Final Project Summary

Project title	Improving the sustainability of phosphorus use in arable farming – 'Targeted P'		
Project number	RD-2007-3454	**Final Project Report**	PR569
Start date	August 2010	**End date**	July 2015
AHDB Cereals & Oilseeds funding	£200,000 plus an extension of £1,428 from HGCA (now AHDB Cereals & Oilseeds) and £50,000 from the Potato Council (now AHDB Potatoes)	**Total cost**	£1,544,330

What was the challenge/demand for the work?

To reduce depletion of finite global phosphorus (P) supplies, to reduce or prevent environmental degradation (especially of rivers and coastal waters) due to phosphorus losses from arable land, and to improve the economic benefits of using phosphorus fertilisers.

How did the project address this?

A collaboration between 17 partners from government, industry and academia explored whether and how to change to a more efficient and sustainable strategy for P use on UK arable land. We used (i) a review, (ii) experiments on crop performance and P run-off, both in pots and the field, and (iii) modelling to explore how the farming industry might make the transition to this new approach, dubbed 'feed the crop, not the soil'.

What outputs has the project delivered?

In a review of 77 pages, several refereed scientific papers and a final report of 194 pages we showed that soil P reserves could be run down and crop productivity maintained if P fertilisers and monitoring techniques were more efficient. Although techniques for improved efficiency were demonstrated, improvements were insufficient to enable immediate adoption of the new 'targeted P' strategy. Given the environmental imperatives for change, a roadmap was laid out for progress towards the new strategy, including development of new fertilisers, manure processing, and monitoring of crop P status.

Who will benefit from this project and why?

Given impending challenges to agricultural impacts on water quality, this project's outputs provide the farming industry with much improved evidence to support and defend its current strategy for P use, whilst showing the actions that it can take to develop and adopt a more efficient strategy. If the farming industry accepts the project's recommendations, the project will enhance market opportunities for new innovative products and techniques to be developed by the crop nutrition industry.

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If the challenge has not been specifically met, state why and how this could be overcome
This project achieved its aim of setting out an agenda towards adoption of a new strategy for P fertiliser use. Industry can immediately adopt some changes; for example wider use of P fertiliser placement and of crop P monitoring. However, a need for further research was always envisaged, and initial steps are already being funded by AHDB, specifically to support better interpretation of soil P analysis and to deduce the reliability with which fertiliser placement improves crop recovery of fertiliser P (through the Cost-Effective P Project). The scale of the task of changing to a new P nutrition strategy is such that further specific projects will be required e.g. to build confidence in interpretation of crop P analysis, to protect available P applied as fertiliser from soil fixation, and to improve and demonstrate effectiveness of P seed dressings.

Lead partner	ADAS
Scientific partners	SRUC, Bangor University, University of Southampton, University of Newcastle-upon-Tyne
Industry partners	Verdesian, Carrs Fertilisers (Origin Fertilisers), Omex Agriculture, Virotec Europe, Severn Trent Water, Ostara Inc., Agrivert Ltd., Michael Payne (environmental consultant).
Government sponsor	Defra