

Octocopter to monitor crops

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The octocopter is a standard 8 rotor battery powered unmanned aerial vehicle, as typically used in the film industry. Four cameras have been added, two of which at any time can give a live feed of their picture to a monitor on the ground.

Credit: Rothamsted Research

Rothamsted Research has obtained a high performance radio remote-controlled octocopter equipped with four distinct cameras, thanks to funding from The Biotechnology and Biological Sciences Research Council (BBSRC). The custom-built equipment will enable high-throughput collection of data from experimental crop plots at each of the

Institute's sites as well as at collaborating organisations' trials. Collection of data with this method will give unique perspectives on crop growth and plant functioning, and will vastly extend capabilities for screening crops of different genetic background for performance, nutrition, stress, pathogen and disease responses.

The UAV is an octocopter, a standard 8 rotor battery powered [unmanned aerial vehicle](#), as typically used in the film industry. Four cameras have been added, two of which at any time can give a live feed of their picture to a monitor on the ground. One [camera](#), which can take videos and stills is on a fixed mounting, pointing forwards, and is used to identify where the camera is flying, via goggles. The other three cameras are all mounted on a stabilized platform which can be tilted remotely from the transmitter, and comprise a high definition RGB camera, a thermal infrared camera and a hyperspectral camera.

A BBSRC spokesperson, said: "World-leading bioscience needs state-of-art equipment. This new octocopter will offer unprecedented information on crop growth helping to keep the UK at the forefront of agricultural research."

Dr Malcolm Hawkesford, lead scientist of the 20:20 Wheat Programme at Rothamsted Research said: "We are very excited to have been able with the support of the BBSRC to obtain this unique equipment. The UAV will be deployed over the full range of crops studied at the institute and will enable detailed evaluations of growth and functioning of the plants. It will enable multiple measurements to be made within a short space of time with pre-programmed low level flight paths. It is anticipated that many thousands of plots will be monitored sequentially or in parallel in blocks in projects currently screening germplasm variation amongst thousands of lines combined with multiple treatments and replications".

Professor Maurice Moloney, Director and Chief Executive of Rothamsted Research said: "I am delighted that here at Rothamsted we continue to advance our capacity to carry out high quality research that will provide solutions to pertinent issues of food security. This is the first time that an [agricultural research](#) organisation in the UK has obtained an UAV equipped to this standard. The technology will substantially increase throughput and precision of analysis, and make a substantial contribution to current programmes of crop improvement including 20:20 Wheat®, Cropping Carbon, Sustainable Systems and the cross institute WISP (Wheat Improvement Strategic Programme) project. The technology will compliment ground-based measurements initially but eventually aerial-based observation will replace the need for low throughput non-automated manual measurement.

Provided by Biotechnology and Biological Sciences Research Council

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