

The  
National Centre  
for Precision Farming



Precision Agriculture  
Precision Livestock Farming



Harper Adams  
University College

On the world stage, the terminology has been in existence for nearly 25 years. But as a practical farming method, precision agriculture has been relatively slow to catch on in the UK, despite Britain leading much of the early technological development.

The National Centre for Precision Farming aims to change that. Based at Harper Adams University College, in Shropshire, the centre provides a bridge between the theory and practice of agricultural techniques that many believe are vital if sufficient production of the world's food is to be sustained.

### Managing the variables

Most farms deal with averages rather than specifics because farmers don't have the wherewithal to apply precise techniques. Farmers tend not to have the information they need in enough detail to be able to understand all the variables. For example, if parts of a field are not yielding as well as the rest they may realise there is a problem but may have to treat the whole field rather than just the parts that are deficient. This is where the Centre steps in.

In crop production precision farming has two main aspects. The spatial deals with issues such as soil types, and levels of crop yield. The temporal is about the weather – is there too much or too little rain and which crops respond best to different conditions.

A variation in any of these events can set back the whole process because growing a crop is not a linear exercise. Precision farming aims to make the whole crop production process more efficient, so farmers can grow the amount of crops to a higher quality, for less.



The National Centre is of significant benefit in helping policy-makers and the wider public recognise the vital contribution made by the agricultural engineering sector to future food production.

Roger Lane-Nott  
Chief Executive of the AEA



Harper Adams is uniquely placed in the UK as a school of agriculture with an engineering department and commercial farming practice alongside its teaching and research. This makes it the ideal home of the NCPF now that precision livestock farming is globally recognised as vital to future food supply.

Hugh G Crabtree  
Director, Farmex Ltd



### The role of the Centre

The Centre has two main roles. On the one hand, it promotes and evaluates the use of technology as a vital aspect of precision agriculture, building upon the university's reputation as an innovator in the field of engineering. Its work in the area of robotics in crop scouting and dairy production, for example, is already well-known in the agri-food sector. It has also developed automatic steering systems which use GPS, and can measure to within an accuracy of 2cms which sections of the field have been sprayed, resulting in less chemical wastage.

Using new technologies in this way can help improve and reduce the cost of food production by targeting inputs - doing the right thing, at the right time, in the right location. This is beneficial to both the bottom line as well as for the environment, as it aims to make the production process more efficient.

In arable farming, the concept reduces the size of management zones from farm, to field, to sub field areas. In livestock, the obvious management unit is each individual animal. By utilising smarter machines it is also possible to improve the delivery of information to support better decision making.

The Centre's second role is to provide a focal point for the industry; offering a place for agriculturalists to meet and source information, and gathering and disseminating good practice from within the UK and abroad. To achieve this, it has recently recruited experts in the fields of controlled traffic management, mechatronics and hydraulics.

### Networking and support for the industry

The Centre is inclusive, non-competitive, and used for networking, passing on of information and bringing people together. Its aim is to point farmers in the direction of someone who can help them with specific problems. It also puts on short courses and conferences on precision farming and offers links to centres doing similar work overseas.

Precision farming is still an up-and-coming practice in agriculture in this country and some people are still sceptical. But the early practitioners used technology which is now employed in mainstream agriculture, and many farmers have modified their techniques because of what they've learned by adopting some aspects of precision farming.

The National Centre is a much-needed resource. While farmers are expected to produce more food, there is a growing recognition of the need to protect soils, manage water and nutrient availability, and improve animal welfare.

### Harper Adams University College – ideally placed

Harper Adams is ideally placed to host this new initiative because of its academic record in agricultural higher education, its strengths in applied research and knowledge exchange and its links with the industry and organisations such as the Institution of Agricultural Engineers and the Agricultural Engineers Association.

In discussion with the Agricultural Engineers Association, the recently formed AEA Precision Farming Forum works with the National Centre to promote knowledge transfer and assist networking.



## Open forum

As new technologies are developed an open forum is being provided by the Centre to critically assess and promote suitable methods for commercial exploitation. Current issues include, for example, compatibility between different ISOBUS (the new communication standard between tractors and smart implements) equipment providers and data exchange formats.

## Collaboration and partnership

The Centre aims to promote collaboration between universities, the agricultural engineering industry and the food and farming sectors, and provides the means to contribute, in this field of expertise, to other collaborative agri-food networks. The focus is on how advanced technologies can be employed to help increase food production, whilst minimising inputs and reducing the carbon footprint of the agri-food chain.

Harper Adams runs the only undergraduate degrees in the country in agricultural engineering, which produce engineers to design and deliver this vital but under-recognised aspect of the farming sector – covering everything from tractors and combine harvesters to spraying technology.

The agricultural engineering industry is increasingly joining up mechanical systems with electronic solutions in arable production, but more needs to be done to get these techniques in front of a wider audience. The Centre also covers livestock production, which has been slower to develop technologically than crop-based precision farming. There are now technologies, for example, that could help improve animal welfare by better monitoring feed intake and informing the farmer, remotely, about what is going on inside the animal. The Centre brings all of these new technologies and practices together, and provides a unique contribution to the UK's efforts to tackle the global challenge of food security.

## Harper Adams University College

Harper Adams has a reputation for excellence and innovation. Its Shropshire campus offers state-of-the-art facilities for research and knowledge transfer and courses for undergraduate, postgraduate and lifelong learners in agriculture, agribusiness, animal, engineering, food, rural and land-based studies.

[www.harper-adams.ac.uk/ncpf](http://www.harper-adams.ac.uk/ncpf)



More needs to be done to bring advances in technology and innovation to a wider audience in the agri-food sector – the Centre does this.

*Dr David Llewellyn  
Principal of Harper Adams University College*



The agricultural industry needs a facility where research can be carried out in a secure and risk-free setting, where lessons will be learned and applied across the sector.

*Professor Richard Godwin  
Chairman of the Douglas Bomford Trust*



**Harper Adams University College**, Newport, Shropshire, TF10 8NB  
Tel: +44 (0) 1952 820280  
Fax: +44 (0) 1952 814783  
Email: [ncpf@harper-adams.ac.uk](mailto:ncpf@harper-adams.ac.uk)



**Harper Adams**  
University College