



Cover crops in horticulture

Cover crops are non-cash plants grown between planting and harvesting the main crop to cover the ground. Usually, they are planted in winter but can be used whenever the fallow season falls.

Why use a cover crop?

Using a cover crop has multiple environmental and soil-associated benefits.

Erosion

Cover crops physically protect the soil from wind and rainfall. High winds can erode the top layer of soil and raindrops can displace soil particles at the surface resulting in depleted soil organic matter (SOM) and potential runoff. Studies suggest that crops with fine, fibrous roots (ryegrass or oats) are more effective in preventing erosion than those with thicker, deeper roots.



Soil fertility

Green manures are fast-growing cover crops that are ploughed into the ground while still green, offering all the benefits of a cover crop and boosting soil nutrients. Green manures are usually legumes that fix nitrogen and therefore contribute significantly to soil N content. While fertilisers improve soil nutrient profiles they do not contribute to SOM, this is achieved by adding plant residues, SOM is an extremely important part of healthy soil.

Improved soil structure & drainage

Better water infiltration & retention + reduced flooding & erosion

Provides nutrients for soil microbes

Improved nutrient holding capacity

Buffers pH

Acts as carbon store (SOC)

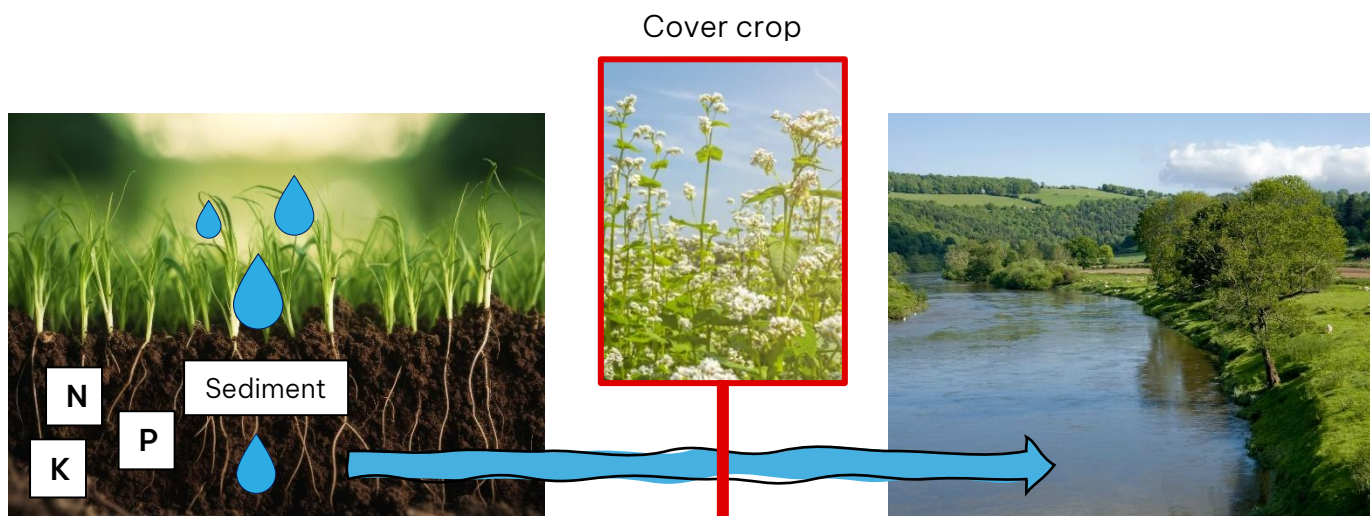
Soil quality

Increasing SOM significantly improves soil structure by affecting aggregate formation and stability. A well-aggregated soil contains large pores between aggregates that allow water to infiltrate and small pores within aggregates that hold water allowing uptake. The roots of cover crops can also help to remedy compaction.



Water and flood control

Cover crops intercept nutrients, sediment and water preventing leeching, runoff and helping reduce flood risk.



Control of weeds, pests & diseases

Selecting a species of cover crop that doesn't support pathogens and pests that affect the cash crop is a simple way of reducing problems. Some brassica cover crops such as mustard bio-fumigate – releasing toxins that kill pests and pathogens. Fast-growing cover crops with dense foliage can out compete weeds though they are not sufficient to control weeds alone.

Types of cover crop

Cover crops can be split into four groups:

Legumes	Cereals & grasses	Brassicas	Herbs
Vetch (crown, hairy)	Triticale	Mustard	Buckwheat
Clover (red, white, crimson, berseem, sweet)	Rye	Oilseed radish	Chicory
Lucerne (common, crown)	Wheat	Oilseed rape	Linseed
Sainfoin	Barley		Phacelia
Peas and beans	Oats	For grazing:	
Yellow trefoil	Ryegrasses	Swede	
	Sudan grass (summer only)	Turnip	
		Radish	

Mixes are highly effective and often outperform monocultures.

It is important to select a cover crop according to requirements and environmental conditions. Each species has an optimum sowing time and sowing rate, see [AHDB's guidance](#).

When to plant

Winter cover crops are usually sown August-September as this provides favourable conditions for successful establishment. Some hardy species can be planted later in the season (November), so it is most important to select a species or variety that can cope and thrive under the required conditions.



Cover crops may also be used in the summer to prepare for winter cereals, some species that are particularly well suited include:



Destroying the cover crop

Cover crops are killed (mowing, ploughing or rolling) or die off (due to frost) and are incorporated into the soil. Killing crops using herbicides should be avoided.

Cover crops grown specifically for fodder can be grazed, however, there is a significant contamination issue posed by animal faeces if the main crop is for human consumption. It is advisable to allow 1-2 weeks before planting the main crop to get the greatest benefit from the decomposing cover crop.

Undercover

Cover crops may be used to address common issues encountered when growing under cover, such as:

- **Soil and foliar disease** – The humid and protected environment encourages the growth of fungi, mould and insects.
- **Weeds**
- **Depleted SOM** – extending the growing season and intensively using soil depletes SOM which affects water and nutrient retention, buffering capacity and soil structure.
- **Depleted nutrients**

Using a legume as a green manure will improve N and SOM content, leading to better soil structure, water infiltration and soil fertility. Mustard can be especially effective in controlling pathogens due to its ability to bio-fumigate. It is important to consider the destruction of the cover crop when selecting a species, for example, tall crops with high biomass may be particularly difficult due to the confined space.

After planting, the cover crop must be irrigated, which could be problematic if temperatures are low enough to freeze water lines.





Useful resources

[AHDB: Introduction to cover crops](#)

[Scientific article: Quantifying soil quality in a horticultural-cover cropping system](#)

[Book chapter: legume-based green manure crops](#)

[Article: Grow cover crops within high tunnels](#)