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Catch crops

The benefits, management
and their role in compliance

Germinal

Sowing future seeds.

Contents

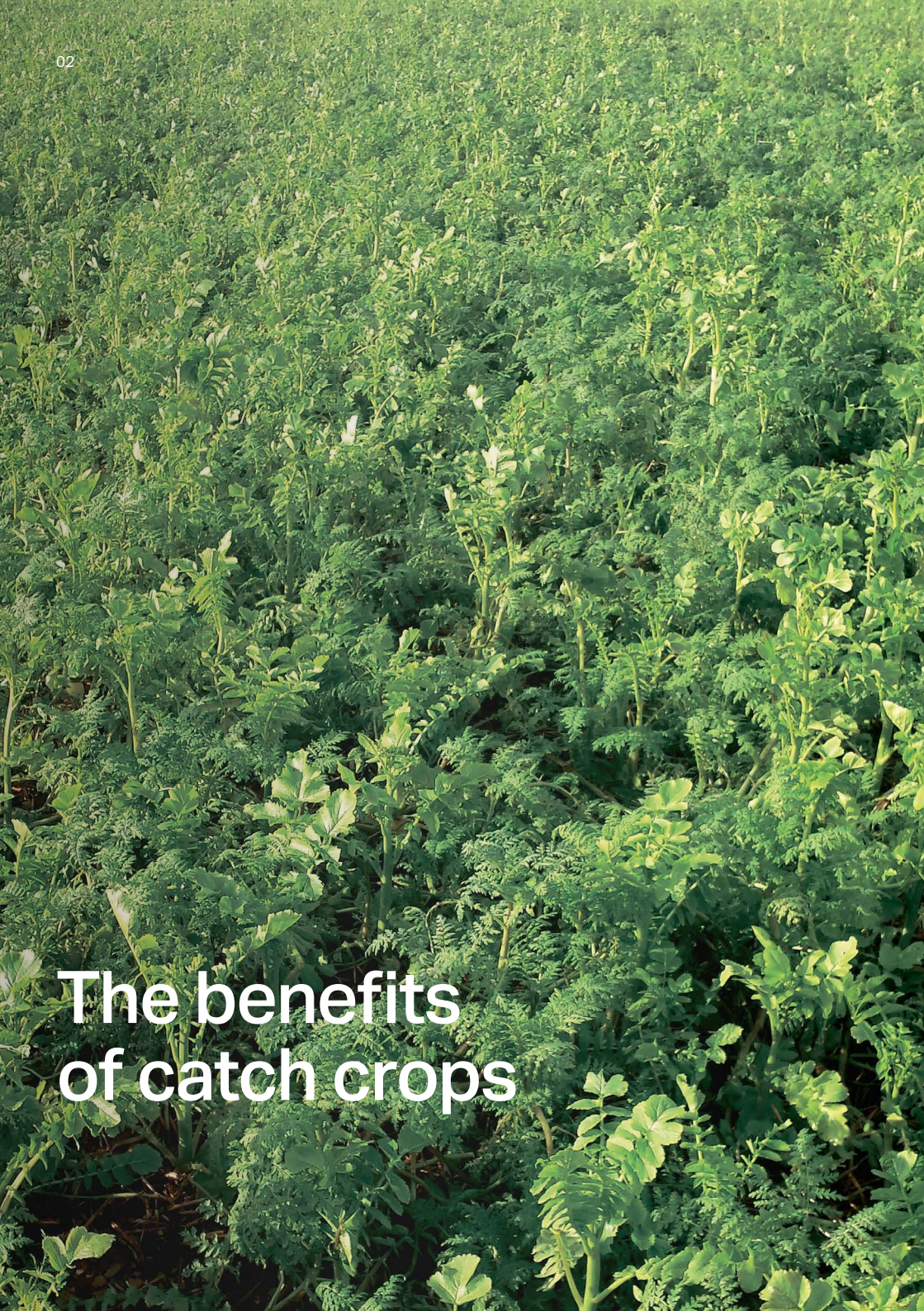
Introduction

In recent years, we have seen renewed interest in the use of catch crops in Ireland.

Also known as cover crops or green manure, catch crops have a role to play within regulatory requirements for green cover under the GLAS (Green Low-Carbon Agri-Environment Scheme) rules, but the increased interest is more about farmers' desire to use them to improve crop productivity and soil structure.

There are different options available in terms of the species or mixtures that can be used as catch crops. In this guide, we aim to explain the requirements for catch crops under GLAS and examine the benefits of growing catch crops. We also explore the suitability of different crops and mixture options for different requirements.

We hope you will find this guide useful when planning an effective catch crop programme.



The benefits of catch crops

The benefits of catch crops

Catch crops are planted to reduce nutrient leaching from the soil following the main crop. The catch crop scavenges available nitrogen and other nutrients.

Cover crops are grown to provide “green” cover to the soil. Cover crops will help prevent soil erosion while also supressing weeds. Some cover crops can also reduce incidence of pests and disease.

Green manure describes crops which are sown for the purpose of incorporation into the soil to improve and condition it, while also releasing nutrients.

In this brochure, we will refer to all of these as “catch crops”.

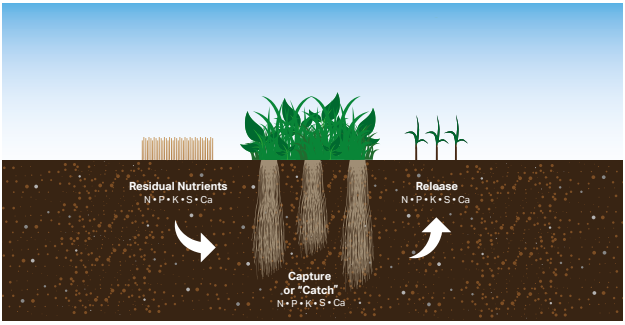


Fig 01.

Holding nutrients in place

Fig 02.

The benefits of catch crops

GLAS

Catch crops are an important part of both GLAS and Greening Schemes. If participating in either scheme, it is important to comply with the rules. See **www.agriculture.gov.ie** for further information.

The objective within GLAS is to establish a catch crop that will absorb nutrients and prevent leaching in the autumn/winter period.

- Catch crops must be sown annually by 15 September
- Use a mixture of at least two crops from the list of prescribed crops
- Light cultivation techniques must be used for sowing – ploughing is not permitted
- Catch crops must remain in place until 1 December
- Grazing of catch crops is not permitted before 1 December

The following is the list of prescribed catch crops permitted within GLAS and their sowing rates:

Fig 03.

List of prescribed catch crops

Catch crop	Sowing rate (kg/ha)	Type
Forage/ Fodder rape	3-5	Brassica
Tillage radish	5	Brassica
Leafy turnip	5	Brassica
Mustard	6-10	Brassica
Vetch	12	Legume
Peas	30	Legume
Crimson clover / Berseem clover	10-15	Legume
Beans	90-100	Legume
Oats (& black oats)	75-100	Cereal
Rye	65-80	Cereal
Phacelia	2-5	Other
Buckwheat	30-40	Other

Greening

Catch crops can play a very important role in fulfilling Greening obligations.

1. As an Ecological Focus Area (EFA)
2. When grown in GLAS under equivalence, they negate the necessity for crop diversification. There is a reduction in the GLAS catch crops payment in this case

The catch crop mixture must contain at least two species from the list of prescribed crops. The list is the same as those prescribed under GLAS (see previous page). However, the seed rates are not specified, but should be similar to the seeding rates within GLAS.

Mixture options

Mixture options

Regardless of whether or not you are participating in the GLAS or Greening schemes, catch crops offer multiple benefits to improve soil condition in arable situations. At Germinal, we have designed a range of catch crop mixtures to comply with GLAS and Greening rules, while also bringing multiple benefits to your soil.

When sowing catch crops, it is important to remember:

- Sow as early as possible (prior to 15 September for GLAS/Greening requirements)
- Ensure you select from the list of prescribed catch crops
- If you have a brassica in your arable rotation (e.g. oilseed rape), do not use a catch crop mixture containing a brassica
- Do not allow catch crops to set seed (weeds in future crops)

We recommend you select one of the following mixtures when sowing your catch crop:

- Soil Booster Pro
- Soil Booster Max
- Soil Booster Plus
- Soil Booster Graze

Fig 04.

The key benefits of each mixture

	Soil Conditioning	Reduce nutrient leaching	Increase soil organic matter	Fix nitrogen	Nematode control	Animal forage*
Soil Booster Pro	Y	Y	Y	Y		
Soil Booster Max	Y	Y	Y	Y	Y	
Soil Booster Plus	Y	Y	Y		Y	
Soil Booster Graze	Y	Y	Y			Y

*Can be grazed after 1 December. Soil Booster Plus can also be grazed, but if grazing is a priority Soil Booster Graze will be the best option.

Soil Booster Pro

1.5 ha Pack

21 kg
Phacelia 3 kg / Vetch 18 kg

Vetch is a popular option to quickly provide green cover and fix Nitrogen. It is particularly good at competing against weeds. With good frost tolerance, it can maintain canopy over the winter. Phacelia is very quick to establish and produces a large root that helps improve soil structure. Soil Booster Pro is an ideal option where oilseed rape is in the mixture as radish or brassicas could be problematic.

Key benefits

- Fast establishment
- Nitrogen fixing
- Improves soil structure
- Suited to rotations containing oilseed rape
- Suppress weeds

Soil Booster Max

1 ha Pack

25 kg

Tillage radish 5 kg / Vetch 19 kg / Phacelia 1 kg

This mixture provides rapidly growing green cover that will help condition the soil and reduce erosion. The vetch will fix atmospheric nitrogen and boost the overall performance of the cover crop mixture. Phacelia will grow rapidly and quickly provide green cover while helping to reduce nutrient loss from the soil. It will condition the soil and improve soil structure by helping to increase air movement and improve drainage. Tillage radish will scavenge nutrients from lower down in the soil and bring them to the upper layers, where the next cash crop can utilise them.

Key benefits

- Quick establishment
- Nitrogen fixing
- Nutrient scavenging & reduced nutrient leaching
- Soil conditioning
- Reduces erosion
- Suppress weeds

Soil Booster Plus

2 ha Pack

20 kg

Tillage radish 10 kg / Forage rape 6 kg / Phacelia 4 kg

This mixture provides rapidly grown green cover that will help condition the soil and reduce erosion. Phacelia will quickly provide green cover while helping reduce nutrient loss from the soil. Tillage radish will condition the soil and improve soil structure by helping to increase air movement and improve drainage. The taproot will also help scavenge nutrients from lower down in the soil and bring them to the upper layers where the next cash crop can utilise them.

Key benefits

- Rapid establishment
- Nutrient scavenging
- Reduces nutrient leaching
- Soil conditioning
- Suppress weeds

Soil Booster Graze

2 ha Pack

16 kg

Forage rape 6 kg / Leafy turnip 10 kg

Soil Booster Graze will scavenge nutrients, condition the soil and can also be used as a forage option for grazing animals after the 1 December. A rapidly growing mixture that will quickly establish green cover. Soil Booster Graze will reduce nutrient leaching and condition the soil by improving the structure through drainage, aeration and reducing erosion.

Soil Booster Graze will provide a valuable high energy feed for winter grazing of cattle and sheep. Animals will require constant access to water and a fibre source (e.g. silage if grazing this mixture).

Key benefits

- Rapid growth
- Soil conditioning
- Improves soil structure
- Reduces nutrient leaching
- Supress weeds
- Suitable for grazing after 1 December

Catch crops options

To simplify the selection of catch crops, we have developed a star rating to indicate the suitability of each catch crop to conventional Irish conditions. We have taken into consideration that the crop will not be sown until late summer/autumn, the potential benefits of the crop, the price and availability of the crop and its suitability to Irish growing conditions.

In some cases, the recommended sowing rate will be higher than the rate outlined due to the method and timing of sowing.

***** = suitable as a catch crop in Ireland
* = less suitable as a catch crop in Ireland

Forage rape ★★★★★

Can be grazed after 1 December as a forage for cattle or sheep. Rapid growing ability with good winter hardiness. A high energy feed for grazing ruminants.

Sowing rate:	3-5 kg/ha
Frost tolerance:	Good
Biomass:	Good
Pests & diseases:	Generally not a problem, but clubroot could become an issue if brassicas are used as a cover crop over a period of years

Tillage radish ★★★★★

A deep-rooting plant that extracts nutrients from down in the profile and helps open channels in the soil for subsequent crops. Improves water movement and drainage and increases airflow through the soil.

Sowing rate:	5 kg/ha
Frost tolerance:	Poor – frost will help decay tillage radish and thus avoid the requirement for chemical spray
Biomass:	Will generate large biomass quickly
Pests & diseases:	Generally not a problem, but clubroot could become an issue if brassicas are used as a cover crop over a period of years

Mustard ★★★

A rapidly growing annual that will help reduce nitrogen leaching and suppress weeds.

Sowing rate:	6-10 kg/ha
Frost tolerance:	Low, but this helps in its incorporation as it will be largely diminished over the winter
Biomass:	Good
Pests & diseases:	Generally not a problem, but clubroot could become an issue if brassicas are used as a cover crop over a period of years

Leafy turnip *****

A member of the brassica family, with high early vigour. Their deep rooting will help condition the soil and relocate nutrients from the sub-soil to the top. Will also help reduce nitrogen leaching.

Sowing rate:	5 kg/ha
Frost tolerance:	Good
Biomass:	Yields of 3-5 t DM, suitable as a forage crop
Pests & diseases:	Generally not a problem, but clubroot could become an issue if brassicas are used as a cover crop over a period of years

Oats & Black Oats ***

These provide cover over the winter to help reduce soil erosion due to good tillering capacity. Oats have poor winter tolerance and are easily killed and worked back into the soil. Useful for weed suppression and as a nurse crop with hairy vetch.

Sowing rate:	75 - 100 kg/ha
Frost tolerance:	Poor
Biomass:	Reasonable
Pests & diseases:	Generally not a problem

Peas *

Peas have good nitrogen fixation abilities and can be sown as a nitrogen-fixing crop in an area declared as an EFA. Generally, peas are not suited for sowing after a main cereal crop as it is too late in the season for them to establish.

Sowing rate:	30 kg/ha
Frost tolerance:	Poor
Biomass:	Good if sown early in the season
Pests & diseases:	Generally not a problem

Beans *

Beans, like peas, have excellent nitrogen fixation abilities and can be sown as a nitrogen-fixing crop in an area declared as an EFA. Beans are not suited for sowing after a main cereal crop as it is too late in the season for them to establish.

Sowing rate:	90-100 kg/ha
Frost tolerance:	Poor
Biomass:	Good if sown early in the season
Pests & diseases:	Generally not a problem

Hairy vetch *****

Hairy vetch, a forage legume also known as Winter vetch, has superior winter hardiness over common vetch and is very suitable for sowing as a cover crop due to its ability to fix nitrogen at lower temperatures than many other legumes. This can also be used as arable silage with grass or as a whole crop mix combined with cereals. Vetch will help increase the protein content in the mix.

Sowing rate:	12 kg/ha
Frost tolerance:	Good winter hardiness
Biomass:	Rapidly produces a large biomass
Pests & diseases:	Generally not a problem

Common vetch ****

Vetch is a well-known legume also known as common vetch. It is suitable for sowing as a cover crop because of its ability to fix nitrogen and suppress weeds due to its ability to rapidly form a canopy.

Sowing rate:	12 kg/ha
Frost tolerance:	Good
Biomass:	Rapidly produces a large biomass
Pests & diseases:	Generally not a problem

Forage rye ***

Extensive and deep rooting so excellent for soil conditioning. Effective at reducing nitrogen leaching and soil erosion over the winter. Forage rye is also suitable for grazing in early spring. It provides a flexible sowing option after maize/cereals and can be grazed or zero grazed.

Sowing rate:	65-80 kg/ha
Frost tolerance:	Good winter hardiness
Biomass:	Good
Pests & diseases:	Monitor at establishment for leatherjackets, slugs and frit-fly. Generally not a problem once established

Crimson clover **

Clovers have excellent capability to fix nitrogen at soil temperatures above 8°C but are less effective over the winter period. Crimson clover is suited to earlier sowing in July/August to maximise warmer temperatures. Quicker to establish than longer-term clovers. Ideal for usage as green manure for soil improvement.

Sowing rate:	10-15 kg/ha.
Frost tolerance:	Crimson clover can tolerate frost
Biomass:	Moderate
Pests & diseases:	Generally not a problem

Berseem clover **

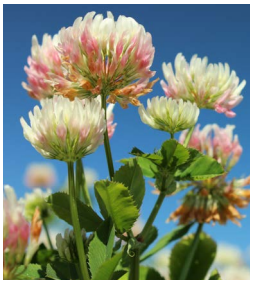
This short-term annual legume is referred to as Egyptian clover. It can establish quickly and produce biomass when sown at suitable temperatures. It can be used as soil-improving green manure. Some work has shown that it can be used as a companion crop in oilseed rape.

Sowing rate:	10-15 kg/ha.
Frost tolerance:	Berseem clover is sensitive to frost
Biomass:	High biomass potential
Pests & diseases:	Generally not a problem

Squarosse clover ⁎⁎⁎ (not GLAS approved)

This annual clover can withstand temperatures of -10°C at its rosette stage. It grows upright with a thin taproot and many branches. It can produce a lot of organic matter and is good for soil structure.

Sowing rate:	10-15 kg/ha
Frost tolerance:	Very winter hardy
Biomass:	High biomass potential
Pests & diseases:	Generally not a problem



Balansa clover ⁎⁎⁎ (not GLAS approved)

Balansa is an annual clover noted for its winter hardiness when compared to other annual species such as Egyptian and Persian clovers. It can establish quickly and produce biomass when sown in suitable warm conditions, much like the other annual clovers. Balansa's unique top growth along with a large taproot makes it a species option worth looking at.

Sowing rate:	5-8 kg/ha
Frost tolerance:	Very winter hardy
Biomass:	High biomass potential
Pests & diseases:	Generally not a problem

Phacelia ★★★★★

A rapidly growing crop, which will reduce nitrogen leaching and suppress weeds, with a beneficial root structure.

Sowing rate:	2-5 kg/ha
Frost tolerance:	Poor
Biomass:	Lower biomass than many other cover crops, but it works extremely well as part of a mixture and the recommendation would be to sow it with other cover crops
Pests & diseases:	Generally not a problem

Buckwheat ★★

Establishes quickly and helps suppress weeds. A rapidly growing crop which will help reduce nitrogen losses. Buckwheat is good to scavenge phosphate in the soil which it can make available for subsequent crops after incorporation.

Sowing rate:	30-40 kg/ha
Frost tolerance:	Poor
Biomass:	Good
Pests & diseases:	Generally not a problem

Management of catch crops

Management of catch crops

Sowing

Rapid establishment of catch crops following harvest will ensure there is adequate moisture for germination before stubbles dry out from lack of cropping cover.

When to sow

Spring or autumn are the best times to grow catch crops. In autumn, the earlier they can be established the better, to make use of longer days and warmer ground temperatures. Every day counts once the cereal crop is harvested.

How to sow and establish

Drilling a catch crop keeps the soil active all the time. The leaching of nitrogen is minimised and the organic matter that will be incorporated in the upper soil is maximised.

Catch crops can be drilled directly into stubble or broadcast onto cultivated ground.

Since all mixes contain a mixture of small and big seeds, a sowing depth of 1.5 cm to 3 cm is recommended. Rolling is important to ensure good soil-to-seed contact and help maintain soil moisture for germination and growth.

Fertiliser

Farmyard manure/compound fertiliser could be applied prior to cultivation/drilling to provide the growing plants' basic nutrients. This will maximise growth and subsequent biomass for grazing or cover for overwintered crops.

Nutrients applied will be taken up by the growing catch crop and released upon breakdown in the spring to the following cash crop. Where sown as a Greening requirement, minimal fertiliser if any is recommended. However, if intending to graze the catch crop, applications of nitrogen and phosphate are essential to increase yield.

Incorporation of the catch crop

Generally temperatures over winter in Ireland are not low enough to kill the crop, so it is recommended to burn them off with a herbicide or cut with a flail mower. Incorporation then can generally be done by ploughing or rotavating. After burning off, the catch crop can be incorporated by discing and the cash crop can be drilled in.

Find out more

Should you require any more information or to request a selection of free brochures and technical guides, please visit our website:

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