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Assessment of IPM packages for *D. suzukii* - A Decision Support System

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Infested fruits of the main crop targets of D. suzukii and a D. suzukii adult, from left to right; Strawberry [1], Raspberry [2], Grape [3], Cherry [4], Blueberry [5], D. suzukii [6].

The Pest: *Drosophila suzukii*

D. suzukii was imported into Europe from South East Asia in 2008. Since then, characteristics of the fly have allowed it to become a serious pest of European fruit crops.

D. suzukii females are able to lay eggs in undamaged soft fruits with a preferences for ripe fruits. Larvae develop within the fruit causing damage to their hosts. In 2010 and 2011, *D. suzukii* infestations caused losses of over €8 million in northern Italian fruits crops.

They are able to attack over 80 species of crop and wild plants in Europe, including the main crop hosts pictured above. They breed rapidly, with an average of 7 generations a year, allowing large populations to build up over fruit growing seasons.

Current control relies heavily on the application of pesticides. This causes concerns in relation to resistance but also, as females attack fruits close to harvest, causes concern with Maximum Residue Levels of pesticides.

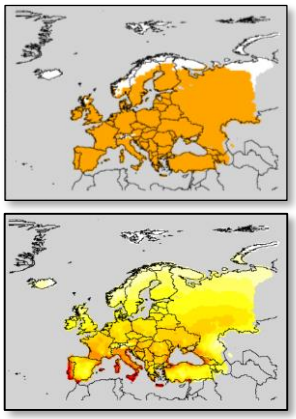

Figure 1. (top) Area of potential establishment of *D. suzukii* and (bottom) seasonal growth potential based on climatic factors, graduated colours from white to red.[7]

The Project

Under the DROPSA project, 4 years of research has looked into innovative ways to control emerging pests, including *D. suzukii* and *Pseudomonas syringae* pv. *actinidiae* (see Olliff *et al.* poster).

Our task? To build a tool which assesses these measures and Integrated Pest Management (IPM) packages developed in DROPSA, compared against current practice (baselines). This DSS can then be used by industry actors to make informed decisions in pest control.

The Decision Support System (DSS)

2. Environmental accounting

For each pesticide or biopesticide, risk and monetised indices of human and environmental cost.

3. Expert judgement

Experts are asked to make informed judgements on performance for each measure and the overall IPM package:

- How good is it at reducing the crop losses from the pest?
- How good is it in relation to human health and safety, for both workers and consumers?
- What is the direct cost to growers?
- What is the environmental impact?
- What is the time and effort required of the user for implementation?
- How easy is it to implement on a scale that is effective?

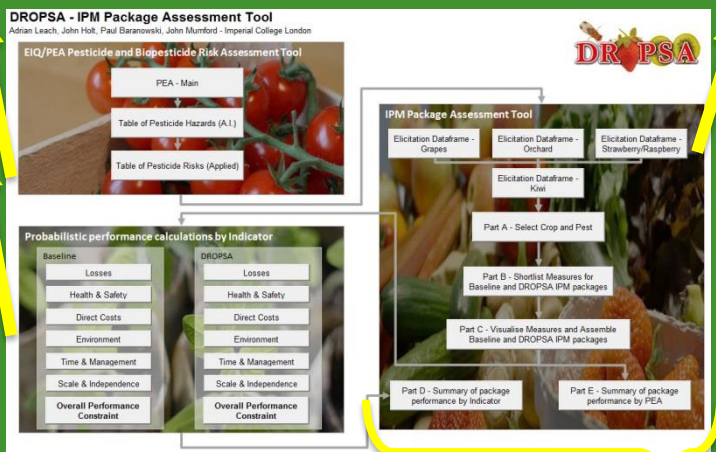

Figure 2. Screenshot of the opening page of the DROPSA IPM package assessment tool.

1. What are we evaluating?

Control measures and IPM packages from across DROPSA, compared to standard control measures and packages.

Types of measures include:

- Biological
- Cultural
- Chemical

4. Why are we evaluating?

The tool brings together all the aspects described; measures developed in DROPSA, current standard measures, expert opinion, pesticide risk indices along with **specific incorporation of uncertainty**, based on understanding of the pest. It provides a visual comparison of new IPM packages and current practice to allow industry actors to make **informed management decisions** on control.

See the Olliff *et al.* poster for a worked example of Kiwi Canker (Psa) management.

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