Essex Plant Innovation Centre (EPIC)

Report on EPIC Launch - 20th September 2019.

Introduction

The launch of EPIC was designed to bring together academics and the Agri-tech industry from across East Anglia. The intention was to foster relationships for collaboration and the sharing of ideas which could lead to improved access to funding for Agri-tech across the region. The day was therefore framed around an 'ask and offer' theme. Around 80 people attended the day.

Professor Tracy Lawson chaired the morning session and the conference was introduced by Professor Christine Raines. This was followed by an overview of Life Sciences and Computer Science & Electronic Engineering from Professor Philip Mullineaux and Professor Anthony Vickers.

Key themes emerging from the EPIC launch:

Robots and labour challenges –the role of robots as a solution to the labour challenges which are being exacerbated as a result of Brexit. While robots were seen as potentially part of the solution, there remains a concern about how to ensure commercial viability of the robots in the field and their ability to deliver precision agriculture.

Soils & plants - Use of beneficial micro-organisms and natural extracts to increase plant resilience was a key concern. This fed in to discussions about novel approaches to crop management as the crop protection product landscape changes. Within that, once again there were questions around how we bridge the gap from research to effective implementation. There was a debate about approaches to farming crops with soil health in mind and the improvement of nutrient use efficiency by breeding better plants. One popular idea was to develop pre-inoculated microbial organic carbon sources.

Use of big data - a discussion was held about data helping to understand potential yield but also informing debates about quality and ensuring continuous supply. The need for intelligent algorithm design and rural connectivity was an important theme. Much could be gained by combining satellite, drone and ground-captured data.

The University of Essex - research expertise and capacity

There followed an outline of the research that the University of Essex could offer which might be helpful to regional Agri-tech businesses. This included:

- **Plant productivity - Dr Uli Bechtold** introduced the faculty and what their research facilities could offer the industry including:
    - Manipulating carbon metabolism to improve photosynthesis and yield
    - Improved water use efficiency: stomatal behaviour
    - Phenotypic exploration of natural variations in Photosynthetic capacity for breeding high biomass.
    - Signaling pathways that control defense gene expression
    - Transcriptional networks of drought stress responses
    - Genetic mapping for gene discovery and evaluation
    - Novel genes that can be exploited for biotechnological applications

- **Soil health – Professor Alex Dumbbell** spoke about how the University of Essex could improve soil health including:
    - Methods by which the ecosystem processes and functions in healthy soils can be quantified
    - How the department can be link soil physical and chemical characteristics to soil biodiversity, ecosystem functions and health

- **Robotics and Sensors – Dr Vishuu Mohan** outlined the offers available from robotics department at Essex University including:
    - Cobots for Soft Fruit harvesting, expanding into crops such as lettuce & coffee
    - Weed/Blackgrass detection, Aerial Surveying using drones
    - Autonomous Navigation of AGROBOT fleets (Logistics, Transport, Yield Analytics)

- **Artificial intelligence/data processing – Dr Spyros Samothrakis** outlined the University of Essex's offer around:
    - AI and data science including the Institute for Analytics and Data Science
    - Natural Language processing through chat boxes and sentiments analysis
    - Computer vision and its application to agriculture

Next steps:

- **In 3 months**
  - We will set up a facilitation scheme via social media to manage and match your 'asks' and 'offers'. Contact us if you want to speak to anyone.
  - We will keep you updated regularly on the activities of EPIC and give you updates on ask/offer activities and suggest ways to promote greater collaboration.
  - You will continue to see our presence on Twitter. Tag @EPIC_Essex into your asks and offers to stimulate interaction.
- **Working parties / sandpits / workshops**
  - In the next few weeks, we'll set up working groups on key themes to develop collaborative projects. We hope to take the best ideas from the launch day to use as a jumping off point for a more-extended sandpit. We will keep you posted on progress, and report back at a subsequent meetings and in regular updates.
- **Follow up conference**
  - We'll be back next year bigger and better than ever.

And finally…

Thanks again to everyone who came to the launch of EPIC on 20th September 2019 – the day was a huge success, and I look forward to working with all of you in the coming years. At the University of Essex, we're always here to listen to our colleagues in industry, academia and government, and to try help you find the solutions to the biggest challenges in the agri- horti- cultural space. So keep us in mind for Blue Sky, Green Thinking.

Tracy Lawson,

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