



HARTPURY
UNIVERSITY
AND COLLEGE

**DIGITAL
INNOVATION
FARM:**

**A GROWTH STRATEGY
2020-30**
Shaping the future
of digital farming



“These plans highlight the scale of our commitment and our ambition to be leaders in shaping the future of digital farming in the UK and beyond. Our aim is that, by 2030, the Digital Innovation Farm will have expanded and grown into a state-of-the-art complex at Hartpury University and Hartpury College, attracting leading agri-tech companies and contributing to increased productivity in Gloucestershire and the UK.”

Russell Marchant
Vice-Chancellor and CEO
of Hartpury University and
Principal of Hartpury College

This document has been written to open a dialogue with key stakeholders about Hartpury University and Hartpury College's current and proposed estate developments at Home Farm.



An artists impression of the proposed Digital Innovation Farm buildings at Home Farm.

Hartpury: World-class Agriculture

At Hartpury University and Hartpury College, we are driven to make a difference to the future of the planet and continue to push the boundaries to find solutions to real world problems.

We are blazing a trail for agriculture and are relentless in our pursuit of excellence. Our vision is to make Hartpury University and Hartpury College a world-leader in agriculture and create an industry-leading Digital Innovation Farm providing world-class facilities, education and research to meet the global demand for new technology in farming.

As a specialist provider of further and higher land-based education we have the potential to be truly transformational in our support for the agricultural and land-based industries we serve. We have developed an ambitious

plan for our Agricultural Department that will create a pioneering facility combining our commercial farm and strong industry connections with technology companies to address the inevitable challenges of a robotic future through data management, ownership, security and protection in this fourth agricultural revolution.

Over the next ten years and beyond, we are committed to further enhancing the quality of our provision so that we enable our students, the farmers of the future, and industry to be the best they can become, armed with the latest technology to increase productivity and safeguard the natural environment. This prospectus outlines the justification, and benefits of the costs associated with each new campus facility on the Home Farm estate and the rationale for investing in its success.

To enable the farm to reach its full potential, our phased developments will be made possible through effective partnerships and collaborations with

those who share our vision for the future. Only by working in partnership with other providers, with statutory funders regionally, nationally and internationally, with businesses, and with philanthropists will the Digital Innovation Farm gain the momentum it deserves to succeed.

With your support, Hartpury University and Hartpury College can be world-class for agriculture shaping the agriculturalists and agri-technologists of the future to deliver sustainable, healthy and affordable food for future generations.

Help us drive the change.

“Our vision is that the UK becomes a world leader in agricultural technology, innovation and sustainability; exploits opportunities to develop and adopt new and existing technologies, products and services to increase productivity; and thereby contributes to global food security and international development.”

HM Government Industrial Strategy: A UK Strategy for Agricultural Technologies



Context and opportunity

A global technological revolution is taking place

Agricultural science and technology are rapidly becoming one of the world's fastest growing and exciting markets. It is driven by global changes: a rising population, rapid development of emerging economies with western lifestyle aspirations and growing geopolitical instability around shortages of land, water and energy.

A global technological revolution is also taking place. Breakthroughs in nutrition, genetics, informatics, satellite imaging, remote sensing, meteorology, precision farming and low impact agriculture are driving major global investment in agri-tech.

By launching its Industrial Strategy in 2017, the Government publicly recognised its vision that the 'UK becomes a world leader in agricultural technology, innovation and sustainability'.

An ever-increasing digital and technical skills gap

With the significant global investment in agri-tech there is increasing demand to educate students with the technical skills and knowledge of the agriculture industry. This combined with future automation of agricultural production systems and remote technologies to increase productivity is creating an ever-increasing digital and technical skills gap. The launch of the Government's new industry-led T Level programmes mark a significant, and much needed change in technical education to ensure young people develop the technical knowledge and skills required by employers.

“The growing global agricultural technologies sector is worth \$400 billion, offering export opportunities in emerging markets.”

HM Government Industrial Strategy: A UK Strategy for Agricultural Technologies

In response to growing evidence of the global demand for new technology in farming and the need for cyber security as digitalisation reaches every aspect of the food chain, Hartpury University and Hartpury College's strategy is to create an industry leading Digital Innovation Farm of regional, national, and ultimately, global significance.

As a sector, we need to harness the power of innovation to help meet the employment needs of our agricultural industry, scale-up new solutions to increase productivity and economic growth and drive change.

“To meet growing food demand from a projected population of close to 10 billion people in 2050, agricultural output will need to increase by about 40% compared to 2012.”

Food and Agricultural Organisation of the United Nations

A 2019 study by the National Farm Research Unit found that:

- 57% of those surveyed think that emerging technology will greatly impact their business in the next five years
- Skills maintenance in the ever-changing digital landscape is challenging to keep up with, even for the most technically advanced
- Businesses that don't use IT daily will need it to boost productivity and will require support to adapt



"Agriculture employs more than one billion people worldwide and generates over £1 trillion worth of food annually." *



*WWF (World Wildlife Fund) 2019

DIGITAL INNOVATION FARM: 10 YEAR VISION

Rationale

By 2030, our vision is to have radically developed our 360-hectare campus to create a pioneering Digital Innovation Farm, in response to an increasingly digital world with global demand for new technology in farming.

“We want to take the technology that's out there, which let's be honest, 80% of the industry aren't really utilising and demonstrate it hands-on within a commercial-scale farm.”

Russell Marchant, Vice-Chancellor and CEO of Hartpury University and Principal of Hartpury College

This ground-breaking development, to assist industry in its advancement of agricultural technology, data and security will comprise the following phases:



Scope and objectives

This immersive digital education and applied research farm campus will provide an innovative learning experience. The farm will provide space and support for a range of related technology businesses focused on the challenges of cyber security for agri-tech companies and associated organisations. Working in partnership with these technology companies, we will support the inevitable adoption of proven agri-tech with farmers locally, regionally and nationally.

This investment will provide acceleration facilities for businesses, a demonstration farm combined with an advanced skills training facility; a commercial test bed through digital replication of our farms and exploiting technologies such as virtual and augmented reality applied within agriculture.

We are building our academic resources and expertise in agriculture, particularly through research and enterprise. This new Digital Innovation Farm will drive our applied research and innovation ambitions and provide essential physical and knowledge exchange capacity to support businesses during this fourth agricultural revolution.

“We're at the start of a revolution in farming as technology begins to transform the way our food is produced. Making these technologies work in farm conditions is a real challenge and that is where the Hartpury University and Hartpury College Agri-Tech project comes into its own.”

David Harrison, Farming and Agriculture Sector Lead, NFU Mutual



“Hartpury University and Hartpury College's plans for a Digital Innovation Farm present a great opportunity to further bolster Gloucestershire's unique position as a leader in agri-tech. It's vital that Gloucestershire, and the UK, continues to improve productivity and develop our cyber and digital offer to compete globally.”

David Owen
Chief Executive, GFirst LEP
(Gloucestershire Local Enterprise Partnership)



HARTPURY AGRI-TECH:
TECH TO PLATE PROJECT

Showcasing new approaches to food and farming systems

Rationale

The first phase of our 10-year Digital Innovation Farm strategy, the Agri-Tech Centre was launched in February 2020. The Centre includes unique demonstration, bio-security and livestock areas to showcase the latest smart farming techniques and equipment available to the livestock industry.

Scope and objectives

The aim of the facility is to enable those involved in agriculture including farmers, students, businesses and manufacturers greater access to the latest commercial technology. Experienced through practical on-farm demonstrations, as well as seeing real-time information being gathered and understanding the benefits, individuals can apply newly gained knowledge on how to improve productivity, welfare, sustainability and profitability to their own businesses.

Key aims:

- To provide real on-farm demonstrations of the latest technology available to farmers, producers and students, our farmers of the future.
- To show the production, welfare and financial benefits that correct use of existing technology can bring to overall farm performance and productivity.
- To demonstrate the full potential of new technology to increase farm performance and yields with reduced inputs and environmental impact via practical demonstrations and talks from industry professionals and technology manufacturers.



“Landex is pleased to support Hartpury University and Hartpury College’s ‘Tech to Plate’ initiative. Hartpury’s proposal will support the agri-food industry by helping to improve the productivity of agriculture, as well as helping to establish Gloucestershire as a leader in the sector.”

Chris Moody, OBE Chief Executive, Landex

THE BUILD

The Agri-Tech Hub

The Hartpury University and Hartpury College Agri-Tech Hub will provide visitors with access to key information and case studies on all the latest technology and innovative ideas which will be available commercially across the beef, sheep and dairy sectors. Visitors will also be able to see live information being gathered from the farm and have access to the highest welfare standards.

4000
 INDIVIDUAL VISITS/
 CONTACTS WITH
 INDUSTRY AND
 SCHOOL LEAVERS

METRIC OF ENGAGEMENT:
 The Agri-Tech Centre – Tech to Plate initiative will aim to achieve 4,000 individual visits/ contacts with school leavers, public and/or industry bodies during (full-year) Year 2.



Livestock Handling Unit

The new 950m² livestock housing facility will include the latest handling system, kitted out with up-to-the-minute technology to be accessed via a viewing gallery. This will provide visitors with the chance to see practical demonstrations of the latest commercial technology in a real farm environment.



Biosecurity Building

With the entry and spread of pests and diseases becoming even more difficult to control, biosecurity measures are becoming increasingly important regardless of your geographical area. This facility will demonstrate industry best practice to protect Hartpury and other farms from disease transfer.

Cost

This is a £2m construction project funded from GFirst Local Enterprise Partnership (LEP), Hartpury University and Hartpury College and supporting trusts and foundations with a passion for agriculture and education including The Elizabeth Creak Charitable Trust and The Clive and Sylvia Richards Charity.



“This cutting edge facility will give farmers, students and wider industry access to the latest proven technology and innovative practice. Gaining valuable insight into how this can improve productivity, sustainability and quality of produce.”

Ben Thompson
 Hartpury Agri-Tech Centre Project and Industry Engagement Manager

The Agri-Tech Hub

HARTPURY AGRI-TECH:

DIGITAL INNOVATION IN AGRI-TECH PROJECT

Enhancing innovation in the farming industry

Rationale

Continuing to build upon the Agri-Tech Centre – Tech to Plate project, we intend to develop an area of Home Farm into practical workshop units for start-up businesses, SMEs and micro businesses, with some shared office space for collaboration and networking. The Digital Innovation in Agri-Tech Project will provide an innovation workspace and dedicated support programme for SMEs in Gloucestershire operating, or seeking to operate, within the agri-tech sector. The project will deliver an immersive innovation programme of in-house and external agri-tech and cyber-security experts with on-site live demonstrations.

Targeting SMEs and micro-businesses, especially those within growth or expansion stage, we will provide products or support services to the agricultural/land-based sector in Gloucestershire from Tech Box Park accelerator units located within a genuine, on-site commercial working farm environment with outstanding agricultural resources and facilities.

Scope and objectives

Within this specially designed digital innovation facility, farmers will have greater access and exposure to commercial software and hardware products in addition to data accessibility and security. The project will offer workspace in which to develop innovative products, utilising:

- Robotic testbeds - undertaking experiments and tests on new/enhanced products using robotics located within an on-site diagnostic workshop
- Artificial intelligence - able to perform tasks normally requiring human human intervention.
- Data management analysis - acquiring, validating, storing, protecting, and processing data



An example of our acceleration space Tech Box Park
Courtesy of ProspusGroup



An example of our acceleration space Tech Box Park
Courtesy of ProspusGroup

With your support
Hartpury University
and Hartpury College
can be world-class
for agriculture
shaping the
agriculturalists and
agri technologists
of the future.

HARTPURY AGRI-TECH:

AGRICULTURAL AND ENVIRONMENTAL TECHNOLOGY LAB

Using technology to address the carbon zero agenda

Rationale

This facility will work in partnership to support the National Farmers' Union (NFU) vision to enable UK farming to achieve its net zero greenhouse gas emissions aspiration by 2040 by the following three pillars of activity:*

1. Boosting productivity and reducing emissions

Improving farming's productive efficiency to reduce our greenhouse gas emissions - enabling farming to produce the same quantity of food, or more, with less inputs, in smarter ways.

2. Farmland carbon storage

Farmland carbon storage in soils and vegetation - improving land management and changing land use to capture more carbon, through bigger hedgerows, more trees and especially more soil organic matter.

3. Coupling bioenergy to carbon capture, utilisation and storage

Boosting renewable energy and the bioeconomy to displace greenhouse gas emissions from fossil fuels and to create greenhouse gas removal through photosynthesis and carbon capture.

Scope and objectives

This phase will incrementally grow our accelerator space and house technologies for high-tech farming in a controlled environment and maximise the advantages for industry from the global shift to clean growth.

This investment will deliver the construction of an Agricultural and Environmental Technology Lab, a place and a space, to develop the agrotechnologists of the future.

The technology lab will empower farmers to produce the same quantity of food, or more, with less inputs, in smarter ways by:

- Using environmental technology and green technology to monitor, model and safeguard the natural environment
- Maximising the advantages for industry from the global shift to clean growth

- Providing technologies that allow more crops to be produced on less land, with more efficient use of inputs and under conditions of climate change, deforestation, genetic engineering, irrigation problems, pollutants and soil degradation
- Advancing renewable energy technologies for food production, farming technology and systems, agribusiness and sustainable farming
- Allowing research into projects related to agriculture technology with a focus on how to improve land management and changing land use to capture more carbon

“The farming industry is blighted by an ageing, tech-averse population and will be struck by a labour shortage. Automation and smart technology - individual sensors on animals, thermal imaging to detect sick livestock, automated segregation and weighing is the future, and Hartpury is the hub.”

Russell Marchant
Vice-Chancellor and CEO of Hartpury University and Principal of Hartpury College



“We will champion sustainable development, lead in environmental science, innovate to achieve clean growth and increase resource efficiency to provide benefits to both our environment and economy, and keep our pledge to hand over our planet to the next generation in a better condition than when we inherited it.”

HM Government
A Green Future: Our 25 Year Plan to Improve the Environment



HARTPURY AGRI-TECH:

NATIONAL CENTRE FOR AGRICULTURAL DATA MANAGEMENT AND INTERPRETATION (NCADMI)

Rationale

Our future ambition is to seek investment to create an industry-leading National Centre for Agricultural Data Management and Interpretation of regional, national, and global significance. This will be delivered in a multi-phased approach, building upon the previous three phases of the Digital Innovation Farm strategy, offering access to state-of-the-art technology facilities to demonstrate how precision farming techniques and equipment can improve productivity and commercial application for agricultural businesses across the industry.

Scope and objectives:

This National Centre will provide flexible advanced skills training in a contemporary complex of buildings, with services and facilities that will attract leading technology companies. Investment is sought to deliver:

- A futuristic, data rich education and learning experience for business and students alike in a genuine working farm environment with outstanding agricultural resources and facilities
- Dedicated innovation workspace and a programme of support by agri-tech specialists/cyber-security experts
- Accelerator space where agri-tech companies test and trial products utilising artificial intelligence, robotic test beds, and data management
- A commercial test bed through digital replication of the farms and exploiting technologies such as virtual and augmented reality applied within agriculture

“Accelerating and scaling up innovation in agriculture can trigger the transformation needed to respond to feeding a growing and increasingly urbanised population.”

(The Food and Agriculture Organisation of the United Nations)



"The UK has a long history of global influence in agriculture. With a continuing push for innovation and a focus on making brilliant ideas a reality, we can again lead the world in this vital and expanding sector."

(HM Government: A UK Strategy for Agricultural Technologies)



About Hartpury

Hartpury Agriculture has a well-established reputation as a specialist provider of land-based education. Since we opened in 1949, our roots have been in agriculture and land-based studies. Currently, our 360-hectare campus is home to a record number of 3,800 students studying a mix of agricultural diplomas and degrees, alongside students studying A-levels and Further and Higher Education qualifications in agriculture, sport, equine, animal and veterinary science.

We have four multi-disciplinary research and knowledge exchange Arenas. The Arenas set their own research focus and action plans:

- Animal Welfare
- Equestrian Performance
- Sport, Exercise and Wellbeing
- Pedagogy, Practice and Community

Gold standard

Our teaching and learning are rated Gold in the Teaching Excellence Framework (2017), placing Hartpury University in the top 25% of UK higher education providers nationally for teaching and learning.

Outstanding

We have students studying A-levels and diplomas at Hartpury College, which was awarded Ofsted Outstanding in all areas in 2018.

Highest for student satisfaction

We have the highest student satisfaction of all land-based further education colleges in the UK, with 83.8% student satisfaction (Department of Education survey 2017/18).

TEF Gold

Ofsted Outstanding Provider

98%
graduate employability (HESA 2018)

WORK READY
The strength of our career focused programmes, the quality of teaching staff and industry links ensure that Hartpury graduates are work-ready and highly sought after.

TOP FOR EMPLOYABILITY
We work closely with employers and industry to shape the specialist education we provide and are proud to partner with over 2,000 approved work placement providers.



Our Mission
"Hartpury will be a specialist niche provider delivering relevant, effective and high-quality education and training for employment in sport, equine, animal and agricultural industries; locally, regionally, nationally and internationally."

Hartpury Strategy 2025





FOR FURTHER INFORMATION:

Individuals and businesses interested in finding out more, or partnering with the Digital Innovation Farm should visit:



+44 (0) 1452 702607



agri-tech@hartpury.ac.uk



www.hartpury.ac.uk/agri-tech



Hartpury University and Hartpury College
Hartpury, Gloucester, GL19 3BE

Image Disclaimer:

All images used are for illustrative purposes only. Images are indicative of the quality and style of the specification but do not represent wholly the actual fittings and furnishings of any build project