

Results of competition: Agri-Tech Catalyst Early Stage Feasibility Award - Round 1

The Agri-Tech Catalyst competition is co-funded by the Technology Strategy Board, the Biotechnology and Biological Sciences Research Council and the Department for International Development.

Note: These proposals have succeeded in the assessment stage of this competition. All are subject to grant offer and conditions being met.

Participant organisation names	Project title	Proposed project costs	Proposed project grant
Adas UK Limited (lead) J Sainsburys plc; University of Manchester	WheatScan: Tractor-mount sensing for precision application of Nitrogen and control of milling wheat protein content.	£252,448	£206,965
Project description (provided by applicants)			
<p>The project brings together agronomy research, on rapid protein assays for milling wheat, with engineering of photonic sensors, image recognition & mechatronic systems. The ultimate goal is to deliver a tractor-mount scanning unit for autonomous mapping of protein content across wheat fields, to a spatial resolution better than 2 square metres at full field application speeds (17km/hr) for precision application of nitrogen (N). N is the primary input cost and 80% of the carbon footprint, in milling wheat production, however it is over applied in 3 out of 4 cases. This system will enable growers to dynamically map protein distribution in the crop canopy so that all areas attain the threshold 13% protein content. The Sainsbury's 'Camgrain Consortium' of 500 growers will act as early adopters for the retrofittable system, which will incorporate emerging technologies in high-speed infrared photonics, steered on a miniature robotic gimbal through rapid embedded image processing.</p>			

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Cambivac Limited (lead) Moredun Scientific Limited	Development of novel attenuated PRRS vaccine and disease model.	£235,950	£176,963
Project description (provided by applicants)			
<p>PRRS is widely regarded as the most economically important disease in swine, estimated to cost global swine producers in excess of £1billion per annum in production losses alone. These losses are largely the result of a failure to develop and deploy effective vaccines. Cambivac aims to produce vaccines that more effectively control the disease and can respond rapidly to emerging threats. We believe the technology under development collaborating with Moredun in this study, ultimately deployed towards effective PRRSV vaccines could derive substantial earnings for the UK animal health industry and be an important tool to combat the challenges posed by PRRS disease</p>			

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Royal Holloway, University of London (lead) Germaines Technology Group UK	Novel biomaterial engineering technologies, molecular and hormone analyses to improve lettuce seed priming and production in stressful environments	£404,648	£330,200
Project description (provided by applicants)			
<p>Seed priming is conducted by seed technology companies improve the quality of vegetable seeds including lettuce. Primed lettuce seeds provide alleviated dormancy, fast and uniform germination, followed by sturdy and uniform seedlings to ensure improved primary leafy salad crop production even in stressful environments. In this multi-disciplinary collaboration project between Germaines Seed Technology (Norfolk, www.germains.com) and the seed science lab at Royal Holloway University of London (RHUL, Prof G Leubner and Dr T Steinbrecher, www.seedbiology.eu) we will use novel biomaterial engineering technologies, growth imaging and molecular/hormone analytics to provide innovative diagnostic tools which will enable to further improve the lettuce seed priming process. The feasibility and commercial potential of these novel agricultural technologies will be explored with the vision to further improve priming, plantlet raising and primary crop production of leafy salad.</p>			

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Saturn Bioionics Limited (lead) University of Manchester	SaturnSense Hydrofeed: In-line sensing of the full composition of nutrients for precision management of hydroponic farming	£299,659	£261,944
Project description (provided by applicants)			
<p>The project will deliver the prototype of a new in-line sensing technology for smart real-time management of the nutrient composition within intensive hydroponic, aeroponic and aquaponic farming. The emergence of new growing protocols and batch production techniques, from the process sector, have positioned this approach at the forefront of UK horticultural and exotic fruits production, both reducing the UK's requirement to import such produce and offering category managers a flexible production facility to meet changing consumer preferences. This business proposition exploits emerging materials and sensor engineering to deliver an appropriately costed in-line unit capable, for the first time, of monitoring & closed-loop control of the individual major nutrients, notably N, P, K, S & Ca. By integrating this with light management, within a supervisory data-acquisition & control system (SCADA), 100% QA of produce may be achieved with optimised inputs and minimised energy.</p>			

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Scottish Association For Marine Science (lead) Celtic Sea Spice Company Ltd Otter ferry Seafish Limited	Seaweed as a Solution for Sustainable Economic and Environmental Development (S3EED)	£471,711	£369,433
Project description (provided by applicants)			
<p>Seaweed is healthy, nutritious and very tasty. Worldwide, seaweed for human consumption is the largest aquaculture industry. But here in the UK we are only just waking up to seaweed's culinary potential. However, the seaweed industry in the UK is growing and now requires more seaweed than can be harvested from the wild. And so there is a need to start farming it. This project, Seaweed as a Sustainable Solution for Economic and Environmental Development (S3EED), will develop the technology to grow two species of delicious seaweed in the cool, clear waters that surround the UK.</p>			

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The James Hutton Institute (lead) Enza Zaden UK Ltd Mylnefield Research Services Limited	Enhanced vector toolkit for vegetable germplasm improvement	£250,981	£209,355
Project description (provided by applicants)			
<p>Modern crop breeding aims to incorporate useful properties (traits) from related wild plants into the varieties that consumers are more familiar with. This project aims to develop a set of biological tools that will make it an easier, cheaper and faster procedure to identify the genes in the wild plants that are responsible for producing these desired traits. The tools will be based on a common plant virus, Tobacco rattle virus (TRV), that has already been shown to be adaptable for this purpose. The project will construct improved versions of the TRV-based tools, and will then test these new tools in a range of vegetable crop plants (including pepper and tomato). Beneficial plant genes identified using these tools will be selected for incorporation into the crop improvement programmes of Enza Zaden.</p>			

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The National Lobster Hatchery (lead) CEFAS Falmouth University Fusion Marine Limited University of Exeter West Country Mussels of Fowey Limited	Lobster Grower - Develop the technology to fast track the aquaculture potential for the European Lobster	£447,471	£388,604
Project description (provided by applicants)			
<p>Support from the Agri-tech catalyst has been secured for a 15 month project addressing fundamental food security challenges by examining novel angles to expand the aquaculture industry; to include a species not currently exploited, the European Lobster. This species commands the highest value (by volume) of any species landed in the UK and supply does not meet demand. Sea based culture, in containers (SBCC) exhibit potential for a low carbon form of rearing with no feed costs. The project will design and develop a SBCC system specifically designed for nursery and on-growing, that can be used to rear the product to a marketable size. The project will set up a marine licence, essential for establishing a pilot scale site, so that future work can develop the essential tools and techniques required in order to pioneer a new industry. The consortium will be led by the National Lobster Hatchery and consists of three SME's and micro SME's, two HEI's and a Government Agency.</p>			

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University of Nottingham (lead) Quality Milk Management Services Limited	Evaluation of MALDI-TOF-MS to differentiate sub species of the pathogen <i>S. uberis</i> to provide an improved approach to mastitis treatment and control	£267,480	£230,662
Project description (provided by applicants)			
<p>Mastitis, an inflammatory disease of the udder, is a major barrier to profitable milk production, dairy cow welfare and the sustainability of dairy farming worldwide. The aim of this project is to reduce the incidence of bovine mastitis.</p> <p>Mastitis is caused by a bacterial infection and a central premise of mastitis control is to minimise the risk of infection. In order to control mastitis, it is necessary to understand how and when infections occur and how pathogens cause an infection. Although only a few species of bacteria commonly cause bovine mastitis, it is now recognised that sub species (strains) of these bacteria behave in different ways in terms of disease transmission and outcome. The aim of this research is to develop a method to differentiate strains of a common mastitis pathogen, <i>S. uberis</i>, according to their disease transmission characteristics. Information of strain type will then be used to inform and improve mastitis control.</p>			

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University of York (lead) Syngenta	Putting the Ecology into Efficacy: a new paradigm for pesticide discovery	£356,520	£173,363
Project description (provided by applicants)			
<p>Chemical crop protection remains central to meeting the challenges of food security, changes in geographical distribution of pests, and emergence of pest resistance. Discovery of new pesticidal products adopts a screening approach with largely empirical optimisation once candidate molecules are identified. This project will investigate a new paradigm in pesticide discovery/optimisation. Therein, the development process will be driven by detailed understanding of the ecology of target species bedded within a modelling framework to identify optimal molecular properties, formulation, timing and placement of the crop protection product.</p>			