

Researchers dish up digital avocado

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It's an ancient fruit, but the avocado has been brought into the new millennium with the publication of its draft genome, which may be the key to improvements in future crops.

UQ Centre for Horticultural Science's Professor Neena Mitter, along

with colleagues Dr. Alice Hayward and Stephen Fletcher collaborated on the international research led by Professor Luis Herrera-Estrella that recently published the first draft sequencing of the Hass variety genome.

Professor Mitter said the [avocado](#) had around 25,000 protein-coding genes—roughly the same as humans.

"There is a lot of genetic variation in avocado, and this new genetic information, coupled with advances in [big data](#) means there's huge potential for future crop improvement and breeding that we can now tap into," Professor Mitter said.

UQ researchers in the Hort Innovation National Tree Genomics Program will now complete the final assembly of the genome.

"Unlocking the avocado genome will help us better target management practices by understanding the genetic controls for biological processes that influence commercially important traits," she said.

Hort Innovation's R&D Manager Dr. Vino Rajandran said having a detailed blueprint of the avocado genome would provide the Australian industry with an important tool to drive future productivity.

"It will give us new insights into improved tree architecture and flowering, and the intensification of orchards, which are priorities of our National Tree Genomics Program," Dr. Rajandran said.

Avocado can be traced back 65 million years to the beginning of the Cenozoic era and was a source of food for giant sloths and other large animals.

Dr. Hayward said the genome draft also helped unravel how the fruit evolved.

"Avocado is an ancient flowering tree in the family that also includes cinnamon," Dr. Hayward said.

"The [genome](#) data supports the idea that the avocado lineage split from other flowering plants around 150 million years ago."

As well as being valued for its buttery flavor and health qualities, avocado is an important crop of Mexico which produces around half the world's supply.

The UQ team also provided [sequence data](#) for Velvick, a disease-tolerant rootstock that is widely sought-after in Australia for grafting new avocado [trees](#).

"Avocados can be highly susceptible to diseases such as phytophthora root rot, so having this new understanding of avocado genetics will be important in combating the disease, and also disease like black spot," Professor Mitter said.

Avocado is an economically important fruit crop with the global market predicted to reach US\$23 billion by 2027.

More information: Martha Rendón-Anaya et al. The Avocado Genome Informs Deep Angiosperm Phylogeny, Highlights Introgressive Hybridization, and Reveals Pathogen-Influenced Gene Space Adaptation, (2019). [DOI: 10.1101/654285](https://doi.org/10.1101/654285)

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