

# Advantages of catch crop cultivation

## Multifaceted help for farmers

In recent years, the topic of catch crop cultivation has come under the spotlight. One of the reasons for this is the greening requirement under the Common Agricultural Policy. Catch crop cultivation has received various promotional opportunities and areas growing catch crops have come to be considered ecological focus areas with a weighting factor of 0.3. In Germany, however, catch crop cultivation had been widely used long before the greening initiative and has proven to be successful over many decades. The advantages of this cultivation component have been known for centuries and has been used as an important part of agriculture. The important benefits of catch crop cultivation are as follows:



### Humus formation

Humus is the wholly or partially decayed organic component of soil organic matter. It is formed by the decomposition of organic material (such as plant parts) by soil biota. This decomposition releases stored nutrients like nitrogen into the soil and makes them available to plants. In catch crop cultivation, the growth is mostly incorporated into the soil and thus converted to humus. The mineralised nutrients are then available to subsequent main crops. The quality of the humus is closely related to the ratio of carbon to nitrogen (C/N) – the higher the nitrogen percentage, the better the humus quality. A humus-rich soil is one of the preconditions for good yields. For example, increasing the humus content can improve the water retention capacity and nutrient binding capacity over the long term.

### Biomass utilisation

Catch crop growth can be used in various ways. Apart from incorporating growth into the soil, it can be used as substrate for biogas plants. An im-

portant application of the growth is its use as forage. 2018 was marked by drought and because of the extremely sparse growth of fodder crops, harvesting fodder from greening areas was also permitted. Certain plants in catch

crop cultivation are particularly important fodder plants, e.g. Italian ryegrass, crimson clover and vetch. In years with forecasted fodder shortages through late summer, sowing fodder plants as a catch crop is a sensible option.



### Nutrient conservation

After the main crop is harvested, a good quantity of nutrients still remain in the soil. Leaching may occur depending on the form in which the nutrients are present, making nutrients unavailable to the rotational crops. Moreover, nitrate and phosphate leaching causes environmental pollution, which should be avoided. Catch crops can absorb and store these nutrients through their root system. Later, when they are incorporated into the soil and decomposed, the nutrients once again become available to the subsequent crop. This makes it possible to store nutrients and save fertiliser costs.

### Nitrogen fixation

Certain legumes are suitable for catch crop cultivation, including field pea, Egyptian clover and Persian clover.

Legumes are able to fix atmospheric nitrogen through symbiosis with rhizobia, making it available to the subsequent crops. In this symbiotic relationship, the plants provide the rhizobia with carbon compounds that the plant generates during photosynthesis, which provide the bacteria with energy. In return, the bacteria convert atmospheric nitrogen and supply it to the plant in the form of ammonia. Inoculating seeds with rhizobia is recommended to encourage this symbiosis right from the moment of planting (RhizoFix®); using seeds coated with rhizobia is another option (coated seed Rhizo).

### Promotion of soil life

The soil is full of a multitude of tiny, even microscopic, creatures. Some say that a handful of soil contains more organisms than the number of



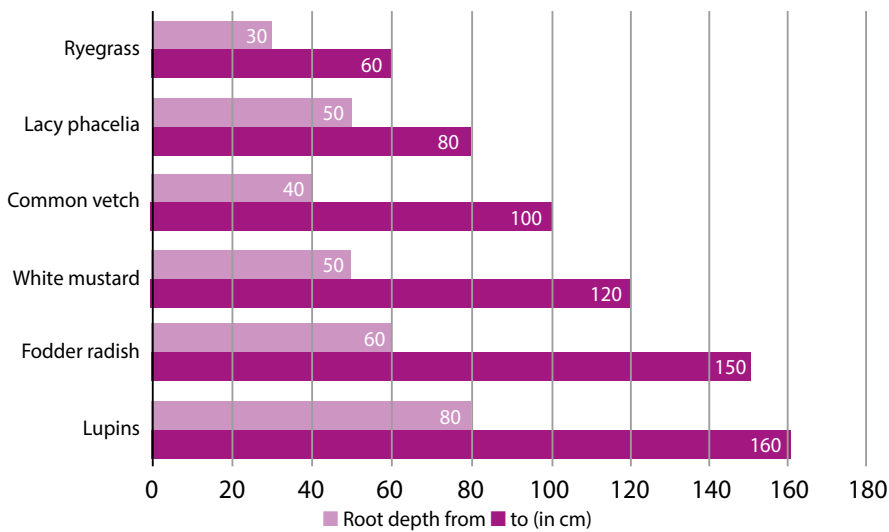
people on the earth. Apart from animals and plants, an abundance of fungi and bacteria also inhabit this environment. These organisms play an extremely important role in maintaining soil fertility. Cultivation of catch crops promotes the growth of this soil biota. The incorporated substance, in particular, acts as important nutrition for these microorganisms. If no catch crops are incorporated and all harvest residues are removed, the soil biota goes into decline, with negative effects on soil structure and fertility and lower cultivated plant yields as a result.

### Weed suppression

During the growth phase of the main crop, the soil is normally well-covered and only a few competitive weeds manage to establish themselves in such stands. After the harvest, the soil is relatively free and unprotected, and the lack of competition makes it easy for many different weeds to spread, grow and propagate. In the worst case, weed infestation may then drastically increase in the fields and adjoining areas. This can lead to decreasing yields and increased herbicide use. If competitive catch crops are sown after the main crop, they quickly form a dense plant stand that effectively manages to suppress weeds and check their spread. This is best achieved by fast-germinating catch crops that are sown immediately after the harvest, e.g. white mustard.



## Root depth



### Soil loosening and soil structure improvement

Certain catch crops have extreme root growth and are able to break open highly compacted soil, making it accessible to successive crops. Even the soil zones beneath the plough sole are often extremely compacted and are difficult to loosen and keep loose using conventional agricultural methods. In such cases, deep-rooted varieties such as fodder radish (up to 160 cm deep) or lupins (up to 150 cm), play a very important role. Oriental radish has a very special function: after the winter season, the decayed radish matter leaves deep holes, which allow more water to seep into the soil in winter for a strong frost wedging effect. The openings in the soil also help the soil to warm up faster in spring. As a result, the growth period of the next crop can sometimes begin early. Highly branched root systems, as in the case of lacy phacelia, help to increase the soil crumbliness, creating the right conditions for a fine-grained seedbed.

### Erosion control

Uncultivated soil is always exposed to the elements, which puts it at risk of erosion. Wind and especially water can erode considerable quantities of invaluable soil away from the fields, even in gently sloping areas. Since fertile soil is fundamental to farming, this loss of substrate should be avoided.

The easiest way to do this is by ensuring adequate plant growth on these fields. The growth above ground protects the soil against wind erosion and the roots hold the soil and protect it from being washed away. The soil is mostly protected while the main crop is growing; however, after the harvest, the soil is unprotected and prone to erosion. Catch crop cultivation and the resulting plant growth offer simple protection for the soil until the next main crop is sown. In high-risk areas, undersowing the catch crop may be advisable in certain circumstances.

### Nematode control

Some of the most harmful nematodes can be destroyed by planting nematode-resistant fodder radish and white mustard varieties. Apart from active nematode control, selecting the right catch crop can also help prevent these pests from spreading further. It is important to use species that do not serve as host plants to existing nematodes and, ideally, reduce their populations as well.

### Phytosanitary measures

Catch crops should be able to fit every operation's crop rotation. Plant diseases can only be prevented or minimised through good agricultural practices through selected crop rotations. Generally, the relationship between plants and diseases can be classified into three categories:

1. The plant increases a disease. Use of such plants, even as a catch crop, should be avoided at all costs to curtail the spread of disease.
2. The plant is not a host and has no effect on the disease. Such plants can be used without hesitation with no need to worry about increases in disease.
3. The plant destroys the pathogen, controlling the disease. These varieties should be integrated into the crop rotation as much as possible.

### Insect food

Many catch crops form flowers, which act as a source of nutrition for a large number of insects. Lacy phacelia is excellent in this regard; it is also known as bee pasture because of its appeal to bees. The honey yield from fields growing lacy phacelia is up to 500 kg per year per hectare. Some other plants such as white mustard, fodder radish and different types of clovers provide a good source of food as well. Issues like insect decline and bee mortality have gained a great deal of public attention in recent times. Cultivating this food source for beneficial insects is therefore a very positive step.



**Community aspects**

Many catch crops, such as lacy phacelia, crimson clover or sunflowers, grow extremely beautiful flowers and offer an attractive view to passers-by. Catch crop mixtures consisting of several flowering varieties like the TERRA

GOLD® mixture TERRA GOLD® 4 are particularly effective in this regard. Agriculture has long received criticism from certain sections of the population due to issues like monoculture, cleared out landscapes etc. Colourful catch crop mixtures are a simple and

effective means to prevent such criticism and create a positive image of farming. This improvement is not only due to the most popular flowers, but also an ever-increasing species diversity in the field.

