

Unique concept recognised with prestigious prize

## Case IH autonomous tractor development takes silver medal in SIMA awards scheme

*Prize awarded by SIMA organization / Recognition of Autonomous Concept Vehicle's potential to make both machinery and labour more productive / Tractor based on proven Case IH Magnum drivetrain / Design focus is on safety and productivity with new styling to match.*



St. Valentin / Paris, 24 November 2016

Case IH has been awarded a silver medal in the Innovation Awards scheme of SIMA, the French international farm machinery exhibition, in recognition of the potential its Autonomous Concept Vehicle (ACV), a driverless version of the Case IH Magnum CVX tractor, offers for the advancement of agriculture. This innovative technology was first shown at the 2016 US Farm Progress Show.

Open to all show exhibitors, SIMA's Innovation Awards recognise new developments with design and features having the potential to offer significant user benefits. The silver medal for the Case IH ACV recognises the value of relieving operators from monotonous field operations, allowing that labour to be redeployed more effectively, and bringing the next step in precision farming efficiency.

"The need for this technology exists because in some parts of the world it's increasingly difficult to find skilled labour to work long hours on large farms during busy periods," says Dan Stuart of Case IH.

"This concept illustrates the commitment of our engineers to finding a solution, and as we progress its development we may see elements of its technology gradually integrated into existing equipment. Precision farming and machine automation are already taking on ever-greater importance in order to meet the need for more efficient, economic and environmentally-friendly agriculture, but at key times of the year long hours in the field are still required, especially when harvesting or establishing a crop."

The result of five years' development, the ACV helps meet this challenge, through the ability to make the most of ideal soil and weather conditions while minimising the need for unsociable hours.

"While auto-steering and telemetry are already available on today's tractors, autonomous technology takes this a significant stage further. Based on the existing Case IH Magnum high-horsepower

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conventional tractors, and using AccuGuide auto-steering supplied with Case IH RTK+ GPS for ultra-accurate guidance, the autonomous tractor concept has been designed to allow completely remote monitoring and control, with immediate recording and transmission of field data. The Magnum CVX was chosen as the base tractor for the ACV development because of the type of applications for which it is primarily used, such as planting and primary/secondary tillage,” explains Mr Stuart.

These large tractors are often used for pulling wide planters at high speeds, requiring skilled operation and long hours to make the most of weather windows. Autonomous operation puts less pressure on labour during those windows and makes maximum use of them, but the ACV can be seamlessly integrated into existing fleets, and aside from the driverless technology uses a standard engine, transmission, chassis and hitch/pto/hydraulic couplings.

Tractor operation begins by using a desktop or laptop computer to plot the most efficient field paths – autonomous technology is most suited to jobs that make this possible, such as cultivation, planting and spraying, and is equally applicable to smaller tractors, where it could be employed in mowing or orchard spraying, for example. Manual path plotting can also be carried out where required. The operator can then choose a job from a pre-programmed menu by simply selecting the vehicle, choosing the field and then setting the tractor on its task, a sequence taking little more than 30 seconds. Machine functionality is controlled through sensors which automatically govern engine start/stop, acceleration/deceleration, engine rpm, steering angle, transmission, pto, linkage and hydraulic services operation, differentials and horn.

Thereafter, the machine can be monitored and controlled via a PC or tablet computer displaying a fully interactive interface providing operating, monitoring and recording of machine data and images. A path-plotting screen shows the tractor’s progress, another shows the camera feed from it, providing the user with the same views as the vehicle, and a further screen enables monitoring and modification of key machine and implement parameters such as engine speed, fuel levels and implement data – seeding rate, for example. The route to the field can also be planned, should this involve negotiable private roads/tracks.

Case IH has worked with technology provider ASI to create the ACV safety package, using the latest infra-red, metal detection, radar, laser and video technology to ensure both third party safety and trouble-free working. Should the tractor detect an object in its path it halts and a warning appears on the owner’s computer, offering a choice of how the tractor should respond – by waiting for human intervention, driving round the obstacle or, in the event that it is an object such as a straw pile, driving onwards. Should something – for example, another machine – cross its path and continue moving, it will come to a standstill and move off again once its way is clear. Any loss of GPS signal causes the vehicle to stop automatically, and there is also a manual stop button on the control interface.

There is also the possibility for the tractor to use 'big data' such as weather records to make best use of ideal conditions by operating regardless of the time of day, and stopping automatically should it become clear changeable weather is going to cause a problem, before recommencing work when conditions have sufficiently improved. Alternatively, if on private roads it can be sent to another field destination where conditions are better – soils are lighter or there has been no rain, for example.

“While the ACV is currently a concept, product development is ongoing and the technology it incorporates is relevant and ready for real-world situations. We are following developments in autonomous vehicle regulations, and are developing the on-road element, as well as looking at optimising implements for autonomous application,” says Mr Stuart.

“The tractor has been demonstrated in the US working with a 16-row Case IH 2150 planter/precision drill fitted with liquid fertiliser system and full precision planting options, including DeltaForce coulter pressure control and electric drive V-set meters, plus Clean Sweep row cleaners ahead of each row unit. Although not sold in Europe, this the latest production Case IH planter and shows the ACV is able to provide a fully integrated tractor/implement solution. We've developed advanced seeding information sensors and software, draft monitoring and other implement software for performance supervision, and already have available systems such as tyre pressure monitors on current tractors.”

“And because autonomous tractors can be integrated seamlessly into current equipment systems, no other changes to a business or its assets are necessary. Autonomous tractor operation is suited both to owner-operator situations, where it could allow a person working with no employees to operate two tractors, or to very large businesses where finding good labour is increasingly becoming difficult. As the costs of key technology fall over time, we're likely to see gradual integration into current machines. Much of the technology required for autonomous vehicles, such as obstacle detection, is currently available, but at a relatively high price point. As those technologies are more widely adopted by car makers, we anticipate reduced costs.”

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