

GPS-Switch with AutoPoint

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Fully automatic regulation of the headland shut-off times for seed drills including driver assistance system

At Agritechnica 2015, AMAZONE presents for the first time, the system function GPS-Switch with AutoPoint for seed drills. GPS-Switch with AutoPoint comprises of two subsystems, one determining the conveying time and the other, driver assistance.

In order to reduce overlap on headlands and in wedge shaped fields, AMAZONE introduced GPS-Switch, the fully automatic headland and part-width section control for crop protection sprayers and fertiliser spreaders, at Agritechnica 2005.

Again for seed drills, this automatic control was realised in 2013. For pneumatic sowing systems, however, the determination of the precise on/off times is more complicated than for fertiliser or crop protection applications. Depending on the seed delivery distance from the metering unit to the coulters there is a delay time between switching on the metering unit and consistent seed flow at the coulter. When switching off, it takes a certain period of time after the metering unit stops for the final seed to pass through the conveying distance and arrive at the coulter. Depending on the machine type and the flow property of the seed, this delay can last from 1.4 to 5.0 seconds which, at a forward speed of 14 km/h, means a distance of 5.4 to 19.4 m. Therefore the conveyance time for different seeds, depending on the machine type, is significantly important.

Therefore, for the perfect result of GPS-Switch during sowing, so far the teamwork in the laboratory to determine conveyance times has resulted in preview times that give an on and off switch time of the metering unit as well as the knowledge of the driver also being indispensable. The preview times indicated in the operator manual are guidelines and thus setting recommendations. Apart from the conveyance time, the forward speed and any subsequent heavy deceleration or acceleration in forward speed in the headland zone are influencing factors in that precise switch time. Up to now, the driver has had to optimise the pre-determined delay times by checking the seed bouts on the headland to avoid seed gaps or over-sowing. This,

however, includes various potentials for error, such as, for example, inaccurate distance measurement or inaccurate forward speed determination. In addition, this check is extremely time-consuming as the preview times for different seeds and, if necessary, changing blower fan speeds have to be matched and checked again. So, the objective is to offer the user an assistance system which minimises any potential errors and reduces the time taken to produce a perfect operational performance of GPS-Switch.

GPS-Switch with AutoPoint for seed drills is the logical supplement to give maximum stress reduction on the driver and to optimise results in the field. The new AutoPoint system automatically determines the delay time, i.e. the time between the starting or stopping of the metering system and the conveyance behaviour of the seed at the coulter. Seed flow at the coulter is determined via a sensor. In this way the system can determine, in relation to the switch times of the metering unit, the conveyance time of the seed through the machine. This happens constantly during every switch on or off of the metering unit. This value provides the basis for the automatic calculation of the switch points. In this way, even changes in the conveyance characteristics of the seed or changes in driving behaviour can be responded to. And that time-consuming manual check in the field is also avoided.

The function of automatic switching on and off on the headland is supplemented by the GPS-Switch driver assistance. A preview bar in the GPS-Switch overview shows the driver, depending on the forward speed, at what point the system will switch. A colour change of the bar, combined with an acoustic signal advises the driver to maintain speed from this time on until reaching or leaving the headland.

The main advantages of GPS-Switch with AutoPoint

Main benefits for the farmer of GPS-Switch with AutoPoint

+ GPS-Switch

- Automatic GPS-assisted control of the metering system without input from the driver
- Precise start and an exact stop of the sowing procedure on the headland to prevent overlapping or seed gaps
- In practice with pneumatic seed drills, the result to date is hardly ever 100 % satisfactory

+ AutoPoint automatic conveyance time determination

- The conveying times are automatically determined, manual measuring and set-up are not required

AutoPoint driver assistance system

- Preview seed rail to assist the optimum driving behaviour
 - Selection of the correct speed
 - Keeping a constant speed in the relevant zone

Potential applications for the new technology

- + GPS-Switch has been up to now common on sprayers and fertiliser spreaders as well as increasingly more and more on seed drills
- Disadvantages so far with sowing systems are many, partially variable influencing factors
- Preview values from the operator manual are pure guidelines requiring sophisticated matching in the field
- + Opportunities with AutoPoint
- With the aid of AutoPoint, GPS-Switch can gain a similar widespread appeal for drilling, the same as when used when fertilising and spraying

Operational and cost management

- + Saving of seed depending on machine type and field geometry
- + Fine-tuning the potential field performance of seed drills due to optimised switch points

Simplification of the drilling task

- + Removal of the need for time consuming measurements in the field in order to check the preview time against the reality
- + Reduction in driver stress whilst turning on the headland

Operational safety and environmental protection

- + Prevention of leaving dressed seed on the soil surface of the headland
- + Reduction in drift of seed dressing dust

Source: AMAZONEN-Werke H. Dreyer GmbH & Co. KG