

# Why does a capsicum picked green stay green?

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Shoppers hoping their brownish-green capsicums will eventually ripen into those beautiful pillar box red ones will always be disappointed. University of Adelaide researchers have shed new light on why capsicums picked green stay green, and aim to discover how to turn this around.

In papers published online in the journals *Postharvest Biology and Technology* and *BMC Plant Biology*, the researchers have found that vital components needed for the production of the plant ripening hormone [ethylene](#) are missing in capsicum.

Led by Associate Professor Amanda Able at the University's Waite Campus, the team has been investigating the differences in proteins and other plant products produced at different ripening stages in green, red and breaker (turning from green to red) capsicums.

"Fruit such as bananas and tomatoes are generally picked when green and ripened after transport to the supermarket with the [plant hormone ethylene](#), making them easier to manage in the supply chain," says Associate Professor Able.

"The red capsicums bring a higher price but they take another couple of weeks of ripening naturally on the plant before they change colour. Even though capsicums are in the same family as tomatoes, they can't be ripened with the usual application of ethylene - at least not at feasible concentrations of ethylene. And at the moment, little is known about the

ripening process.

"For capsicum growers, there's a large cost in keeping them on the bushes - another 20 days or so of pest control, fertiliser and water - so there's a lot of interest and motivation in discovering how to ripen them more quickly."

In earlier work, the researchers were surprised to find that despite the lack of response to ethylene, an enzyme responsible for ethylene production was present during the ripening phase.

"This did not seem right but in our recent work, we have found that other essential components of the ethylene pathway were missing. Despite the enzyme being there, the ethylene production pathway is not working properly."

Associate Professor Able says there is also some indication that low numbers of ethylene receptors in green capsicum may be critical.

"In the green capsicum, it can't produce much of its own ethylene and it can't tell if ethylene has been applied - so if picked at the green stage, it doesn't ripen."

"We have identified some reasons why capsicum doesn't ripen when picked green," she says. "We are now trying to find ways to get the ethylene pathway working properly and if there is anything else that might speed up [ripening](#)."

**More information:** Wan M. Aizat, Daniel A. Dias, James C.R. Stangoulis, Jason A. Able, Ute Roessner, Amanda J. Able, "Metabolomics of capsicum ripening reveals modification of the ethylene related-pathway and carbon metabolism," *Postharvest Biology and Technology*, Volume 89, March 2014, Pages 19-31, ISSN

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