Innovate UK

Results of Competition: Satellites to improve Agri-food systems - FS
Competition Code: 1511_FS_SAT_AGRI_SATFOO

Total available funding for this competition was £3,175,000 from Innovate UK & NERC

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
Frontier Agriculture Ltd ADAS UK Ltd Remote Sensing Applications Consultants Ltd University of Nottingham Agriculture & Horticulture Development Board (AHDB)	SHiFT: Sentinel-2 - compatible Historical datasets for Future crop Targeting	£164,296	£111,362

Project description - provided by applicants
The project will investigate the use of archive satellite imagery to predict spatial variability within arable fields.Many applications of precision agriculture use current satellite imagery to provide guidance on localisedmanagement operations, for example application of Nitrogen fertiliser, but assumptions have to be madeabout the causes of spatial variation. A 20-year archive of satellite image data will be developed to assess thedegree of persistence of spatial patterns over years and their dependence on weather and cropping factors.Maps of potential yield variation and other interpretive tools will allow more intelligent, context-basedassessments that are expected to lead to improved land management with both economic and environmentalbenefits. The project is being conducted by a consortium led by SOYL, together with ADAS, RSAC, AHDB and theUniversity of Nottingham.

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ADAS UK Ltd Precision Decisions Ltd Agriculture & Horticulture Development Board (AHDB)	GRASS improvement using Satellite TECHnologies: GRASSS-TECH	£161,770	£77,600
Project description - provided by applicants			
The project will investigate the feasibility of measuring grass yield and quality remotely by using satellitesensing technologies. If successful then the technology will enable farmers to improve yield and quality byoptimising the timing of silage harvest, producing grass growth curves for bench marking and creatingyield/quality maps which will enable precision management of crop inputs (e.g. fertilisers). The project is highlyinnovative because it will develop techniques for sensing grass crops through cloud and additional uniquenesswill be achieved by sensing for grass quality as well as yield. This 12 month project is a collaborative projectbetween industry partners; ADAS UK Ltd (Agricultural research and consultancy), Precision Decisions (precisionfarming company) and farm levy board AHDB.			

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Avanti Communications Ltd Precision Decisions Ltd Adroit Economics Ltd	Satellites to improve Agri-food systems - FS	£172,866	£99,985
Project description - provided by applicants			
Connected Farm is an Innovate UK co-funded study designed to increase precision farming productivity in farmswithout 3G/4G coverage through the provision of high speed broadband connectivity to the farm house,tractors, combine harvesters, and other farm production equipment. The study will evaluate and develop acost-effective solution based on two options; farm-wide long range Wi-Fi using Ka-band satellite backhaul andKa-band satellite broadband direct to tractors and farm equipment using novel small/lightweight antennas withform factor optimised for installation on mobile farm production assets. The study will consider the pros andcons of each option and one will be selected for trial.			

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Mfatech Ltd Ringtrack Ltd De Montfort University	FROST STIC	£168,330	£130,937
Project description - provided by applicants			
FROST_STIC will combine Earth Observation from satellites, with data from ground based sensors. Highaccuracy space data is expensive, therefore our concept is to use low cost or free space data and improve itsaccuracy by using sensors on the ground. The enhanced accuracy maps will be presented to farmers using aweb based map presentation tool. Machine learning will added, so that the system will remember how cropsgrew in previous years, and that can be used to predict the optimum time to fertilise and harvest the crops inthe future.			

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Precise Crop Nutrition Ltd University of Leicester	Development of an on-farm handset for variable N management from satellite images	£150,064	£118,535

Project description - provided by applicants
The project is exploring the technical feasibility of developing a hand held device which will enable farmers andagronomists to take advantage, on the farm, of satellite images used for variable nitrogen application to cerealsand oilseed rape.Precision Crop Nutrition Limited currently provide the Precise N-Map service using centrallyprocessed data which is delivered electronically to each farm. The development of the device will offer aquicker and more flexible way to convert data which will be of greater value to agronomists and farmers.Expertise from Leicester University will be called on to develop the device which will be evaluated in the field,with the involvement of farmers and agronomists, by the Precise Crop Nutrition team.

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ADAS UK Ltd Assimila Ltd	Integrating Satellite data to create an underpinning Crop Intelligence System	£198,473	£113,224

Project description - provided by applicants
This project seeks to establish the feasibility of (i) using multiple Earth Observation data to deliver canopyprogress curves for every field in the UK, and (ii) integrating these into a Crop Intelligence System with soils,met and crop records, so as to provide tools and services for a range of decision support, benchmarking,strategic and tactical uses for farmers, industry and government customers. Within this feasibility study we willengage with a range of potential users, suppliers, partners and investors to scope out the requirements andcommercial opportunities for the Crop Intelligence System. We will demonstrate the technical feasibility ofproducing field by field curves using public and commercial satellite data for an example area, specify therequirements and costs for building and operating a commercial system and identify the best business modelsto bring the Crop Intelligence System to commercial reality.

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Precision Decisions Ltd Harper Adams University	Hands Free Hectare - study into the feasibility of using open source drone technology to automate field agriculture	£199,437	£157,605
Project description - provided by applicants			
The Hands Free Hectare aims to produce the first crop in the world to be grown completely autonomously -from establishment to harvest, no humans will enter the field. The project will modify existing farm machinerymodels to utilise control systems developed from open-source data, providing a low-cost route to on-farmmachine control.			

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Hoofprints Technologies Ltd SRUC	Geolocation tracking of extensive livestock systems	£200,000	£158,000
Project description - provided by applicants			
The consortium will develop an ear tag mounted geolocation tracking and monitoring device to catalyseimprovements in production efficiency of sheep farming through reduced losses achieved due to early healthinterventions. The solution, aimed at extensive livestock systems, will enable producers in challenging physicalenvironments to optimise their labour and equipment resources.			

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Precision Decisions Ltd Satellite Applications Catapult Ltd	Field Variability Assessment Tool	£128,486	£101,415
Project description - provided by applicants			
The Variability Assessment Tool is an cost efficient online tool that exploits the use of satellite Earthobservation (EO) imagery to highlight field crop variability. Typically field variance can be caused by long-termfundamental properties of the field (eg. soil types, terrain, topography, exposure), mid-length manageableproperties (eg. nutrient levels, soil structure), and in-season uncontrollable factors (eg. climate, weatherevents, infestation). Management of variability is complex because many of these factors affect each other indifferent ways to create an overall yield variability. True variability management requires the identification ofthe different key factors in a field, and then an appropriate management strategy to minimise the effect onyields. This project will enable farmers across the UK to make smarter decisions about their investment inprecision farming technology and services. It seeks to give all farmers a chance to experience the benefit ofusing EO imagery and demystify the use of this technology within the agricultural sector without the risk ofheavy investment.			