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HANDS FREE HECTARE

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Hands Free Hectare (HFH) was a project of precision farming led by researchers at Harper Adams University working alongside leading company Precision Decisions Ltd., which aimed to be the first in the world to use only drones and autonomous vehicles to grow and harvest a cereal crop over a hectare of land. Whereas previous projects had only automated part of this process, HFH sought the automation of the entire system using machines to grow the first arable crop remotely, without any humans stepping into the field. It demonstrated the field-to-fork food chain in operation.

The project partners succeeded in their aim of producing and harvesting a crop (barley) through entirely automated processes. They have gone on to plant and harvest a second crop, and the project has expanded into the ongoing Hands Free Farm, a 35-hectare farm which allows the HFH team to continue to develop and improve the technologies and outcomes.

The technologies include connected and autonomous vehicles (CAV) and drones.

Application scenario

Agriculture (arable farming). Producing and harvesting a crop (barley) through entirely automated processes

Digital technologies

Connected and autonomous terrestrial vehicles (CAV), aerial drones (UAVs)

Socio-economic impact

- Economic: Reduced labour costs, better productivity
- Environmental: Precision farming reduces chemical inputs. Smaller, lighter machines reduce soil compaction
- Social: Enabling time for other tasks on the farm, improved farm management, data access

More info: https://www.handsfreehectare.com/

https://www.handsfree.farm/

Implementing autonomous machines on the farm has the potential to be transformative for arable farms. Automation is touted as the future of farming for a number of reasons – reduced labour in rural areas, increased precision and production on the farm, decreased environmental impact and soil compaction through the use of a greater number of smaller and more precise machines. The use of automated vehicles and drones frees up time of existing staff on the farm, allowing them to turn their attention to managing data and fine tuning the automated processes. However, there is some concern that this could lead to lost jobs, and that the skills required to manage automated systems are not present in the sector, or hard to acquire. The project has made a worldwide impact, receiving attention in 85 countries, and has won multiple prestigious awards for innovation.

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Purpose of the tool

The purpose of the digital tools applied in the Hands Free Hectare (HFH) project is to automate the processes involved in planting, growing and harvesting arable crops on farms. Automation is argued to be the future of farming due to a number of benefits – it frees up labour on the farm to be concentrated in other areas, it reduces the environmental impact due to a number of smaller machines taking the place of larger ones which can compact the soil, and automation can improve precision leading to reduced inputs. Hands Free Hectare aimed to harness these benefits whilst developing an automated system with optimal outputs.

Description of the tool

Hands Free Hectare is a system of automated digital tools applied in arable farming. These include connected and autonomous vehicles (CAV) (e.g. a small combine harvester) and drones which improve the navigation and interaction of tractors, to complete more technically-challenging tasks. The stakeholders relevant to the project include companies developing precision farming technologies, as well as farmers considering taking up automated technologies to improve or innovate their farming practices. The project was developed due to an increasing interest in automation as the future of arable farming, and a need to develop systems which harness the benefits of automation whilst producing optimal outputs on the farm.

Areas of socio-economic impacts

Social	The tools can reduce heavy workloads for farmers and their staff, freeing up time to work on other areas of the farm – this might include working with the data and the automated systems to understand and improve their efficiency and outputs.
Economic	The system provides reduced labour costs, and improved outputs through more precise farming practices.
Environmental	Smaller, lighter and more precise machines are able to reduce chemical inputs. They reduce environmental impact and compaction of the soil.