WASHINGTON STATE UNIVERSITY
SNOHOMISH COUNTY EXTENSION

Community Horticulture Fact Sheet #27
Green Manures:

Plants to improve your soil

More than anything else, successful gardening depends upon soil quality. Soil organic matter is a vital part of soil quality. It makes soil easier to work, holds water and nutrients for easy absorption by plants, improves soil aeration, and helps soil warm up earlier in the spring. Since soil organisms constantly break down organic matter, gardeners need to build and then regularly replenish its supply in their soil. Green manures are an important and inexpensive way to produce organic matter for your garden. Instead of buying and lugging home bags or truckloads of compost or manure, all you need to carry are some seeds.

What are green manures?

The name "green manure" is given to any crop that is grown only to be tilled back into your soil. As it rots, the nutrients in its leaves and roots will be taken up by the next crop planted in the same place. Instead of tilling them back into your soil, you can cut or pull out the plants, compost them and then return them to your garden as finished compost. Green manures also act as "cover crops," plants grown at times when other crops do not occupy garden space. They protect the soil from compaction and erosion caused by wind and rain and they reduce the extent to which weeds take over bare soil.

How do green manures work?

You can grow green manures any time of the year. Winter is an excellent time to grow them, when other crops take up less garden space and rain can do the most damage to uncovered soil. During the rainy winter, many nutrients are leached out of the root zone down to the water table and soil can be washed away by surface erosion. Green manures prevent this loss by absorbing those nutrients. They also soften the impact of the rain drops on the soil, reducing compaction and erosion.

In addition to preventing loss of nutrients, green manures actually add important elements to the soil. All plants undergo photosynthesis, a process that captures carbon dioxide from the air and transforms it into sugars (another form of carbon) in plant tissue. Green manures that are in the legume family (peas, beans, clovers, etc.) have an added bonus. Nitrogen-fixing bacteria living on their roots can take nitrogen from the air and make it available to the plant.*


Crimson Clover

As the green manures decompose, the nutrients that they contain are used by the next crop planted in that soil. The carbon captured from the air through photosynthesis becomes an important part of soil organic matter. The various nutrients absorbed from the soil or from the nitrogen-fixing bacteria are broken down into forms that crops can readily absorb.

*If you have never done so, adding these bacteria to your soil or "inoculating" can greatly increase nitrogen fixation. Most seed companies sell inoculum. Apply by coating seeds with inoculum before sowing.

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How do I use green manures?

Choose the best crop for the time of year and your situation. Growing more than one kind of green manure (mixed together or separate) is a good idea. Sow or transplant green manures into a prepared garden bed.

If you need to get your green manure in before you are ready to harvest your previous crop, try under-sowing. Lightly cultivate the soil under or between maturing crops and sow the green manure. By the time your crop is out of the way a few weeks later, the green manure will be germinated, growing and glad to have more light and space.

The best time to "harvest" green manure is when most of the plants start to bloom, but before they go to seed. The plants will become woody and slower to break down, if you wait too long. Harvested early, the plants will not have reached their maximum amount of nutrients and organic matter.

Use a spade to chop up the green manure, then either mix them with the top few inches of soil or rake them up and compost them. If you choose to compost the green manure, remember to add finished compost before planting. If you turn them into your soil, wait until they have decomposed (several days to three weeks) before planting.

Suggested Green Manure Crops

Crop	Planting Date	Spacing	Seeds/ 100 sq. ft.	Comments
Crimson Clover	Sept. – mid Oct.	Broadcast	1-4 oz.	Legume* - Does poorly in poorly drained, acidic, infertile soil. Good for undersowing. Avoid other, perennial clovers, such as red clover.
Vetch	Late Aug. – mid Oct.	Broadcast	5-10 oz.	Legume* - Soak seeds overnight before sowing.
Field Peas	Late Aug. – Oct.	Broadcast	10-12 oz.	Legume* - Does reasonably well in poorly drained or infertile soil. Very hardy. Matures later than crimson clover.
Fava Beans	Late Oct. – early Nov.	6"-8"	12-14 oz.	Legume* - Soak seeds overnight before sowing for quicker germination. Large plants, lots of organic matter, nitrogen for soil. Not very hardy.
Cereal Rye	Late Sept. – Oct.	Broadcast or 5" spacing	5-10 oz.	Produces lots of biomass. Harder than legumes to chop up. Breaks down more slowly. Roots improve soil structure. Chop before stalks turn brown.
Winter Wheat	Late Sept. – early Oct.	Broadcast or 5" spacing	5-10 oz.	(see Rye comments)
Buckwheat	June-Aug.	Broadcast	3 oz.	Good summer green manure. Doesn't need lots of water. Attracts beneficial insects. Not winter-hardy.
Tyfon	May – Sept.	Broadcast or transplant 4"	½-1 oz.	Cabbage family. Do not follow with same family crop. Edible greens and roots.
Corn Salad	Sept.	Broadcast	1 oz.	Good salad greens in winter. Allow to grow in early spring before chopping.

* Legumes fix nitrogen from air with the aid of bacteria. This nitrogen becomes available for subsequent crops. Legumes break down fairly quickly when turned into soil or composted.