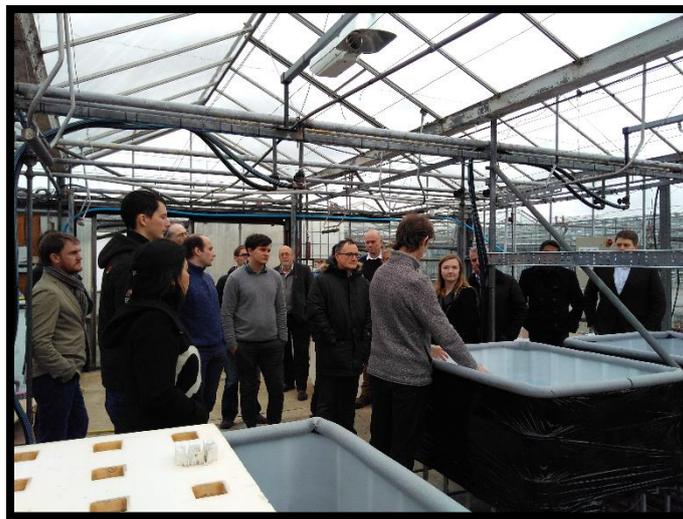




Meeting report: Indoor Food Production – Challenges & Opportunities Stockbridge Technology Centre, 22/01/18:



Aim:

To stimulate co-designed, multi-disciplinary research into new and novel farming systems that can offer year-round, sustainable production of high-quality produce (including e.g. vertical farming, aeroponics, aquaponics, automated warehouse farming...) and capitalise on recent developments in precision technologies and automated control.

Summary:

The innovation workshop was attended by academics from across the N8 universities and by a selection of businesses involved in indoor food production (Growstack, Hydrogarden, Gartenzweg, Aponic, Aqualabs, and Farmurban). After an introductory session, during which the background context for the workshop was introduced and the academics and businesses introduced their research, products and systems, we were shown the suite of facilities hosted at Stockbridge Technology Centre, including their LED4CROPS facility, Vertical Farming Development Centre and advanced glasshouse systems. After this, we discussed and prioritised the critical challenges and key opportunities for the sector (below), before prioritising some (in bold) for development into draft proposals for upcoming funding calls and for N8 pump priming funds.

Challenges/opportunities identified:

- Exploring the economic potential for off-peak growing as a power balancing mechanism
- Exploring new, low-cost infrastructure components and the viability to mechanise indoor food production across all scales, including small-scale
- Designing efficiency into the four critical system inputs: power, water, nutrients and seeds
- Engaging the public and building social capital through urban food production and hyper-localisation
- **Educating the next generation through ‘technology driven farming’ demonstrators and virtual linkages to real systems**
- Building SME collaborations through enhanced co-ordination and knowledge-sharing
- Plant symbioses in interconnected vertical farming systems
- Root-zone system modifications (temperature, CO₂) for resilient yields
- Exploring the future plants of hydroponic systems (e.g. stevia leaves, strawberries)
- Utilising waste streams as liquid feeds in hydroponic systems
- Early, rapid and reliable detection of pests
- Pesticide alternatives for aquaponics systems
- Water quality management tools for improved disease management in hydroponic systems
- Timing production with demand, lengthening seasons and creating bespoke products
- **Seed varieties that are suited to ‘ponic’ systems**
- Adapting specialist crops to indoor environments (stevia, samphire, mint, pharmaceuticals...)
- **Low-cost, modular monitoring and control systems, incorporating controllable lights to give the flexibility to change crops/adjust through the growth cycle, temperature control (including solution temperature), air movement control (to avoid ‘dead’ spots above plants)**
- How can we fit indoor food production systems into awkward urban spaces?
- **Sustainable substrates for flood and drain systems – biodegradable, compostable, AD digestible**
- How can we accommodate larger root systems and different growth periods in the same vertical space?