

Innovate UK

Results of Competition: Agri-Tech Catalyst - Industrial Research - Round 5

Competition Code: 1506_CRD_SAF_AGCATIR5

Total available funding for this competition was £10,344,929 from BBSRC, BIS & DFID

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
Thanet Earth Marketing Ltd Rail Vision Europe Ltd NIAB	Tools and Technology for Predicting Tomato Glasshouse Production	£1,397,062	£930,000
Project description - provided by applicants			
Year round UK glasshouse production of tomatoes for supermarkets is highly intensive. Although this production is highly controlled it is still difficult to accurately predict picking yields which has an impact on the food supply chain. This inaccuracy requires businesses to continually react to this inefficiency. Over-prediction results in costly imports, whilst under-prediction incurs financial losses from the disposal of surplus fruit. There is considerable potential to reduce these losses and increase the proportion of UK sales by improving the accuracy of yield forecasts. We will develop an imaging system, TomVision, and mathematical models, PredictTomPro, to more accurately predict weekly yields and deliver significant savings in import costs and waste. Our aim is to predict weekly harvests to 10% of actual, that will generate £30K/ha extra income p.a. for producers and for the developers the anticipated sales of these tools of £1.3M/£11.3M/£26M (UK/EU/W) after 5 years.			

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APS Biocontrol Ltd University of Leicester Community Foods Ltd Tesco PLC	Bacteriophage Management of On-Farm Salmonella Contamination of Vine Fruits	£671,432	£475,350
Project description - provided by applicants			
<p>Salmonella is the most important foodborne pathogen and incidences caused by contaminated food of non-animal origin have been increasing, reflecting rising consumers' demands for fresh/minimally-processed fruit and vegetables. Crops with an outdoor post-harvest management period are particularly at risk; this project focuses on Salmonella contamination of vine fruits (raisins, sultanas), which are dried outside post harvest and exposed to animal fouling. Impacts throughout the supply chain are significant, from grower to retailer, with significant recall costs involved. This project will transfer technology from both industry and academia to develop an innovative technology to prevent on-farm Salmonella contamination; i.e. at source. The solution will be based on safe, naturally-occurring, highly-specific antimicrobial agents (bacteriophage). A business-led consortium will address questions of technology specificity and characterisation, together with deployment and integration into commercial practice.</p>			

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Berry Gardens Growers Ltd NIAB Plantworks Ltd Environmental Monitoring Solutions Ltd Netafim UK Ltd	Use of stress pre-conditioning, novel sensors and AMF to improve crop management, marketable yields, stress resilience and environmental sustainability of raspberry production	£1,000,095	£701,191
Project description - provided by applicants			
UK raspberry production was worth £109M in 2014, but a further 11KT of berries, worth £59M, are imported each year. A 20% increase in the 14KT of fruit produced p.a. in the UK could be expected to reduce imports by 2.8KT, and raise the value of the UK industry by £15.7M p.a.. However, improved on-farm management of water and fertiliser inputs is needed to optimise productivity; currently, excessive fertigation to substrate-grown raspberry result in vigorous cane growth which makes crop management difficult and harvesting costly. Nutrient leaching also poses a risk to groundwater quality. We will use novel affinity sensors combined with fuzzy logic to automatically adjust nutrient inputs to match plant demand in real time, reduce fertiliser losses to the environment and improve berry quality. Stress preconditioning and arbuscular mycorrhizal fungi (AMF) will be used to raise marketable yields, improve resource use and acquisition, and increase crop resilience to stresses.			

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H L Hutchinson Ltd DuPont (UK) Ltd KWS UK Ltd Weston Park Farms SynTech Research UK Ltd F G Taylor & Son University of Hertfordshire	Integrated control of Leptosphaeria pathogens on UK winter oilseed rape	£747,663	£512,931
Project description - provided by applicants			
Phoma stem canker is a damaging disease of oilseed rape in the UK, leading to yield losses > £100M p.a. despite the use of fungicides. This disease is caused by two related pathogens: <i>Leptosphaeria maculans</i> and <i>L. biglobosa</i> . However, current control of the disease focuses only on <i>L. maculans</i> . Recent work showed that <i>L. biglobosa</i> can cause substantial yield losses and that it is less sensitive to triazole fungicides than <i>L. maculans</i> . <i>L. biglobosa</i> is a threat to oilseed rape production in the UK since no methods have been developed to control it. This project will investigate stem canker epidemics caused by <i>L. biglobosa</i> , determine the proportions of <i>L. biglobosa</i> and <i>L. maculans</i> in pathogen populations, screen cultivar resistance against <i>L. biglobosa</i> , determine efficacy of different fungicides for control of <i>L. biglobosa</i> as well as <i>L. maculans</i> . The new knowledge about the pathogens, host resistance and efficacy of fungicides will be used to develop new control strategies that ensure both pathogens are targeted.			

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Sharp Laboratories of Europe Ltd Shadow Robot Company Ltd STC Research Foundation	Automato	£1,255,132	£537,112
Project description - provided by applicants			
The Automato Robot project aims to address the seasonal labour constraints in the UK/Europeantomato industry and their increasing cost through the development of a cost-effective robotic systemthat performs on-crop quality and ripeness inspection and then automated harvesting.The project brings together state of the art knowledge of innovative robotic arms, 3D sensing, computervision and object/pattern recognition as well as expert industry knowledge of commercial greenhouseoperations and optimum growing/harvesting practices.This is an industry led project with clear goals for manufacturing and commercialisation post-projectfollowing proof of concept demonstration.			

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James Finlay Ltd Dudutech Ltd Forum for the Future University of Reading University of Lincoln	Supply Chain Development in Kenya - UK Agritech to Improve Rural Livelihoods	£1,174,169	£688,320
Project description - provided by applicants			
The project plan undertakes to develop a new sustainable essential oil market supply chain for largenumbers of smallholder in Kenya. The project aims to develop a range of crops to market which wouldenable the small holders production portfolio to be more balanced, robust and develop into long-termsupply programs. The Project is centred on the Fairtrade Fintea Co-operative Union Ltd (12,000Members) In Kericho Western Kenya and the Dudutech Marigat Project In Baringo County (Approx 7,000members). We will develop sustainable production systems for 5 oil crops, underpinned by research insustainable crop production systems and the development of novel QA processes to monitor oil qualityin Kenya.			

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Moy Park Ltd Devenish (NI) Ltd Primer Design Ltd University of Lincoln University of Liverpool Slatehall Veterinary Practice St Davids Poultry Team	A whole supply chain hurdle approach to control Campylobacter	£1,091,569	£756,563
Project description - provided by applicants			
Campylobacter is one of the most serious food borne pathogens, infecting over 280,000 people, and costing the UK economy £580m p.a. In this study, we will conduct the largest known molecular study to track and trace Campylobacter through the supply chain. We will deploy whole genome sequencing on a massive scale to optimise a series of on farm and factory interventions that reduce the contamination of whole chickens with Campylobacter. These interventions include novel animal feeds and factory processes. We will also develop a new qPCR testing kit for Campylobacter. This will be deployed and validated on farm and in factories. The kit will be developed to segregate live from dead cells. It will provide the industry with a real time and accurate rapid enumeration technique.			

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Johnson Matthey PLC Cranfield University	Next generation modified atmosphere materials to extend farm storage & reduce waste	£542,644	£366,284
Project description - provided by applicants			
<p>The control of respiratory gases within a storage or packaging environment is often used to extend postharvest storage/shelf life of fresh fruit and vegetables, and thereby reduce wastage in the supply chain. Current modified atmosphere packaging (MAP) can extend the postharvest quality of fresh produce, but its performance is often limited by its inability to adequately respond to the changing physiology of the produce, leading to the development of sub-optimal gas conditions. MAP would benefit considerably if it were made flexible and more responsive to these conditions. This project will focus on the development of the next generation of MAP comprising innovative cost effective inserts which are able to manipulate the internal atmosphere of the packaging by administering the ideal gaseous conditions at the optimum time for prolonged storage & improved management of produce in the farmer's cold storage and the entire supply chain.</p>			

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British Texel Sheep Society Ltd Anglo Beef Processors UK Scotland's Rural College (SRUC)	Carcass trait phenotype feedback for genomic selection in sheep	£1,545,718	£809,517
Project description - provided by applicants			
Only around half of UK-produced lambs meet target conformation and fat quality specifications resulting in waste at the farm and processor levels. This livestock genomics project addresses key issues in primary livestock production by collecting, analysing, and exploiting state-of-the-art genomic and new phenotypic data from meat sheep on hard to measure (HTM) traits, combining carcass and disease for sustainable sheep improvement. New visual image assessments (VIA) of post-mortem lamb carcass quality, and novel, in-line meat hygiene records on individuals will be linked to genome-screening technology to identify superior bloodlines and genomic regions that are more productive and also more resistant to economically-important disease traits. This allows greater productivity to be achieved without compromising health and welfare, and explores the best method to deliver genomic solutions for increases in productivity and efficiency in tandem with improvements in animal health.			

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Provenance Partners Ltd Vegpro (K) Ltd NIAB Weatherquest Ltd Flamingo Horticulture Kenya Limited	Improving consistency of yields and quality of large-scale and small-holder bean production in Kenya by precision management of soil, water and pathogens	£853,294	£573,685
Project description - provided by applicants			
Delivering consistent supplies of high quality fresh produce is a significant challenge for Kenya's freshveg. growers. Yields of beans range from 5 to 50T/ha and up to 40% of produce is of poor quality, due to ineffective irrigation and soil-borne diseases. A 12% increase in average yield and a 20% reduction in waste would raise Class 1 yields by 978T/year; this would generate an extra £3.2M/year, increase food security and improve soil management practices. We will: 1) Develop irrigation scheduling tools to improve consistency of cropping; 2) Identify effects of biocontrol agents on soil pathogens and soil microbiome 3) Determine effects of soil water availability on incidence and severity soil pathogens and efficacy of biocontrol agents; 4) Develop integrated control measures to improve Class 1 yields, quality and shelf-life; 5) Promote benefits of precision irrigation and biocontrol at workshops/on-farm demos; 6) Assess social and economic impacts of outputs and implement sustainability improvement plans.			

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Avalon Produce Ltd Richard Hochfeld Ltd Xewt Ltd Chelsea Technologies Group Ltd Tesco Stores Ltd Cranfield University	Extending the availability and flavour-life of UK apples using innovative photonics	£700,945	£497,455
Project description - provided by applicants			
<p>The British apple industry is continuously asked by UK retailers to extend availability; this being achieved by implementing ever more sophisticated storage technologies. Whilst this demand is driven by a brand loyalty to domestic production, the industry is increasingly challenged by imports. In order that primary production of UK apples can be fully utilised and be made more competitive, a paradigm shift is needed to improve how apples are stored such that the focus is moved towards 'flavour-life' rather than being just driven by firmness and sugar content. The proposed work will develop novel sensor and allied storage interventions which will control ripening whilst maintaining 'flavour-life'. This offers a route to incremental storage extension to help reduce the reliance on imports and extend the window in which high quality British fruit can be offered.</p>			

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Syngenta UK Ltd University of Nottingham	Integrating Control strategies Against soil-borne Rhizoctonia solani in OilSeed rape (ICAROS)	£619,000	£337,825
Project description - provided by applicants			
Rhizoctonia solani is an aggressive soil-borne pathogen of oilseed rape (OSR) and canola worldwide. It is implicated in the yield decline of the crop when grown with increased frequency in field rotations. Presently there are no disease resistant varieties, hence the control of the disease relies on the use of chemical seed treatment. The key objectives of this project are to identify novel resistance traits and loci to R. solani which can be utilised in crop breeding and effective seed treatments that can be registered against the pathogen in OSR and made commercially available to UK growers. The ultimate output of this multidisciplinary project will be the first integrated guidelines for the control of R. solani incorporating targeted seed treatments and varietal resistance for improved disease management and protection of OSR yield.			

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