



National Rural Network



## GLAS CATCH CROPS

A CASE STUDY



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An Roinn Talmhaíochta,  
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# GLAS - Catch Crops, Catching what?

## What is a Catch/ Cover Crop?

Fallow land is a term used to describe land which has been used for the production of crops, when the field is left fallow it is mean that it lies idle (no crops sown) to allow it to recover its fertility. Catch crops are a crop planted in fallow fields. Over the course of a winter period when a field is fallow, studies have found that due to the harsh conditions the bare soil had been exposed to negative impacts like soil erosion and leeching of nutrients which may end up in waterways over the winter months were experienced. Planting the fallow land with Catch Crops provide a green cover over winter, these catch crops absorb nutrients and prevent leaching.

Cover crops have been found to improve soil structure, improve drainage, reduce compaction, reduce leeching of nitrogen, increase soil biodiversity, increase earthworm activity and improve the soils overall health.



The Department of Agriculture, Food and Marine (DAFM) indicate that the primary aim of catch crops is for the protection of soil during fallow periods over the winter.

## Good Soil Structure

Good soil quality and structure relies on good management of soils. Soil testing is essential in getting the balance of soil nutrients right. Maintaining a pH of between 6.3 and 6.6 regulates nutrient availability and supports biological processes in the soil.



Image: Teagasc Soil Structure



## Why is soil structure so important?

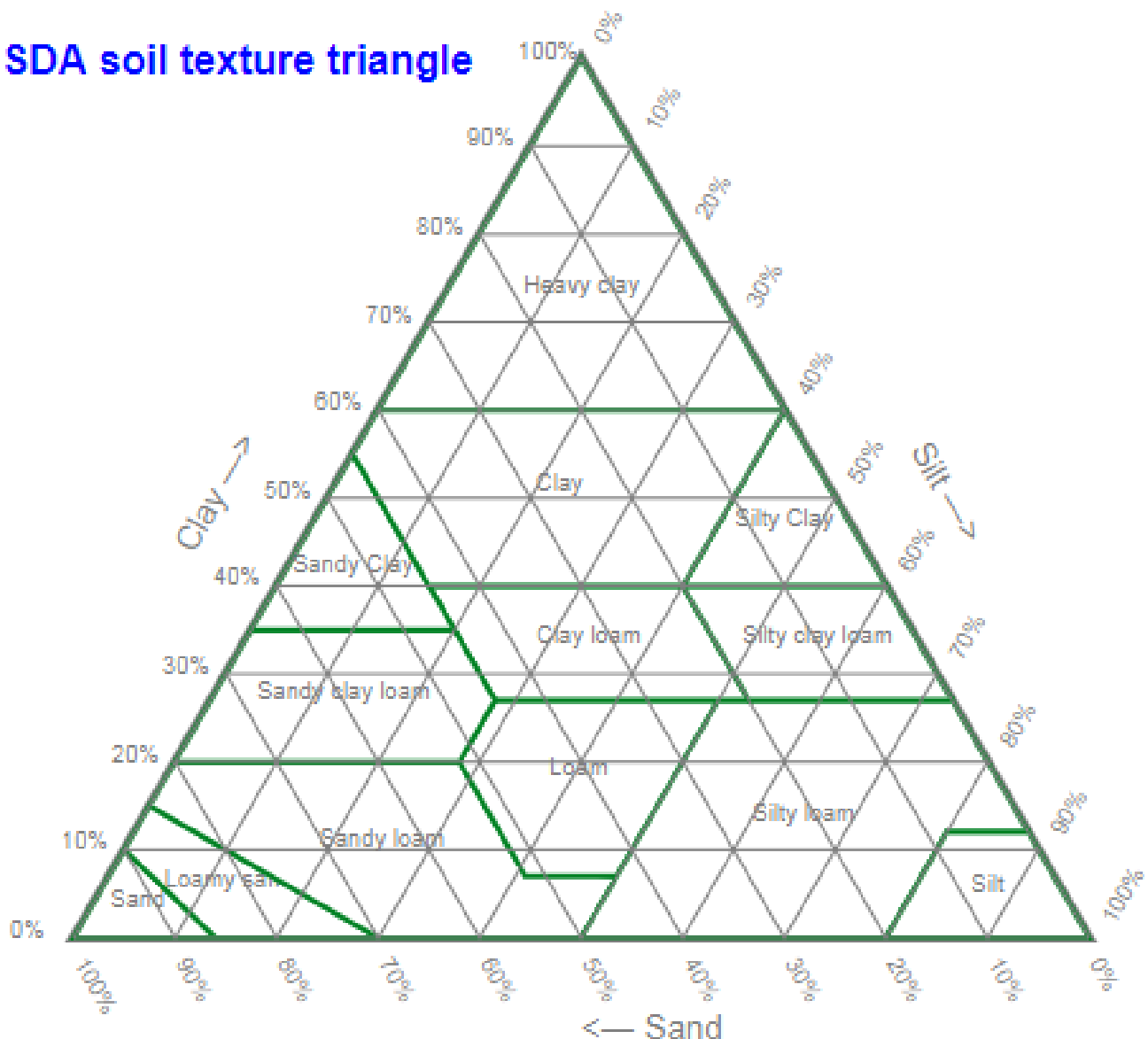
Soil structure refers to the shape, size and development of soil structural units or 'peds'. Soil structure is critical in determining the provision of nutrients, water and air in soil. The benefits of good soil structure from an agronomic and an environmental perspective are plenty and include:

- Root support, water and air for the growth of food and fibre
- Cycling of nutrients into plant usable forms
- Purification of water through the percolation process that relies on good soil structure
- Storage and cycling of carbon
- Represents the largest biological habitat on earth

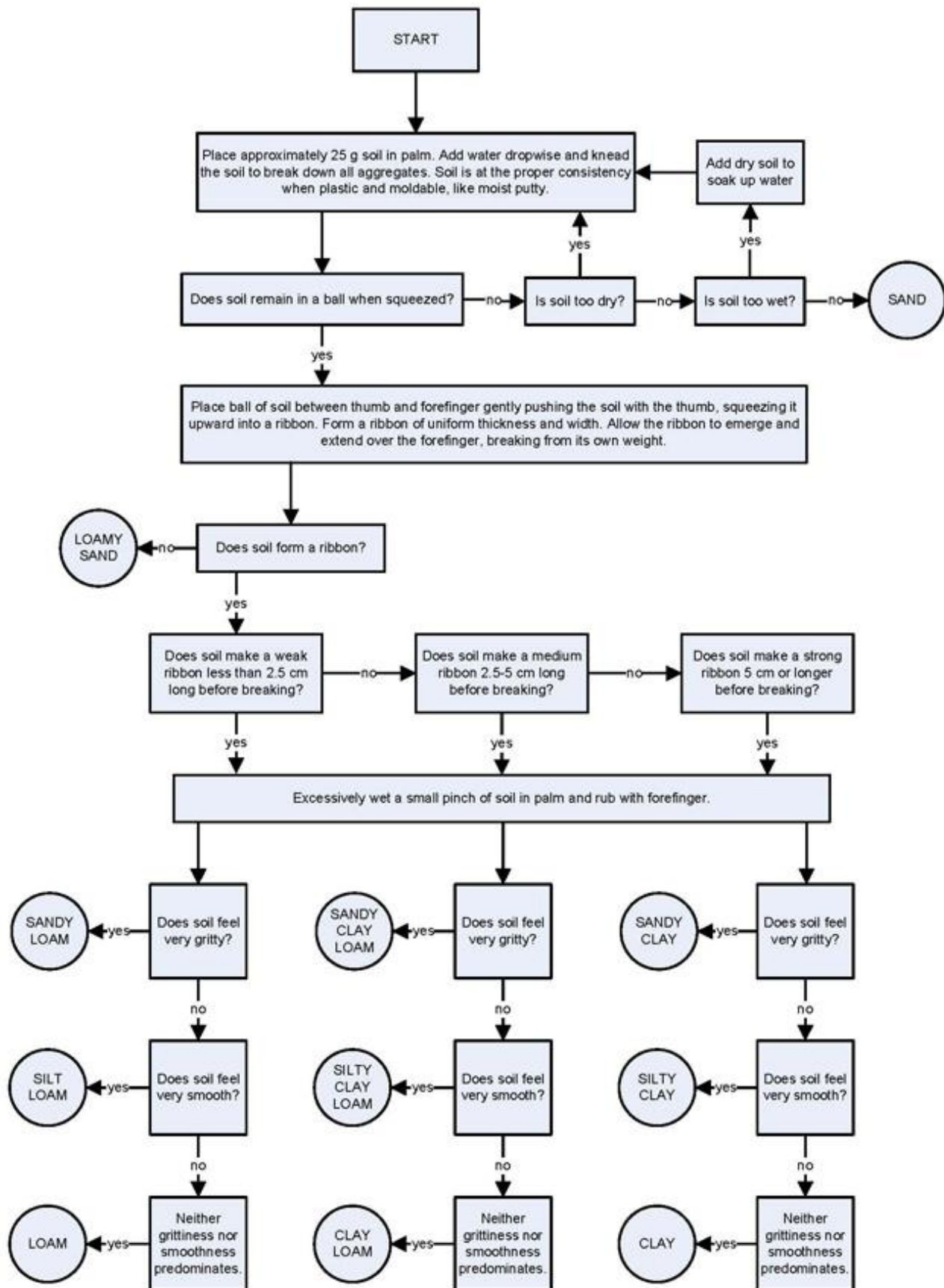
## Soil texture

The natural structure of the soil depends upon the texture and organic matter content of the soil. The texture is based on the amounts of sand, silt and clay in the soil. Soils with equal amounts of sand, silt and clay provide a loam texture and represent the optimum soil texture. A 'crumb' structure similar to breadcrumbs is considered the best soil structure.

## USDA soil texture triangle



You can identify soil texture using your finger tips and following the chart below:



Source: [https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/home/?cid=nrcs142p2\\_054311](https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/home/?cid=nrcs142p2_054311)

## **Managing soil structure**

Nitrogen (N) is the main driver of plant growth and protein production. N moves freely through plants, water and air. N availability for plant uptake is important but must be managed given its volatility. N mineralisation relies on soil conditions which include temperature, moisture and oxygen. Good soil structure helps to maintain optimum N mineralisation rates. Sources of N include: atmospheric N, inorganic fertilisers, crop residues, animal manures and soil organic matter.

Soil organic matter is a major source of N used by crops. Organic matter plays an important role in maintaining soil quality. Organic matter can increase the nutrient capacity of the soil and release nutrients to plants, strengthen soil structure, reduce capping, encourage root development, improve aggregation and prevent erosion and compaction. In turn, improved soil structure improves water infiltration and improves the overall water holding capacity of the soil. Organic matter is similar to a sponge, holding six times its weight in water. Represent a source of energy for biological activity in soils.

Phosphorus (P) plays a central role in energy regulation of all organisms. The behaviour of this nutrient is opposite to that of N, being tightly bound to the soil particles and is largely unavailable to plants. Total P reserves must be monitored especially in dairy systems as cows invest a lot of P into milk production. Soil P is measured using the Morgan's Index and an Index 3 is recommended. Below this level, P-reserves can become exhausted.

Potassium (K) is the third macro-nutrient required for plant growth. The behaviour lies between that of N and P. The main effect of K deficiency is reflected in a change in the botanical composition of grass swards changing from productive to unproductive species. (Source: Teagasc)

## **Benefits of Catch Crops:**

Catch Crops are used on arable land (arable land is land that is in use for tillage). Catch crops prevent soil erosion and leeching of nutrients (nutrients being washed from the soil). Research shows, where catch crops have been planted on fallow land, there has been a reduction in soil erosion during heavy rainfall periods, resulting from reduced surface run-off and increased water infiltration via roots of the catch crops. The foliage from the plants protecting soil from the elements the cover crop roots break and condition the soil preventing slumping (condensing of the soil), thus easier cultivations and better soil tilth as a result the following spring. Depending on the species planted, catch crops increase the absorption of residual nitrogen and reduce the nitrate leachate from the soil.

Catch Crops are the fourth largest annual crop after Spring Barley, Winter Barley and Winter Wheat planted by tillage and mixed farming enterprise farmers. Catch Crops provide grazing into the winter for stock, benefit subsequent crops, add fertility to the soil, reduce input costs and reduce the need for soil cultivations.





The National Rural Network (NRN) met with BASE Ireland member Rob Coleman, Castlemanger Co Cork, after he won 3<sup>rd</sup> place in the NRN's 2017 National Biodiversity Photo Competition. Rob is a tillage farmer and has carried out minimum tillage practices on his farm for many years. Rob is pictured in a field of a leafy kale cover crop. BASE Ireland (Biodiversity, Agriculture, Soil & Environment) are a farmer led organisation who are committed to principles of Conservation Agriculture (CA). BASE Ireland members hold on farm meetings where farmers share their experiences of CA and learn from each other on a range of topics, cover crop mixes, direct drilling, soil quality and nutrition.



Image: Rob Colman, BASE Ireland, Cover Crop Roots

The differing root structures, thickness and depths all provide excellent root structure to fallow land, catch crops provide a welcome break to the hard working soils. The differing roots structures aerate and rejuvenate the soil and encourage soil biology.



## Images: Ploughed & Over wintered stubble VS Min-Till & Cover crops Cover Crops:



Ploughed Soil  
Anaerobic conditions  
Slumped soil  
Poor infiltration of rain  
Visible compaction of layers.



Minimum tillage for over 10 years  
Cover cropped for last 5 years  
Enhanced soil structure  
Yield benefit from nutrient cycling  
Improved moisture retention  
Increased soil biology  
Infiltration of rain.

Image: Walter Furlong, Grain Ltd, Wexford.

The following table indicates the catch crop species that are eligible under the GLAS scheme

Species	Catch/Cover Crop	Nitrogen Effect
Brassicas	Forage/Fodder Rape/ Kale	Will trap existing Nitrogen
	Leafy Turnip	
	Tillage Radish	
	Mustard	
Legumes	Berseem Clover	Will trap and add Nitrogen
	Crimson Clover	
	Vetch	
	Peas	
	Beans	
Grasses & cereals	Rye	Will trap existing Nitrogen
	Oats (and Black Oats)	
Other	Buckwheat	Will trap existing Nitrogen
	Phacelia	

Source: DAFM



## The Benefits of grazing Brassicas

Brassicas are a type of catch crop, they are easily established and can be fast growing. They act as a good winter break crop when grown in cereal rotations. Able to produce high DM yield/Ha in a short growing season to reduce winter feed deficits.

- Can reduce feed costs.
- Can be strip grazed over the winter reducing winter housing costs, labour and machinery requirements for feeding.
- The crop stubble helps prevent poaching when grazing into the winter.



Image: C. Moran 04,2014 Agriland

When feeding Brassicas, farmers must be careful to not allow a sudden flush of unlimited access for livestock to the cover crops, this is to prevent the risk of rumen acidosis. To counteract this risk, animals must be allocated just enough fresh material via strip grazing to fully utilise the fresh weight of crop available while also having a supply of roughage to the diet. For cattle feeding on a brassica crop such as fodder rape the diet is usually made up of two thirds fodder rape and one third roughage via high DM grass silage or straw.

## **The Benefits of Planting Legumes:**

### **What are Legumes?**

Legumes are members of the pea family. Legumes are any plant which bares its fruit inside a pod. Legumes have the potential to fix nitrogen and reduce fertiliser requirements in the subsequent crop. They act as a good winter break in a cereal rotation. Legumes can be expensive and difficult to establish.



Image Agriland Nov2014

### **What supports are available for farmers?**

Under the Rural development Programme 2014-2020, the Green Low-carbon Agri-environmental Scheme (GLAS) allows tillage farmers choose Catch Crops as an action for their farm under the scheme. There are currently 49,119 active GLAS participants, up to 7% of GLAS farmers have selected the catch crop action.

Farmers who selected the Catch crop option could receive a payment of €155/ Ha per year up to a maximum area of 32Ha's. Farmers who selected this option must sow a catch crop before the 15<sup>th</sup> of September annually using light cultivation techniques such as minimum tillage, ploughing is not allowed.

To get the best value from the catch crop it is advised to sow the crop as soon as possible post-harvest. Catch crops sown in August are likely to provide more green material than a later sowing date in September. The Catch Crops must be left in situ and can be grazed after the 1<sup>st</sup> of December.

When planting the Catch Crops to the DAFM's specifications two species of crop must be sown, with one species not exceeding 75% of the overall crop mix.

The National Rural Network met with Tom Short, a tillage and mixed livestock farmer from Newtownmountkennedy, Co. Wicklow joined the GLAS scheme in 2015.

Tom selected the Catch Crop action as part of his GLAS Plan. Tom selected this options because of the benefits it would provide to improving soil quality and the feed value the crop will provide his livestock over the winter period. The crop will also prevent the loss of nitrogen, and protect water quality by having less run-off of nutrients. The root system will also help aerate the soil and encourage soil biodiversity.

Tom choose to sow catch crops as it provide a great opportunity to extend his grazing season. "The catch crops will help improve the soil organic matter and aerate the soil leaving it good and ready for the next crop, allowing the livestock graze this area from December has a big impact om my farms profitability as there is a lesser requirement for winter accommodation and it reduces the winter feeding bills"



Tom choose a mix of tillage radish and fodder rape which he intends to graze his sheep on after the 1<sup>st</sup> December.



Image: Agriland 2017

In 2016 Teagasc Research lead by Tim Keady highlighted through data from the national farm survey that the average farm stocking rate of lowland ewes was 7.5 ewe/Ha, when considering mid to late pregnancy feed requirements & management of ewes, farmers are faced with a decision how they will manage the feed requirements of their flock pre-lambing.

Research from Teagasc Athenry indicated that with low stocking densities, the use of cover crops worked well in achieving an extending the grazing season which has a direct effect on reducing feed, accommodation and machinery costs, as there was no need for additional housing or machinery usage for feeding. Tim highlighted in the report that there was a strong link between an extended grazing season and improved lamb weights at birth as well as at weaning versus trials of ewes unshorn and housed over the winter period. This action could increase profitability of many farms.

The National Rural Network would like to thank Tom for kindly meeting with us. It must be said that the work completed by Tom through his farming practice and his involvement in the GLAS scheme not only benefits the profitability of his farm but also provides additional environmental benefits.



