



Smart C Spray 124 automatically adjust rates to each nozzle location relative to how fast each section of the boom is travelling

Altek and LykkeTronic. The Smart C Spray 124:

Turning a corner

Sprayer boom turn compensation can now be offered with an ingenious auto nozzle switching system from Altek and LykkeTronic, giving you the option to work with a wider range of nozzles. Read on to see what else it does and how it works

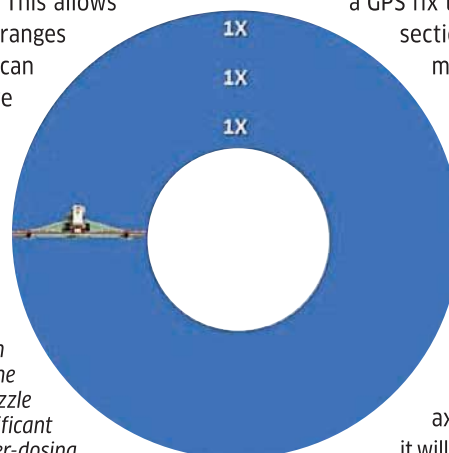
Getting a sprayer to deliver an even application is relatively straightforward when travelling in a straight line, but throw corners into the equation and the task becomes significantly more complex. The problem arises because of the differing speeds nozzles along the length of the boom travel when performing a turn. Those at the tip of the outer section can be moving at a considerable lick, while those at the end of the inner boom may be travelling so slowly that they're actually moving backwards. When a constant flow is delivered to every nozzle, this results in some significant under- and over-dosing every time the driver turns the wheel.

One system that helps solve this problem is Pulse Width Modulation (PWM). It adjusts the duration each nozzle opens relative to its position on the boom and it's becoming an increasingly popular option among sprayer operators keen to get a high level of accuracy. However, one of the downsides is that the system limits nozzle choice, including some popular drift-reducing air-inclusion options. Now operators have an alternative, which has been put together using technology from Altek and LykkeTronic. The Smart C Spray 124 system makes use of auto nozzle select technology - using multiple nozzle bodies -

and adds GPS positioning and some clever algorithms to make it work when cornering. The result is that the system will automatically change to a smaller or larger nozzle, or employ the services of multiple nozzles, to get the desired rate at each location. Cleverly, it will work out if any nozzles are travelling in reverse and these will be temporarily switched off.

Because chemical delivery is through conventional solenoid valves with electric over air actuation, the system has the added benefit of working with all nozzle types. Those with few corners to negotiate can opt for a simpler version of the system that only works in straight lines. This allows spraying at wide speed ranges where multiple nozzles can be employed to give accurate application at speeds of 20km/h or more.

Performing tight turns with a conventional wide sprayer boom can dramatically alter the speeds at which each nozzle travels, leading to significant under- and over-dosing.



How it works

One of the key components is a set of Altek's twin or quad bodies that allow the system to switch between nozzles or use two or more at a time.

The decision on which should be employed is made by LykkeTronic's software, which can be installed in its own 10in terminal (as used by Househam) or other brands via ISObus. Those using the in-house terminal also have access to the firm's NavGuide mapping software that works with multiple GPS systems.

In order to work out which nozzles should be employed at each location, the software uses a GPS fix to calculate how fast each section of the boom will be moving at a given time.

The first part of this equation is working out how tight the vehicle is turning. To do this, the system needs know the distance between the GPS antenna and the pivot point while turning. In two-wheel steer this will be the rear axle and in four-wheel steer it will be the centre of the chassis.

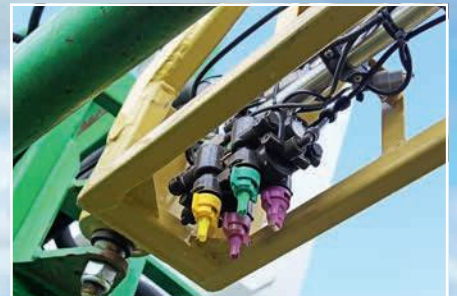
The system can be retrofitted to almost any sprayer or boom with minimal modifications required.

THE SHORT VERSION

- ▶ Turn compensation with auto nozzle select on twin or quad nozzle bodies
- ▶ Nozzle switching takes 0.2s
- ▶ Works with all nozzle types
- ▶ Minimal additional wiring
- ▶ Flow monitoring detects blockages
- ▶ Can run in any ISObus controller



Each pair of Altek quad solenoid nozzle bodies is controlled by a Lykketronic module that can switch between outlets in just 0.2s.



Any combination of the four nozzles can be engaged to give the right flow at any given time.





The system seems complex, but INC 2.0 controllers are simple plug-and-play units with flashing LEDs to highlight any errors in the setup.



Altek recommends using the system with its SBR 500 regulation valve to give precise adjustment of flow to the boom.



GPS and algorithms are used to calculate how tight the vehicle is turning and how fast each section of the boom is travelling in relation to that.

Once this has been established, algorithms use the forward speed of the vehicle to work out how fast each section of the boom will be traveling when performing a turn of this magnitude. Cleverly, the software then decides which of the nozzles fitted (or combinations of nozzles) will be most suitable at each location. It isn't capable of detecting nozzles automatically, so the operator keys in which it has fitted at each position - such as a 02, 025 and 03 at positions one, two and three on a quad body.

To avoid any errors in the setup, the system will alert the operator if these nozzle choices aren't suitable for the job. For example, if two nozzles don't give sufficient overlap at the selected speed and pressure range, an error will be displayed on the screen.

To save removing unwanted nozzles when changing between jobs, there's a box in the

programme for selecting which are active. This means a liquid fert outlet can be left in place, without affecting the nozzle switching process. Once the software has decided which nozzles it's going to use, the signal is sent to each body via one of Lykketronic's INC 2.0 modules. One of these units can control two nozzle bodies (up to eight nozzles) typically set at 0.5m spacings. However, other less conventional setups can be used, which might require different length leads.

Although the process of switching nozzles sounds convoluted, it all takes places in just 0.2s, so there is no discernible interruption to the spray pattern.

Pinpointing problems

The INC 2.0 modules use CANbus communication signals and this has the added benefit of being able to diagnose and pinpoint any errors in the

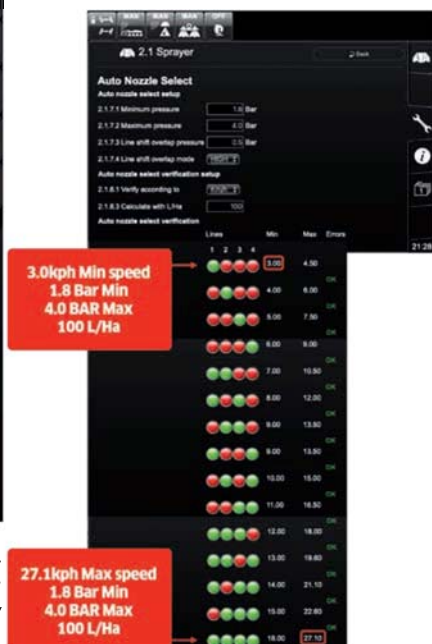
system. This means that if a cable or module gets damaged, the location of the error will be displayed on the in-cab terminal so that the operator can quickly find and fix it.

A pair of flashing LEDs on each module also show if they are working correctly. Handily, all of these modules are universal, so if one becomes damaged, a new one can be put in its place and it doesn't require any programming. The ability to report what's happening at each nozzle also gives the opportunity detect blockages. By adding Altek's line clamp flow meters to each body, the modules can spot any deviation in flow compared to other nozzles of the same size. If the deviation drops below a certain percentage, the driver will be alerted that there is a blocked or partially blocked nozzle at that location. This system is being sold as an optional extra and is called Nozzle Spy.

The last part of the puzzle is precise regulation that allows fast proportional adjustment of flow to the boom, which comes in the form of Altek's SBR 500 regulation valve.



Operators select which nozzles they would like to use for each task and the system will work out if there are suitable.



This setup shows that utilising all four nozzles can give a theoretical speed range of 3.0 to 27.1km/hr at 100 litres/ha in a 1.8 to 4 bar pressure range.

Operation

Once the system has been setup and configured, operators have three operating modes to choose from.

Manual allows conventional operation of a single line for jobs such as liquid fertiliser application, while Auto mode engages the conventional auto nozzle select system. This simultaneously switches all nozzles along the spray line according to the pre-set pressures. The final mode is Turn, which switches on the turn-compensating nozzle selection.

Although the inner workings of the system are deeply complex, Altek and Lykketronic have worked hard to make the interface as user friendly as possible. Other than selecting the correct mode and entering the types of nozzles fitted into the screen, the system will operate entirely automatically.

Installation

Installation is also fairly straightforward and simply involves attaching the nozzle bodies to the spray line and air supply and connecting the INC modules together like a daisy chain.

This means that no other wiring is required, other than a 12V feed from the battery and a lead back to the terminal.

To show the versatility of the setup, Altek has installed its demonstration system on a 2005 Househam Air Ride. Other than upgrading the regulator from a Ramsey to Altek SBR 500, the spray pack is entirely original.

Purchasing options

Altek plans to offer the system as a factory fit option with selected sprayer manufacturers and as a retro-fit kit. The primary fitter for these is S and K Sprayers in Alford, Lincolnshire, but other sprayer specialists will be able to install them.

Guideline prices for a 24m twin system with controller start at £25,000 and a quad version starts at £31,000.

James Andrews

Smart C Spray 124 can be used with LykkeTronic's own 10in terminal or any other ISObus compatible unit.



Quality, function, value and robust design.

The power to perform

Introducing the Kestrel S 5.7P Power Plus

This new model release of the Kestrel now takes this popular reach arm mower to a new level with increased power and additional features.



Tel +44 (0) 1789 773383
E-mail info@bomford-turner.com
Website www.bomford-turner.com

Proven Landscape Technology

Follow us

