Cover Crops

A Guide to Cover Crops suitable for South West England

Department for Environment Food & Rural Affairs

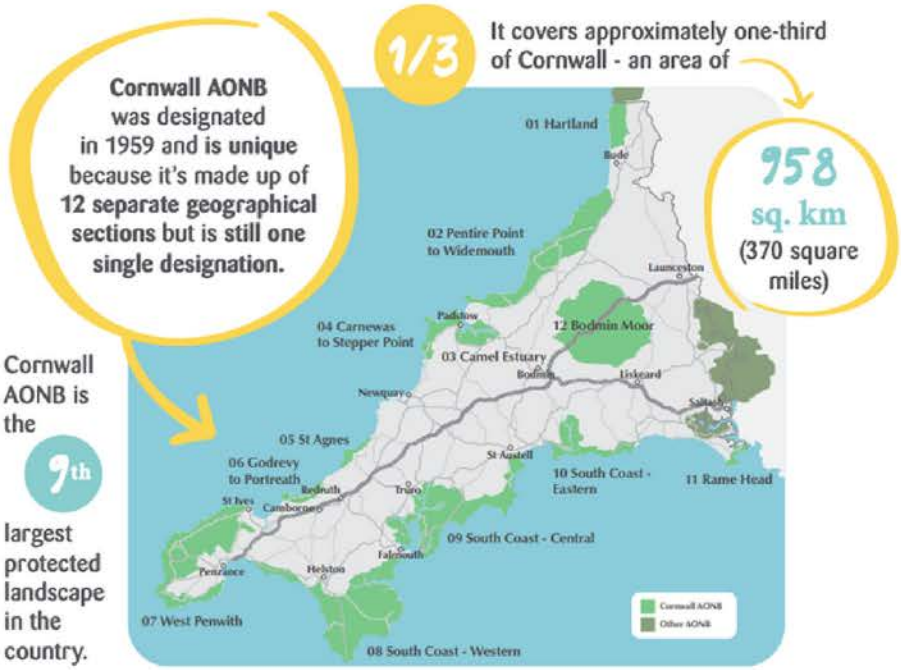
Cornwall Area of Outstanding Natural Beauty

12 Sections - One Designation

Farming in Protected Landscapes programme

Areas of Outstanding Natural Beauty are protected landscapes whose distinctive character and natural beauty are so outstanding that it is in the nation's interest to safeguard them. As such they have been nationally designated by the same legislation as National Parks and have the same status and level of protection.

The Cornwall Area of Outstanding Natural Beauty (AONB) is a national asset, critical to Cornwall's economy and the wellbeing of communities. The objective of the AONB is to ensure that the special qualities of the Cornwall AONB are conserved, enhanced and appreciated by all who live, work and visit, inspiring those people to be connected with the landscape.



READ THE FULL Cornwall AONB Management plan

A shared strategy for those who live, work and visit the Cornwall AONB. It provides guidance to help Government, statutory organisations and any public body to ensure they are fulfilling their Section 85* duty to 'have regard to the purpose of conserving and enhancing the natural beauty' of the AONB.

Farming in Protected Landscapes (FiPL)

Farming in Protected Landscapes (FIPL) is a 4-year programme providing grant-funding for Farmers and Landowners, designed to deliver for People, Place, Nature and Climate.

The programme is funded by Defra, delivered locally by Cornwall AONB and focuses on the key challenges facing farmers, land managers and communities in Protected Landscapes.

FIPL is running until March 2025. Your project must deliver against one or more of Defra's national outcomes; People, Place, Nature and Climate.
The funding is not prescriptive, so there is scope to come up with an innovative idea – this also puts the onus on the applicant to think of something that meets the Defra outcomes and also helps the applicant.

You can have a look at our case studies for inspiration and if you would like to apply, please fill in an Expression of Interest Form and we will be in touch. All of the above is accessible from our website
Farming in Protected Landscapes – The Cornwall Area of Outstanding Natural Beauty (cornwall-aonb.gov.uk)


People


Place


Nature


Climate

Why Sow Cover Crops?

Cover crops are increasing in popularity due to their widespread benefits e.g. improved drought resistance, reduced soil compaction and increased biodiversity. FiPL can provide financial support to establish cover crops as part of a wider project.

Biodiversity:

Cover crops encourage biodiversity on farmed land which benefits crop production due to improved pollination and predatory insects that can reduce pest damage, ultimately regulating ecosystems and increasing crop yields.

Soil Leaching and Wind Erosion:

Bare soil, paired with rainfall can leach nitrogen and other nutrients from soil. Fast growing species with tap root systems are best suited to prevent leaching, perennial ryegrass is an effective preventative, mustard is too. Root structures can bind soil particles, reducing topsoil loss through leaching or wind erosion - crops such as mustard and deep rooted herbs and grasses are effective.

Fertiliser:

Legumes such as red/white clovers and lucerne (alfalfa) are used to incorporate N into soils, whereas faster growing species such as Persian and crimson clover are sown in short breaks between cash crops, boosting soil nitrogen.

Soil Structure & Compaction:

Cover crops aid soil aeration, increase water and nutrient retention and improve drainage and increase organic matter . Organic matter secretes acids, making plant nutrients readily available to the next crop. Lucerne and chicory have strong tap roots, which reduce soil compaction.

Crop rotations

The successive cultivation of different crops on the same field has been practiced for hundreds of years, often being associated with increased crop yields. Cover crops improve biodiversity between harvest and planting of the main crop to protect and enrich soils. For example late harvesting of maize leaves bare soil - increasing risks of soil erosion and nutrient leaching. Sowing a cover crop such as mustard post maize harvest will help bind the soil, preventing topsoil loss due to the crops fibrous root system and increased canopy cover.

Considerations

- What is your current crop rotation?
- What month would you be able to sow the cover crop?
- What timeframe would you like the cover crop to last for?
- What seed sowing technique would you use?
- What are you looking to achieve from the cover crop?

Cover Crops

Species Guide

Clovers Trifolium

Clover can fix atmospheric nitrogen (N), helping maintain soil fertility and increasing crop yields. Clovers are also excellent animal feed, having higher protein content than most grass species. Best suited to loamy soils and areas of full sun or partial shade.

Alsike clover
Trifolium hybridum

Alsike clover is a short term perennial (2-3 years), low growing species, often used as an under-sown crop with cash crops.

Sowing

Alsike clover must be sown at a shallow depth, into warm soils. Sowing after September is likely to reduce germination rates. This species is hardy so can withstand frosts and due to its low growing nature is a great weed suppressor once established. Alsike clover can be topped or grazed regrowing for 2-3 years. Diseases such as mildew affect this species, growing in rotation will help reduce disease and pest problems.

Crimson Clover
Trifolium incarnatum

This species is an annual - boosting soil fertility. Commonly grown in horticultural systems, the vivid crimson flowers are attractive to pollinators potentially increasing crop yield.

Sowing

The small seed of crimson clover should be broadcast or drilled at no more than 10 mm, any deeper will reduce germination. Sowing should be followed by rolling, increasing seed-moisture contact. For spring sowing - March/April, August for autumn sowing. Germination rates decrease further into September. Crimson Clover rapidly establishes, producing a canopy which is an excellent weed suppressor. Topping is not necessary.

Red clover
Trifolium pratense

Red clover is a popular green manure for short/medium term leys, popular with organic farmers. Red clover silage has high protein levels.

Sowing

Seed should be broadcast or drilled no more than 10 mm depth, followed by rolling. March/April spring sowing, Mid August for an autumn sow. Fairly frost tolerant. Slower to establish than most clovers, however competes well against weeds. Red clover should be regularly mown once the crop has exceeded 30 cm in height. Susceptible to pests and diseases such as stem nematode (Ditylenchus dipsaci), for this, a four year gap between red clover crops is recommended.

Vetch
Vicia sativa

Vetch is an annual species which fixes nitrogen (N). There are multiple species of vetch. Best suited to well drained soils and areas of full sun or partial shade.

Sowing

Vetch can be spring sown (March/April) or Autumn (August/September). Vetch requires deeper sowing than clover species, approximately 2 cm depth into moist soil. Pest protection may be necessary (e.g. from weevils). The species does not respond well to topping.

Yellow Trefoil 'Black Medick'
Medicago lupulina

Yellow Trefoil is an annual/biennial. Growing habit is low making it popular for under-sowing. The species is N fixing, if the crop is left to flower it encourages pollinators. Best suited to well drained soils and areas of full sunlight.

Sowing

Yellow Trefoil is best sown March-May or if it is to be under-sown in a spring cereal May sowing is suitable. Seed should be sown or drilled at a maximum of 2 mm, sowing too deep reduces germination rates. It is suggested soil is rolled after sowing to increase soil moisture contact with the seed.

Lucerne (alfalfa)
Medicago sativa

Lucerne is suited to the production of silage for dairy cows, cattle or sheep. For specialist use it may be made into hay for the equine market where it is also known as alfalfa. Once established the species root structure is vast and deep providing reliable yields irrespective of drought. Best suited to well drained soils and areas of full sun.

Sowing

Lucerne is slow to establish, farmers often under-sow in a spring cereal crop. Others prefer to summer sow following an early-harvested cereal such as winter barley. Mid-August is the latest date for sowing. Whether under-sown or directly drilled, the seed should be sown into warm soil to increase germination rates. Hard or frequent grazing should be avoided within the crops' first year.

Chickpea
Cicer arietinum

Chickpeas are a relatively new N fixing crop to the UK, although they have been cultivated for centuries in Asia and the Mediterranean. In hotter climates the species are grown for their seed, however in the UK climate they are best harvested as a green crop similar to petit pois. Best suited to areas of full sun and well drained soils. Avoid clay soils and shady sites.

Sowing

Site depending, chickpeas can be sown direct March/early April at a depth of 3 cm. After seedling establishment little aftercare is necessary, however birds are a common pest. Plants may need weeding until a full canopy is achieved, from then the crop will supress weeds due to a dense cover being formed.

Chicory
Cichorium intybus

Chicory is a perennial herb, commonly used for grazing with its anthelmintic properties (reduces liver flukes and worms in livestock). The long roots can aerate soil, aiding drainage and crop root development. Best suited to free draining soil and areas of sun or partial shade.

Sowing

Seeds should be sown at approximately 1 cm depth. Seed sowing should be followed by rolling to ensure moisture contact. Warm seedbeds are required for maximum germination rates (March/early May). Later sowing may reduce crop establishment. Chicory requires frequent topping or grazing.

Phacelia
Phacelia tanacetifolia

Phacelia is a rapid growing, nitrogen holding annual crop. A key benefit of the crop is the attraction to pollinators. Phacelia grows vigorously providing good weed suppression.

Sowing

Spring sowing (March onwards), and early autumn sowing (similar timings to oilseed rape, mid August/early September). Seeds should be sown at a maximum of 2 mm or surface broadcast. No other inputs are necessarily required; however, crops may need to be managed for pest damage. Autumn sowings do not require topping. Spring sowing may require canopy management - topping to prevent set seed. Phacelia is not fully frost tolerant

Mustard
Sinapsis alba

Mustard is a rapidly growing nitrogen lifter for the summer months. The crop is also a great weed suppressor. Suitable for most soil conditions, avoid waterlogged soils - best suited to areas of full sun or partial shade.

Sowing

Mustard seeds are small and should be sown at a few mm or surface broadcast. Spring sown (March onwards) or Autumn sown. Leaves will break down after a few frosts, this is beneficial to incorporate the crop. Mustard can suffer from pests and diseases which are commonly associated with growing brassicas. The crop is susceptible to clubroot (Plasmodiophora brassicae) so should should not be grown within a rotation that incudes commercial brassica crops.

Fodder Radish
Raphanus sativus

Fodder radish is not a legume however it holds residual nitrogen in soil which the crop slowly releases over time. The annual brassica flowers later than mustard and produces deeper roots. Best suited to areas of pull or partial sun and suitable for well draining soils.

Sowing

Fodder radish seeds are small, therefore should be broadcast and shallow sown onto a fine tilth seedbed, followed by rolling to increase germination rates. Seed should be sown in spring/summer or autumn into warmer soils. Fodder radish has a higher frost tolerance than Mustard, however several sharp frosts will kill the plant. The crop is a good weed suppressor due to its rapid growth rate. Fodder Radish suffers from the common brassica pests and diseases, although the rapid growth aids avoidance to such problems.

Buckwheat
Fagopyrum esculentum

Buckwheat is an annual species with great weed suppression abilities and is a scavenger of soil phosphate, breaking it down and making it available for crops after incorporation. The species establishes in 10 weeks, meaning it can be utilised for narrow gaps within a crop. The crop is also a nectar and pollen source for pollinators and other beneficial insects due to its shallow white blossoms. Frost terminates buckwheat. Grazing livestock, especially pigs, on dense stands of buckwheat may suffer skin issues (fagophyrism). Buckwheat is best suited to well drained soils and areas of full sun or partial shade.

Sowing

Sow Buckwheat 1 cm deep, from late spring to late summer. The species is not frost tolerant.

Land characteristics should be acknowledged when selecting a cover crop, as well as budget and farming equipment. The more species diversity the mix contains the more benefits will be achieved - such as supporting biodiversity, increasing soil health and reducing soil leeching and erosion. Diversity will also given an indication of what grows well in the area informing future species choices.

Winter mix

Crimson clover, fodder radish, phacelia and ryegrass.

This mix will cover soil rapidly whilst fixing nitrogen and sequestering N which would have been washed from the soil in heavy winter rainfall. This mix will also remain green until severe frosts, the grass species providing grazing.

Multi species Cover Crop Mix

Vetch, buckwheat, mustard, fodder radish and phacelia.

High diversity aims to maximise the benefits from species; soil structure, nutrient availability, water holding capacity, soil microbial enhancement and pollinator attraction all benefit from this mix.

Rapid growth cover crop

Mustard, fodder radish and phacelia

A fast-growing mixture, covering bare soil quickly and sown directly post harvest into stubble for summer cover. For reliable germination mix must be sown at a maximum of 10 cm depth.

Seed Supplier information:

- Cotswold Seeds: www.cotswoldseeds.com
- Boston Seeds: www.bostonseeds.com
- Farm Seeds: www.farmseeds.co.uk
- Oliver Seeds: www.shop.oliver-seeds.co.uk
- Cope Seeds&Grain: www.copeseeds.co.uk

Acknowledgements

Sources of information:

Cotswold Seeds Ltd 2022
Agrii Cover Crop Guide
NIABTAG Cover Crops 2015
AHDB: Maxi-Cover Crops
Shackelford et al., 2019. Effects of cover crops on multiple ecosystem services.
Soil association [image]
wildflower.co.uk [image]
growveg.com [image]
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agrii.co.uk [image]

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