

## IMPACT FACTS



- It is estimated that more than 10M tonnes of synthetic nitrogen fertiliser is wasted annually in China.

# Precision agriculture for family farms



**PAFiC: Precision Agriculture for Family-farms in China.**

**PROJECT LEAD** Newcastle University



Professor Zhenhong Li demonstrating the PAFiC project to Madam Liu Yandong, Vice Premier of China

“In PAFiC, the UK and China joint team have developed and implemented a range of agri-technologies, and have been working closely with local governments and farmers to translate research findings into best practices for environmentally and profitably sustainable production on commercial family farms in China.”

Project Leader, Professor Zhenhong Li, Newcastle University

## PROJECT SUMMARY

Unsustainable increase in synthetic fertiliser use in China has occurred against a backdrop of rapid social and economic change. Novel precision technologies designed to assist reduction in agricultural inputs must be appropriate and affordable to the average smallholder farmer.

This collaboration aims to improve the use efficiency of nutrients and agri-chemicals in crop production in China, by addressing key technological, agricultural and socio-economic barriers to the use of precision agriculture methods in commercial family farms.

### SOLUTION

In promoting optimal use of agricultural resources, such as chemical fertiliser and water, the project will develop appropriate technology and data sources for agricultural decision making at the smallholder scale. This includes application of advanced hyperspectral cameras, satellite imagery, especially novel radar imaging systems, and improved technology for precise spatial positioning within fields. These methods will be combined to

provide frequent and detailed spatial information on crop health and soil condition.

These novel methods will be tested on exemplar farms in China, covering a range of geographic regions and crop systems that have been established in previous research projects. A key feature of the project is research on the societal and economic barriers to uptake and use of these technologies. Lessons learned will be applied to maximise engagement from a diversity of community and industry members, and the optimal use of the agri-technologies and precision agriculture methods by smallholder farmers.

### PROJECT IMPACT

By working closely with local farming communities, validating specific requirements and ability to exploit new technology, the project will overcome social and economic barriers to uptake. This in turn will help reverse the trend in use of harmful chemicals and promote sustainable methods of soil and water conservation.

### UK PARTNERS

- Project Leader, Professor Zhenhong Li, Newcastle University
- FERA Science Limited
- RAL Space
- AgSpace Ltd

### CHINA PARTNERS

- China National Engineering Research Center for Information Technology in Agriculture (NERCITA)
- Beihang University

### IMPACT FACTS



Newcastle University developing a **Precise Point Positioning (PPP) GNSS application** that removes need for RTK reference networks. **Reduces capital cost to farmers and ongoing operational costs. Allows precise positioning application where RTK networks do not exist.** Newcastle University are in discussion with a local Chinese company to roll out a commercial product.