

# Cover Crops Improve Garden Soil

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“You don’t need to have a green thumb to be a good gardener, but it certainly helps to have good soil”. This quote from a former colleague sums up nicely the importance of soil to a successful garden. Unfortunately, many of us are burdened with soils that are less than productive and, for lack of a better term, need help. Late summer is a good time to start the process of soil improvement in the garden.

One of the most beneficial measures a gardener can take to improve soil health is to add organic matter. Organic matter improves soil structure, increases nutrient content and exchange, aids in water retention and enhances the microbial population of the soil. In short, organic matter often has been described as “a gardener’s best friend”.

There are a number of ways by which organic matter can be incorporated into garden soil. Compost, well-rotted animal manure, and peat moss are materials commonly used. Perhaps the easiest and least expensive method of adding organic matter involves planting cover (or green manure) crops. In vegetable gardens, cover crops frequently are planted in late summer as the harvest is completed.

For late summer planting, one of several grasses might be considered as a cover crop. Cool-season grasses that thrive in mild days and cool nights are ideal candidates. Although the plant tops provide organic matter, it actually is the extensive root systems of these species that contribute most to soil improvement. When working with poorly-drained clay soils, it might take several years of planting and incorporating cover crops before dramatic improvement can be noticed.

Annual ryegrass (*Lolium multiflorum*) is one of the most popular and reliable grasses to plant as a garden cover crop. It grows quickly, competes well with weeds and does a fine job of building soil structure because of its extensive root system. Normally, annual ryegrass is seeded in mid- to late September at the rate of one to two pounds per 1000 square feet of garden area.

If planting a cover crop must be delayed, grasses that show greater winter hardiness such as rye (*Secale cereale*) and oats (*Avena sativa*) are good choices. Both tolerate cold weather quite well and may grow throughout the winter, weather permitting. Rye is most often seeded at the rate of three to four pounds per 1000 square feet whereas oats is seeded at the rate of one and one-half pounds per 1000 square feet.

Cover crops often are used as “catch crops” to take up and fix any residual fertilizer in the garden. This is especially true for the element nitrogen which would be lost via leaching during the course of the fall and winter. If more vigorous and predictable growth is desired than that prompted by existing nutrients, the addition of a balanced fertilizer (e.g. 15-15-15) at the rate of about ten per 1000 square feet is recommended.

Those gardeners having the luxury of plenty of space might want to consider rotational planting, with a full-season cover crop as part of the rotation. Species chosen for this type of cover crop are planted in the spring and must be able to withstand the warm temperatures of summer. Buckwheat (*Fagopyrum esculentum*), Sorghum-sudangrass hybrids (*Sorghum bicolor* x *S. sudanense*), cowpea (*Vigna unguiculata*) and soybean (*Glycine max*) are species that can be used as full-season cover crops for gardens. They are easy to establish, make rapid growth and compete well with weeds. Cowpea and soybean are legumes and add valuable nitrogen to the soil as well as organic matter.

Cover crops should be turned under in early spring, when the soil is dry enough to work. Preferably, this will be at least three to four weeks before planting the garden. Adequate time is needed to allow soil microbes to break down the organic matter in cover crops to a more stable form. Partially decomposed organic matter will continue to be broken down by soil microbes during the early part of the growing season. These organisms use nitrogen in the decomposition process at the expense of garden plants, resulting in nitrogen deficiency symptoms.

When turning under cover crops, do so as thoroughly as possible. Exposed parts of the plant may decompose slowly or not at all. Partially decomposed organic matter tends to tie up nitrogen when soil microbes complete the decomposition process. If the cover crop has become tall, mow it before turning it under.

The addition of organic matter to garden soil is a never-ending necessity. Organic matter continually is broken down in a biological process carried out by soil flora and fauna. The result is both a physical and chemical transformation of the material that ends in the formation of humus, along with the release of the nutrient elements that comprised the organic matter. For this reason, the yearly addition of organic matter to garden soil is considered a “best management practice”. Cover crops represent a good way to accomplish that goal.

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