

Results of competition: Agri-Tech Catalyst – Industrial Research - round 3

Total available funding for this competition was £7.24m from Innovate UK/Department of Business, Innovation and Skills, 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
APS Biocontrol Limited; Monaghan Mushrooms Limited; BioRationale Limited	Innovative and Sustainable Control of Mushroom Blotch	£588,445	£245,224
Project description - provided by applicants			
<p>The UK mushroom market is facing fierce competition from EU growers and rising operating costs; imports now make up 55% of the UK marketed total. A novel competitive advantage would provide an important boost to the UK industry and this application aims to provide this through tackling one of the most serious bacterial disease of mushrooms; bacterial blotch, which is responsible for crop losses of up to 10% (≈ £20M industry losses). This project will build on proof-of-concept data from a previous TSB feasibility project in which an innovative biocontrol technology based on naturally-occurring antimicrobial agents (bacteriophage) was shown to control bacterial-induced mushroom blotch symptoms in the laboratory. A business-led consortium will carry out further investigations on the technology, addressing key questions of technology deployment and efficacy, together with formulation and integration into commercial practice.</p>			

Participant organisation names	Project title	Proposed project costs	Proposed project grant
Aviagen Limited; The Roslin Institute, University of Edinburgh	Precision Breeding: Broilers from Sequence to Consequence	£2,724,848	£1,750,120
Project description - provided by applicants			
<p>This project is a collaborative partnership between Aviagen, the world’s leading broiler breeding company and The Roslin Institute, the world’s leading research centre in the application of genomics and quantitative genetics for livestock species. Our goal is to advance the sustainable intensification of broiler production for the benefit of the UK and global supply chain. We propose to develop a new, highly innovative, platform technology to accelerate the rate of genetic improvement we can achieve in our nucleus populations. With the support of the Agri-Tech Catalyst, we will collect sequence and genotype data on a huge number of individuals and we will analyse this unique repository to increase the precision of our breeding and obtain better biological insight on the mechanisms governing the phenotypic expression of traits in our holistic breeding goal that are of economic, environmental and societal importance. Our objective is to establish the feasibility of this UK innovation.</p>			

Participant organisation names	Project title	Proposed project costs	Proposed project grant
ECOspray Ltd; Target Set Technology Ltd; Universty of East Anglia	Side Ridge Injector (SRI)	£936,575	£508,044
Project description - provided by applicants			
<p>Prompted by environmental and health concerns, an increasing number of chemical pesticides now under threat of being banned. The loss of such pest control methods (especially in mainstream crops like potatoes) poses a substantial threat to crop production and food supplies.</p> <p>This project aims to establish side-ridge injection technologies for localised under-soil delivery of environmentally benign (garlic-derived) pesticide treatments in order to tackle the threat of the prominent potato pest (potato cyst nematode (PCN)) potato crop quality and productivity. Ultimately this will enable farmers to sustainably secure high yielding and high quality crop protection in the UK, across the EU and further afield.</p>			

Participant organisation names	Project title	Proposed project costs	Proposed project grant
Greengage Lighting Limited; T. L. R. Limited; Cambridge CMOS Sensors Limited; Campden BRI; Tioga Limited; Nettlecombe; University of Nottingham	Poultry Livestock Sensor System (PouLSS)	£779,796	£539,687
Project description - provided by applicants			
<p>Raising poultry for meat is a large industry which is highly regulated by government and quality assurance bodies, due to consumer concerns about animal welfare and health and safety of meat products. To help farmers meet such regulations a consortium has designed a product to monitor the welfare of chickens and the environmental conditions of barns in which they are housed. The consortium aims to turn the design of this all-in-one environmental and welfare monitoring system into a tried and tested product. The product will help farmers more closely monitor and respond to changes in chickens' environment or welfare. It will improve existing legal and quality assurance requirements by providing real-time monitoring and will provide up-to-date advice to famers on how they can create better, more productive environments for their chickens. This innovative product will help farmers to more easily comply with regulations, whilst improving welfare and maintaining a healthy profit.</p>			

Participant organisation names	Project title	Proposed project costs	Proposed project grant
International Controlled Atmosphere Ltd; Sainsbury's Supermarkets Limited; AC Goatham and Son; Norman Collett Limited; Natural Resources Inst., University of Greenwich	SafePod: New technology for intelligent control of fresh produce storage	£860,385	£616,596
Project description - provided by applicants			
<p>Over 170 k tonnes of apples are stored annually in the UK. In the absence of post-harvest chemicals, losses due to poor quality and disease are estimated at 3-15%. The project will deliver a new engineering solution to reduce losses. By monitoring metabolic status of fruit, SafePod will allow growers to use lower storage O2 concentrations than currently achievable, extending storage-life of fruit without risking damage. The project will optimise the use of the prototype SafePod in growers' stores and under lab conditions to define optimum storage for different apple varieties and operating conditions for SafePod. Furthermore use of the technology will be translated to other commodities. The project brings together post-harvest researchers, storage engineers, growers and the retail sector to deliver better quality fruit to the consumer and reduce waste. The global market for SafePod is huge with potential markets in UK and worldwide including USA/Canada, Australia, Europe and India.</p>			

Participant organisation names	Project title	Proposed project costs	Proposed project grant
KWS UK Ltd; The James Hutton Institute; Mylnefield Research Services Ltd	Breeding for Durable Resistance to Rhynchosporium (DRRUM)	£476,243	£328,715
Project description - provided by applicants			
<p>Leaf scald, caused by the fungal pathogen Rhynchosporium commune is one of the most damaging diseases of UK barley. Current control strategies rely heavily on fungicides, but the most effective and sustainable way to protect crops is to develop new cultivars that incorporate and express effective built-in resistance. In order to do this, we need to, simultaneously introduce multiple, complementary resistance genes into a single line. This is extremely hard to do if traditional selection methods are used. This project will translate cutting edge advances in barley genetics to deliver innovative breeding methods along with DNA markers that are needed to achieve this objective. These resources and knowledge will be used by the commercial partner (KWS UK Ltd) to produce the next generation of highly resistant barley varieties that will protect yield and quality for growers and end users of barley grain.</p>			

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Nestlé Product Technology Centre York (Nestlé PTC York); KWS UK Ltd; The Scotch Whisky Research Institute; ADM Milling; United Biscuits	To develop sustainable approaches to improve grain quality and help end users of soft wheat to mitigate challenges in downstream processing	£554,107	£202,835
Project description - provided by applicants			
<p>Users of soft wheat have identified variation in quality to be a major root cause of challenges encountered in downstream processing. These challenges are currently managed reactively, and are exacerbated by a fundamental lack of understanding in terms of defining the principal quality characteristics of soft wheat for a given process.</p> <p>This project will address this challenge by identifying desirable quality characteristics, developing analytical tests to allow screening of soft wheat lines, and finally testing the stability of these characteristics in the context of variation according to growing environment and year. This will enable a new pipeline of quality soft wheat varieties in the UK, less reliance on wheat imports, and a reduction in downtime and use of processing aids in downstream manufacturing.</p>			

Participant organisation names	Project title	Proposed project costs	Proposed project grant
PIC (Pig Improvement Company UK Ltd); University of Edinburgh	Innovative NextGen pig breeding using DNA sequence data	£2,576,784	£1,655,523
Project description - provided by applicants			
<p>This Project addresses food security and sustainability by substantially increasing the efficiency of genomic selection of pigs. Specifically we will develop a new technology we call NextGen Breeding, based on the collection and utilization of very large quantities of sequence data, which will enable us to dramatically accelerate the rate of genetic improvement in our pig populations. The project involves collaboration between two world class UK partners, PIC (part of Genus plc), the world’s leading pig breeding company and The Roslin Institute (RI), the world’s leading research centre in the application of genomics and quantitative genetics to farm animal breeding. The project requires whole genome sequencing of samples on an unprecedented scale and even though our innovative approach dramatically reduces the costs over the conventional paradigm, the risk and costs are still considerable.</p>			

Participant organisation names	Project title	Proposed project costs	Proposed project grant
Seawater Greenhouse Ltd; Aston University; Gollis University, Hargeisa	Sustainable intensification of agriculture in the Horn of Africa	£722,377	£518,078
Project description - provided by applicants			
<p>The project will develop an integrated agricultural enterprise that is both profitable and sustainable in the arid conditions of the Horn of Africa. Traditional agriculture is marginal and risky in this climate because it is generally too hot, too windy and there is a shortage of fresh water. As a consequence, evaporation exceeds rainfall by a large factor and crop yields are low. The project will overcome these obstacles with a low cost shade net structure to protect the crops from the extremes of wind and solar radiation and which is cooled and humidified with seawater, using the prevailing wind to drive the evaporative cooling process. Brackish ground water will be treated by reverse osmosis, powered by solar PV to provide irrigation and drinking water. The pilot will be built near Berbera in Somaliland and managed by a local team with support from the UK. Once demonstrated, the technology will be scaled up and replicated locally and in other hot, arid coastal regions.</p>			

Participant organisation names	Project title	Proposed project costs	Proposed project grant
SoilEssentials; The James Hutton Institute; Scottish Agronomy Ltd; MyInfield Research Services; SRUC; Mack Multiples	Assessment of SOIL quality using a BIOindicator (SoilBio)	£1,340,737	£875,511
Project description - provided by applicants			
<p>Providing sufficient food to feed an increasing global population is challenging given limited resources. Soil is a key component of food production providing nutrition and organic matter. However, modern methods of crop production have resulted in degraded soil leading to reduced yields. This contributes to the so-called yield gap, the difference between yield in optimal conditions to that actually achieved. This project focusses on developing a test for soil quality that uses measures of soil biology, chemistry and physics. We profile soil nematode community DNA, similar to genetic fingerprinting, to inform the status of soil quality. Whereas soil chemical and physical measures are snapshot measures in time e.g. hours, nematode data is a reflection of weeks/months. The consortium partners will develop a tool for farmers to be used in a precision agriculture framework to identify fields in need of soil quality improvement.</p>			