Telematics for logistics:

Meeting harvest logistics goals



Communication with the lorry drivers can direct them to a different tip site to save downtime; some of the lorries also have Fleet View so their position can be seen on screen as they enter the field, and the drivers can check the location of the chaser bin.

Modern harvester telematics can provide proof that something as simple as reducing the size of lands when working across a field is capable of boosting overall efficiency. Brixworth Farming Company has done just that to keep combine, chaser and haulier properly co-ordinated

Boosting harvest efficiency by using telemetry to keep track of combine, grain cart and lorry movements has helped Brixworth Farming Company stay on top of this tricky season. Taking time out to analyse combine performance has also tackled potential bottlenecks and made the optimum use of available resources.

Brixworth Farming Company was established in 2000 and as a joint venture business has five shareholders plus local contract work, covering some 2,500ha of combinable crops, in an eight-mile radius of its base in Northants.

"We aim to crop in blocks, although in recent years this has been divided up to tackle blackgrass," explains BFC director Ian Matts. "We often have two combines working in the same field, and there can be plenty of roadwork."

The business has always used Claas combines since updating machinery acquired when its shareholders came together, and in 2007 the first harvesters with telematics installed arrived on farm. For the 2018 harvest, two new 780TTs with 12m headers joined the fleet.

"We took part in the Claas 'combine league' where farms were able to compare harvesting data, and, although it was interesting, we didn't find it that useful for informing decisions. It was only when the combines came up for renewal at the start of 2018, that I really started to dig into the available data," he comments.

HARVEST FACTS

Brixworth Farming Company

Area cut

2,500ha

Crops

Winter barley 390ha, oilseed rape 170ha, spring barley 300ha, winter oats 215ha, winter wheat 1,040ha, winter beans 370ha, canary seed 50ha

Harvesting fleet

Claas Lexion 780TT with 12m headers x2, Grain Saver 24.8m³ chaser bins x3, Fendt 724, Massey Ferguson 7720S and John Deere 6195R tractors, six bulk lorries from local hauliers. Balers where appropriate from neighbour on 'straw for muck' arrangement

The challenging harvest of 2017 had prompted Mr Matts to look more closely at harvest operations – there had been a shortage in capacity and a third combine was hired in. "I felt we should be able to cover our harvest with two machines, so I studied the telematics data for the 2017 season to see how the operation could be improved."

The combines unload into 24.5m³ Grain Saver chaser bins, which empty into lorries to transport grain to a local merchant. "We ended up using a total of 38 lorries just to cope with the unpredictability of the harvest. But examining the telematics data showed that the combines were often sitting full for too long, and this added up to 24 hours of harvest time lost while waiting to unload."

With the difficult conditions at the end of the 2017 harvest, this meant that the combines left the field for the last time three weeks later than they should have done. "The chaser bins were all too often waiting for lorries – It was clear we needed to improve communication between the chaser bin drivers and the hauliers," he comments. "We now work with fewer hauliers, mainly dedicated to the



Data from the 2017 harvest has been used to fine-tune chaser bin and lorry movements for the following seasons. In-season reviews add detail such as changes from forecast yield, which may affect capacity.



Challenges for director Ian Matts include the compatibility of telemetry and management systems, as well as how to streamline the transfer of data to and from machines.

harvest and with an understanding of farming, and we commit to giving them plenty of notice when they are needed. This year we used up to six lorries."

Chaser bin drivers have access to the Claas Fleet View app, which provides detail down to the fill level of the combine's grain tank as well as its position and that of the other grain carts, and the app is also supplied to some of the lorry drivers, to try to better understand their movements. Directions to the tip sites are relayed over Google maps, but all drivers remain in communication to ensure a lorry driver unfamiliar with a particular farm reaches the right place at the right time.

"The chaser bin drivers use Fleet View to plan their logistics – for example, tipping a part bin load to finish filling a lorry rather than having a driver waiting to leave," explains Mr Matts. "They also work to maximise the efficiency of harvest and will move between combines so they're not stopped, waiting to be unloaded."

With a change in cropping for this year entailing fewer early crops and more pressure at the end of the harvest, including a large block of spring barley, Mr Matts plotted a graph of harvest progression through the crops to be cut, comparing 2017 and 2018 with the potential suggested by Nix.

"It identified we were dropping away from our target and might need help from a contractor, especially as there was a delay as the wheat was not fit, and then we reached that bottleneck of oats, spring barley and wheat. I had informed our shareholders that we might need to do this, and the figures helped to make the call. It was also a useful exercise to demonstrate to the harvesting team how far through we were at any point."

The ability to monitor fuel consumption and uptime data via telematics has assisted in fine-tuning operator efficiency and comparing the performance of the two combines.

"We have discussed the significance of idle times, and the diesel figures have highlighted



The Field View app shows the position of combines and chaser bins, and it also lists all the vehicles connected.



Brixworth Farming Company uses Claas telematics on its two Lexion combines to help improve overall harvesting efficiency.



Using Fleet View, chaser drivers can see combine grain tank levels and move to unload them rather than waiting for the beacon to come on, cutting idle time.

to the drivers that if the machines don't need to be running, they should be switched off."

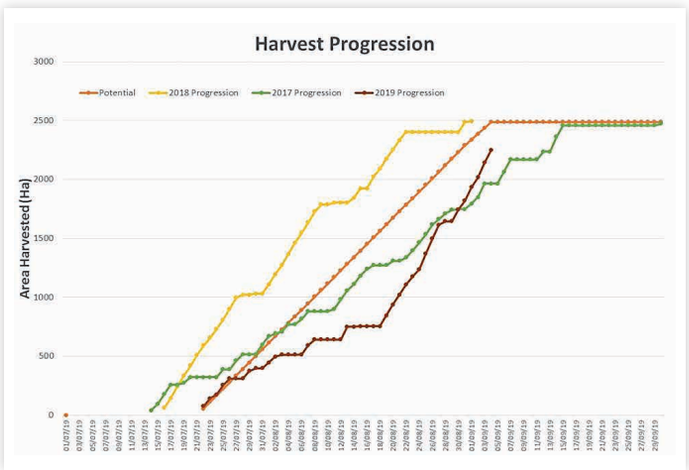
Mr Matts comments that telematics produces such a large volume of data that it's easy to get bogged down with it, but he can customise the information that he wants to see and share it with operators.

"We met with Ed Miller from Claas before the season began to see how we could get more out of the machines. He explained that turning time for the combines was high at 13% in 2018 – reducing the size of the lands that were being cut has reduced the figure to 11% for this harvest."

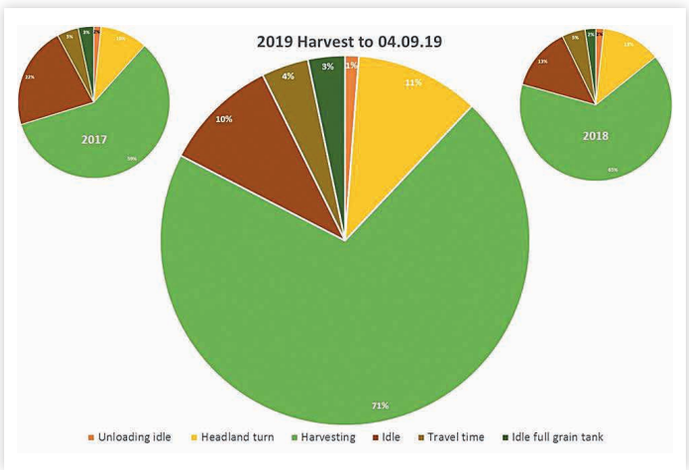
Claas suggests that a good average for 'processing time' should be greater than 70%, and while it had not been achieved for the past two years, the Brixworth team topped this figure in 2019.

"Operators have taken the data on board, and we like to compare between the two combines to create healthy competition between them, although you have to bear in mind that tasks such as tidying up the last of the oilseed rape will bring one combine's results down," says Mr Matts. He adds that the data shows operators are working more efficiently, down to ensuring that a block of land is finished at night so combines are moved in the morning, making use of time when they would be unable to harvest.

Operator John Baxter comments that he found the pre-season meeting extremely useful. "It was good to get advice on how to increase productivity; I'm new to driving combines, and I was surprised by the improvements we have been able to make. Fleet View is also extremely helpful to keep everyone in the loop and work out the best way to unload. Sometimes lorries can back up at the store which could potentially hold us up, but now we can just rejig unloading until lorries are back in line."



Plotting a harvest progress graph allows team members to assess how far through the crops they are and provides guidance on lags and bottlenecks. This helps with decisions to increase capacity by calling in a contractor.



Uptime charts generated from telematics data show that changes to harvest strategy have increased 'process time' to 71% this season and trimmed headland turning time. Ultimately this reduces costs.

The difficulty, Mr Matts adds, is that while data can be readily produced for inspection, it is more complex to utilise it for other purposes. "I also have to work with the data to obtain usable information – it would be nice to just press a button to generate reports."

The complexity of handling and using data makes it tempting to leave analysis until a quiet period, but Mr Matts finds it useful to review results in the season and make small tweaks. "I take yield data from telematics and enter it into a spreadsheet to assess tonnes/hr coming from a particular block so that I can calculate how many lorries are needed. It allows me to tweak the haulage requirement the day before if necessary, updating the spreadsheet as yield forecasts change."

The figures also dictated the increase from two to three chaser bins for this season, so that the extra machine is always available if needed. One glitch is that the two combines don't always calibrate consistently – one is significantly higher than the other – so the tonnes/hr harvested from the yield monitor can't be relied on to be totally accurate.

"I get a report of yield and quality from the store the morning after each load arrives and use this to update a harvest spreadsheet. Because the Lexions' yield monitoring is not really trustworthy, I enter a yield adjustment factor and then add it to a spreadsheet for normalised yield to compare with other years."

This information highlights fields that are yielding below average and this can guide stewardship reviews, indicating poor performing fields that may be taken out of production. Mr Matts also analyses by block, soil type, organic matter and blackgrass levels to identify any trends. "It's not an exact science, and more robust data would be ideal – I believe the new generation of Claas combines will be more accurate."

Specific benchmarking is used to assess individual combine performance, although the fuel consumption data offered by telematics has come in handy, showing the Lexions to be thirstier this year, probably due to a combination of wetter conditions, more straw and increased chopping.

"I plan to go through this year's results with the team just before the 2020 harvest so it's fresh in their minds. We're reliant on casual staff for carting so I'd like to get the same operators back to improve consistency. It's been a tricky season but, apart from one breakdown and one tipping issue with the lorries, grain logistics have run smoothly."



Combines are numbered for easy identification when working on the same block. The app also shows which direction they are travelling in – handy when they disappear in a cloud of dust!

A third chaser bin has been added for this season to increase capacity. The Grain Saver bins hold 24.8m³ of grain so will take two tank-fulls.



Chaser bin operator David Tobin makes good use of the Claas Field View app to optimise combine unloading and boost work rates.



Combine driver John Baxter found a pre-season meeting with Claas useful to focus on improving machine performance.



The Lexion 780TTs were new for the 2018 harvest and have 12m headers to fit in with the farm's CTF system.

Fleet View

Claas's Fleet View app is a tablet-based mapping system showing all vehicles involved in the harvest operation that are connected via telematics – all combines, all chaser bins and some of the lorries. It is displayed on iPads used by Brixworth Farming Company operators for a number of other functions including timesheets, Health and Safety information, maintenance records and workplans transferred via Gatekeeper, but it's also compatible with Android systems.

"The live map shows the position of the combine and its fill level, which helps us decide which one to prioritise for unloading," says bin operator David Tobin. "The combines are numbered so we know exactly which is which, so we don't have to wait for the beacons to start flashing when the tank is at 70%. Tracking its position on the map makes travel quicker in a large or hilly field, and we can also see in which direction it is facing, which is useful when it's in a cloud of dust."

Mr Tobin says the aim is to keep the combine unloading on the move, with the chaser bin having the capacity for two full grain tanks. The display shows the combine's forward speed, allowing the tractor to match it rather than slowing the harvester. Travel is on the tramlines where possible to follow the farm's CTF system, with the combine opening up on the first tramline to provide a route for the chaser bin. "We can also see where the lorries are and, if necessary, direct them to a different loading site to avoid waiting time," he adds.

It's Mr Tobin's first year driving a chaser bin, having taken a harvest job away from his home in Ireland, and he says that he finds Fleet View straightforward.

"I was more familiar with Android, so ioS has taken a bit of getting used to, but the app makes it very easy to see where everyone is and to get the best out of the chaser bins."

Summary: Technology helps to optimise the harvest for Brixworth Farming Company, but it currently requires time spent on reviewing and analysing data in a busy season to get the most out of it.

Byline here, byline here

mini page ad