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Self-fertilising almond trees secure the future of industry

In a world-leading research project funded by Hort Innovation, Australian scientists have successfully bred self-fertile almond varieties for growers that are not entirely reliant on bees for pollination.

The longitudinal project centered around the industry's breeding program first began in 1997 and has since successfully produced four (4) almond varieties that are self-fertile.

Research project lead Dr Michelle Wirthensohn from the University of Adelaide said the objective was to continue to develop new high yielding self-fertile almond varieties with improved tree architecture, closed shell and disease resistance.

"When we first started this project more than two decades ago, the aim was to identify and breed new varieties so growers could have better long-term options. Back then there were only a few old varieties and they lacked a strong taste profile and were mostly used for processing," she said.

"We needed to investigate ways to create a sustainable domestic almond industry that was robust and resilient and could thrive in a number of challenging conditions.

"Disease resistance was important, as was producing high yield with the same water use. So, we set our sights on breeding varieties that would meet all of the industry's standards and have successfully completed field trials which have shown that these varieties will set fruit without any insect intervention."

Dr Wirthensohn said the breeding program is now aiming to produce varieties which are resistant to diseases such as almond hull rot – which costs the industry millions of dollars in production losses each year and bacterial spot disease – both common plant diseases that affect plant productivity.

"We're also looking to increase the diversification of current varieties for the almond industry by 2023; incorporating a selection of new self-fertile varieties with larger kernels, higher yields; and improved pollinators for Nonpareil," she said.

Hort Innovation Research and Development Manager Dr Vino Rajandran said the almond levy investment utilises cutting-edge breeding technologies to develop new and innovative varieties with traits like self-fertility and precocity to enable early production, while driving resource-use efficiencies through improved yields.

"The investment in transformational breeding technologies shortens the time taken to produce a new variety for Australian growers," he said.

"The Australian almond industry is expected to grow significantly over the coming years with this year's production forecast set at 108,000 tonnes. The development of new varieties will give growers more choice for their new plantings and re-plantings, while increasing productivity per hectare and driving sustainability."

The new almond industry varieties (Maxima, Carina, Capella, Mira, Rhea and Vela) are now available to Australian growers through several nurseries or contact the Almond Board of Australia.

A research paper on the self-fertile varieties has been published here:
https://www.nature.com/articles/s41598-020-57498-6

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