

Using DNA Information to Breed for Disease-resistant Strawberries

Katie O'Connor¹, Jodi Neal¹, Apollo Gomez¹ and Joanne De Faveri²

Abstract

Strawberries are susceptible to many diseases that cause damage to leaves and fruit, such as powdery mildew. Many chemical sprays are used to control disease, but there is an industry, environmental and societal push to move away from fungicides. Breeding for disease-resistant varieties offers an alternative approach, and DNA information can be used in this strategy. We identified multiple genetic markers linked with resistance to powdery mildew in leaves and fruit using a statistical modelling method called 'genome-wide association studies'. We also used DNA information across the entire genome to predict the susceptibility of different strawberry varieties. These results will help Queensland strawberry breeders to identify candidate varieties that are resistant to powdery mildew without expensive and time-consuming disease screening trials. These statistical methods can also be applied to other diseases, as well as yield and fruit quality traits.

Keywords: strawberry, powdery mildew, fungus, genomics, DNA

¹ Queensland Department of Agriculture and Fisheries, Brisbane, QLD 4000, Australia
(Katie.OConnor@daf.qld.gov.au, jodi.neal@daf.qld.gov.au, apollo.gomez@daf.qld.gov.au)

² Queensland Alliance for Agriculture and Fisheries, University of Queensland, St Lucia, QLD 4067, Australia (j.defaveri@uq.edu.au)

O'Connor, K., Neal, J., Gomez, A., & De Faveri, J. (2022). Using DNA information to breed for disease-resistant strawberries. *Proceedings of The Royal Society of Queensland*, 131, 147. <https://doi.org/10.53060/prsq.2022-16>

This work is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International Licence. Individual articles may be copied or downloaded for private, scholarly and not-for-profit use. Quotations may be extracted provided that the author and The Royal Society of Queensland are acknowledged. Queries regarding republication of papers, or parts of papers such as figures and photographs, should be addressed to the Secretary of The Royal Society of Queensland (rsocqld@gmail.com).