

Go forth and forage

“ Biomass production is developing fast in response to the growing demand for sustainable fuels. ”

Machinery Forage harvesters

Grass and forage crops continue to gain popularity among arable farmers for their soil enhancing, weed suppressing and biodiversity encouraging properties, with many now using the cut as a fuel for anaerobic digesters. *CPM* looks at the latest trends and harvesting machinery.

By Melanie Jenkins

Forage crops are increasingly appearing in arable rotations because of the ground level benefits they provide, as well as for the potential they have as an alternative revenue stream.

One of these markets is for anaerobic digestion (AD). Grass, maize and other forage crops are able to stabilise and supplement other AD inputs such as slurries and can slot nicely into arable rotations to extend them for better weed suppression, increasing soil health or for carbon sequestration.

Philip Cosgrave, agronomist and grassland specialist at Yara, has noticed an increase in the amount of enquiries he gets from arable farmers who have started to grow grass in their rotation. “There are certainly more farmers who’ve had no grass in the rotation for years starting to look at ways of improving their soil health.”

Assess the end goal

For those new to grass and forage crop growing, the farm’s cereal and oilseed rape yield maps may not correspond with yields from the new crops. Philip suggests assessing the end goal for the grass or forage crops and then looking at micronutrient contents. “When making silage, nitrogen timings can be important; getting it wrong can mean grass is too high in nitrates, making it difficult to ensile.”

He also points out that farms where grass hasn’t been grown for a number of years might have soils with low levels of organic matter, meaning nitrogen mineralisation won’t be great. “Crop choice depends on what the farmer wants to achieve — whether that’s to lower nitrogen applications, improve organic matter or better soil structure,” says Philip.

But for those without livestock or the opportunity to provide silage to other farmers, one alternative type of income could be in the form of AD, an area which

is growing as the Government moves away from fossil fuels.

Not only are these crops enhancing to the farm, but they also far outweigh muck and slurries in their biogas yield — so can be especially beneficial for anyone with their own AD plant. According to Cropgen — an EU funded project to examine the production of methane from biomass, including crops and agricultural residues — grass has a biogas yield of 298-467m³/t, maize silage 200-220m³/t (33% DM) and grass silage 160-800m³/t (28%). Pig and ▶



According to Dr Michael Gifford, biomass energy crops have grown on a small scale for decades, but the industry is yet to reach its peak.

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Forage harvesters



John Deere's new forage harvester models aim to provide more power and optimum efficiency.



This year John Deere has also expanded its Machine Sync integrated system to self-propelled forage harvesters and tractors.

▶ cattle slurry on the other hand produces just 15-25m³/t, with dry matter contents of 8% and 10%, respectively.

Launched earlier this year, the Government's Biomass Feedstocks Innovation Programme is helping to drive projects to deliver commercially viable innovations in biomass production through a £4M funding pot.

NIAB has been awarded funding as part of this and is aiming to provide growers with independent advice on varieties, agronomic practices and equipment suitable for cultivating a range of biomass crops on marginal land.

According to Dr Michael Gifford, NIAB's director of commercialisation, biomass energy crops have grown on a small scale for decades, but the industry is yet to reach its peak. "We expect this government investment to stimulate new growth in this area.

"The support is part of a new 'green industrial revolution', alongside changes in UK food and farming policy and markets, and advances in crop science and production," says Michael. "The Climate Change Committee stated that in 2020 energy crops in the UK amounted to

10,000ha, which they have recommended would need to rise to 720,000ha by 2050."

With so much potential for energy crops, what have forage harvesting machinery manufacturers brought to the market this year?

John Deere

John Deere has expanded its 9000 series forage harvester range with the new 9500 and 9600 models. These are powered by a new 18-litre John Deere engine (JD18X) which produces 700hp and 750hp for each model, respectively.

Building on the successful HarvestMotion technology — a low engine RPM concept to boost productivity — incorporated in the 9000 series, the new models introduce HarvestMotion Plus. According to Deere, this update delivers both a rise in torque and even more power at low engine revs.

It also produces extra power — up to 766hp on the 9500 and 787hp on the 9600. To handle the higher horsepower the foragers also feature a reinforced drivetrain and improved main frame.

The engine boasts a 10% reduction in fuel cost per harvested tonne and a 33% lower oil cost when compared to other machines of the same horsepower class, says Deere.

Both models come with a new longer eight-row spout design, featuring optimised contours and styling to enable a higher throughput. The 850mm crop channel width is tailored to handle the

machines' higher throughput, ensuring best possible forage quality and chopping efficiency, according to the company. The DuraDrum cutterhead is also designed to handle high crop flows independent of the selected cut length.

Kernel processor rolls are available with a standard sawtooth design on the Premium KP unit, and either the sawtooth or a new XCut design on the XStream KP, which features a spiral cut groove across the roll surface. Both roll designs are also available with the Dura Line heavy-duty coating for increased durability.

Both models are available with John Deere's Intelligent Solutions Group precision farming systems for improved operator comfort and cutting quality. These include additions like the HarvestLab NIR sensor to produce real-time crop measurements, AutoLoc automatic length cut and silage additive dosing, and clamp silage analysis.

This year John Deere has also expanded its Machine Sync integrated system to self-propelled forage harvesters and tractors — including on the new 9500 and 9600 foragers. First introduced in 2012, John Deere's Machine Sync technology is a global navigation satellite system which allows machines to automatically control the speed and direction of travel relative to one another — reducing operator stress and improving safety.

According to the firm, it helps to eliminate waste during unloading and

60 years of New Holland self-propelled foragers

This year New Holland is celebrating the 60th anniversary since it produced its first self-propelled forage harvester.

To celebrate, it will be releasing a special anniversary edition of its FR Forage Cruiser, which will feature MyPLMConnect, UpTime Solutions and UpTime Warranty as standard, as well as a 60th anniversary decal.

New Holland will also host a European demonstration tour to celebrate, which will include a stop in the UK.

According to the firm's Henrik Aaskov Hansen, New Holland forage harvesters have helped to deliver farmers quality silage over the past 60 years and are now helping with biomass production.

"Biomass production is developing fast in response to the growing demand for sustainable fuels," he says. "As we mark this important milestone, New Holland forage



New Holland celebrates 60 years of self-propelled forage harvesters with demo tour and decal.

harvesters are demonstrating how their versatility is helping our customers improve their profitability and fully grasp the opportunities of new revenue streams."

avoids damage to both machines and crops — even at higher driving speeds — and is especially useful in the dark.

To operate, it requires JDLink telematics, a StarFire satellite receiver and a Gen4 Premium display with automation activation.

Kongskilde

Though not new to the market, the New Holland-owned Kongskilde FCT trailed harvester provides UK growers with a tractor powered option.

It includes an UpperCut system, designed to ensure low energy consumption while throwing the crop directly into the chute — meaning it doesn't have to go through the rotor housing first; hence the reduced power consumption. This should result in a 25-50% higher capacity than conventional choppers without needing more power.

It's available with two types of cutting rotors, with either 24 or 32 knives to get the right forage composition.

The foldable chute can direct crop into 4m high trailers and on the FCT 1060, 1260 and 1460 models all functions are operated by a single electro-hydraulically control box.

The feed rollers are made of demagnetised material and if a metal object gets near, a magnetic field will be actuated, and a stop pawl will cease the input feed immediately.

Fendt

New to the all-in-one forage wagon market is the Fendt Tigo VR. The Tigo range already included the PR and XR models, and with the VR Fendt provides growers with a new compact version, says the firm.

The VR series comprises two models — the 65 VR with a capacity of 38m³ and the 75 VR with a capacity of 44m³ (DIN-standard spec).

Both machines have a multifunctional bulkhead with VarioFill as standard.

With a swinging pick-up work width of 2m, it's likely to suit larger farms reliant on self-mechanisation. This wider width means more material can be picked up and should make it easier to drive into the swath, as well as ensuring a high impact when cornering, notes Fendt.

What's more, the hydraulic drive is designed to adapt the speed of pick-up from 70rpm to 150rpm depending on the crop and conditions.

There's an option to purchase the FlexSharp knife sharpener, so knives can be sharpened in the wagon without

removing the blades. This is compatible with different machines and round or square baler knives. It's also possible to purchase a second set of knives and brackets — these can be exchanged in field to reduce downtime.

An optional self-levelling feature — Stability Control — provides full suspension to counteract rocking movements on slopes and roads.

It also features the Tractor Implement Management (TIM) tool, which allows the wagon to regulate the driving speed of the tractor, depending on the pick-up load.

It comes with an option of two or three feed rollers and a variety of different tyres. Special chassis or drilled axles are also available on request.

Fliegl

First introduced to Fliegl's line-up in 2017, the Büffel (Buffalo) was the German company's first move into forage harvesting technology. The loader wagon itself introduced an all-in-one system with a combination of pickup, cutting rotor, hopper and overloading apparatus.

So how does it work? A 1.5m wide rotor with seven rows of tines and 8mm wide Hardox fingers press the feed through up to 49 knives. These can be hydraulically swivelled in and locked as well as individually secured via rocker arms and can be used on both sides — meaning a theoretical cut length of 30mm.

The rotor and two hydraulic pumps are driven by a T-gear below the hydraulic articulated drawbar. These supply the conveyor belt and the metering rollers at the rear with a capacity of 100 litres/minute at 180 bar. All other hydraulic functions, as well as the speed ratio of the scraper floor and dosing rollers, are controlled by the tractor.

Using 200hp the Büffel can get through around 130t/hr of fresh mass. It has a 5.1m high transfer belt which reaches an overload length of 4.3m and which can be pivoted behind the metering roller. For field use the dosing rollers and the rear wall are folded in a funnel shape so that the belt can be fed optimally.

The Büffel is capable of preventing metal objects from entering the silage, and also incorporates a silage additive dosing system.

Weighing 8t, the machine is light, and combined with its 6m length and 90cm telescopic axle for stability it should be a highly manoeuvrable piece of equipment.



Fendt's Tigo VR is a compact all-in-one loading wagon with a 2m pick-up width.



Fliegl's first venture into forage harvesting, the Büffel is an all-in-one wagon.

Kemper attachments

Designed specifically for the Claas Jaguar forage harvester series, Kemper's C3003 should pick up any crop without pushing it forward. Kemper claims that short crop from the last cut won't 'roll' in front of the pick-up, but instead is taken directly in by the header.

With self-adjusting rollers which adapt automatically to the side of the swath, the C3003 has a hydraulic accumulator taking part of the weight. Swath guide tines are connected to the roller and lead the crop to the auger.

It also has a trash net attached to the compression roller arms, which covers the whole pick-up. The fine mesh prevents crop build-up over the whole machine, including the cutter head cover.

Maintenance of the forage harvester should be easier as operators shouldn't have to remove large amounts of crop residue — and it also helps the cab windows stay clean. ■