

New computing tool could lead to better crops and pesticides say researchers

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A new computing tool that could help scientists predict how plants will react to different environmental conditions in order to create better crops, such as tastier and longer lasting tomatoes, is being developed by researchers.

The tool will form part of a new £1.7 million Syngenta University Centre at Imperial College London, announced today, which will see researchers from Imperial and Syngenta working together to improve agricultural products.

Scientists are keen to develop new strains of [crops](#) such as drought

resistant [wheat](#) and new [pesticides](#) that are more environmentally friendly. However, in order to do this, they need to predict how the genes inside plants will react when they are subjected to different chemicals or [environmental conditions](#).

Professor Stephen Muggleton, Director of the new Centre from the Department of Computing at Imperial College London, says: "We believe our computing tool will revolutionise agricultural research by making the process much faster than is currently possible using conventional techniques. We hope that our new technology will ultimately help farmers to produce hardier, longer lasting and more nutritious crops."

The researchers have developed a prototype of the new tool, which they are currently testing. It can analyse in a matter of minutes, instead of months, which genes are responsible for different processes inside a plant, and how different genes work together. It uses a type of computer programming that relies on 'machine learning', a set of sophisticated algorithms that allows a computer to 'learn' based on data that it is analysing. The researchers say the tool will recognise complex patterns in that data to find 'nuggets' of information about [plant biology](#) that might previously have taken months or even years to find.

The 'machine learning' ability of the new tool means that researchers can develop an understanding of different plants even when they are lacking information about some aspects of their inner workings.

Previously, mathematical modelling of a plant's behaviour has been time consuming and difficult because without all the information about a plant, the models have been imprecise.

For the first project using the tool, scientists will look at how different genes affect the way a tomato's flesh hardens and tastes, and how the

fruit's skin changes colour from green to red.

The researchers hope that this will enable them to develop new tomato strains that are tastier, and that redden earlier and soften later so that they can be transported more easily to market. These qualities could be especially useful in developing countries, where factors such as poor transport can quickly spoil fruit and vegetables.

Another project will see researchers testing the safety of pesticides that Syngenta is developing, before they reach the manufacturing stage. The tool will allow them to construct models that reveal, for example, whether a proposed pesticide might affect metabolites, which are responsible for processing energy inside a plant.

All software developed by researchers at Imperial College is intended to be made publicly available over the next four years.

Source: Imperial College London ([news](#) : [web](#))

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