies the essential nutrients of Calcium & Sulfur.
Encourages root growth. Improves plant growth, vigor and productivity.

Recommended applications of Gypsum: In all cases Water Thoroughly after application

On established lawns, spread 25-50 lbs. per 1,000 sq. ft. twice a year. Spring and Fall to maintain soil condition.
On new lawns, incorporate in top 2" of soil. Apply 50-100 lbs. per 1,000 sq. ft. prior to seeding or sodding.
On planting beds, incorporate 5 lbs. per 25 sq. ft. into top 6" of soil prior to planting.
For trees, shrubs and flowers, incorporate 1-2 cups around the plant base. Increase application rates around larger trees and shrubs.
For winter road salt damage, frequent applications of 6-12 lbs. per 1,000 sq. ft. can be applied throughout the growing season to maintain optimum growing conditions. Rates should be determined on the basis of a soil test or water test.
For heavy clay and compacted soils spread 100-150 lbs. per 1,000 sq. ft. annually in the spring and fall to maintain soil conditions.
Heavy clay soils: 150 lbs. per 1,000 sq. ft. (15 lbs. per 100 sq. ft.) annually in the spring and fall.
Lighter clay soils: 100 lbs. per 1,000 sq ft. (10 lbs. per 100 sq. ft.) annually in the spring and fall.

S-sul Ammonium Sulfate

S-sul is used to lower soil pH (making it more acidic). It also contains 21% quick release nitrogen. Incorporate into new beds or sprinkle around existing plants and water well. The rate below outlines the amount needed to lower soil pH to 6.5 within the top 6 inches.

Original pH	Sandy soils	Loamy soils	Clay soils
	Pounds per 100 square feet		
7.5	1.0 to 1.5	1.5 to 2.0	1.0 to 2.5
8.0	2.5 to 3.0	3.0 to 4.0	4.0 to 5.0
8.5	4.0 to 5.0	5.0 to 6.0	6.0 to 7.5
9.0	5.0 to 7.5	-	-

Ironite

If you have clay soil and your lawn and plants are turning chlorotic (yellow), you may need to add iron. Most soils in the Great Falls area are clay, which makes the iron in the soil unavailable to plants. Adding Ironite to your soil will give your plants the iron that they need and will keep them green. Ironite is safe to use on all plants and will not burn them.

Benefits of adding Ironite to your soil:

- Develops stronger, deeper root systems to help plants fight against diseases and insect infestation.
- Quickly greens up your lawn and plants.

Recommended uses:

- On established lawns, spread 5 pounds per 1,000 sq. ft. Cover evenly when grass is dry then water.
- On newly seeded lawns, cover seeds with clean topsoil first, then apply same amount as above and keep soil well moistened. Can be used with other lawn fertilizers.
- For shrubs, flowers & vegetables, use 5 pounds per 1,000 sq. ft. of planting area and work into soil.
- For trees, spread evenly under the tree canopy at the rate of 5 pounds per 1,000 sq. ft. of planting area. Work into soil and water thoroughly.

Mycorrhiza

Mycorrhiza are tiny beneficial fungi that attach themselves to and penetrate the roots of plants and effectively become extensions of the root system. They produce soil compounds, which stimulate the plant to produce additional roots on which the fungus can grow. The roots in turn secrete a substance, which stimulates the growth of the fungus. Natural areas with organic matter generally contain an array of mycorrhizal fungal species. But when soils are disturbed during construction and mycorrhiza are killed or the soil has little organic matter in it to begin with, mycorrhiza can be reestablished to the site by inoculating the plants. We carry two products that contain mycorrhiza:

- **M-roots™** is a special blend of natural nutrients formulated for newly planted conifer and deciduous trees and shrubs, turf, flowerbeds, and gardens. It contains organic composts, humus extracts, sea kelp extracts, ferrous sulfate, potassium sulfate, and mycorrhiza spores.
- **Endo-ROOTS™** contains eight species of endomycorrhiza and is effective on turf grass, flowers, and many deciduous trees and ornamentals. It is derived from composted poultry manure, ferrous sulfate, potassium sulfate, kelp meal, humus, vitamins, amino-acids, and endomycorrhiza spores.
- See packages for application rates.

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