

Introduction

Nanotechnology may offer an improvement to conventional vineyard inputs through environmental gains and enhanced productivity^{ab}. Proponents point to the possibilities of greater efficiency of nano-pesticides, fertilisers, and fungicides allowing lower application rates than conventional analogues. However, there is concern over the acceptability of nanotech, particularly in products that are consumed^c.

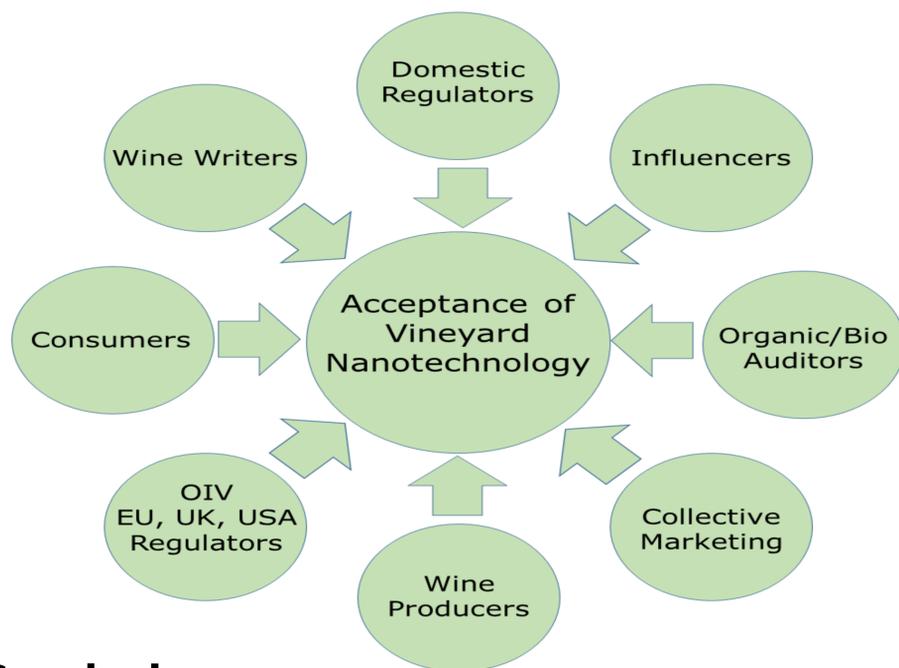
Wines need to maintain their reputation and market position, and provide sufficient returns to their producers^e. Whether nanotechnology use will hinder or aid that is still unknown.

This research comes at a time of development of nanotechnology process across agriculture^{abd} and the wine industry should expect to see nano-enabled products emerging in the next few years. This should inform researchers, nano-product developers, wine producers, regulators and intermediaries of the risks and barriers to nanotechnology adoption.

Aims and Methods

- This project uncovers the perceptions and attitudes of key informants in the New Zealand wine industry towards nanotechnology.
- This poster aims to explain the obstacles, fears, and market concerns of vineyard nanotechnology use.
- 15 semi-structured interviews were conducted in late 2021.
- Participants were selected across that value chain of NZ wine.
- Responses were coded and this poster highlights the fears, concerns, and negative views that respondents expressed toward nanotechnology.

Which actors will be involved?



Conclusions

This study uncovered a range of views towards nanotechnology. While most respondents, as industry members, embraced the idea of technology that could target challenges such as cost of production, pest & disease management or labour they also raised several concerns. This included the unknown health effects, need for regulatory approval including a debate over labelling requirements, and environmental concerns. The issue of market acceptability of nanotechnology is still unknown, and will depend on the narrative management by industry actors, intermediaries, and 'influencers'. Before nano-products are deployed, it is imperative that a market and consumer perception study is carried out. This will reduce the risk of rejection. Public opinion can change fast, and there is a risk that nanotechnology will end up in the same basket as genetic modification, making it a no-go for the industry. Consumers and intermediaries will need to be educated on the reasons for nanotechnology use. For nanotechnology to succeed, it must support sustainability goals, be cost effective, and target genuine issues faced by wine producers.

References

- ^aWang et al., 2022, doi: 10.1038/s41565-022-01082-8
^bKah, Tufenkji, & White, 2019, doi: 10.1038/s41565-019-0439-5
^cCook & Fairweather, 2006, *Nanotechnology - Ethical and Social Issues: Results from a New Zealand Survey*
^dLiu et al., 2022, doi: 10.3390/nano12081292
^eLe Heron, Le Heron, & Lewis, 2013, doi: 10.1111/nzg.12023

Interview themes

need good case studies manipulating molecules
 creepy connotation it's uber invasive requires training staff
 few consumers understand wine production anyway
 sounds rather futuristic data on effectiveness vegan friendly?
 acceptance within the regulatory framework
 consumers would probably be pretty interested in learning about it
 people are worried about what goes into their bodies
 scepticism based on the lack of trials highly regulated industry
 nanotech is not in my lexicon nanoparticles can damage DNA
 messing around with the natural order of things
 branding nanotech with sustainability at the forefront
 foresee a lot of push back the industry is very heterogeneous
 reputation for sustainability is essential to our product value
 what is the world's attitude towards nanotech? should be embraced with caution
 something you're going to consume vaccinations
 a moral and ethical technological choice science-fiction
 nanotech does not fit into that traditionally focussed image

Key obstacles to market acceptance

<p>Health concerns</p> <ul style="list-style-type: none"> • Wine needs to be "safe" • Any possible health impact must be evaluated. • Winery applications will face greater scrutiny 	<p>Negative associations</p> <ul style="list-style-type: none"> • Genetic Modification/GMO (which is a "no go") • Science-fiction weapons (eg No Time to Die) • COVID-19 vaccine conspiracies.
<p>Environmental concerns</p> <ul style="list-style-type: none"> • Environmental impacts need to be assessed. • Possibility of water, soil, and air pollution. • What is the greenhouse gas impact? 	<p>Financial imperatives</p> <ul style="list-style-type: none"> • Cost is a key barrier, particularly for smaller businesses. • Unproven, need pioneers to show nanotech's value. • Must provide a good return on investment.

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Read my Thesis

