Supporting guidance for Stubbles Followed by Green Manure in an Arable Rotation

Date published: 15 January, 2021

To see recent changes to this guidance, check the bottom of this page.

Note: In March 2024, an update was made to the final paragraph of the 'Introduction' relating to the hectarage limit per holding.

Introduction

This option encourages the use of a green manure as part of your arable rotation.

Stubbles are retained over winter and in the following spring you must establish a green manure crop.

The green manure crop must be maintained for at least three months, until late summer or the following spring.

This option has a hectarage limit per holding. Therefore, if you have already reached this limit in a previous AECS approved application, you cannot apply for this option in a subsequent application, on the same holding, until this option in the existing contract has expired. Where the previous application did not utilise the full potential area for the option on a holding, the balance area would be available in a subsequent application. When existing contracts expire, the area of the option relative to that contract becomes available again for subsequent applications.

How to claim

The option should be claimed in the year in which the arable crop becomes stubble, not the following year when the green manure is established. This is because the requirements around the stubble must be available for inspection. The nature of the green manure option means that to be claimed every year it must be rotational.

The capital item should be claimed in the year following the management option. Depending on the timing of other options claimed, this could result in a six-year contract with only the green manure capital item in the sixth year.

For example:

	2022	2023	2024	2025	2026	2027
LPID A management	x			x		
LPID A capital		x			x	
LIPD B management		x			x	
LPID B capital			x			x
LPID C management			x			
LPID C capital				x		

Legumes and nitrogen

Leguminous plants, such as clovers and vetches, take nitrogen from the atmosphere and fix it in the soil where it becomes available for other crops.

This is done through nodules on the roots which are home to nitrogen-fixing bacteria. The use of legumes is a good way of reducing inorganic nitrogen fertiliser costs.

Organic matter

The decaying remains of plants and animals form soil organic matter. Soil organic matter is associated with a wide range of nutrients, such as nitrogen and phosphorus, and trace elements that are essential for plant growth and health.

Green manures are a good way of increasing levels of organic matter in depleted soils, particularly in all-arable farming systems.

Soil and water quality benefits

The main benefit of green manures is an improvement in soil condition. They can boost soil nitrogen levels, improve soil structure, increase soil organic matter, and increase microbial activity.

Poor soil structure, compaction and low levels of organic matter can increase the risk of soil erosion. Using green manures is one way of helping improve soil condition and protecting water quality in areas prone to erosion.

Wildlife benefits

Green manures can benefit a range of species, particularly pollinating insects. Plants such as clovers, vetches or phacelia included in green manures will provide an excellent source of pollen and nectar for insects during the flowering season.

Green manures can also add habitat diversity in intensive arable areas. Species such as brown hare prefer a mosaic of land use types including green cover crops.

Which fields to choose

- this option is rotated around the farm so it is important to consider the location of the green manure over the five years of management
- fields where there are issues with soil structure, compaction and low levels of organic matter are best suited to this option
- sloping fields close to watercourses which have a higher risk of soil erosion are well suited to this option

Which green manure to use?

There is a variety of plants that can be used and each has different benefits.

Your choice of green manure depends on what you are trying to achieve – whether you wish to improve soil structure, fix nitrogen and / or improve soil organic matter.

Your choice of green manure will also depend on soil type and location.

A mixture of two or more species is a good way of getting the crop to perform multiple benefits, with legumes fixing nitrogen and other species improving soil structure. The seed mix must include at least one annual flowering plant (e.g. vetch, clover or phacelia). Crops used in green manures include:

- legumes such as red clover, crimson clover, sweet clover and vetches. These crops fix nitrogen, and their flowers are attractive to pollinating insects
- brassicas such as mustard. These are often fast growing, hold soil nitrogen and suppress weeds
- grasses such as Italian ryegrass. Fast-growing grasses are commonly sown in mixes with legumes

Others to consider:

- chicory is a deep-rooted plant and its long tap roots are good for improving soil structure and easing compaction
- phacelia is a fast-growing annual and particularly good for attracting pollinating insects

Using a variety of flowering plants can extend the availability of pollen and nectar for insects throughout the growing season.

Green manure – Credit: Hywel Maggs

Managing the green manure

- after harvest, retain the stubble overwinter and then establish the green manure crop from 1 March the following spring. This option requires you to include at least one annual flowering plant, for example vetch, clover or phacelia, and not to apply fertilisers or pesticides.
- the conservation value of the stubbles will be affected by the weed control you undertake in the preceding crop. Where possible, the use of herbicides in the preceding growing season should be reduced, especially in fields with light soils and a low burden of undesirable weeds.
- incorporate the green manure into the soil before the following crop is established.
- once a green manure is incorporated it releases nitrogen into the soil. The rate at which this nitrogen becomes available depends on the type of green manure and its growth stage at incorporation. Fleshy legumes like vetch release nitrogen quickly, making most of it available after incorporation. Other plants, such as grasses, are much slower to release nitrogen. Consider both the potential nitrogen release, and the needs of the following crop, when calculating fertiliser requirements

Further information

Further information on the establishment of green manures:

- Green Manures – species selection (HDC)
- Green Manures – effects on soil nutrient management and soil physical and biological properties (HDC)

Recent changes

Section	Change
How to claim	Changes to table

Previous versions

Previous versions of this page

Download guidance

Click 'Download this page' to create a printable version of this guidance you can save or print out.