



Harper Adams  
University College

# Precision Farming – Agricultural Engineering in the 21st Century

Prof Simon Blackmore  
Inaugural Lecture

NOVEMBER 2012

# Precision Farming – Agricultural Engineering in the 21<sup>st</sup> Century

Prof Simon Blackmore Inaugural Lecture

Delivered on November 27<sup>th</sup> 2012, Royal Academy of Engineering, Carlton House Terrace, London SW1Y 5DG

In the prestigious setting of the Royal Academy of Engineering, London, Professor Blackmore, Head of Harper Adams University College's Engineering Department, delivered his inaugural lecture to a packed audience of invited guests. He spoke passionately on his chosen subject for the lecture, Precision Farming and Agricultural Engineering for the 21<sup>st</sup> Century. He began by recounting some of his earlier experiences in agricultural engineering, taking time to define the nature and role of agricultural engineers in tackling world food problems. He drew attention to the consequences of increasing demands for food worldwide and the impact of climate change on Europe's production potential. Then to his project work relating to future food and farming and the work of the Institution of Agricultural Engineers (IAgrE) in producing a report on Agricultural engineering as a key discipline in enabling agriculture to deliver global food security (Report downloadable from [www.iagre.org](http://www.iagre.org) ).



Taking both a world view and a UK view Professor Blackmore pointed to the need for greater consideration of agricultural engineering by policy makers, but recognised that good political and commercial support is now beginning to appear. With this need for further recognition Professor Blackmore introduced the plans for the Harper Adams-based National Centre for Precision Farming (NCPF), based upon the £3 million funding that the University College has received to provide a new building for the initiative. He spoke of the importance of this venture in helping to fulfil his vision for helping farmers make better decisions through:

- 1) developments in farm management information systems, good practice and strategies and use of better, real-time information
- 2) the use of ICT to improve production efficiency through improvements in current machines and the development of new, smart machines.

Smart machines and systems became the focus for the remainder of the lecture, opening up that vision for the future in a stimulating and thought provoking consideration of issues relating to current trend and limitations in vehicle mechanisation, leading to the identification of new requirements, design factors and a systemic approach to designs for the future. While recognising complexity in the model being proposed Professor Blackmore also recognised the foundations for tackling that complexity and the need for lateral thinking in approaching farming problems. Here on Professor Blackmore focused on his particular passion relating to agricultural robotics and the particular problem areas in which robotics could be seen to offer a significant and beneficial platform for solutions.



Soil compaction, trafficability, and seeding were seen as particular areas of concern in which robotics can be seen to offer an approach to radical, cost-effective solutions. So too with the use of robots for scouting and plant care (including context modelling and exploiting media-based modelling techniques) and particular attention to precision weeding and spraying wherein suitably equipped robots, supported by accurate GNSS (Global Navigation Satellite Systems) positioning systems, could deliver spray to plants on an individual basis (each plant effectively identified through its position). Weeding using low energy lasers was also seen as a precision approach that could exploit the individual identification of plant position. Video clips of these techniques demonstrated that the future in these respect could be seen here and now.

Professor Blackmore went on to consider the role of robots in selective harvesting, harvesting and re-harvesting according to particular criteria, including for example, customer product requirements on

size and condition and concluded by recognising that agricultural engineering and precision farming can and will make the bio-production processes more efficient and will have a major impact upon food sustainability in the UK, Europe and prospectively the world. Recognising too that the UK is in a strong position to develop and commercialise new technology systems.

The lecture slideshow is downloadable as a PDF from: [www.harper.ac.uk/xgph](http://www.harper.ac.uk/xgph)