

Application: Increasing productivity and polyphenols in the New Zealand olive oil Industry

Business: Olives New Zealand (ONZ) - the association of New Zealand olive oil producers.

Statement:

The Productivity and Polyphenols Project follows ONZ's recently completed Focus Grove Project (FGP) which was supported by MPI through the SFF Futures program. The FGP established guidelines for olive grove management in NZ to optimise olive fruit production throughout all regions. This new application is to advance the science and practices underpinning Extra Virgin Olive Oil (EVOO) production by utilising the olive grower goodwill and high levels of engagement established through the FGP. It will continue the research processes developed within the industry to focus specifically on the production of top quality EVOO.

The aim is to follow two future imperatives for the advancement of the NZ olive oil industry:

1. To better characterise polyphenol production in NZ EVOO by:
 - a. Establishing baseline quantitative knowledge of the content and production of polyphenols in NZ EVOO through analysing existing data collected by ONZ over 10 years.
 - b. Establish grove management guidelines that can influence and increase the production of total polyphenol content and beneficial phenolic compounds in NZ EVOO.
2. Furthering grove management programs to increase olive grove productivity by:
 - a. Establishing pathways to help implement the outcomes of the FGP.
 - b. Establishing grove management guidelines for maturing groves currently being managed and maintained using the Focus Grove recommendation's to further:
 - i. Increase fruit set.
 - ii. Increasing the quantity and quality of oil yield at harvest.
 - c. Correlate productivity metrics with EVOO polyphenol content from Focus Groves' management guidelines used to increase fruit and oil yields.

The health and nutritional benefits of EVOO are well documented and increasingly valued in NZ and globally. It is also recognised that polyphenol levels in EVOO are a significant component of its medical value. Overseas research, particularly in Greece and Australia (1), has enhanced understanding of the health benefits of polyphenols in EVOO. This will be the first industry-based project to specifically focus on the impact of climate, soils and grove management practices on polyphenol levels in NZ produced olive oils.

New Zealand olive oil producers are currently contributing to a multi-centre dietary intervention study, He Rourou Whai Painga (HRWP), through which researchers are developing an uniquely Aotearoa New Zealand Wellbeing Diet using high quality NZ produced food and beverages, including EVOO (<https://www.hrwp.co.nz/>). The aim is to address cardiometabolic disease in NZ. A focus on the characteristics of NZ EVOO polyphenols, specifically the beneficial phenolic compounds levels, supports the aims of HRWP.

Olive groves in NZ are mostly small to medium sized. Many are not consistently managed for optimum production due to the costs involved. The two proposed research imperatives outlined above place emphasis on increasing the quality and value of NZ EVOO, and its polyphenol profile, which has the potential to be reflected in the market and help make grove management costs worthwhile.

Timeframe: The project is ready to start immediately. A duration of 3 years (3 growing seasons) is envisaged.

Funding across 3yrs:

\$300,000, SFF to pay for costs associated with a Plant & Food scientist and a data analyst

\$100,000, ONZ to pay for the Project Coordinator and the associated costs of additional olive oil testing by an internationally accredited laboratory.

\$450,000, ONZ membership costs to cover tree and grove management expenses (eg. materials, sprays, fertiliser, soil and leaf testing). Time and labour in kind.

ONZ's previous experience in applying for and delivering outcomes from government funding is evidenced through the documentation pertaining to the completed Focus Grove Project, supported by MPI, available through the ONZ website, www.olivesnz.org.nz.

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Marx W, et al. Effect of high polyphenol extra virgin olive oil on markers of cardiovascular disease risk in healthy Australian adults (OLIVAUS): A protocol for a double-blind randomised, controlled, cross-over study. *Nutr Diet*. 2020 Nov;77(5):523-528.

Parkinson L, Cicerale S. The Health Benefiting Mechanisms of Virgin Olive Oil Phenolic Compounds. *Molecules*. 2016 Dec 16;21(12):1734.

Sarapis K, et al. The Effect of High Polyphenol Extra Virgin Olive Oil on Blood Pressure and Arterial Stiffness in Healthy Australian Adults: A Randomized, Controlled, Cross-Over Study. *Nutrients*. 2020; 12(8):2272