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VALUING THE ECONOMIC IMPACT OF *DROSOPHILA SUZUKII* ON SMALL FRUITS INDUSTRY IN TRENTO (ITALY)

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The present paper aims to enhance a first estimate about the *Drosophila suzukii*'s potential economic impact on small fruit production in Trentino, North East of Italy. This was made possible not only thanks to a greater amount of data detected in the meanwhile, but also to the major knowledge developed about feasible mitigation strategies. At the present time there are still relatively scarce works on the subject, and focused on the USA despite of various invasions of *D. Suzukii* detected also in Europe since 2008. We think that our work can narrow this gap in the economic analyses about the impact of *D. suzukii*.

As *ex ante* reference, i.e. the revenues generated by the industry in standard conditions, our evaluation utilised the average output value generated by the local industry in the period 2007-09. That is to say the most recent years prior that economically significant damages of cultivated berries were detected in the area. According to the official statistics (Provincia Autonoma di Trento, 2012), during the 2007-2009 period the average revenues of small fruit industry amounted in Trentino to about 30 M€. Almost half of the total figure is due to strawberry, while the yearly output of the other selected crops vary from 2,4 M€ of blackberry to 5,3 M€ of raspberry. The invasion of *D. suzukii* challenged this situation.

The growing scientific literature about the economic analysis of alien invasive species offers a range of methodological tools that can be used for the evaluation of the *D. suzukii*'s impact. Following the framework presented by Born *et al.* (2005), at least three methodological issues have to be taken into account: the field of application of the analysis (decision aid or impact assessment?), the range of impacts to be considered (just direct or even indirect impacts?), the data used (business or economic, i.e. societal, data?).

Concerning the field of application, this paper focus either on the assessment of damage in absence of management strategies and on the management costs of control strategies. Attention was paid to just the five host crops mostly affected by the pest infestation in the analysed area: strawberry, raspberry, blueberry, blackberry and cherry. As a matter of facts damage reported by other crops can be actually considered negligible. Business data coming from the grading of infected samples at the level of marketing co-op were used. Moreover the costs of two specific pest management programmes were computed and compared with the production losses in the absence of management. With regard to this, the estimated costs include insecticides and other material used in the pest traps, but also the application costs.

With regard to the range of impacts, the analysis is concentrated on the direct impacts of *D. suzukii*, i.e. the effects of the invasion on the host crops(s). No trade effects have been examined, since according to the industry operators the contingent decrease of production in the area could be easily substituted by other supplier of the Italian market. Consequently it was assumed that quantity reductions caused by infestation in Trentino do not increase market prices, differently from the analysis of Goodhue *et al.* (2011) about the impact on California strawberry and raspberry industry. No other indirect impacts, like for instance shifts in consumer demands caused by the pest's invasion, were considered.

Moreover, the present study aims to assess the impact of *D. suzukii* at the business level, and not at the whole society level. Biological invasions imply for sure external societal costs, above all whether the adopted control strategies are based on an increase of chemical inputs.

However, due to the lack of data necessary for reliable estimates, our work focuses on the impacts on local fruit industry.

Keywords: *Drosophila suzukii*, impact assessment, agricultural production, berries, Italy