

BREAKTHROUGH

21. NATIONAL AGRI-FOOD INNOVATION

50. THE AGRI-TECH REVOLUTION

74. GLOBAL INCUBATION SUCCESS



Blue Skies Green Fields

The future of farm to fork technology

R&D for Agri-tech

Government backed R&D in agriculture may help solve a global food crisis



Evgeni Vachkov
BUSINESS OPERATIONS
DIRECTOR, R&D TAX
SOLUTIONS

Evgeni has consulted to global blue chip companies for over 15 years and has the insight to unveil R&D gems for tax relief claims

Some of the latest R&D technologies in agriculture will be key to addressing global food production problems in the near future. Severe issues facing the farming sector include a massive increase in global populations and drier soils because of the warmer temperatures. Technological advances, particularly within agri-tech, have the potential to tackle these challenges.

ABOUT AGRI-TECH

Scientists, engineers and technologists work hand-in-hand with startups, research bodies and established businesses to innovate within the agri-tech sector. Since the mid-20th century farming has increasingly been recognised as a business, with farmers and managers spending considerable amounts of time looking at input costs, like seed, nutrients and water to determine returns on investment (ROI).

As we move into the 2020s and beyond, the demands facing farmers are increasing, as they face limited resources and higher input costs. Maintaining a

profitable farming business can be a real struggle and this is where the agri-tech sector comes into play. New technologies are in development to assist in cutting costs while increasing productivity, with science and data playing an important role in these solutions.

AGRI-TECH AND R&D

The UK government is firmly behind Agri-tech innovation and has promised further funding for the sector in the near future, including £20m currently available for agri-crop developments.

UK-based agri-tech businesses also have opportunities to take advantage of government backed R&D tax credit schemes to help ensure money invested into research and development stretches as far as possible. The Research and Development Tax Credits Statistics for 2017 published by HMRC show only a small increase in Agriculture claims. In total 135 claims were paid in 2017 compared to 105 claims for 2016. The total amount claimed for the sector remained at £5 million for each year, although one would expect to see an increase. Compared



70% Over 70% of land in the UK is used for farming (17.2 million ha.)



Vertical farming is an ideal food production solution for urban environments

THE UK GOVERNMENT IS FIRMLY BEHIND AGRI-TECH INNOVATION AND HAS PROMISED FURTHER FUNDING IN THE NEAR FUTURE

to other sectors such as Manufacturing (7,210 claims / £860m claimed for 2017) and IT & Communications (6,650 claims/ £550m claimed), it can be clearly seen that Agri-tech needs to gain further confidence and momentum to realise the full potential of the available R&D tax relief.

CURRENT INNOVATIONS

Some of the problems agri-tech research is currently addressing include:

- Growing sufficient food for an increased global population
- Increased pressures on natural resources, combined with more limited resources
- Disease or natural disasters caused by environmental threats and greater resilience in crops and livestock
- Cutting energy use, wherever possible
- Wastage, within harvests, storage and food and ways to handle this

Some of the innovations currently underway within the agri-tech sector to help solve these problems include:

Big data and the Internet of Things (IoT)

The use of big data and the IoT is promising to vastly improve agricultural efficiencies and productivity by way of greater use of analytics and cloud-based programmes. One way this technology is used is by fitting sensors to farming machinery which can make it easy to collect and track data and monitor changes to crops and soil quality. Collecting and

analysing this data helps farmers make the right decisions about the best crops to grow and ways of improving growth and performance.

Remote monitoring

Using sensors and remote monitoring equipment can provide data that helps improve the farming process and cut costs. This can cover everything from the amount of fertiliser left in a tank level to soil and water management. As well as removing the need for a person to do this manually, it also helps provide data and, in turn, insight into usage.

Precision agriculture

Precision agriculture, also known as satellite farming, is another data-gathering technology which entails the observation of crops across a number of fields using satellites. This gives farmers the best information on ways to manage fields and crops.

Drones and robots

Drones and AI working in combination can help provide a range of solutions for agriculture and cut out requirements for a human labour force. There are already a range of agricultural robots (agribots) on the market and these are used for watering, fertilising and harvesting, in the main. In the UK, their development is seen to be critical for growers previously reliant upon casual European labour, as Brexit has caused substantial reductions to numbers of Europeans prepared to work in the UK on a seasonal basis.

When it comes to drone technologies, farmers are routinely using drones to obtain aerial imagery for the identification of disease and other problems.

Smart tractors

Use of GPS signals enable smart tractors to carry out a variety of jobs around farms and incorporating a variety of sensors is enabling this technology to grow by leaps and bounds.

Vertical farming

Vertical farming is a huge area of interest to agri-tech businesses. These indoor farms, as the name suggests, are based on farming crops indoors in trays, as the trays are stacked vertically in racks, to make utmost use of water and, obviously, with a requirement for less land. Vertical farming is also an ideal food production solution for urban environments, as it's possible to use space in disused warehouses and create an indoor farm that's totally reliant on LED lighting.

Smart, floating farms

Smart, floating farms are another solution to reduced availability of farm land and are being considered by Forward Thinking Architecture based in Barcelona. In this scenario, the farm is situated on a large body of water and uses hydroponic methods to grow organic crops, with solar panels to provide all required energy.

The developments noted above are just a few of the exciting innovations in agriculture that are currently underway. This sector is an exciting place to be at this moment in time, as new technologies are making it possible for more advances and solutions to the global food crisis that appeared to be on the horizon. ■

For further advice on R&D tax credits, please contact the author on: office@rndtax.co.uk

