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# Catch crops

The benefits, management  
and their role in compliance

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# Introduction

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

Also known as cover crops or green manure, catch crops have a role to play in regulatory requirements for green cover under the Agri-Climate Rural Environment Scheme (ACRES) 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 ACRES 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, cover crops or green manures are normally grown between successive production crops, such as cereals, to provide ground cover, capture soil nutrients and improve soil characteristics, bringing various benefits to the subsequent cash crop.

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

Cover crops are grown to provide “green” cover to the soil. Cover crops will help prevent soil erosion while also suppressing 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

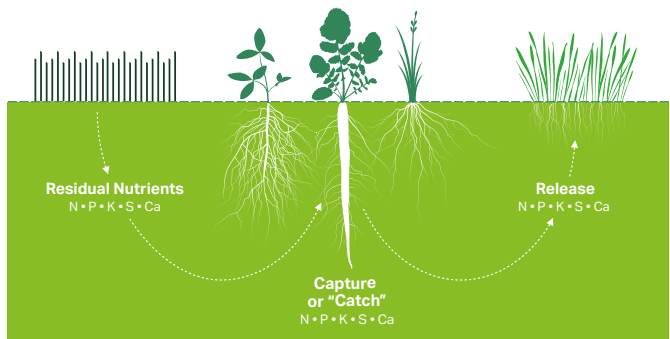


Fig 02.

**The benefits of catch crops**



## ACRES

Catch crops are a valuable part of the ACRES scheme and it is important to comply. For more information go [here](#).

The objective within ACRES is to establish a catch crop that will reduce nutrient leaching and help prevent soil erosion in the autumn/winter period.

- Catch crops must be sown annually by 15th September
- Undersowing or the sowing of a grass crop is not permitted
- A main cereal crop cannot be undersown with catch crops
- A seed mixture must contain at least two species from the prescribed list using the minimum seed rates indicated
- Light, non-inversion cultivation techniques must be used for sowing – ploughing is not permitted
- Catch crops must remain in place until 1st January
- Light grazing or incorporation is permitted after 1st January

Fig 03.

### List of prescribed ACRES catch crops

Catch crop	Sowing rate (kg/ha)	Type
Forage/ Fodder rape	4-5	Brassica
Tillage radish	4-6	Brassica
Leafy turnip	4-6	Brassica
Mustard	8-10	Brassica
Vetch	15	Legume
Beans	70-90	Legume
Peas	40-50	Legume
Crimson clover	10-15	Legume
Berseem clover	10-15	Legume
Red clover	8-10	Legume
Oats	60-75	Cereal
Black oats	30-40	Cereal
Forage rye	60-75	Cereal
Linseed	15	Other
Phacelia	4-5	Other
Buckwheat	30-40	Other
Sunflower	10-15	Other



# Mixture options



## Mixture options

Regardless of your participation in the ACRES scheme, 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 ACRES 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 15th September for ACRES 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:

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 Max	Y	Y	Y	Y		
Soil Booster Graze	Y	Y	Y			Y
Soil Booster Biofumigant	Y	Y		Y	Y	
Soil Booster Plus	Y	Y	Y		Y	
Soil Booster Gold	Y	Y	Y	Y		
Soil Booster Non Brassica Grazer	Y	Y		Y		Y
Soil Booster Vetch & Rye	Y	Y		Y		Y
Soil Booster Pro	Y	Y	Y	Y		
Soil Booster Drill 'n' Fix	Y	Y	Y	Y		
Soil Boster Oilseed Companion	Y		Y	Y		

\*Can be grazed after 1st January



## Soil Booster Max

1 ha pack

20 kg

**Tillage radish 4 kg / Vetch 15 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

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



## Soil Booster Graze

2 ha pack

16 kg

**Forage rape 8 kg / Leafy turnip 8 kg**

Soil Booster Graze will scavenge nutrients, condition the soil and can also be used as a forage option for late winter grazing. 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.

### Key benefits

- Rapid growth
- Soil conditioning
- Suppress weeds
- Improves soil structure
- Reduced nutrient leaching
- Suitable for grazing after 1st January



## Soil Booster Biofumigant

1 ha pack

16 kg

**Oilseed radish 2 kg / Smart Radish® 2 kg /  
White mustard 6 kg / Brown mustard 2 kg / Vetch 4 kg**

This mixture offers an all-round biofumigant approach from the combination of species. Mustard and oilseed radish contain biofumigant properties to reduce soil borne nematodes in potato and beet rotations. These species contain high levels of glucosinolates which help plants fight pests and diseases.

Smart Radish® is a new type of radish bred specifically for soil health. It has a large penetrating taproot along with lateral side roots that explore the soil around the root and anchor the plant, giving excellent scavenging ability and benefits to improve soil structure and break compaction.

### Key benefits

- Nitrogen fixing
- Nutrient scavenging
- Biofumigant benefits
- Improve soil structure
- Reduced nutrient leaching



## Soil Booster Plus

2 ha pack

18 kg

**Tillage radish 8 kg / Forage rape 8 kg / Phacelia 2 kg**

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

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



## Soil Booster Gold

2 ha pack

22 kg

**Tillage radish 2.5 kg / Phacelia 2.5 kg / Linseed 2 kg  
Berseem clover 2 kg / Mustard 2 kg / Vetch 6 kg /  
Sunflower 3 kg / Crimson clover 2 kg**

This mixture offers a wide variety of benefits due to the diverse nature of the species contained within mixture. This mixture will establish quickly to create a large amount of biomass while fixing nitrogen from the atmosphere due to its high legume content. It will aid in water infiltration helping drainage along with suppressing weeds due to the potential to produce a large amount of biomass in a short window.

### Key benefits

- Nitrogen fixing
- Organic matter
- Suppress weeds
- Reduce nutrient leaching
- Biomass production
- Soil conditioning
- Improved drainage
- Diverse mixture of species



## Soil Booster Non-Brassica Grazer

1 ha pack

14 kg

**Vetch 6 kg / Berseem clover 3 kg /  
Crimson clover 3 kg / Red clover 2 kg**

This mixture will scavenge nutrients and condition the soil while also fixing nitrogen from the atmosphere through its legume content. This mixture is perfect for oilseed rape (OSR) rotations where clubroot and other rotational diseases may be an issue. This mixture can be grazed by livestock.

\*Add forage rye to significantly increase forage yields.

### Key benefits

- Suits rotations with oilseed rape
- Nitrogen fixing
- Can be grazed
- Suppress weeds
- Nutrient scavenging
- Reduced nutrient leaching



## Soil Booster Vetch & Rye

0.25 ha pack

18.75 kg

**Forage rye 15 kg / Winter vetch 1.875 kg /  
Spring vetch 1.875 kg**

This mixture offers components which are extremely compatible with each other for an overwinter cover crop mixture. Vetches are quick growing with a long growing season, combined with their ability to fix nitrogen at lower temperatures than other legumes.

Forage rye is extensive and deep rooting which is excellent for soil conditioning. Effective at reducing nitrogen leaching over the winter period, forage rye has the potential to offer a flexible sowing option after maize and cereals and can be zero grazed or baled in the spring.

### Key benefits

- Nitrogen fixing
- Nutrient scavenging
- Reduces nutrient leaching
- Improves soil structure
- Suitable for animal fodder



## Soil Booster Pro

1 ha pack

19 kg

**Phacelia 4 kg / Vetch 15 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
- Suppress weeds
- Improves soil structure
- Suited to rotations containing oilseed rape



## Soil Booster Drill 'n' Fix

1 ha pack

14 kg

**Crimson clover 10 kg / Tillage Radish 4 kg**

This mixture brings the benefits of Daikon Tillage Radish's ability to scavenge nutrients from deep in the soil profile, breaking up compaction while absorbing key nutrients with the large taproot. It also has the crimson clover's ability to fix atmospheric nitrogen into plant-available nitrogen, helping reduce fertiliser inputs for the following crop while improving soil health by adding organic matter.

### Key benefits

- Rapid growth
- Nitrogen fixing
- Nutrient scavenging
- Reduces nutrient leaching
- Improves soil structure and health



## Soil Booster Oilseed Companion

1 ha pack

(not ACRES approved)

10 kg

**Buckwheat 4 kg / Winter vetch 3 kg / Berseem clover 3 kg**

Companion cropping can help protect oilseed rape (OSR) plants against pests and aid establishment. This mixture is designed to be sown either before the OSR crop or on the same day. Earlier sowing allows the OSR crop to be drilled into the companion mix, allowing better soil health, weed suppression and increased moisture retention, which all help crop establishment.

The fast-growing legumes start to fix nitrogen quickly, releasing it to the crop along with other nutrients during the season. Buckwheat creates a large amount of biomass but will break down with frost during the winter.

### Key benefits

- Nitrogen fixing
- Improves soil health
- Attracts beneficial insects
- Disguise the OSR crop from pests



# Catch crops options



## Catch crops options

Cover crops bring a range of benefits to the soil and subsequent crop. Choosing the ideal species to meet your requirements will unlock the most benefits for your farming system.

The following range of cover crops will achieve various degrees of biomass accumulation while also bringing additional benefits:

- Reduced nutrient loss
- Improving soil structure
- Prevention of soil erosion
- Improving organic matter
- Reduced disease, pests and weeds
- N fixation and a potential forage source

Our cover crop mixtures are designed specifically for Irish farm situations. Coming up is a summary of the key benefits for each species, including details on frost tolerance, disease and pest resistance, and ability to produce biomass.



### Forage rape

A good option for those targeting a catch crop which is suitable for grazing. Rapid growing ability with good winter hardiness. A high energy feed for grazing ruminants.

- Sowing rate:** 4-5 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:** 4-6 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:** 8-10 kg/ha  
**Frost tolerance:** Low, but this helps in its incorporation as it will be largely diminished over 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:** 4-6 kg/ha  
**Frost tolerance:** Good  
**Biomass:** Yields of 3-5 t DM, suitable 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:** Oats 60-75 kg/ha  
Black oats 30-40 kg/ha  
**Frost tolerance:** Poor  
**Biomass:** Reasonable  
**Pests & diseases:** Generally not a problem



### Sunflower

Sunflowers have a robust root system enabling them to scavenge nutrients and are also good for mycorrhizal fungi growth in the soil. They are best sown early after harvest, developing a deep taproot which helps them penetrate layers within the soil and alleviate compaction.

- Sowing rate:** 10-15 kg/ha  
**Frost tolerance:** Good  
**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.

<b>Sowing rate:</b>	15 kg/ha
<b>Frost tolerance:</b>	Good winter hardiness
<b>Biomass:</b>	Rapidly produces a large biomass
<b>Pests &amp; diseases:</b>	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.

<b>Sowing rate:</b>	15 kg/ha
<b>Frost tolerance:</b>	Good
<b>Biomass:</b>	Rapidly produces a large biomass
<b>Pests &amp; diseases:</b>	Generally not a problem



### Beans

Beans 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.

<b>Sowing rate:</b>	70-90 kg/ha
<b>Frost tolerance:</b>	Poor
<b>Biomass:</b>	Good if sown early in the season
<b>Pests &amp; diseases:</b>	Generally not a problem



### Phacelia

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

- Sowing rate:** 4-5 kg/ha  
**Frost tolerance:** Poor  
**Biomass:** Lower biomass than many other cover crops, but it works extremely well as part of a mixture - recommended to sow it with other cover crops  
**Pests & diseases:** Generally not a problem



### 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:** Moderate  
**Biomass:** Moderate  
**Pests & diseases:** Generally not a problem



### Berseem clover

This short-term annual legume is referred to as Egyptian clover, establishing quickly and producing 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:** Poor  
**Biomass:** High biomass potential  
**Pests & diseases:** Generally not a problem



### Red clover

Red clover is primarily used in grass and forage mixtures but can also be sown as a cover crop. This winter hardy crop offers several benefits, including fixing nitrogen to meet the needs of the following crop, protecting soil from erosion over winter, improving water infiltration and alleviating compaction as red clover produces a deep taproot. When destroyed, it's an excellent green manure. Red clover also attracts beneficial insects while growing.

- Sowing rate:** 8-10 kg/ha  
**Frost tolerance:** Good  
**Biomass:** Moderate  
**Pests & diseases:** Root rot and fungal diseases



### 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:** 60-75 kg/ha  
**Frost tolerance:** Good winter hardiness  
**Biomass:** Good  
**Pests & diseases:** Monitor at establishment for slugs. Generally not a problem once established



### 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



### Smart Radish®

Smart Radish® is a new radish bred in New Zealand specifically for the cover crop and soil health market. It is the first true cover crop radish designed for nutrient scavenging. Smart Radish® produces a strong taproot to break compaction and a mass of lateral roots to take up nutrients. It's also clubroot resistant and has biofumigant properties.

- Sowing rate:** 4-6 kg/ha  
**Frost tolerance:** Poor  
**Biomass:** Generates biomass quickly  
**Pests & diseases:** This radish is clubroot resistant so suitable for all mixtures



### Austrian winter pea

Peas have good nitrogen fixation abilities and can be sown as a cover crop after a main cereal crop, but need to be sown as early as possible post-harvest to maximise growing temperatures. Austrian winter peas are a type of pea which can withstand lower temperatures and produce more biomass over winter.

- Sowing rate:** 40-50 kg/ha  
**Frost tolerance:** Good  
**Biomass:** Good if sown early in the season  
**Pests & diseases:** Generally not a problem



### Linseed

Linseed is a thin upright plant that establishes easily, developing a deep fibrous root that has the ability to condition soil to depth.

- Sowing rate:** 15 kg/ha  
**Frost tolerance:** Poor but will stand through winter  
**Biomass:** Lower biomass than other cover crops  
**Pests & diseases:** Generally not a problem



### **Squarosse clover (not ACRES approved)**

This annual clover can withstand temperatures of -10°C at its rosette stage. Squarosse clover grows upright with a thin taproot and multiple branches, producing organic matter to help 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 ACRES 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



### **Safflower (not ACRES approved)**

Safflower belongs to the family compositae and is widely grown as a catch crop and green manure across Europe. It can establish quite quickly and has an extensive rooting structure, penetrating up to 2.5 m of soil depth. The main advantage of safflower is its drought resistance and rapid growth once sown.

- Sowing rate:** 3 kg/ha  
**Frost tolerance:** Poor  
**Biomass:** Moderate to low  
**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. The ACRES scheme specifies catch crops must be sown by 15th September.

## 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 when broken down in the spring to the following cash crop. If intended for grazing, applications of nitrogen and phosphorus 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

## Find out more

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