



Weigh cells – worth the extra cost?

Fertiliser spreaders with weigh cells were once reckoned to benefit only bulk users. But with high fertiliser prices and demands for ever-greater precision, should more farmers be using them?

By Martin Rickatson

Electronic control facilitates automatic re-calibration on the move, says Keith Rennie.

'There's no need to calibrate the machine in the yard before setting out.'

With no apparent end in sight to the upward march of fertiliser prices, technology would appear to be one of the few weapons farmers have at their disposal to mitigate the financial impact.

For those using solid fertiliser, variable-rate application is probably the current 'ultimate' in that technology, closely followed by guided steering to ensure perfect bout matching.

But whether or not a farm chooses to follow either of those paths, a weigh cell-equipped spreader can boost the degree of application accuracy overall, reckons Keith Rennie of KRM.

"Accuracy of application is important, regardless of the price of fertiliser, but as costs continue to rise, it becomes increasingly vital to ensure spreaders are consistently putting on the amount

But it's not simply a case of making direct cost implications, believes Keith Rennie. "The limitations of working within NVZs and field margins also have a bearing on the accuracy of fertiliser spreading."

Weigh cell-equipped spreaders have a valuable role to play in this respect, he adds.

Danish manufacturer Bogballe (whose spreaders KRM imports) were one of the pioneers in weigh cell technology 20 years ago. Nowadays, their role in fertiliser application is more about the real-time accuracy of the fertiliser flow from outlet-to-discs and out across the working-width, as it is about what's left in the hopper, says Keith Rennie.

"Modern weigh cell set-ups are designed to measure the weight change in the volume of fertiliser remaining in the spreader. Relating this information via the in-cab computer to the spread-width and forward speed means the outlet size can be altered automatically to constantly maintain the desired application rate — even if forward speed should drop on steep ground, for example.

"The original weigh cell spreaders simply

that's where the concept initially proved particularly useful to bulk fertiliser users."

While the design has been updated, the principle remains the same — with a parallelogram linkage designed to ensure the weight in the hopper is always evenly loaded on to the weigh cell, he notes.

Linkage design

"For example, a 20kg weight added at one corner of the hopper would still register 20kg on the controller, with the linkage designed in such a way that the effects of the volume of fertiliser in the hopper — regardless of sloping ground or any bounce in the tractor's travel — are negated."

More recently, it's the integration of electronic control — allowing for constant automatic re-calibration on the move — which has really boosted the value of weigh cells beyond simply checking total product weight and helping to work out when the spreader is running low, continues Keith Rennie.

The Bogballe's Zurf control terminal not only allows information to be exchanged

► but also between the farm computer and terminal.

“That means data on the application rate and machine settings can be entered onto the farm office computer and saved onto a memory stick, then uploaded to the Zurf whenever they’re needed again. The machine will then apply the desired rate of fertiliser — but more consistently than a

standard spreader because of the weigh cell data.

“Then with each spreading job complete, the data can be transferred back from the Zurf terminal to the computer again for future reference.”

One of the other big advantages of a spreader equipped with weigh cells is that there’s no need to calibrate the

machine in the yard before setting out for the field, says Keith Rennie. “After entering the required application rate and the outlet setting, based on the product spreading chart data, the machine will automatically and constantly calibrate itself according to the information from the weigh cells.”

He notes that changes in the weather ►

► and differences between batches of product can have a significant effect on the characteristics of a fertiliser, and therefore how well it spreads, and continuous weighing allows the machine to account for this.

“For example, a product might be more difficult to spread accurately early or late in the day due to increased air humidity. An integral weigh cell system accounts for this and adjusts the machine outlet accordingly to achieve the required application rate.”

KRM/Bogballe have recently introduced a new ‘Intelligent Control’ system for the Zurf controller on their M2W/M3W weigh cell spreaders — claimed to further improve spreading accuracy on sloping

ground. “It constantly measures and records the spreader position and movement to account for the effects of the additional forces created by slopes — maintaining the desired application rate accordingly.”

With demand for weigh cell technology now increasing from medium-sized farms, Bogballe has developed a smaller weigh cell-equipped spreader — the L2W— with a hopper size ranging from 1,150 to 2,050 litres. “The machine spreads up to 24m, and uses the same patented double shutter design as the larger models, with the disc drop-on point of the fertiliser remaining the same

— regardless of the aperture size.”

Four primary factors affect the way a fertiliser product will spread, says Phil Norman of Kuhn — which offers a weigh cell option on its Axis and Axera machines. “A fertiliser’s initial quality and age will obviously affect how well it spreads, but so too will the way it’s stored and transported.

“Without weigh cells, the information gleaned from a static calibration is purely theoretical — relating to the performance of a fertiliser sample at any given time. A calibration made in the morning can be affected not only by changing humidity, but also by varying product quality within a stack of fertiliser bags.

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'Weigh cell well worth it'



Before switching to a new weigh cell spreader, Michael and Ian Watson were having to fit a new variator and sets of vanes each year on their previous machine.

East Herts farming brothers, Michael and Ian Watson, use both solid and liquid fertilisers across their 720ha all-arable enterprise — their choice of nitrogen varying according to the price from year-to-year.

They've run a 24m KRM/Bogballe M2W spreader, equipped with weigh cells, for the past two years and reckon the extra investment of around £4,000 was well worth it at Greens Farm, Furneux Pelham, Buntingford.

Having used both solid urea and liquid fertiliser in recent seasons, they estimate the move has saved them around £60,000 in fertiliser costs.

"We use a Patchwork BlackBox connected to the spreader's Zurf controller for variable rate applications, based on the results from soil mapping using SOYL, and this has definitely had a bearing on our fertiliser costs," says Michael Watson.

They also prefer solid compound products, believing liquids are relatively expensive by comparison.

More direct savings come from the time advantages gained by using a weigh cell-equipped spreader, he continues.

"Not only have we cut out the time required for calibrating every day, we now have no need to change the disc vanes required for different fertiliser types.

"I still reckon the most accurate way to apply nitrogen is as a liquid via the sprayer, but the higher cost of the product plus the additional workload for the sprayer and the risk of scorch, mean we prefer to have the option to use solid fertiliser instead."

That's one of the main reasons the two men have stuck with a 24m tramline system as it makes them confident that — even when using urea — they're spreading to the full bout width.

"It's with urea in particular where the greatest value is to be had from a weigh cell-equipped spreader. The idea of buying in bulk doesn't really appeal as I like to keep machines away from handling fertiliser as much as possible — its corrosiveness is a problem on concrete as well as steel." He tries to buy good quality, bagged product wherever possible, he says.

Even so, humidity during the early and later parts of the day used to have a noticeable effect on the spreading capability of their old machine. We specified a weigh cell system on our new KRM/Bogballe because we wanted to improve our

"With each new batch of product, you simply email KRM for the recommended spreader settings according to the crush test.

"In work, you can see the Zurf controller in the cab constantly recalibrating the spreader to account for the effect the conditions are having on the fertiliser — I have to say that I've been impressed with its accuracy.

"There's very little fertiliser left in the hopper when the allocated area has been covered at the desired application rate.

As a rule, the farm's wheats receive a three-way split dose of nitrogen before an 18% liquid N is used on the ear for a protein boost. The first dose tends to be applied as a blanket amount, while variable rates are used for the second and third applications.

Although Michael Watson admits last year was one of the business's poorest harvests for a while, wheat proteins were still in the 12.5-13.1% bracket.

"With variable rate spreading, we're not making huge savings in the amount of fertiliser we use — but we are improving our application accuracy and putting it where it's needed most. Weigh cells are an important part of the equipment needed to do that accurately, and we've made significant savings on MOP and TSP applications.

"But even last year when the very dry spring meant the value of variable rate spreading was lower due to drought-stressed