

How to Increase Soil Organic Matter

1. **Green Manure**; Green manure crops are grown in non-cropped areas of a garden and turned under while still green. Crops such as buckwheat, peas, clovers and medics, grains and radish are commonly used for soil enhancement.
2. **Animal Manure**; Fresh manure adds more nutrients and beneficial organisms than rotted (composted) manure, but also adds more weed seeds and can burn tender foliage. It is best to add fresh manure in the fall and incorporate it in the soil. For spring feeding, add rotted manure only. The quality of manure depends upon the species of animal, what the animal ate, how much bedding is contained in the manure, and how the manure was handled before spreading. High amounts of bedding increase the C:N ratio and may mean you'll have to add extra nitrogen to the soil. Manure piled in exposed areas will have much of the nutrients content leached out. Horse manure normally contains more weed seeds than other manures. Sheep and poultry manure contain much nitrogen and can cause excessive growth. Don't use the manure of carnivores since they have the potential to carry parasites.
3. **Compost**; generating compost is a long term investment. Our dry, cold conditions slow the decomposition process. The finer the raw material, the faster it decomposes, so use a shredder if one is available.

Chemical Properties of Soil

The pH of the soil is an expression of the acidity, neutrality or alkalinity. On a scale of 1 to 14, a pH of 7 is neutral. Higher numbers indicate increasing alkalinity; lower numbers indicate increasing acidity. The pH of soil regulates the decomposition of organic matter and the availability of nutrients to plants. Most garden plants grow best at soil pHs of 6 to 7 because that is the range in which nutrients are highly available to plants. Soil microorganisms that break down organic material and increase nutrient availability are also most active in a near-neutral soil. The pH of most Montana soils is neutral to alkaline (pH 7 to 8) but can vary on specific sites from pH of 4.5 to over 8.5.

Helena's Climate

Annual precipitation averages about 12 inches of which at less than half falls during growing season. Helena has a 50% chance of having last frost on May 14th with a 50% chance of having first frost on Sept. 15th. This gives Helena a 50% chance of having a 128 day growing season. Most experienced gardeners don't transplant outdoors sensitive plants such as (tomatoes, peppers, and basil) until the first or second week of June to avoid all too frequent late spring frost. If you wish to transplant out earlier plan on season extenders or be prepared to cover. Occasionally Helena is hit with a mid or late August frost which can be evident on squash leaves. Most often we can count on going well into September and in recent years even into early October without a killing frost.