

Development of strategies for the sustainability of the kiwifruit industry through the creation of a value-added product

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Problem Identification

Kiwifruit industry has been growing in Portugal, having increased 1 thousand ha between 2009 and 2017. In 2016, Portugal was the 12th worldwide kiwifruit producer, with 12 thousand tonnes exported, which represented a 12 million euros income (FAO, 2018). Even with the increase in investment, this agricultural sector has not been growing as expected and three main problems were identified: kiwifruit bacterial canker caused by *Pseudomonas syringae* pv. *actinidiae* (Psa), pollen quality and efficient pollination, and kiwifruit cultivars.

Psa is classified as a quarantine bacteria present in EPPO A2 List. In 2010 Psa was detected in Portugal for the first time and it is being spread to all kiwifruit producing regions. Despite all efforts to control the disease, the losses in productivity has been unavoidable since there are no curative treatments and the knowledge about the bacteria in our country is insufficient. Thus, it is crucial to establish new strategies to be used by producers that mitigate the disease's impact on their production.

Concerning propagation materials, similarly to what happens in other fruit species, they mostly come from other countries. Either economically or agronomically, this situation proves unfavorable since the existing varieties were developed for edafo-climatic conditions different than those observed in our country. It is imperative that we identify higher quality plants, well-adjusted to our soil and environment variables, less vulnerable to plagues and diseases and producers of higher quality pollen (in order to become a group of ancestors for next generation plants) aiming to increase productivity, as other kiwi producing countries do.



Project Status

The development of mitigation and control methods for Psa, in pollen and in the field, through the use of antagonists along with the development of bio-based methods to boost the immune system of the plant is in course. In parallel, the varieties adapted to the climatic of the two main producing regions are being identified based on high productive capacity and resistance/tolerance to Psa. Innovative pollen application methods adapted to the national context have been tested and the results in productivity collected during the harvest season.

This integrate vision of the kiwifruit production also encompasses the mapping of the main Portuguese producing regions based on abiotic and biotic factors. Information regarding cultural practices

and economic impact are also being collected. These layers of information are being gathered in a web-based platform developed in the scope of the project. The results of field surveys and productivity on the three pillars of action: presence and severity of disease, quantification and diversification of pollinistic services and cultivar variability will also feed the platform. In sum, this tool will correlate several layers of information in order to determine the impact of each factor on the overall productivity allowing the producers to implement strategies to increase productivity.

For more information see: www.i9kiwi.pt



Objectives

i9kiwi intends to improve the competitiveness of Portugal in the kiwifruit sector through product and process innovation. i9kiwi aims to develop and implement new procedures involving new monitoring and risk assessment technologies, introduction of cultural methods suitable to our national environment (biotic-abiotic factors and host liability), the application of pollen and new products to control pathologies affecting *Actinidia* spp. and using activators to enhance the plant's immunity system. It is also intended to identify a group of ancestors more resistant to national biotic/abiotic factors.



Results to be achieved

- Charting of the main producing regions based in abiotic and biotic factors. Implementing programs to identify the most vulnerable regions based on the forecast for direct and indirect effects of biotic and abiotic factors.
- Psa natural containers identification, their management is to be included in a Technical Manual.
- Psa mitigation and control methods through the use of antagonists with real appliance by producers.
- Methods for enhancing the plant's immune system with real appliance by producers.
- Identification and propagation of highly productive and Psa tolerant/resistant varieties adapted to edafo-climatic constraints of the two main producing regions.
- Methods for mitigating and controlling Psa in pollen.
- Methods for applying innovative and country-adapted pollens (lot size, edafo-climatic conditions, pergola vs T-bar, and so on).
- Natural pollinator's identification and quantification.
- Web-based platform of data collection (management, costs, productivity, Psa severity, cultivar catalogue, pollen deficit) for integrative decision-making

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