

TAG test on Lemken VariTansanit plough:

One eye on the plough, the other on the tank

Looking to prove the advantages of its innovative VariTansanit semi-mounted plough, Lemken UK enlisted the independent services of The Arable Group to assess the design's productivity and fuel efficiency. Geoff Ashcroft watched the proceedings

At first glance, Lemken's innovative VariTansanit plough appears to deliver a significant advantage for those in search of more ploughing output.

The core principle is simple enough: Use clever electrohydraulics to give a semi-mounted plough the field characteristics of a mounted machine. Doing so reduces the need for a much more powerful and more expensive tractor just to handle that bigger plough's bulk.

Lemken reckons to have achieved exactly this result, by developing a nifty weight transfer system for what it describes as a hybrid plough.

A mix of semi-mounted and mounted, the VariTansanit is available in 6 and 6+1 versions, with variable furrow width and auto reset (profi 11/08). By attaching the plough to the three-point linkage using a pressure-sensing hydraulic top link, the company claims to have solved the weight transfer issue that has been missing from larger, semi-mounted equipment.

Rather than lift just the front of the semi-mounted plough using traditional lower link sensing, intervention of the VariTansanit's top link changes the working characteristics into that of a mounted plough when extra draft is required.

On demand, the top link automatically shortens and transfers more plough weight onto the tractor's rear axle, increasing grip, as if the implement were fully mounted. Yet at the headland, the top link extends and allows the plough to behave as a semi-mounted tool for

improved headland manoeuvrability and increased tractor stability.

The result, says the firm, is that lighter, lesser powered tractors – typically 140-210hp – can be used to handle the VariTansanit hybrid plough range, rather than the heavyweight tugs needed to operate a semi-mounted plough.

So, what's to stop anyone popping down the dealer and buying a hydraulic top link to do the same job on any plough?

"The VariTansanit's hardware and software required to give the plough these characteristics are far in advance of just adding a hydraulic top link into that extra spool valve service," says Mark Ormond, Lemken UK's general manager.

"Getting the best from the VariTansanit needs the tractor's linkage to be used in position control. Then the operator dials in a suitable working pressure through the plough's control box to determine



In-cab Solitronic control box needs top link pressure to be dialled in.

Lemken says its VariTansanit allows larger ploughs to be used on smaller tractors. In this instance, seven furrows are easily handled by 180hp.





The VariTansanit's hydraulic top link system controls how the plough's weight is applied to the tractor, in response to draft requirements.

how the top link reacts," he says. "And this is done in the field to suit specific soil and operating conditions."

Top link pressure is adjusted according to the level of draft required. Any variations are sensed via the Solitronic control box, which then causes the ram to shorten or lengthen accordingly.

If the electronics detect that the pressure pulling on the top link has dropped, the top link is shortened to bring the pressure back to the user's chosen value. This is said to maintain a constant force pulling on the top link – to keep a downward force on the tractor rear wheels when the plough is in work.

Solitronic also looks after the plough's functions and simplifies operator control, too. It takes information from a variety of sensors around the plough to control draft and, ultimately, depth.

In effect, the plough headstock link forms a flexible connection between the tractor and the plough when working normally, enabling the machine to follow contours and maintain an even ploughing depth.

But when sensors detect an increase in the draft forces, the top link shortens automatically and transfers weight to the tractor's rear axle.

Lemken likens the arrangement to operating a draft control system on the plough rather than on the tractor, but adds that depth of work is not affected by the weight transfer process.

The VariTansanit is also equipped with an auto headland management system, which assists the operator with machine control. A time-based

"We wanted to compare the 6+1 VariTansanit on a 180hp Fendt 718 with a fully mounted six-furrow EurOpal plough on the same tractor," says Lemken's Mark Ormond. "We then wanted to compare the VariTansanit system against an eight-furrow semi-mounted VariDiamant on a much larger and more powerful Fendt 924 – which would be needed to handle the semi-mounted plough."

Mr Ormond was also intending to determine fuel consumption and wheel slip, to establish a cost per hectare scenario for the three systems.

As all the ploughs were being fitted to the required tractors, Michelin technical specialist Peter Debenham ran each outfit over scales to measure axle loadings and calculate optimum tyre pressures and ballasting to achieve max tractive effort.

The tractor ballast, axle loadings and tyre pressures were recorded for each of the ploughing tests.



system, Lemken's headland management control is automatically activated when the rear of the VariTansanit is raised up using the Solitronic joystick. This instigates the process of raising and lowering the depth wheel and turning the plough bodies over.

All of this sophistication does, of course, come at a price. In seven-furrow tested guise, the VariTansanit lists at £35,790.

In the field

To carry out this analysis, Lemken called on The Arable Group (TAG) to independently conduct the tests as well as record productivity and fuel consumption.

The field tests were carried out over a two-day period at TAG's Norfolk research centre at Morley, where three Lemken plough systems were analysed working on two different field types following arable and root crop rotations.

Fuel monitoring tubes provided precise and easy recording of fuel consumption with each test.

