



An Agri-Tech Action Plan for Wales

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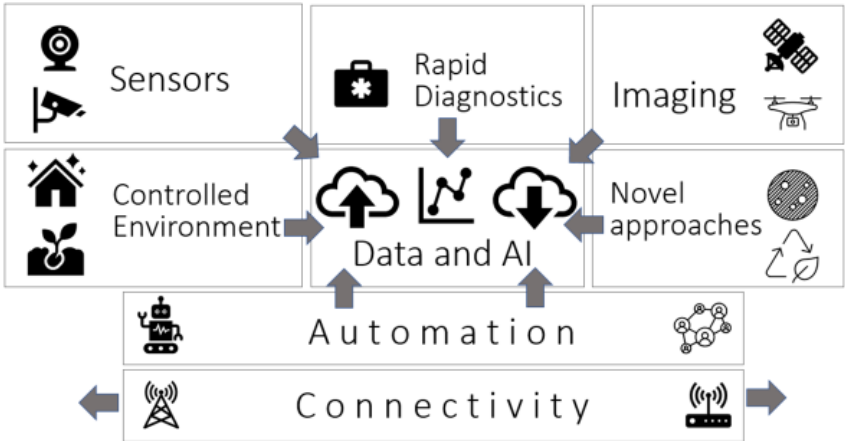
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Appendix A: Drivers for Agri-Tech Development

Introduction

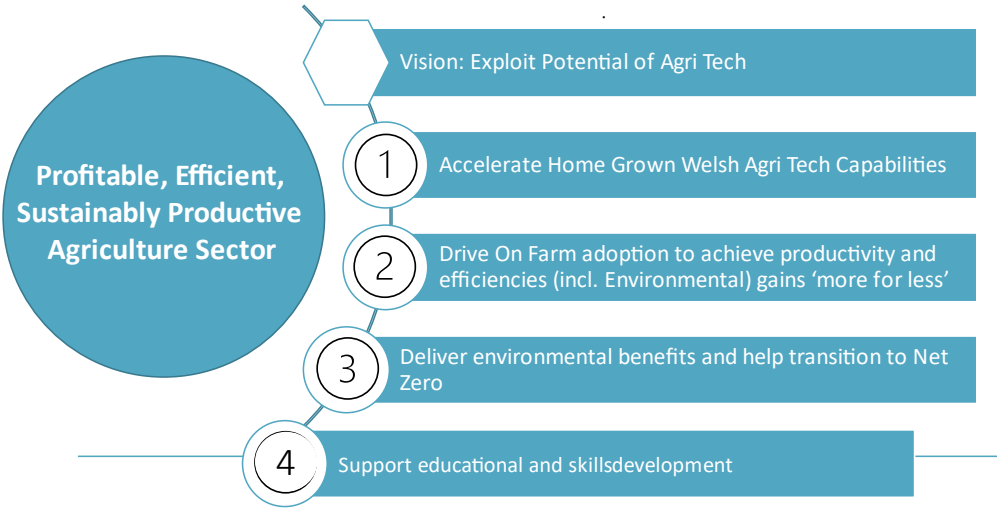
The topology for agri-tech can be very diverse and as such, it is important to clarify what the scope is in relation to the work undertaken within this document which focusses on the digital aspects of agri-tech. For the purposes of the content of this action plan and the priorities associated to the Digital Economy in Wales:

What is Agritech? A Typology for Wales



The agri-tech action plan for Wales needs to set out a clear vision for Agri-tech being a profitable, efficient and sustainably productive agriculture sector with Wales exploiting the potential of agri-tech through four objectives.

Agri-tech Strategy – Mission, Vision and Four Key Priorities



This action plan has been created with the endorsement of Ministers with responsibilities for Rural Affairs, Climate Change and Digital Transformation.

The drafting of the plan has benefitted from the support of externally commissioned research and contributions from an inter-disciplinary Welsh Government Agri-Tech Task & Finish Group. Critical to the content has been the assistance of broader Welsh Government policies and strategies, external evidence and reports pertinent to its development from industry, academia and intermediaries involved in the support and development of the agricultural and environmental agendas in Wales.

Background & Vision

Following the publication of the Digital Strategy for Wales in March 2021, the fourth mission of the strategy - Digital Economy, sets out several key priorities including:

‘Develop our Welsh Industrial clusters to be equipped for a 21st Century digital society. Adopting, exploiting and creating digitally driven innovation for the benefit of the broader economy’

The development and adoption of Agri-Tech and Precision Agri-Tech is a strategic area of growth for the Welsh economy and one that Welsh Government deems requiring of focussed attention and a road map for development. The vision is to exploit the potential of Agri-tech through a blend of collaborative, coordinated activities delivered by government, commercial and academic stakeholders through measurable and impactful interventions. This will need to include growth of the Agri-tech sector, its application and use in the agricultural community and initiatives that have a positive impact on Wales environmental and climate credentials.

To progress understanding of the existing landscape of activities in Wales and provide a foundation for work towards an Agri-Tech Action Plan for Wales, the Welsh Government openly procured an independent study to provide intelligence the following areas:

- Mapping of Welsh Agri-Tech activities & players
- Best practise in Agri-Tech on an international stage
- Priorities for action in Wales

Whilst this could not be an exhaustive study, it provided significant and necessary intelligence upon which to build the foundations to facilitate the development of this action plan.

Policy & Strategy Context

The Programme for Government (PfG) 2021-2026, published December 2021, sets out the ambitious commitments that Welsh Government will deliver over the next five years. The creation and implementation of a Wales Agri-Tech Action plan will contribute to several commitments contained within the PfG. They are:

- Deliver the Digital Strategy for Wales
- Create a new system of farm support that will maximise the protective power of nature through farming.
- Help key areas of our economy to innovate, grow and reduce their carbon footprint.

In addition to the PfG, additional strategy and policy areas to which the Agri-Tech Action Plan will contribute are:

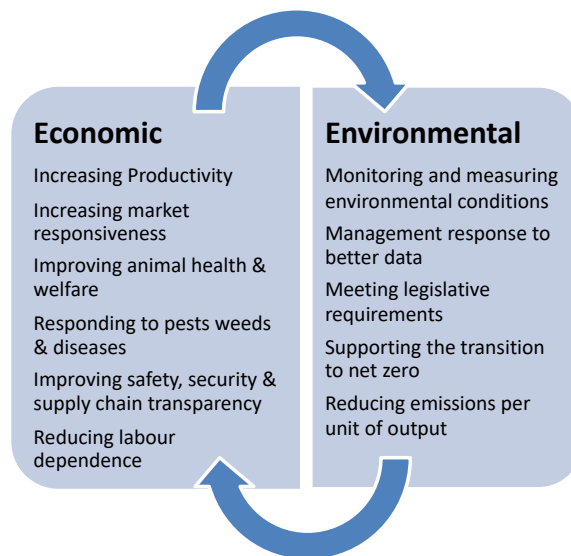
- Strategic Action Plan for the Welsh Horticultural Industry
- Welsh Agriculture Act
- Innovation Strategy for Wales
- Wellbeing of Future Generations Act

Rationale & Approach

Rationale

There are many drivers for Agri-tech development, and their importance/hierarchy vary by industry application, farm type, land use, livestock and cropping and a multiplicity of challenges and opportunities faced.

These challenges and opportunities can be classified simplistically as mainly economic or environmental in nature. However, benefits and improvements in economic outcomes often have a co-benefit of improving environmental outcomes. Some examples are:



Drivers for Agri-tech development, including but not limited to:

- Productivity
- Market opportunities, responsiveness and traceability
- Animal health and welfare
- Pests, weeds, disease
- Safety and security
- Reduce labour dependency
- Legislative changes
- Environmental, climatic and biodiversity

A more detailed explanation of these drivers can be found on in appendix A.

From research, innovation and commercialisation perspectives, issues include the ability to access and link different data sets, funding for Agri-tech product development beyond trial/ embryonic stage and access to test beds to demonstrate technology and

collaborative problem solving with industry. Commercialisation of developments from an academic environment is also an area that will benefit from focussed attention if we are to improve Welsh agri-tech export capabilities.

Education and awareness of the benefits of Agri-tech solutions is an area that would benefit from attention to support the sector with on-farm adoption. It is critical that the community of potential users of Agri-tech are engaged effectively and that the benefits of adoption are at the core of the story, not the technology.

Welsh Government commitments to climate change targets and the known impacts that agricultural practices can have to the environment make Agri-tech a vital part of the bigger picture when it comes to environmental monitoring and change. It is of paramount importance that the benefits of deploying appropriate Agri-tech solutions be realised in seeking to help address the future challenges associated with a move to a Net-Zero Wales.

Finally, the skills agenda is a critical factor that needs to be included as part of the bigger picture in developing Wales's future Agri-tech capabilities. Both existing and the next generation of agricultural professionals need to be adequately equipped to understand, embrace and embed Agri-tech effectively. While there are several extremely positive activities already underway in the educational space, better prioritisation, coordination and investment could reap significant improvements.

Approach

The overriding principle is that this Agri-tech action plan be owned by the Agriculture, Sustainable Development Division with the committed and ongoing support of functions within the Economy, Treasury and Constitution Group – namely Business & Regions and Innovation.

Any successful Agri-tech Action plan requires a mission orientated approach to deliver measurable impact. The goal of improving environmental credentials through improved productivity could help drive both public and private investment in Agri-tech and bring together fragmented activity under common objectives:

- Develop an action plan with clear goals
- Accept risk, and the trial-and-error nature of innovation
- Work with industry to realise change in lieu of market (which may not currently value agri-tech deployment benefits)
- Encourage industry collaboration – academics (across the specialisms), businesses, farming businesses, public sector (government and Agri bodies)

A mission-orientated approach will enable the sector to focus on the core drivers, challenges, opportunities and risks and develop a sustainably productive sector that can also support the challenge to mitigate against climate change.

To achieve our objectives, to exploit the potential of Agri-tech and to realise the benefits it can bring when deployed, we will require a combination of 'push' and 'pull' policies across three priority areas.

- **Push Policies:** Aimed at encouraging collaboration amongst researchers (cross discipline), farming test beds, industrial and farm business to develop solution to help solve key challenges of driving a more sustainably productive sector.
- **Pull Policies:** Aimed at encouraging uptake and adoption of Agri tech (and evolved) solutions on to the farm and along supply chain to realise potential.

Following the earlier referenced externally commissioned report to support the development of an Agri-Tech Action plan, Welsh Government formed an internal task & finish group to mature thinking and the development of the plan. This inter-divisional group consisted of representation from Economic Development, Digital Economy, Innovation and Agricultural Sustainability & Development and Food Directorates with individuals representing various specialisms within each Directorate.

The Agri-Tech Action plan, prior to publication, has been distributed for views among a broader internal Welsh Government audience prior to being shared more widely with external stakeholders from the agricultural community in Wales including industry, farming, academia and other appropriate intermediaries for comment.

Priorities for Action

Under the general rider of exploiting potential of Agri-tech in Wales, the following four priorities have been identified:

1. Accelerate Home Grown Welsh Agri-tech Capabilities
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- Nurture home grown Welsh Agri-tech capabilities through business support, cluster development, knowledge transfer and inward investment and funding to enable proof of concept and scale up to commercial size.

2. Drive on-farm adoption to achieve productivity and efficiencies (incl. Environmental) gains ‘more for less’

- Support on-farm adoption of productivity enhancing Agri-tech initiatives in Wales – whether developed in Wales or elsewhere.
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3. Deliver environmental benefits and help transition to Net Zero
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- Support environmental monitoring through Agri-tech as part of demonstrating the green credentials of Wales in its move to net zero. Identify synergistic benefits for business and the environment through Agri-tech developments and applications.

4. Support educational and skills development to equip future and existing agricultural professionals to exploit Agri-tech to its fullest

- Build on existing networks of FE, HE and other deliverers alongside industry to support the skills needs of the marketplace.

Proposed Initiatives

Contribution and input from inter-divisional specialisms within Government have resulted in a comprehensive and complementary range of proposed initiatives agreed by the Agri-Tech Task & Finish Group. A suite of reports, papers and policy objectives supporting these have been utilised in development of this plan.

1. Accelerate Home Grown Welsh Agri-tech Capabilities

- Allocate a specialist from the Innovation Team to lead on Agri-tech and undertake in-depth analysis of existing and potential Agri-tech R&D
- Seek to secure budget to invest in an Agri-tech innovation cluster for a 3–5-year period and make case for future annualised funding to match industry spend
- Secure input from Welsh Government Inward Invest Team to develop and grow the Welsh offer
- Heighten awareness and transparency of UK Funds (e.g., InnovateUK) with an aim to increase Wales's award success rates
- Seek to develop a Wales specific Agri-tech R&D grant scheme to support collaboration between companies and research organisations
- Explore potential for an Agri-tech investment option within current Development Bank for Wales Ventures Offer to support start-ups, early stage and established Agri-tech companies in Wales
- Seek to secure budget to deliver 'R&D Challenge fund' for Agri-tech

2. Drive on-farm Adoption

- Secure funding to build on existing initiatives delivered through Farming Connect to concentrate resources to address the Agri-tech challenge
- Build capacity in demonstrator farms, farm advisors and support farming unions and agricultural press with the Agri-tech agenda
- Support pilot deployment of disruptors that provide new ways of achieving production objectives
- Create exemplars to support engagement with the agricultural community
- Deliver an awareness campaign, workshops, webinars and events targeting potential users of Agri-tech to raise awareness and to support the sector in its journey of adoption
- Identify funding to support innovation and investment in Agri-tech by the farming community

3. Deliver environmental benefits

- Work closely with international and national industry expert bodies in the fields of environmental monitoring and fugitive emissions to establish a framework for action in Wales
- Deploy pathfinder projects to assess IoT based platforms to support environmental monitoring and subsequently data driven decision making
- Support implementation of Agri-tech solutions in policy monitoring and self-monitoring to improve the environmental performance of farm businesses and to reduce monitoring costs.
- Explore the application of Agri-tech solutions in support of the Control of Agricultural Pollution Regulations, (Phases effective from Apr21, Jan23 & Aug24)
- Develop competitive advantage for Wales through validation of sustainability credentials and/or development of accreditation.

4. Support educational and skills development

- Create and facilitate a network for academic institutions to collaborate and share best practice and learning content in Wales.
- Seek to establish a number of Peripatetic Agri-Tech Development Officers appointed to the FE sector who can:
 - Provide Professional Learning for FE staff in the use of Agri-Tech
 - Ensure consistency across the post-16 curriculum in the teaching of Agri-Tech
 - Build relationships with related Engineering/ AI and Food Science departments in FE / HE
 - Develop and deliver short courses to the existing workforce in the use of Agri-tech
 - Provide school STEM enrichment programmes to inspire the next generation of agriculture and land-based workforce.
- Identify and broker collaborative actions with HE initiatives for AI, Machine learning and other data analysis tools to be developed and commercialised.
- Consider closely the recommendations of the 2021 Arad report, commissioned by the Colegau Cymru to develop and enhance facilities in post-16 provision in agricultural and rural development.

Metrics

Given the diverse nature of the proposed initiatives and strategies/policies that they stand to satisfy, it will be necessary to develop a suite of fit-for-purpose metrics. This will enable officials, delivery partners and participants of initiatives to measure the impacts of each individual action and the collective contribution they make to objectives.

It is proposed that upon agreement and pre-mobilisation of individual initiatives, metrics be agreed with clear lines of reporting that meet strategic objectives of the Agriculture, Sustainable Development Division and the Ministerial Digital Policy and Delivery Group.

Welsh Government - Business & Regions Digital Economy and Innovation teams will support this exercise to ensure appropriate tools are utilised in supporting stakeholders' ability to measure success of the Agri-tech action plan and its deployment.

With several the initiatives contained within this document seeking to build upon, or bring focus to pre-existing mechanisms and vehicles, it will already be that case that established benefit realisation metrics will be in chain that can easily be adopted.

Dependencies

There are several dependencies across the suite of proposed initiatives, these include agreement from political leadership, Welsh Government human resources, financial resources and stakeholder buy-in and contribution in various guises.

In many cases, the preparatory work undertaken in developing this action plan has already successfully secured positive commitment to several the dependencies for which individual initiatives rely. Formal adoption of the plan will only serve to further reduce any outstanding dependencies that remain to be addressed.

Drivers for Agri-Tech Development

Increasing productivity

In competitive markets, improving productivity is a key driver of change. Technological application enables farmers to improve their productivity through better monitoring of KPIs, responding to changing conditions, reducing waste and increase the efficient use of inputs and capital equipment.

Increasing responsiveness to markets

Being able to understand and respond to changing market dynamics by linking production to market demand and market conditions through technology.

Improving animal health and welfare

Strongly associated with improved productivity, the use of technology to help improve health and welfare of livestock - providing early warning of issues, monitoring health to reduce disease transmission, improving breeding and fertility, reducing animal stress.

Responding to pests, weeds and diseases

Being able to monitor livestock and crops for early sign of pests, weeds and diseases, focused treatments, early warning to enable preventive, targeted action.

Improving safety and security

Improving lone worker conditions, improving farm safety, safety against theft and damage, visitor safety, monitor of farm working conditions.

Improvements in supply chain transparency

Ensuring better traceability, supply chain transparency linked to marketing claims, customer requirements and improved accountability.

Decrease dependency on labour

Use of technology to free up labour, to improve labour productivity, to manage larger/extensive units, to respond to labour shortages, aging workforce, reduce physical demands, improve safety.

Responding to legislation

Adapting to changes in legislation such as reduce used of antibiotics, nitrate legislation, air quality etc.

Responding to environmental/climate concern

Monitoring and measuring of environmental conditions and factors that influence environmental conditions. Adapting to changing climatic conditions and their impacts on production and future production.

