

GREEN MANURES.

Green manuring has many positive effects upon the soil and upon subsequent crops. It has been employed in traditional agriculture around the world for hundreds of years, and can be used in a number of ways in vegetable gardens and allotments:

1. A green manure crop can be grown either to dig back into the soil as soon as it is cut down [such as perennials like comfrey], or grown on for 1-2 months then chopped and dug into the soil where they are growing, or cut down and composted. It is also often useful to build up your own supply of green manure seed by growing to maturity and harvesting the seed before composting the **haulm**.
2. Leguminous (pea-family) green manures act as '**nitrogen-fixers**', that is, they are able to draw nitrogen from the atmosphere and store it in root nodules. Specific **soil bacteria hosts** are required for this, but these are usually present in a healthy and fertile organic soil.
3. Many green manures are deep rooting (e.g. alfalfa) opening up soil structure and drawing up essential elements and minerals from the subsoil which are often lacking in a worked out topsoil.
4. Fast growing types (e.g. buckwheat) can be used to **suppress weeds** on new or neglected beds, or to fill a short gap in rotation. In particular, a green manure crop can be sown on recently dug, rough beds where applications of lime and compost etc. make the growing of crops premature. A thickly sown green manure will help **fiberise** and **homogenise** the soil ready for more demanding crops.
5. Hardy types (e.g. rye) can be sown to survive overwinter and so provide essential protection for the soil from the effects of frost and from the leaching of nutrients during excessive rainfall. In the summer, a green manure crop will protect the soil from the effects of drought, and the drying and baking effects of wind and sun.
6. If no typical green manure seed is available, it is possible to use up old vegetable and flower seeds. For example, I have successfully used for this purpose out of date packets and own - saved seed of radish, cabbage, pea, calendula and fenugreek. If the seed is mixed up before sowing, one or two varieties amongst the mix usually manage to grow well enough to create a useful coverage.
7. Common annual garden weeds can, in fact, be allowed to cover a bare patch of ground, but only for short periods, unless you do not mind weeding out the deeper - rooting perennials that inevitably get established. Many of our commonest weeds are particularly good at collecting valuable trace elements and minerals, and so can usefully be employed as green manures. This is similar to the ancient strategy of leaving the ground **fallow** for a season, to 'rest' the land. In effect, green manuring is a more sophisticated and controllable method of fallowing.
8. Permitting and encouraging certain beneficial species such as chamomile or limnanthes to self-seed into a patch of clear soil will deposit a store of seed which will germinate to produce a self-sown green manure. This technique can also be used to establish a **companion crop** around a cultivated crop, which can be hoed in to produce a mulch before it begins to compete with the main crop.
9. Repeated sowing and digging in of mustard at 4-8 week intervals will help to clear infected ground of **club-root disease**. Like the cabbage family, mustard is a brassica which will activate the dormant spores of this fungal disease, allowing the grower to break its life-cycle when the plants are prematurely destroyed.
10. An interesting variation on this is the growing of a mustard crop almost to maturity so as to clear the soil of **wireworms** - a devastating pest of potatoes. The wireworms feed very successfully on the now dug-in and decomposing mustard crop, so that they all mature quickly and so fly off as beetles to lay in pasture - your own patch now wireworm-free.

TYPICAL GREEN MANURE SPECIES:

ALFALFA: Hardy perennial. Very deep rooter. Rich in calcium and trace elements. Sow April - June. Slow to establish but eventually provides good ground cover and will overwinter. Nitrogen fixer, though bacterial host not always present in British soils.

BUCKWHEAT: Annual. Fast growing deep rooter. Accumulates calcium. Able to grow in poor soil. Self-sows easily. Left to flower will attract hoverflies. Excellent soil texturiser. Attractive pink/white flowers, tasty grain.

CLOVER: Perennial. Red clover hardiest. Good, reliable nitrogen fixer. Good companion crop for perennials. Holds soil together against erosion very well. Slow to establish but works well as an undersown crop (or 'living mulch') for big crops such as calabrese or kale. Good bee fodder plant. Sow April - August.

FENUGREEK: Annual. Legume. Quick growing to fill up spaces during the main growing season.

FIELD BEANS: Annual. Legume. Fairly deep rooting nitrogen fixer. Will overwinter if sown in good time. Sow August - September.

GRAZING RYE: Annual. The best overwintering crop, producing a lush cover that protects the soil. Sow August - September, dig in following spring before it flowers. Note; suppresses germination of following crop if sown too early after digging in, especially other monocotyledons such as all of the allium family [onions / leeks]. Other grains, such as oats, wheat or barley can also be used, but rye is the most effective all round.

LUPINS: Specifically agricultural or blue. Annual. Deep rooter. Acid soil tolerant. Nitrogen fixer. Sow April-June.

MUSTARD: Annual. Fast growing, suppresses weeds. Reputed to control wireworm by growing for a whole season. Sow March - September, or any mild spell overwinter, though will not survive hard frost. Consider as a brassica when considering rotations.

PHACELIA: Annual, very quick growing, weed suppressor. Attracts beneficial insects and bees - pretty purple flowers. Sow March - September.

SUNFLOWERS: Annual, quick-growing, aggressive weed suppressing capabilities. Sow April - July.

TARES: Annual nitrogen fixer. Can be sown after a summer crop, for overwintering. Protects and fiberises the soil.