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# Learning from farmer-led research

**Tom MacMillan** wants to see more agricultural research led by farmers. Why isn't it the norm, and what can be done to redress the balance?

Farmers are in high demand. They are the subjects of farm business surveys, and host variety and product trials, as well as being customers or end-users of countless research results. Yet it is unusual for farmers to be in the driving seat, setting the questions and getting centrally involved in research design and analysis. Farmer-led research of this sort is the exception, but it has huge untapped potential.

## Why farmer-led?

Why have farmers at the centre? First, for accountability. Much public research is done in the name of farmers, with grant applications setting out the potential business benefits, without so much as asking a farmer what they think. There is a growing focus on funding projects with 'impact' and including partners outside research institutions, but the scrutiny of claims that projects will have an impact is relatively weak and those partners are rarely farmers.

Second, to boost innovation. Practical innovation by farmers has been central to the development of modern agriculture and continues to play a vital role in the development of key practices and systems such as minimum tillage. Some farmers do their own R&D - reviewing the literature, trialling new approaches, piloting - if usually without the level of rigour and resources that scientists can bring to bear. Social scientists and policy makers have developed 'systems' models of innovation that recognise the process is non-linear, disruptive and path-dependent, rather than a straight line from 'Eureka' to the field. Research funding has yet to catch up, with most farmers feeling remote from the 'applied' research projects that are supposedly

designed with them in mind.

Even by the least imaginative measures, policies to drive agricultural innovation are struggling. Yields of some key crops like wheat have plateaued despite being a key focus for public and private investment.<sup>1</sup> The fact that yields in trials have continued to rise suggests the research is irrelevant to what farmers are doing on the ground.

Third, there's more to farming than yield, and innovation is not one line along which we just travel slower or faster. Having farmers at the centre changes the aims and focus of research. Much applied agricultural research investment - public as well as private - is premised on the hope of a commercial return to the investor. So, a lot goes into things farmers will ultimately buy, such as new breeds and varieties, medicines, pesticides, fertilisers, machinery and software.

By contrast, all else being equal, the ideal solutions for farmers are free of charge, available year after year, and adaptable. The public return on these kinds of R&D investment is indirect, through the agricultural economy and ecosystem services. But it is potentially more valuable and more sustainable than investing in new stuff to sell to farmers.

## International and UK experience

The recognition that farmers are innovators has informed a number of approaches to supporting agricultural innovation in international development. One of the best-known methods is the Farmer Field School (FFS). More than 10 million farmers have taken part in FFSs across Asia, Africa and Latin America.<sup>2</sup>

The UN Food and Agricultural Organisation set up the first FFS in 1989, in Indonesia. Extension staff were

working with very poor smallholders who could not afford inputs such as pesticides. They helped farmer groups to identify pests and predators, study their lifecycles, and develop practical strategies to manage the pests' natural enemies. This was innovative integrated pest management, and hands-on, basic research, born out of necessity.

Although a 2014 meta-analysis of 71 FFS evaluations found that farmers' experiences varied widely, in targeted initiatives participants gained knowledge, changed practices and consequently netted higher yields and incomes.<sup>3</sup>

A growing number of UK initiatives support participatory and peer-to-peer approaches to farmer learning. However, their focus has generally been on the exchange of existing knowledge and best practice (e.g. through benchmarking) rather than deliberately supporting experimentation or helping farmers develop novel approaches.

Some UK initiatives have directly supported farmer R&D and innovation, including: 'stable schools' that helped peer groups of dairy farmers to reduce antibiotic use; projects by producer organisations, especially in horticulture; and sector-specific innovation networks run by institutes or advisory businesses, such as NIAB-TAG and Kingshay. They have generally been sector- or topic-specific and, in some cases, the results are restricted to the farmers and growers involved.

A new wave of initiatives is expanding the scope and scale of farmer-led research in the UK. The most extensive is the Innovative Farmers network that we coordinate at the Soil Association. Others include Rothamsted's Farmlnn programme, the network of 'satellite

farms' being developed by the Agricultural Engineering Precision Innovation (Agri-EPI) Centre, and the European Innovation Partnership for Agricultural Productivity and Sustainability (EIP-Agri).

### Emerging evidence from UK initiatives

The EIP-Agri deliberately supports innovation by farmers, providing a mechanism for governments to fund 'operational groups' through the Rural Development Programme.

Defra and the Scottish and Welsh governments opted to implement the EIP-Agri. The initiative has experienced teething problems across the EU, including bureaucratic application processes, confusing eligibility conditions, requiring one party in a group to carry the financial risk and expecting groups to front costs, all of which have hindered progress. An EU-wide evaluation of the EIP-Agri praises it as a pioneering initiative but highlights that there is still much to learn in effectively implementing this kind of practical innovation support.<sup>4</sup>

Innovative Farmers has been in action longer than the EIP-Agri. It is part of the Duchy Future Farming Programme, principally funded by the Prince of Wales's Charitable Foundation. It is coordinated by the Soil Association, with LEAF, Innovation for Agriculture, the Organic Research Centre and Waitrose. Sponsors include the BBSRC, AHDB, Anglia Farmers, Buccleuch, Produce World Group, Riverford and Robin Appel.

It is a not-for-profit network that gives farmers and growers research support and funding on their own terms. At the heart of the initiative are farmer groups running 'field labs'. The network provides facilitation, administrative support, collaboration tools, research support and micro-grants.

Since the pilot phase began in 2012, around 1,000 farmers have taken part in field labs on over 50 topics, and over 5,000 farmers have taken part in the programme's wider knowledge exchange (KE).

The field labs are getting results. Findings range from how to reduce antibiotic use in dairy to ways farmers can improve soil health and reduce pesticides. This is already

changing farming practices. The latest independent evaluation by the Countryside & Communities Research Institute found that nine out of 10 farmers involved would recommend it to others and half had made or planned changes to their farming system.

The findings are shared through a web portal ([www.innovativefarmers.org](http://www.innovativefarmers.org)), farm walks, webinars and conferences. The network also reaches wider through the farming press, a key source of technical and business information for farmers throughout the industry. Innovative Farmers' reach last year of 1.9 million meant that, on average, every UK farmer would have heard about the field labs about half a dozen times.

### Development opportunities

As the UK prepares to leave the EU, farming is set to enter a period of transformation driven by changes in trade, markets, labour and support payments. To weather this change, and make the best of it, farmers will need to innovate. Opportunities to support them in this through farmer-led R&D include:

**Advancements in data collection and analysis.** Developing research designs and analytical techniques that suit farmer-led R&D is an important methodological challenge for scientists. One example is the **Agronomics** project led by ADAS, which is developing new statistical approaches to detect small treatment effects in real-world situations.

**Targeting farmer-led projects with research funding.** Only a small fraction of the UK's public agricultural R&D investment – perhaps as little as 1% – supports practical projects led by farmers. Significantly increased, it could transform farming. For example, allocating £35 million per year (10% of agricultural R&D investment) would support around 500 substantial farmer-led projects at any time. Because much of this investment would ultimately go to researchers to take part in projects developed by farmers, there would be little net effect on public funding for research institutions.

**Rewarding researchers for practical research.** Researchers currently

depend primarily on their publication record for career advancement, notwithstanding the growing attention to 'research impact'. Measures that could help recognise, celebrate and reward scientists who support farmers effectively include: an awards scheme with prize funding for researchers working on farmer-led projects (similar to wider innovation awards run by the research councils); training to help researchers work effectively with farmer groups; and involving farmers and other practitioners more in reviewing research grant applications.

### Investing in innovation support services.

Experience shows that farmer-led innovation projects benefit from professional support. This can include: facilitation and project management; research advice to design and analyse trials or other types of research; and communication to ensure the learning is shared widely. Innovative Farmers is an example of an innovation support service. The EIP-Agri has a facility to develop 'innovation support services' to provide such support, which is being implemented in Wales and Scotland, but not yet in England.

**Connecting farmer innovation projects better into KE networks.** AHDB is leading efforts to coordinate the UK's KE landscape, so farmers find it easier to obtain the solutions and advice they need. Innovation support services such as Innovative Farmers need to link effectively into this KE activity.

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- 1 Grassini, P. et al. (2013) Distinguishing between yield advances and yield plateaus in historical crop production trends. *Nature Communications*. 4, 2918.
- 2 Waddington, H. & White, H. (2014) Farmer Field Schools: From Agricultural Extension to Adult Education. *International Initiative for Impact Evaluation*.
- 3 Waddington, H. & White, H. (2014) Farmer Field Schools: From Agricultural Extension to Adult Education. *International Initiative for Impact Evaluation*.
- 4 Coffey et al. (2016) Evaluation study of the implementation of the European Innovation Partnership for Agricultural Productivity and Sustainability.