

With some cover crops costing up to £200/ha, are they worth the investment? Kicking off a three-part series, **Richard Allison** looks at the arguments for growing them on-farm

A growing number of farmers are seeing real benefits in growing cover crops instead of overwintering bare stubbles, especially in northern France where they have been mandatory for 16 years.

The issue that prompted compulsory cover crops in Brittany was nitrate pollution, explains Christophe DeCarville, product manager at Sky Agriculture. An estimated £11m of nitrogen a year was being lost into the sea from one river alone.

So in 2000, cover crops were required after harvest and before drilling a spring crop. The thinking is that it will capture nitrates mineralised in soil after harvest, he explains.

The cost of seed was covered by the government and, initially, there was limited interest by farmers. But then they started to see other benefits including improved soil health and better workability.

Today, farmers take it seriously and see it as a valuable tool – bringing real fertiliser savings, says Mr DeCarville, who is based in northern France and has worked with French growers for 25 years.

He highlighted one maize grower using winter beans as a cover crop yielding 8.7t/ha of biomass with 170kg/ha of nitrogen available for the next crop.

Mr DeCarville believes many UK growers can also benefit. It is a similar story this side of the English Channel, with some farmers' interest limited to complying with CAP greening requirements.

There is much more to gain, adds Ian Gould of Oakbank Game and Conservation. He urges interested farmers to have a go this autumn, put a small area into cover crops.

WHY GROW A COVER CROP?

While cover crops bring benefits to all establishment systems, a key driver in recent years has been to help farmers convert to no-till farming, especially on heavy soil,



The case for considering cover crops this autumn

thereby slashing their establishment costs.

James Woolway, managing director at Opico, says they have a particular role for those on more marginal (heavy) soils or in marginal areas (wetter regions) of the UK for direct drilling.

"It means more growers can benefit from the substantial cost savings of no-till," he says.

He highlights the typical costs of the various establishment systems as published by in the *John Nix Farm Management Pocketbook* (see table, above right).

Comparing ploughing with no-till and with a 10t/ha crop, that's a £10/t reduction in cost of production, he says.

Cover crops enable this by improving soil health and building resilience to traffic, allowing machinery and drills to get on earlier and later in the season.

Another benefit is promoting soil fauna. While worms are easily

seen, there are insects, bacteria and fungi which are also important.

Mr DeCarville says there is plenty of research work suggesting that where there are low levels of worms, there will also be low levels of the other organisms. So low worm numbers are a concern.

He believes the biological side of soils has been neglected for the



Try some cover crops, says Ian Gould

past 50 years. "Cover crops are a good way to increase soil life by feeding it."

A soil with a healthy population of worms can drain much more water and, thereby, cope with intense rain. A fertile soil will have about 1t/ha of worms producing 240t/ha a year of worm casts, which are a mix of organic matter and minerals.

COMPACTION BUSTING

Also, roots can go much deeper than subsoilers can. If you go over 4t/axle, compaction is pushed deeper in the soil profile, even with low pressure tyres.

He points to sugar beet harvesters weighing 70t being used in autumn. "You can see compaction up to 60cm down and you can't cultivate that deep. Cover crops can, however, tackle this."

A well-grown cover crop will support traffic and improve seed-bed conditions and, more impor-

tantly, allow later drilling to aid blackgrass control.

"You are more likely to be able to run a tractor on crops at end of October rather than bare soil."

As with all systems, there are some constraints. One is the time between crops. "What time is there – is it four to five months or only three? You may need to choose a faster growing species if time is short," says Mr DeCarville.

Also you need to ensure there is a break between crops. If you have brassica then avoid it ending up

TYPICAL COSTS OF A RANGE OF ESTABLISHMENT APPROACHES

System	Cost (£/ha)
Plough	163
Deep min-till	138
Shallow min-till	131
Strip-till	92
Direct drill	66
No-till drilling	52
Autocast	30

Source: John Nix Pocketbook

being a green bridge. Also consider the ease of destruction – frosts or the expense of chemistry.

There is also the problem of a high carbon-to-nitrogen ratio. Beans have a low carbon-to-nitrogen ratio, which means half of the nitrogen will be available to the next crop. However, if you go for rye, which has a higher carbon content because of its straw, it will use nitrogen when it decays in spring.

Therefore, it's taking up nitrogen at a time when you are establishing a spring crop.

Also be aware of the impact of unseasonable weather. Mr Gould explains that the mild winter this season resulted in lush crops that survived. Frost would have normally taken them out well before spring drilling.

"This made drilling more challenging this spring."

He adds that these growers that were caught out should not give up. "Don't go by just one season."

DRAIN PROBLEMS

Very long-rooted crops such as diacon radish can cause problems with drains. Mr Gould highlights one Bedfordshire farmer who saw problems and advises growing shorter rooted varieties, as it still has a valuable role including storing phosphate and sheep grazing.

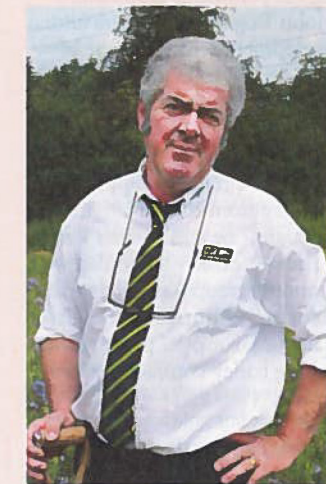
Finally, costs can spiral if using expensive mixes. Mr Woolway believes growers should be looking

THE VIEW FROM FRANCE: 8 BENEFITS OF COVER CROPS IN ARABLE ROTATIONS

* Christophe DeCarville has 25 years' no-till and cover crop experience in France. So what do cover crops do? He sees many benefits which include:

- 1. Capture nitrogen and other leftover nutrients** that would otherwise be leached over winter. In addition, they can recycle nutrients. A good example is buckwheat, which recycles phosphorus into a form that the following crop can use.
- 2. Fight erosion**, such as during intense rain, and protect soil against capping and water loss. The field acts more like pasture than bare soil.
- 3. Increase biological activity**, a foundation of soil fertility. This is different to fertilising soils. You can apply fertiliser, but you need good soil fertility to make it available to crops.
- 4. Increase soil organic matter content** (linked with soil biology).
- 5. Support traffic**, as a carpet of plants allows farmers to drive on fields without damage with plants between the tyre and soil. Also, it helps create a more stable soil structure.
- 6. Restore soil porosity** and improve root activity.

- 7. Help with weed control** in three ways: the crop shades weeds; competes with weeds for water and nutrients; and has allelopathic effects. In pasture, these effects have been seen with agrostis, which exudes substances from roots that inhibit growth of other plants, such as when overseeding pasture. The effect, observed by scientists in Switzerland, is not proven, however, and benefits can be seen one year but not the next.
- 8. Food for grazing animals.**



Specialist Christophe DeCarville

at investing about £100-120t/ha to establish a crop, including seed. Glyphosate and spraying adds an extra £17/ha.

"Trials show nutrient capture will cover this cost," he says. Then all the other longer-term benefits are on top.

Once farmers have decided to give it a try, the first step is to determine what is motivating the farmer, says Mr Gould. "What problem are they trying to solve?"

"For some, it is to stabilise soils in areas of high rainfall to cut erosion, while for others it maybe to increase organic matter content, capture nutrients or suppress weeds," he says.

This is important as it will determine which species to grow, as all have differing roles. For example, diacon radish is an excellent phosphate scavenger.

Then they need to consider if they have the right equipment, says Mr Gould.

"There is no point growing cover crops and looking to drill into a standing crop if you don't have an appropriate disc drill."

Look at your cropping and any contribution to green cover. Oil-seed rape volunteers can be used as part of the mix but, if you are following with spring OSR, you will want to avoid brassicas.

Whatever farmers decide to do, the key thing is to go early. Mr Gould acknowledges that it is a busy time of year, but to get the most out of them, you need to virtually follow the combine.

"Use the day length to get crops off to a good start, as it is still good at that time of the year. But towards the end of August, it starts to tail off and nights draw in once you get into September."

Three days in August equates to a week in September and two weeks in October, he points out.

NEXT WEEK

* Read part two next week for more on selecting which species to grow. In part three, we will offer practical tips for successfully establishing a cover crop this summer.