

Use of Cover Crops

Practical Guide



Cover crops are primarily grown to provide ground cover rather than leaving bare soil. With an increase in extreme weather events predicted due to climate change, cover crops can help protect and improve farm soils.

Cover crops could be annual or perennial plants grown in pure stands or mixtures. They could be in the ground for a few months to several years.

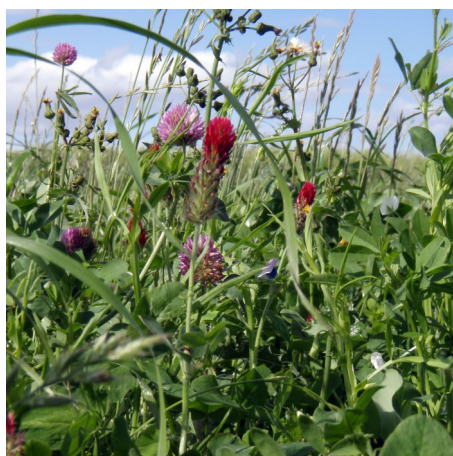
Cover crops are often grown through the wet months over winter, to prevent losses of soluble nutrients such as nitrates through leaching. Plant cover over the winter months also protects soils from erosion by wind and water: wind blow or field runoff can take particles of insoluble substances such as soil organic matter and phosphorus out of fields, contributing to diffuse pollution. Not only is nitrate in watercourses detrimental to water quality and biodiversity, but it can also lead to increased emissions of the powerful greenhouse gas nitrous oxide.

Many cover crops are relatively fast-growing species. When ploughed in, these cover crops add biomass to the soil. This increases the amount of soil

organic matter, which has many benefits to farm soils in the long-term (see Soil Management Practical Guide). In terms of climate change, healthy soils can remove carbon dioxide out of the atmosphere and lock it away in the soil.

Cover crops are often called by different names. **Green manures** are grown with the intention of ploughing them in after a period of growth, to increase the amount of organic matter in the soil and improve soil fertility. When cover crops are grown to capture nutrients from the soil to prevent them being lost by leaching they are called **catch crops**.

This Practical Guide concentrates on the benefits of cover crops and how they can help your farm adapt in a changing climate.



There are five sets of Practical Guides covering :

Use energy and fuels efficiently

Develop renewable energy

Lock carbon into soils and vegetation

Optimise the application of fertilisers and manures

Optimise livestock management and the storage of manure and slurry

Find further information, including links to other Practical Guides and Case Studies, at

www.farmingforabetterclimate.org



Funded by the Scottish Government as part of their Climate Change Advisory Activity

Websites

www.farmingforabetterclimate.org

www.adaptationscotland.org.uk

www.soilassociation.org.uk

www.agrecalc.com



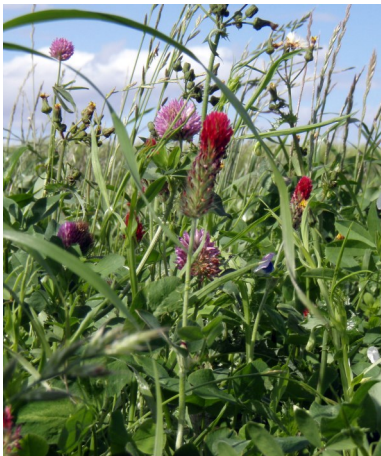
2015
International
Year of Soils



Use of Cover Crops

Cover crops: consider -

- How they fit in to the cropping sequence?
- How long they may be in the ground for?
- Nutrients; soil pH plus N and P status
- What are your aims? For example to build organic matter, improve soil structure, reduce soil erosion, runoff or leaching losses or to improve fertility for a following crop?
- Which are the best cover crops to grow for your rotation, climate and local area?



Improving nutrient balances on the farm

Mixtures of species that include legumes such as clovers help to **increase soil nitrogen** levels; this could reduce the amount of bagged fertiliser to be applied and make better use of nutrients on the farm.

Some farmers use cover crops for **nutrient mining**. This uses species with deep roots to access nutrients lower down in the soil profile and bring them to the surface. It can be particularly effective in boosting levels of a range of trace elements.

Improving weed control

Cover crops can be used as an effective form of **weed, pest and disease control** in the right circumstances. Fast-growing species may out-compete weeds for light and nutrients or physically smother them. This depends on selecting a cover species that grows vigorously when the target weeds are also growing. Some farmers use cover crop species (generally brassicas or grazing rye) that release chemicals that are toxic to weed species, particularly disrupting their germination. This may give additional weed control. Similarly, some biofumigant cover crops have been developed to reduce soil-borne pest and diseases in crops such as potatoes and strawberries.

Improving soil structure

Cover crops that produce high biomass (e.g. fodder radish) help to **improve soil structure** by increasing soil organic matter. This could help to reduce water-logging and after the crop has been ploughed in, the residues release nutrients ready to supply a following crop.

Improving biodiversity

All cover crops help to **improve biodiversity** on the farm. They provide a habitat for many different species above ground, and also help improve the activity of microbes in the soil.

Choosing a cover crop

The potential benefit of using a cover crop needs to outweigh the costs involved in its establishment and management. Rotation, anticipated cover crop duration, local climate, and soil conditions e.g. drainage and pH will all need to be taken into consideration in terms of establishment success and longer term survival (e.g. frost tolerance). If reducing nitrogen losses is important, a fast-growing leafy crop such as forage rye or rape might be useful. If nitrogen fixation is key, including a legume will help. If phosphorus levels are an issue, buckwheat might be considered. Deep-rooted plants such as chicory and lucerne may prove useful in improving trace element availability later in the rotation. You might also consider using a mixture of species with different attributes as this might provide a range of useful benefits.