

Evolution theory

Sixteen years after the Claydon drill first appeared on the UK market, the Claydon family demonstrated its latest model, the compact 6m Hybrid T6c, at a series of open days on its Suffolk farm. *FMJ* went to see it in action

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Farmers are naturally inventive, regularly coming up with solutions to the problems they face on their own farms, but few have been as successful as Jeff Claydon from Wickhambrook in Suffolk. The strip drill concept he developed and launched on the market in 2003 has grown into a comprehensive range of seeders, complemented by rolls, a light cultivator, a straw harrow and a weeding hoe. Sales are now measured in 1000s, and the distinctive yellow

drills can be found in more than 30 countries around the world.

Jeff and his brother Frank are the third generation to farm the family unit, which is located on prime arable land between Bury St Edmunds and Cambridge. The original farm buildings, including the workshop where the first Claydon V drill was built, now sit in the shadow of two large buildings that house the company's production, stores and offices. Fourth generation family members - operations and design

director Oli Claydon and commercial director Spencer Claydon - are also now closely involved in the business.

The latest drill to emerge from the Claydon site is the 6m Hybrid T6c, where the 'c' signifies compact. This is a brand-new version of the company's popular 6m drills, redesigned from the ground up to meet the requirements of a wider range of farmers.

"The starting point was that we wanted to get the price down for customers here in the UK and throughout Western Europe, to appeal to smaller farmers and win a bigger share of the market for 6m drills," Spencer Claydon told *FMJ*. "The aim was a drill that looked more concise and neater; neater when it's in work and neater when it's folded up, with all the components taking up less room to make storage easier."

Different design

Key changes compared to Claydon's standard 6m drill include the use of a smaller 3500-litre seed hopper, rather than 5500 litres, and a new scissor-action folding mechanism.

Below: The first three elements of the Claydon drill's time seeding concept: a shouldered disc, leading cultivation tine and seeding tine

Bottom: The new Claydon Hybrid T6c drill has been designed to be cheaper and neater to appeal to a wider audience of farmers across Western Europe



"The old folding system could have been described as a bit 'agricultural', but the new mechanism, over the rear wheels, is much neater and more in keeping with European drill designs," Spencer added.

The new compact drill has kept the seed hopper and seeding chassis separate. "This is a very important feature on Claydon drills, because you can have a full seed hopper and it won't affect the seeding depth at all because they're completely independent elements," Spencer said.

Something else that hasn't changed is the leading tine operating principle of the Claydon drill. The different elements have been updated from time to time, but the concept remains the same and typically includes four elements on the company's trailed drill range:

Row 1 Shouldered front cutting discs (standard); or front press wheels.

Row 2 Front ground-breaking tine



with tungsten carbide facing (standard) with shear-bolt (standard) or hydraulic stone protection.

Row 3 Seeding coulter options for small, medium and large seeds, and fertiliser placement options.

Row 4 Batterboard and harrows for

dry conditions in all soil types; batterboard and wheels for dry soil conditions in light soils; twin harrows for wet conditions in all soil types; or wheels and harrow for dry conditions in light soils.

During drilling, the leading tine in row two - which can be set at depths from 0 to 15cm to adjust the degree of soil disturbance - busts out any compaction, puts air in the soil and creates drainage and tilth for the seeding and rooting zone. The seeding time then creates more tilth and places the seed in the soil at the chosen depth above the drainage channel. Depth wheels across the width of the drill ensure accuracy of seed placement and, naturally, the Claydon's drills come with fertiliser options that feature a split hopper and can place nutrients above or below the seeds.

Claydon says its drills are simple, strong and high-capacity machines. They offer huge trash clearance, a low horsepower requirement of 50 to 65hp per metre, low running costs and wearing parts costs of about £2 per metre. The new drill comes with a four-channel CANbus control box as standard, but it's also ISObus ready, so for suitably equipped tractors all you need to do is buy a lead and it's plug-and-play.

The result is an impressively versatile, flexible and simple drill that can be used directly into stubble, in min-till systems, or with a plough. Claydon has calculated the costs of each system at about £51, £112 and £148 per hectare respectively - so the appeal of this direct strip-till drill is clear.

Left: The latest version of the Claydon drill's seeding time, which is available with a choice of points. This one also allows fertiliser placement above the seed

Below: The seeding chassis and seed hopper have been kept separate so the weight of seed (and fertiliser) being carried can't influence the seeding depth

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TECHSPECS

Claydon Hybrid T6c

Working width 6.0m

Daily output 40ha

Minimum power requirement 300hp

Transport width 2.90m

Transport height 3.33m

Transport length 8.16m

Weight 7957kg

Hopper capacity 3500 litres

(optional 60:40 seed/fert)

Seeding tines 19

Sowing width 30cm

Above: The new drill employs the Claydon tine seeding system that drills into bands 30cm wide

Above left inset: The drill utilises a hydraulic fan for the seed distribution system

A pair of wheels are used to set the depth of the weeding tines. The angle of attack of the tines can also be adjusted



► TerraBlade enters arable armoury

Also recently introduced by Claydon is the TerraBlade inter-row hoe that has been designed to provide a low-cost, mechanical method of controlling weeds in combinable, band-sown crops. It provides an additional way to control weeds at a time when the efficacy of some herbicides is decreasing and the cost of control is increasing.

Band sowing at 30cm leaves a 14-15cm-wide unseeded strip between the rows that can be mechanically weeded using a hoe. The TerraBlade eliminates weeds from that area reliably, safely and without using chemicals. It catches any weeds that were missed by herbicides, or where such products cannot be used, and it greatly reduces the return of weed seeds and the overall weed burden.

By keeping the unseeded rows clear of weeds during the early stages of crop growth, competition for nutrients, light, air and water is reduced, and the young plants can grow strong and healthy.

"We didn't want to make it too complicated, so the TerraBlade is effectively a good old-fashioned hoe," Jeff Claydon told *FMJ*. "It has the potential to improve crop yields, drastically lower the potential for

carry-over of weed seeds and reduce the risk of more resistant weed types developing.

"It will give years of reliable service, has very low operating costs and offers great flexibility. It's designed for use on any tractor with a Cat II front linkage, and travels at about 6kph and up to 30mm deep. It's manually steered, and can be used whenever soil conditions allow, covering up to 40ha a day with a 6m unit."



Above: The TerraBlade folds for road transport

Left inset: Jeff Claydon launched his original Claydon V drill in 2003



Autumn and spring

On farms that drill early, Jeff suggested the crops may be sufficiently well developed in the autumn to start TerraBlading then, and the operation can continue in the spring as soon as the soil allows, up to the stage where the crop would be compromised by further passes.

"The TerraBlade has been designed for use in all types of strip-seeded crops," he added. "The hoe blades are our own design, and the back plate is specially contoured to hold them level. There's a degree of spring in the tines, and you can set up and alter the angle to change their aggressiveness. The hoe's trailing tines skim through the soil at 2cm deep and decapitate all of the grass weeds, including any residual black grass that the chemicals can't control.

"There's a depth wheel on the front to keep the depth of it where you want it to be. You travel forward at 6kph, which might seem slow to some people, but you're covering the same width that you drilled. It's essential the TerraBlade is the same width as the drill and you run in the same tracks, because even with RTK, there could be a slight offset that would prevent accurate weeding in the adjacent rows."

Claydon is currently making the TerraBlade in widths up to 6m, and an 8m unit is currently under design. The unit is proving popular among organic as well as conventional farmers, and it's easy to see why there's growing interest from the latter. At a cost of less than £8000 for the 6m version, the payback time can be very short given the cost of some of today's herbicides.

Proof in the soil

Jeff Claydon has always said that what makes the company's products unique is the fact they're developed on a working farm by farmers for farmers. They're well and truly tried and tested in real farming conditions, in a real farm environment, before they're brought to market. That's a compelling claim, but it's one the family can back up by having used the drills, in all stages of their development, for approaching 20 years.

At the recent open days at the Claydon family's farm at Wickhambrook, a soil pit gave an impressive picture of the long-term effect of Jeff's tine-seeding concept. Hutchinsons' technical manager Dick

Neale was on hand to tell visitors about the finer points of soil structure in a field that has only been seeded using a Claydon Drill for nearly two decades.

"What I've been talking about is the physical structure, the biology of the soil and the chemical elements of the soil, and the fact that they are all interlinked so you can't consider just one on its own," he said. "I've also been pointing out that pH is a critical factor in the soil because it will impact on the structure of the soil, the chemical mobility of nutrients in the soil and also the biology in the soil - pH really is a dominant feature of any soil."

Dick described the farm's soil as a sandy clay loam to sandy clay. "It's probably 35 to 40 per cent clay, and I would estimate five per cent organic matter," he said. "I would question the ability of this soil to maintain much more than six per cent organic matter, which consists of far more than visible crop residue."

"It is noticeable that the soil structure is clearly allowing for very free root movement down through the soil, so plants have the potential to gather as much moisture and nutrition as they need provided the nutrition is there and available. There are two distinct zones, with 15 to 16 inches of brown, organically active, soil on top, that then shifts into a second zone that starts in a sandy colour and turns more white with chalk deposits lower down."

Unique features

The really fine network of white roots that could be seen throughout the top layer was a feature of soils drilled using a Claydon Drill, Dick said.

"What you notice," he added, "is that you get just as many fine roots between the rows of rape as you get immediately below the rows. The rows were slightly cultivated by the drill but there's been no cultivation of any depth between those rows and the open soil structure is not compromised like it would be with more interventionist cultivation strategies."

These roots are vital to soil health,

Above left inset: Claydon designed its own tine for the new TerraBlade weeding hoe

Left inset: Claydon's new TerraBlade cuts weeds off at the roots and is a vital tool for use in the fight against herbicide resistant blackgrass

playing the important role of exuding acids and sugars produced through photosynthesis by the green part of the plant into the soil to help solubilise nutrients like phosphates into solution so they can be absorbed by the plant to feed itself. This is a biological interaction that can only occur with living roots, so they're not just for feeding the crop, they're the support network supporting biology in the soil.

Just as important is the action of worms within the soil, and Dick estimated a population of about 40 surface feeding and deep-burrowing (up to 2m where soils allow) anecic earthworms per square metre in the

area of the test pit, as well as even more endogenic worms that tend to live and feed in the top 50cm.

"As soil passes through earthworms the availability of nitrogen increases five times, while for phosphorus it's seven times, and for potassium it's 11 times," he said. "As your worms increase to the kind of numbers here, and I've seen it on other farms too, you reach a critical population and your yields jump. I think it's due to access of moisture at depth, recycling of nutrients, pumping of oxygen and water around the soil and all the things the worms bring; you get to this critical mass and things just start to happen."

FML

"As your worms increase you reach a critical population and your yields jump"



Below: Worm holes and fine white roots are signs of a healthy, biologically active soil



Above: Nearly 20 years of seeding with a Claydon drill have left the soils at the family's Suffolk farm with a brown, organically active top layer about 16 inches deep

Above: Healthy, uncompacted soil promotes root development, particularly the fine white roots that promote biological action

Below: Dick Neale says the Claydon drill's tine seeding concept, which leaves the ground between the rows undisturbed, promotes a healthy, biologically active soil

