Smart search for traits

Scientists want to use artificial intelligence to find the right data in the search for the genes for climate-proof and disease-resistant crops.

Plant breeders want to develop drought- and salt-tolerant crops while maintaining yields. Finding all the genes for these complex traits feels like looking for a needle in a haystack. Having more data doesn't always help, says molecular biologist Richard Immink, because it just makes the haystack bigger. Better data, selected using artificial intelligence (AI), is expected to offer a solution in the new research project Plant-XR.

'Bio-informaticians are going to help us identify the data we need right from the start'

Plant-XR involves plant and data scientists from the Universities of Wageningen, Utrecht, Delft and Amsterdam. They have now got the green light from the Dutch Research Council NWO to write a research plan involving a larger team of scientists and plant-breeding companies. If that plan is approved, NWO will contribute 30 per cent of the programme budget of 50 million euros.

Besides Immink, WUR plant physiologist Christa Testerink and bio-informatics experts Dick de Ridder and Aalt-Jan van Dijk are taking part in Plant-XR. They want to find a new method of making agricultural crops climate-proof.

There's an important role for AI algorithms in this, says Immink. 'Currently, plant scientists often collect data and then ask the help of a bio-informatician at a later stage. In our project, the bio-informaticians start helping us identify what data we need to find the needle in the haystack right from the start. So, not big data but smart data.'

There are trade-offs in this process, says Immink. Wild variants of a plant can sometimes be resilient in the face of drought or disease, for example, but produce low yields. And sometimes a gene regulates both a desirable and an undesirable trait. 'So we want to know what the interactions between genes are, and how they combine to drive complex traits.' AS