

Potential impact of *Xylella fastidiosa* subsp. *pauca* in European olives: a bioeconomic analysis

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Xylella fastidiosa is the causal agent of plant diseases which cause massive economic damage (Almeida, 2016; Chatterjee et al., 2008). In 2013, a strain of *X. fastidiosa* subsp. *pauca* was for the first time detected in Italian olives (European Food Safety Authority, 2015; Saponari et al., 2016). Here, we simulate future spread of the bacteria based on climatic suitability modelling and an assumption of radial range expansion. An economic model computes impacts by accounting for discounted foregone profits and losses in investment. The model computes impacts for Italy, Greece and Spain as these countries account for around 95 per cent of the European production (Eurostat, 2016). Climatic suitability modelling indicates that, depending on the suitability threshold, 92.5 to 95.4, 88.6 to 89.5 and 85.8 to 98.5 per cent of the national areas of production fall into suitable territory in Italy, Greece and Spain, respectively. Across the elicited rates of radial range expansion (Bragard et al., 2019), the potential economic impact over 50 years ranges from 3.58 to 8.69 billion euro if replanting with resistant varieties is not feasible. If replanting is feasible, the impact ranges from 2.00 to 4.13 billion euro. Depending on whether or not replanting is feasible, between 0.67 and 1.64 billion euro can be saved over the course of 50 years if the spread is reduced from 5.18 km to 1.1 km per year (50% and 5% percentile of elicited spread rate). The analysis highlights the major economic benefits of replanting with resistant olive cultivars and spread control. This stresses the necessity of strengthening the ongoing research on resistance traits and vector control.