Barriers to adoption of autonomous robots in the soft fruit sector

As part of Agri-Tech Week 2021, a panel of experts gathered to discuss the barriers to adopting autonomous robotics, which is a potential solution to the labour shortage facing the soft fruit sector in the UK.

This summary note outlines the key points identified in the discussion.

Background

Autonomous robots have the potential to address immediate challenges in the agricultural sector, such as climate change (net zero) and lack of labour. As seen in Figure 1, a recent survey of soft fruit growers found that the majority of respondents view autonomous robotics as the sector's future.

However, as autonomous robotics become increasingly ready for commercial deployment, it is important to examine the barriers and challenges that may exist regarding their adoption across the UK agricultural sector, including amongst soft fruit growers.

Overview

- Robotic technologies for agriculture are nearing commercial viability

- Demonstrations of the technology are key to proving its viability

- Agriculture knowledge exchange networks must be strengthened to ensure inclusive conversations

- Robotic adoption may be expensive, financial support or service/hiring models may be needed.

- Return on investment must be demonstrable and reproducible

Barriers

A number of barriers and challenges were identified during the session. These included technical challenges, labour / workforce skills, knowledge exchange, costs and funding, legislation and standards, and return on investment. Panellists were generally positive about the readiness of the sector for robotics.

Technical challenges

Remaining technical challenges include data processing intensity, achieving full autonomy (i.e. removing humans from the robotic working environment), and ensuring that collaboration within the UK robotics community focuses on areas most likely to benefit the agricultural sector.
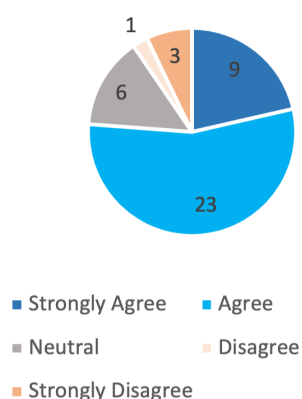
Figure 1: Responses to survey question regarding growers' perceptions of the use of robotics in soft fruit farming (Robot Highways survey)

Labour / workforce skills

Labour availability remains a problem that could, in part, be mitigated by robotics. However, the UK must continue to connect with labour resources, including overseas workers, as human workers will continue to be required on farm in some capacity. A key challenge will be ensuring that this workforce is appropriately upskilled, in order to adapt to a collaborative human-robot environment.

Knowledge exchange

Maintaining robust networks for knowledge exchange will be crucial for breaking down fears around the adoption of new technologies.

Demonstration projects will be an important part of this to ensure that information about these technologies is disseminated to agricultural communities. It will also be important for the whole supply chain, from growers to retailers to consumers, to be involved in the discussion.

Costs and funding

Purchasing robots is likely to be capital intensive, especially at scale. Alternative business models, such as farming-as-a-service, may assist in tackling the cost barrier, particularly in early stages of adoption.

Funding opportunities will be required to encompass everybody within the sector in order to achieve equal access. Funding should also be made available to agricultural robotics companies to assist in bridging the gap between pre-commercial and revenue generating activity.

Legislation/standards

There remains a lack of clarity around the legal requirements and interpretation of legislation that impacts robotic adoption on farm. As such, it is important to work on understanding how standards currently in place for robotics in other sectors may apply to agriculture. This principle extends to health and safety legislation, which should also be interpreted wisely in the context of agricultural robotics.

Return on Investment

Return on Investment (ROI) can be difficult to calculate, particularly in terms of public goods (e.g. biodiversity, reduction in emissions, land availability). There is a need to ensure that ROIs are demonstrable and reproducible.

Demonstration farms will be key to offering growers the opportunity to see the potential of otherwise unproven technology, and improve trust for the model.

Conclusion

As discussed, several barriers remain with respect to the adoption of autonomous robotics for the soft fruit sector. The panel event highlighted that the development of robotics would be an iterative, ongoing process. As one panellist put it "invention does not always equal innovation", so careful attention should be paid to dealing with the challenges and barriers identified in a robust way.

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Further reading

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