Researchers map Hass avocado genome

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What makes the perfect avocado?

In a world-first, University of Queensland scientists have mapped the genome of the popular fruit, a resource that can drive future research and innovation opportunities for Australian avocado growers.

After years of research at the Queensland Alliance for Agriculture and Food Innovation (QAAFI) under Hort Innovation's National Tree Genomics Program, scientists now understand the basis for a Hass avocado that is exceptional in taste, texture and pest resistance.

Dr. Onkar Nath, who spent his Ph.D. studying Hass avocado chromosomes, has created a nearly complete genome sequence.

"Our Hass genome is 98 percent complete—the first in the world of such complexity—and we now know which genes are responsible for which characteristic," Dr. Nath said.

"This means we can now through new research identify opportunities for Australian growers to improve on-farm productivity and sustainability including driving efficiencies across time, labor and land."

Dr. Nath said there were multiple factors influencing the avocado industry.

"Avocado already tastes very good, but there is still scope for improvement for many useful characteristics such as tree height, architecture and resistance to pests and diseases," he said.

Professor Robert Henry said avocado was an important crop around the world.

"Hass is overwhelmingly the most important variety, representing about 80 percent of global avocado production," Professor Henry said.

"Having this accurate genome allows us to better understand the plant's biology and provides a better platform for avocado research.

"Avocado has unique sugars and its fats or lipids are also different, so all

of that can now be better understood."

Professor Henry expects the genome to be adopted around the world.

"Our work has positioned Australia as a leader in avocado research," he said.

"There is a great opportunity for us to further our world-leading work to drive new research targeting crop production from here in Queensland."

Professor Neena Mitter, whose laboratory looks at many aspects of innovating avocado, including tissue culture, cryopreservation and disease management said the availability of this detailed Hass genome was a significant and much needed value add for the avocado industry.

This research is published in *Horticulture Research*.

More information: Onkar Nath et al, A haplotype resolved chromosomal level avocado genome allows analysis of novel avocado genes, *Horticulture Research* (2022). DOI: 10.1093/hr/uhac157

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