Autonomous Agricultural Machines

Dear Reader,

The world's population is growing dramatically. The UN has forecast that it will exceed 9.7 billion people by the year 2050. Feeding this huge population will require modern satellite-controlled machines that maximize crop yields. At the same time, they should cause as little damage to the environment as possible as a result of their emissions, soil compaction, etc. This will require completely new approaches that can be implemented only with the aid of smart technology.

Swarm intelligence could be one possible solution to these challenges. For example, in our interview on page 14, Peter-Josef Paffen describes the electrically powered autonomous robot called Xaver as “a disruptive development that will have a sustainable impact on agricultural technology and which will largely replace the tractor in its current form in performing certain tasks.” The battery-powered electric motor with an output of approximately 400 W, the low weight of around 40 kg, and the autonomous and low-noise operation enable planting to continue round the clock, seven days a week. The ground pressure – an important issue in agriculture – is almost negligible at approximately 200 g/cm². What is more, the robots require around 70 % less energy compared to planting with conventional machines.

In contrast to road-going vehicles, autonomous agricultural vehicles have been in practical use for a long time now. For example, vehicle systems with swarm intelligence are a common sight in the USA in summer. Often, several

combine harvesters are in operation at the same time on the vast fields. As soon as the grain tank of one harvester is full, the driver uses a tablet PC to summon an autonomous tractor with a trailer, which then waits to be loaded before driving automatically to the truck standing at the side of the field.

Personally, I find the Agco/Fendt solution with the “small” robots very attractive. Not only because they have very low noise emissions and are environmentally friendly, but also because of their safety aspect. The consequences of an accident with a 40-kg robot would be far less serious than with a much heavier tractor.

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