



Sustainable Places
Research Institute
Sefydliad Ymchwil
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Knowing to Grow: Increasing the resilience of plant-centred food production skills

Report of Workshop One - 4 June 2019

Sustainable Places Research Institute Cardiff University

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Read all the working papers from this project:
<https://www.cardiff.ac.uk/sustainable-places/research/projects/knowning-to-grow>

1. Headlines

- 20 stakeholders came together to explore issues around skills and knowledge for edible horticulture, what should be done and how research might help.
- Participants expressed a strong wish for more collaboration between those involved in horticulture, and for a clearer collective voice speaking to influential actors such as government.
- Wales-based attendees were keen to champion the potential for more horticultural production, and optimistic that the Welsh legislative context should enable this.
- Participants offered divergent views on how horticultural production in the UK might best evolve, suggesting a range of growing systems and types of enterprise will be required.
- No type of horticultural enterprise will be insulated from ongoing challenges meeting their skills and knowledge requirements, particularly in light of climate change impacts.
- The problem requires further investigation, with certain knowledge gaps being prioritised:
 1. What training and skills is required for key roles and responsibilities across the industry? How does this map this onto training provision? What shortages does this reveal?
 2. How many vacancies are there in permanent horticulture positions?
 3. How does the breakdown of public investment in supporting food production compare with proportions of each food type recommended by the Eat Well diet?
 4. What is the right balance between practical and theoretical training for growers and how can this be provided? Where is the social support to help new and existing growers develop their skills?
- Stakeholders proposed a wide range of potential actions to address the UK's skills challenges:
 1. Get the right people to represent horticulture and to work together with government.
 2. Provide more training in sustainable growing practices to support greater production of this type.
 3. Ensure public investment in the food system matches the make-up of a healthy diet.
 4. Embed food growing in primary and secondary school curriculums.
 5. Promote horticultural careers through advertising and using young ambassadors.
 6. Improve retention of workers in the sector.
- The group was aware of current initiatives which could offer good practice or be replicated:
 1. Growers thriving and delivering good practice: e.g. Puffin Produce.
 2. Support to growers and the sector – e.g. Tyfu Cymru.
 3. Initiatives supporting wider change around food consumption – e.g. Peas Please.
 4. Educational activity and work in schools – e.g. primary schools engagement at Cae Tan.
 5. Policy initiatives – e.g. new agriculture bill.
- Participants identified a number of grower profiles and how their skills challenges vary, then prioritised those for detailed investigation through case studies.

2. Introduction

Knowledge and skills are essential for growing and producing food. Ensuring their future availability is therefore vital for resilient agri-food systems. The project *Knowing to Grow* considers how to meet knowledge requirements for future food supply chains, focusing on the case of horticultural production. It draws on international experiences and stakeholder expertise to inform strategies to enhance food security in Wales and beyond. The research, led by Dr Hannah Pitt at Sustainable Places Research Institute, Cardiff University takes a social science approach. It seeks to involve stakeholders across each stage through a series of participatory workshops. Each brings together academics, people working in or with horticultural businesses, civic society organisations and policy makers to exchange their perspectives and ideas. The project's end result should be knowledge and recommendations to help make food production systems more resilient.

The workshop

The first stakeholder workshop was organised to coincide with the end of the scoping phase of research in June 2019. It offered an opportunity for stakeholders to hear initial findings, and to shape priorities for the future stages, including case study selection. Participants engaged in facilitated discussion activities designed to gather their perspectives on the research topic. This report presents a summary of the day's discussions in order to share them with stakeholders who could not attend. It also serves to record and promote the messages attendees had for others such as politicians and business leaders.

Workshop participants came from across Wales and beyond, having been invited through the project's networks and publicity. Travel time made it difficult for some who expressed interest to attend, skewing participation to Wales-based stakeholders. This was reflected in some discussion which emphasised Welsh issues, context and policy.

As with all the project's activity, the workshop emphasis was on edible or production horticulture, but discussions repeatedly noted the overlap and common ground with other parts of the sector, and that not all stakeholders or activity neatly separates out ornamental horticulture.

It is never possible to capture all the ideas generated during a workshop; it is difficult to convey the energy which participants brought and harnessed by being together. Group discussions were audio recorded to facilitate accurate summaries of the points raised. Where participants had differing views or disagreed the report attempts to reflect this, however it is the author's interpretation which is presented. It should not be assumed that all who attended endorse all individual points included.

The report mirrors the structure of the workshop which began with a presentation of research findings to date, followed by discussion of issues presented, then exploration of types of production horticulture enterprises and their skills issues. This characterisation formed the basis of discussion to prioritise potential case studies for future research.

Thanks to all who generously gave their time and expertise during the workshop. Particular thanks to Alice Taherzadeh and Dr Agatha Herman who acted as group facilitators, and to Catia Rebelo for excellent assistance with preparations and on the day.

3. What's the problem with horticultural skills in the UK?

Dr Hannah Pitt opened the workshop by sharing the results of the initial stage of research which has comprised a review of literature on horticultural skills, interviews with those working in the sector or with

expertise in the topic, and attendance at relevant events and meetings. The detail of this analysis is available in three [working papers](#); key points shared with the workshop are summarised here.

The problem

- For at least a decade there has been discussion of a crisis in horticulture regarding skills and shortages of skilled people to work in the sector.
- However there is inadequate data or evidence to characterise the nature of these shortages or the problems facing the sector. As one interviewee put it: ““we say there’s a skills gap, we don’t know what it is really”.
- Interviewees highlighted two key dimensions of the problem: shortages of people wanting to work in horticulture across all levels and job types, and inadequate or unsuitable infrastructure to develop required skills or provide education in horticulture.
- Interviewees noted the complex factors behind the problem, and that it is a pattern across Europe and developed economies, also affecting other vocational work. These trends were taken to show that the UK leaving the EU was not the cause, but brought the problem into relief.
- Those interviewed suggested a range of factors causing the problem:
 - The image of horticulture as an unappealing career, or for those with low aspirations.
 - The nature of some horticultural jobs being demanding physical work, and/or with low pay.
 - Being a sector of squeezed margins under pressure to cut costs.
 - Under- and disinvestment in relevant education particularly in further education, and decline in specialist horticultural training and research institutions.
 - Lack of collaboration and cooperation within the sector, and failure to connect activity on skills.
 - Lack of government attention to, policy or support for horticulture, particularly relative to other forms of agriculture.
 - Reliance on migration to make-up shortages in personnel.

How has it been addressed?

- The sector has attempted to address most of these causes but seems to have made inadequate progress.
- Interviewees reflected on what these efforts have attempted and why they may have been sub-optimal:
 - Groups & Strategies: have been short-lived and lost momentum, are overly fragmented.
 - Careers promotion: relies on information rather than deeper engagement, fragmented and confusing for the public.
 - Improving job quality: successful values driven enterprises succeeding in attracting new entrants, and restructuring to allow greater employee ownership, but are isolated examples.
 - CPD and training programmes: new initiatives like Tyfu Cymru and Smart Hort seeking to meet company needs.
 - Policy advocacy: most recently through two Roundtables, but the policy context is complex and siloed, difficult for a small sector of low-capacity organisations to engage with.
- Interviewees had varied views on who should take responsibility to lead action, with some expecting government leadership. There was consensus on the importance of collective action.
- The current picture of sector fora and networks demonstrates fragmentation and duplication, with lack of engagement from retailers.
- Few initiatives have been evaluated or reported on their impact. Recent initiatives such as the Senior Skills Leadership Group are seeking to address some of the failings of past efforts.

Reflections from the workshop group

Discussion of the presentation demonstrated a range of views on the challenge, and how it might be addressed. Specific suggestions are summarised in sections 4 and 5. In addition participants made more general observations of the situation and their visions for the future. Echoing issues highlighted in the presentation, a strong theme was the challenge of **making horticulture more appealing**, reversing negative perceptions and ensuring it is portrayed to young people as a worthwhile career.

Participants noted that issues around **skills cannot be divorced from the whole food system**, and its wider challenges. There were differing views about the best route forward. Some favoured an approach prioritising sustainability, integrating human health with soil and plant health, pointing to an emphasis on greater domestic fruit and vegetable production. Some suggested that such a move is timely due to the coincidence of climate, biodiversity, obesity crises which point to changing diets. But the economic challenges of producing in this way were noted, including low farm incomes overall, the difficulty of basing farm businesses on horticulture or of building viable medium scale enterprises.

Others envisaged a move to export oriented production, including greater use of controlled environment growing supported by more advanced technology. These styles of production were expected to offer jobs more appealing to young people including high paid technical roles.

There was consensus that concern with **how food is produced also needs to be connected with how people eat**. Participants noted the problem that diets in the UK typically include less than recommended levels of fruit and vegetables. Others voices an aspiration for ‘a nation of eaters’ who value quality food and understand how it is produced, capitalising on the power of food as something linking everyone. Some felt that attention to how food is consumed can help attract people to food production careers, although it was noted that there are also skills shortages at this end of the supply chain. The challenge was encapsulated as needing to reverse the way food growing work has “been demeaned”, with the hope that if the public better understand the value of food they will enable producers to command higher prices from retailers.

As a group with a strong presence of Wales-based stakeholders, some issues specific to the country were highlighted. The legislative context of the **Wellbeing of Future Generations Act** was seen to offer useful opportunities to support sustainable horticulture. However, specific challenges in expanding the sector were noted: a perception that Wales is not suited to horticulture, the strength of the national meat lobby and its influence on policy, and terrain which limits large-scale production. Countering these are: a history of horticultural production in Wales which could be revived, a strong and growing organic sector, good potential as a producer of high value and specialist crops such as heritage varieties. Participants articulated a desire for a **strong and coherent voice for horticulture in Wales**, and suggested that to gain recognition it is important to unite with the economically significant ornamental sector. It was noted that networks with a UK remit do not always work well for Welsh stakeholders, particularly when policy timelines vary between Cardiff and Westminster.

Following discussion of the issues, participants were asked to identify priorities for future action or investigation, either as part of the *Knowing to Grow* project, or through other avenues. This was organised by three key questions: what do we need to do? What do we need to know? What is already happening? Participants were invited to take a broad interpretation of ‘we’ in each case rather than being confined to those in the room.

4. What do we need to know?

Reflecting on the issues highlighted in the presentation, workshop groups engaged in discussion to identify knowledge gaps or areas for further investigation. Each of three groups were invited to select up to three of these as their priorities. The points proposed as priorities were:

1. What training and skills is required for key roles and responsibilities across the industry? How does this map this onto training provision? What shortages does this reveal?
2. How many vacancies are there in permanent horticulture positions?
3. How does the breakdown of public investment in supporting food production compare with proportions of each food type recommended by the Eat Well diet?
4. What is the right balance between practical and theoretical training for growers and how can this be provided? Where is the social support to help new and existing growers develop their skills?

The groups identified multiple areas where understanding or knowledge should be enhanced, which can be grouped thematically. Firstly, were points relating to **labour market intelligence** or gathering better data on jobs and training. This could be summarised as needing a thorough map of the sector's skills gap in order to tailor and target corrective action. Specific data requirements included the number of unfilled permanent roles, and numbers of horticultural apprenticeships delivered. There was also an appetite for information on current training provision for horticulture, including course availability, provision of specialist organic courses, and levels of demand for all courses. Participants also felt it would be useful to know numbers of people currently being trained through the various programmes available, including apprenticeships and informal programmes such as those run by voluntary organisations. All this information would form part of the assessment recommended in point 1 above – mapping need against current provision in order to **better characterise gaps**.

A second area of interest was gaining a better understanding of **government support for horticulture**. This included knowing how much is invested in the sector, and whether this reflects the significance of fresh produce within recommended diets. A better sense of where there are funding shortages was also judged useful. For Welsh Government specifically, there was interest in information on what is being done to use the school curriculum to attract people to horticulture and develop food education. In order to influence government, it was suggested the sector needs to identify who acts as its voice.

This concern connected with a third area of discussion which noted a need to **better understand potential solutions** and ways to address the challenge. Questions included how to best bring horticulture into schools, and how to change social structures to encourage participation in food and horticulture. One participant summarised this as needing to know “how to make horticulture sexy”. This is linked to the perceived need to understand why the skills and work of food producers have been demeaned and are not valued. Some suggested the importance of understanding **consumer preferences** better in order to shape food production and supply chains. One group proposed mapping Wales' land to identify what can be produced where, and matching this to what the population needs to eat healthily. A specific measure identified as valuable was a baseline of school pupils' awareness of food production, against which progress could be tracked.

Finally, there was a suggestion of needing to know where **best practice** is available, to identify what can be learnt from the success of companies like Puffin Produce or overseas enterprises. New Zealand was noted to have similar conditions to Wales, and a larger horticultural industry, perhaps suggesting experiences to learn from. It was suggested that the UK might learn from how other countries are addressing similar issues around skills and labour for horticulture.

5. What do we need to do?

Discussion elicited a large number of proposed areas for action, or recommended activity to address the problems identified. This included both broad goals and desired outcomes, and more specific initiatives or potential outputs. In terms of desired actions, participants identified the following priorities:

1. Get the right people to represent horticulture and to work together with government.
2. Provide more training in sustainable growing practices to support greater production of this type.
3. Ensure public investment in the food system matches the make-up of a healthy diet.
4. Embed food growing in primary and secondary school curriculums.
5. Promote horticultural careers through advertising and using young ambassadors.
6. Improve retention of workers in the sector.

Discussion of what needs to be done considered four broad areas of action. First was around the general aspiration to **change perceptions** of horticulture to be more positive and exciting, making it a field young people want to work in. This included countering assumptions that it is an unskilled sector, and increasing understanding of the variety of careers it offers, including for those seeking values driven work. It was suggested that presenting growing as more than farming, and as a multi-skilled entrepreneurial vocation could help. One group noted that this is likely to require distinct, tailored approaches for the different types of role available in the industry, as permanent and seasonal vacancies have different profiles. Communication channels suggested to help progress this were Careers Wales, TV campaigns and use of young ambassadors. It was also suggested that communication of available training be consolidated, and all promotional campaigns be evaluated.

The second area of suggested activity focused on schools and post-secondary **education and training**. General aspirations included the wish for more provision of educational pathways outside formal education, and better infrastructure to support training and apprenticeships. Within schools, people wanted more engagement with food growing, and food growing activities linked to the curriculum included to secondary level. Suggestions for how to achieve this included linking horticultural businesses and schools to promote understanding of the food sector. A proposed project would make this easier for schools, linking them to available sites, advising on growing activities, and supporting teachers to link these to the curriculum.

Proposed initiatives beyond schools were to link colleges to enterprises which can offer training placements, and fund placements to allow small growers to host trainees. It was suggested that informing growers about the structure and requirements for apprentice training might enable them to offer suitable placements. The group noted that support is required to enable trainees to move into their own enterprise, providing advice and networks of peer mentors. Some participants highlighted the need for specific attention to training in sustainable production and practices. For Wales specifically, it was proposed that centres around Wales are needed to allow people to gain experience required as a production horticulture apprentice.

The third cluster of ideas considered how the sector should **work together and raise its profile**. There was an aspiration for a strong voice for the sector, by connecting organisations, finding the ear of Government and other influential actors such as big retailers. Specific targets for collaboration were identified as the health service, given the public health benefits of the UK population consuming more fruit and vegetables. **Action for government** would be to ensure dialogue across departments regarding support for horticulture. Another policy proposal was for public subsidies to be extended to smaller scale (<5ha) commercial growers. For Wales specifically, it was suggested that a government-linked cluster focused on horticulture may be appropriate, or that Lantra build on current activity to draw organisations together. The socio-economic duty and responsibilities under Wellbeing of Future Generations Act might be used to promote horticultural production as healthy food from sustainable land management.

The final area of desired action looked at the **food system as a whole**, identifying more fundamental changes which would facilitate the growth and public appreciation of horticulture, making it a more viable and rewarding sector to work in. The over-arching goal was described as shifting the supply chain to increase income generation for domestic horticulture, particularly for small scale and alternative producers. Beneath this was the need for people to eat more plants grown in the UK, and for retailers to support these producers. Participants based in Wales suggested potential to expand horticultural production there but this would need to overcome a popular misconception that the country is 'not a place for horticulture'. The sector's growth in Wales would be bolstered by more locally focused consumption making mid-scale growing enterprises more economically viable. This together with education about the potential for horticulture could encourage farmers to diversify into horticulture.

6. What is already happening?

Participants were invited to share information about activity they were aware of already helping address the issues identified. A wide range of ongoing activity and good practice was mentioned; this has been organised into five categories.

1. *Growers thriving and delivering good practice:* examples in Wales included Puffin Produce with its considerable and ongoing expansion. Participants noted the number of smaller independent farms, concentrated in West Wales, supplying local box schemes, markets and cooperatives or operating as CSAs. Cae Tan near Swansea offers training placements and has supported trainees to move onto set up their own operations. One participant is involved in establishing an academy for controlled environment growing which will provide comprehensive training in running a growing enterprise, addressing a gap in current training provision.
2. *Support to growers and the sector:* AHDB provides online resources enabling development of many of skills essential for producers, including business planning and management. However, not all events and resources are available to non-levy payers. Some participants are involved in the Fruit and Veg Alliance which aims to champion domestic fruit and vegetable production. For smaller enterprises or those growing organically Land Workers Alliance leads various support initiatives, with a focus on peer learning, to be consolidated through planned regional training hubs. The Innovative Farmers Network runs field trials and explores new technology, developing knowledge through links to research facilities. In Wales Tyfu Cymru run by Lantra was seen as a positive step for Welsh horticulture, raising the sector's profile with Government. Farming Connect was also commended but noted to lack significant focus on horticulture.
3. *Initiatives supporting wider change around food consumption:* Examples included Peas Please which works across the UK, to encourage retailers and caterers to commit to increased veg consumption. The first Welsh Real Food and Farming Conference will take place in November 2019.
4. *Educational activity and work in schools:* participants were aware of numerous instances of schools doing positive work on food education and food growing, but not always with national or strategic coordination. Cae Tan CSA secured project funding to employ a teacher to offer primary schools sessions linked to the curriculum. Bridgend College run schools programmes to expose children to horticulture and involve them in garden design projects linked to art lessons. Facetime a Farmer and Open Farm Sunday run by LEAF were mentioned as examples of initiatives to engage young people with positive experiences of food production. Food Growing Schools London was noted as an example of coordinated food growing across all schools.

5. *Policy initiatives*: some participants felt that changes to agricultural policy in the UK will encourage farmers to shift their practices towards sustainable modes, and might encourage diversification into horticulture. This will heighten the need to provide skills development in these areas. Examples of supportive policy activity focused on the Welsh examples such as government clusters focused on food (e.g. Controlled Environment Growing Strategy Group), support for apprenticeships and Government-led research into the influence of food provenance on consumption patterns.

This list is not comprehensive as those present may not be aware of all relevant activity, particularly that without a strong presence in Wales. However, it indicates a range of good practice which could be learnt from, expanded and added to.

7. Types and trajectories of growers

The next stage of discussion sought to tease out some of the different types of horticultural producers and how their experiences of skills issues might vary. This was intended to facilitate identification of potential case studies, by **characterising some variations between growers**. Participants noted that the huge range of types of horticultural producers around the UK could not easily be narrowed to a selection of ideal types, with variables including scale, degree of automation, production system, crop types and more. There were also differing opinions about what types of growing and business set-up will be most viable and desirable in the next 10-15 years. Some participants were keen to champion small to medium scale enterprises with an emphasis on sustainable practices, whilst others thought conditions will necessitate greater use of controlled environments and automation. There was some consensus that the UK is likely to need a range of types, ranging between these poles.

In an effort to simplify this complexity, participants were asked to devise profiles of a range of horticultural enterprises which might exist in the UK. Discussion drew on examples of actual enterprises, but was not limited to considering real cases. This resulted in realistic profiles of five grower types.

Grower Profile 1

A very large commercial business, growing field vegetables across a number of farms linked into a cooperative; own packing facilities; mostly supplies supermarkets; an expanding business.

Skills issues:

- Skills required include supervision and communication; negotiation; technical skills; business management; machinery training.
- Lack of local workforce, need for significant migrant labour which is increasingly hard to secure and of lesser quality.
- Need for people with high level management skills.
- Will need training and new skills for increased mechanisation.
- Aging profile of growers.

Likely responses:

- Are able to provide in-house CPD specific to crop and production system.
- Have resources to undertake a skills audit for their business.
- Look to learn from large enterprises internationally which have experience of responding to these issues and operating at scale.
- Use Block Chain to manage traceability issues and meet supermarkets' standards criteria.
- Benchmarking production systems and efficiency to determine most efficient system.
- Access Government funding for Digital Catapult to support better use of data.
- Upskill next generation on farms to enable succession.

Future skills issues:

- Increasing demand for Carbon footprinting and environmental performance to meet criteria set by supermarkets; requires more data and management systems.
- Likely to see decreased subsidy payments.
- Unpredictability of climate and more extreme events; water management systems a greater priority; different pests and diseases requiring new control practices.
- Having to adapt to loss of chemical pesticides and use of biopesticides.
- Introduction of new technologies and more sustainable systems requiring new technical knowledge.
- Need to turn around decline in soil health.
- Continuing to maximise efficiencies through accessing research, benchmarking and use of mass data.

Grower Profile 2

A recent start up, single site, mixed organic, medium scale farm; independent owner operators; mixed meat and horticulture; hyper-local supply chain supplying a box scheme, markets and retail; prioritise high value outputs; partially mechanised; growing protected and field fruit and veg; practices focused on biodiversity and maintaining fertility; owners work full time, part time and seasonal workforce plus volunteers and apprentices.

Skills issues:

- A huge range of skills required to establish and run the enterprise: building local food communities; access to land; funding/ subsidies; finances / business; managing for different crops and conditions; circular systems; waste management.
- Requires a degree of physical labour which is hard work and not appealing to all.
- Increasing costs of labour.
- Changes to volunteer and seasonal worker in-migration post-Brexit.
- Difficulty accessing training schemes focused on organic / sustainable production methods; lack of specialist organic growing degree courses or training placements with hands on experience.
- Difficulty stepping up from traineeship to running own business.
- Lack of public subsidy and support accessible to sites under 5Ha.
- Takes determination to find opportunities for learning and to keep pursuing business success; requires commitment and passion.
- Seasonal workers and volunteers lack skills for managing specialist issues (pests, fertility) creating a need to constantly train recruits.
- Burden on the owners to manage people and their training.

Likely responses:

- Connect across networks enabling peer learning (e.g. OGA, LWA), including use of social media to exchange ideas and advice.
- Support training provision by hosting apprentices.
- Growers work to promote the benefits of working in food production in order to attract other new entrants, focusing on this work as 'reconnecting to nature' and intellectually challenging.
- Learn by taking up entry level jobs on a farm and working way up.
- Capitalise on interest in eating vegan and vegetarian to build support for this type of food production.
- Campaign for public money in return for wider benefits to improve financial viability.
- Being part of and developing local food economies; broad collaboration as a locally focused sustainable food movement promoting the need for consumers to invest in good food production.

Future issues:

- Difficulty remaining economically viable due to very tight margins.
- Need to retain biodiversity and the seedbank.
- Finding time to get off the farm to engage with wider activity to support the sector and inspire new entrants.
- Climate change will affect all operations and require new practices to mitigate its effects, e.g. new crop varieties, sustainable water management.
- Need to invest in new infrastructure (e.g. boreholes) will further pressure margins.
- Need skills and specialist knowledge to manage declining soil fertility, e.g. green manures and leys, rotations, composting.
- Need to adjust production and systems to future proof - require new knowledge.

Grower Profile 3

Large soft fruit specialist; very high seasonal labour requirement; supplying several large retailers; multi-site production centred on polytunnels.

Skills issues:

- Large labour requirement due to little mechanisation; mostly seasonal workforce.
- Shortages, deteriorating quality and transience of labour due to dependence on migrants.
- Lack of labour later in season for tree fruit as seasonal workers leave once they meet their tax free earning threshold.
- Productivity and efficiency – vast variation between experienced and new pickers.
- Training around fruit quality and ripeness, pests, diseases; require easy to access guides for use in the field.
- Need workforce skilled in assessing produce, pesticide use and pest management.

Likely responses:

- Currently focused on immediate challenges relating to migrants but are interested in bigger picture challenges.
- Trial rotating workforce between enterprises and crops with different seasonal demands.
- Attention to monitoring worker efficiency and understanding reasons for variation.
- Promote champion worker criteria and good practice.
- AHDB resources to support field workers with crop assessment, including translations into multiple languages.
- AHDB strategic sites looking at labour efficiency, testing changes to ways of working and developing learning on how to make up for shortfall in labour (quantity and quality).
- Increase workforce efficiency to make up for labour shortfall: upskill seasonal staff and enable them to be more productive; use LEAN to increase efficiency and reduce waste.

Future issues:

- Robotic harvesting should be viable soon; will require transition to new technologies and technical expertise, with a shift in type of staff and skills needed; increased demand for IT and technical skills.
- Need for research and development into new varieties with enhanced taste and sweetness.
- Identifying local and heritage varieties to deal with climate change and improve premium.

Grower Profile 4

Large scale mixed organic estate; 50-100 acres of field vegetable production; specialist managers for each part of the operation; up to 10 full time staff plus 100s of seasonal / casual staff; supplying multiple retailers; relatively high degree of automation; packing and basic processing on site; large independent business.

Skills issues:

- Declining access to people, especially seasonal staff, making recruitment difficult.
- Complex crop planning including managing fertility requires significant training or buying in expertise.
- Increasing costs of labour.
- Divergent labour pool – some very specialised, others labourers; requires a sophisticated management hierarchy.
- Skills needed: HR and people management; crop rotation/ managing fertility.
- Accessing suitably expert advisers and consultants.

Likely responses:

- Have capacity to invest in training programmes.
- Promote vacancies as highly skilled jobs.
- Provide quality accommodation to make jobs appealing.
- Look to cooperative structures and collaboration with other businesses to share workforce across the year.
- Think creatively about experiences people can be offered to get involved e.g. link to tourism.

Future issues:

- Need to respond to climate change – e.g. water management – and access appropriate knowledge to enable this.
- Looking to use of robotics to address labour shortages.
- Will still struggle with need for certain physical labour which is not particularly appealing.

Gower Profile 5

Small-indoor vertical growing, 1000M²; hydroponics; urban fringe site; employ up to 30 people; some automation; specialised crop production and packing; limited company started by an entrepreneur; year round employment; sell through short supply chains or direct; connected to research institutions and innovation.

Skills issues:

- Have to provide in-house training in specialist skills not provided by education institutions.
- Complex array of skills needed within the workforce; expect basic level IT skills and passion for learning on the job.
- Location can enable access to workforce.
- Rotation between roles to make use of staff year round so all need flexible skills.
- Likely to be linked to research – feeds innovation.
- Very knowledge intensive company.
- Difficult recruiting staff with necessary skills: hydroponics, scientific understanding, sensing, office and IT skills.
- Ideally want Masters level educated people but is difficult to attract them.

Likely responses:

- Highlight the specific appeal of these jobs: year round production, variety / technicality of work, career pathway within the business.
- New accreditation for indoor and vertical growing.
- Connect with FE institutions so trainees can learn about working in these enterprises.

Future issues:

- Likely to increase automation, potentially moving to full automation.
- Need to reduce energy demand and make use of renewables.

- Declining costs of LED is likely to make different crops profitable.

With regard to skills issues it is apparent that there are **commonalities across all types** of grower, particularly around recruiting suitable employees. Each enterprise also has a varied and complex set of knowledge and skills requirements, in most cases quite specific to their production type. It is also notable that new entrants face particularly intense learning requirements and require support to transition from training to operation. Not all skills needs are supported through formal education and training, a gap large businesses can fill through paying for dedicated provision whilst smaller ones rely more on peer learning and informal support. Some other issues can be mitigated through actions deliverable by individual growers, whilst others are likely to require a collaborative response or broader mechanisms such as policy change.

All types of grower face additional or different **challenges in the next 10-15 years**: adapting growing systems to extreme weather, reduced chemical inputs and declining soil fertility will require new knowledge and skills. Most commonly noted amongst these were the impacts of climate change which will affect horticulture in multiple ways, all requiring changes to operations and accompanying knowledge. Some discussions expected that all growers will need to increase attention to sustainability, moving to practices which preserve soil and biodiversity, again requiring new skills and expertise. The other trend potentially affecting several types of grower is the aging profile of those working in the sector, and need to attract more new recruits to succeed them. Although automation may reduce the total labour requirement within the sector, this may not fully offset the succession issue, or need for new expertise to work with the technology and respond to other imminent challenges. Smaller enterprises will also struggle to invest in automation. Overall this presents a complex and uncertain picture of the near future, in which skills issues are likely to remain a concern for most horticultural businesses. The ability to respond successfully is dependent on a business's capacity to invest beyond essential inputs, so **varies with the relative economic strength** of different enterprises.

8. Case study priorities

The profiles created by workshop participants were presented as a range of horticultural producers which might represent suitable case studies for detailed research as part of *Knowing to Grow*. The group was invited to suggest additional grower types, resulting in 12 potential case studies including some named businesses or farms. Each participant was given two votes for priorities for further research. Those receiving the most votes were, in order of preference:

1. Small-medium organic grower supplying local markets (e.g. Troed y Rhiw, Cae Tan)
2. Industrial large scale vertical growing with high automation (e.g. Jones Foods, IGS Dundee)
3. Large mixed farm with livestock and horticulture
4. Specialist glasshouse salad growers (e.g. Thanet Earth, Wight Salad)
5. Overseas examples of high investment and government support (e.g. Netherlands, Singapore, Hong Kong, Spread hydroponics).

This prioritisation will inform case study selection for the next stage of the project.

9. What next?

Before closing the workshop participants were asked to share their aspirations for outputs and outcomes from the project. Those suggested were:

- An education action plan for horticulture.
- A forum for lobbying for horticulture in Wales.
- To be kept informed of progress.
- To keep discussing and sharing.
- To get schools involved / make connections with education, via Welsh Government.

- Identify specific actions for Wales.
- Identify skills development areas for Tyfu Cymru to support.
- Understand which approaches to providing training are most effective (e.g. apprenticeships / hands on doing) and appealing to growers.
- Make sure we don't reinvent the wheel.

Participants expressed a wish for further involvement in the project, and for future opportunities to gather in ways similar to the workshop. It was suggested that retailers and various parts of Government be included, and that the remit extend to ornamental horticulture as the issues overlap.

10. Conclusions

Participants were invited to share feedback on the workshop through an anonymous form. All but one of the 14 responses received stated that they had **achieved what they had hoped** for through participating, and/or had gained something additional. The only aspiration not met was to learn more about Welsh Government priorities. Comments suggest participants found it particularly valuable to discuss the issues with others, and to hear from a wide range of perspectives. It was identified as a useful first step to building a network and platform to raise the sector's profile, particularly in Wales. From the convenors' perspective, the workshop met the intended objectives of feeding back to stakeholders, and involving them in prioritising future research.

Workshop discussions highlighted issues for the project to consider as it evolves. Firstly, stakeholders have **divergent views on how food should be grown** in future and what should be viable enterprises. Some championed local organic sustainable systems, whilst others perceived this approach incapable of feeding the population, or were more positive about export oriented production. These views are not easily reconciled and highlight the importance of recognising stakeholders as diverse actors rather than a unified group. A research project investigating 'the future of horticulture', must remain mindful of the **sector's diversity and varied trajectories**. Where it is not possible to consider or present a broad range of producers this limitation should be accurately communicated in research outputs.

A second consideration highlighted by the discussions, is that **skills and knowledge issues are not easily separated from other dimensions of food systems**. The focus of these investigations therefore has a fluid and shifting boundary. The risk of this is that the research scope becomes too broad to be manageable or meaningful. However, it will be important to present a realistic account of the nature of the challenge, which as participants suggested, might only be resolved by high-level systemic changes.

The final reflection arising from workshop discussions is that although Wales has a relatively small community of horticultural stakeholders, they are keen to **collaborate and gain greater profile**. This project can assist in some regards, but there may be a need for additional mechanisms to facilitate Wales-specific cooperation or to better connection into UK-wide networks.

In response to aspirations expressed during the workshop the *Knowing to Grow* project will aspire to:

- Ongoing sharing of knowledge gathered by the project.
- Future workshops offering stakeholder discussion, networking and participation in research planning.
- Where possible, act as a point of contact for stakeholders and input their views into suitable channels.

11. Appendix 1 – list of participants

Abbey Figg	Bridgend College
Agatha Herman	Cardiff University
Alice Tazerhadeh	Cardiff University
Alicia Miller	Sustainable Food Trust
Andrew Collings	
Anthony Davies	Bridgend College
Catia Rebelo	Cardiff University
Daiana Baldovin	Welsh Government (Food Policy)
Grace Emeny	AHDB
Hannah Pitt	Cardiff University
Jenny Gerrard	Welsh Government (Food Policy)
Katia Zacharaki	Digital Farming
Katie Palmer	Food Sense
Lisa Williams	Social Farms & Gardens
Mark Street	Brit Growers
Nathan Richards	Troed y Rhiw
Peter Lane	Vertical Farming
Sarah Gould	Tyfu Cymru / Lantra
Tom OKane	Cae Tan CSA / Land Workers Alliance
Tony Little	Organic Growers Alliance