

BUILDING ROBUST CROPS FOR VERTICAL FARMS



THE CHALLENGE

Climate change is challenging crop production and our ability to produce sufficient high-quality food and reliable farm incomes. Vertical farms are an alternative way of growing crops.

In a vertical farm you take control of all of the elements required for plants to grow well. By doing this inputs like water, nutrients and pesticides can be reduced substantially compared to farming in a field.

However, indoor farms can have high energy demands, so technologies which support fast crop growth and that use renewable energy are important.

Vertical farming could allow us to produce more food locally, reduce the impact of the weather on our harvests, reduce the use of pesticides and nutrients and reduce our reliance on long-distance supply chains.



VERTICAL FARMS ...

- USE ENERGY DIFFERENTLY
- REQUIRE PLANTS THAT GROW QUICKLY
- NEED HIGH VALUE CROPS

How is our research addressing these challenges?



OUR RESEARCH

At the John Innes Centre, we are investigating how we can improve crops and technology to withstand climate change whilst reducing our reliance on costly and energy-demanding inputs, including fertilisers and pesticides.

As part of our research, we work with industry. This allows us to deliver our world-leading science directly to organisations that can benefit from our work. One such example is companies that develop technology for vertical farming, and the growers that use their equipment.



MODIFYING ENERGY USE

Developing vertical farms requires a good understanding of the optimal conditions for plant growth. As part of our research programme, we collaborate with the company LettUs Grow, which designs vertical farming systems, to help improve lighting regimes for optimal crop growth.

This includes studies of how the biological rhythms of plants can be harnessed to improve growth, and of how lighting conditions can be changed to optimize the quality of the crop.



FAST GROWING PLANTS

Our research into understanding flowering time in plants allowed us to produce broccoli which comes into flower quickly. These plants can produce several generations of sprouting broccoli in a year in a vertical farm, and we are working with vertical farming companies and retailers to bring this UK produced food to market.



HIGH VALUE CROPS

Working with LettUs Grow and collaborators at the Quadram Institute on the Norwich Research Park we are developing pea shoots, the tender young growing tips of pea plants, that, when grown in vertical farms, contain elevated levels of the vitamin B12.

We hope that this new salad product will be available to consumers in the next few years and will provide an alternative to supplements for those who find it difficult to obtain B12 from their diet, for example, vegans and vegetarians.

SCAN FOR
MORE INFO



The Building Robustness in Crops Research Programme will deliver genetic diversity and knowledge, innovative technologies and training to allow sustainable production of robust high-yielding crops.



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