Reduced Application of Chemicals in European Raspberry Production (RACER)

**Objectives**

- Monitor adult raspberry beetle flight and monitor develop sprays at threshold.
- Develop monitoring system to predict Otiorhynchid weevil post-flowering activity in raspberry plantations.
- Develop monitoring system to identify and assess levels of post-harvest rot fungi in European raspberry plantations and evaluate current low-input fungicide treatments.
- Develop methods to manage and understand two-spotted spider mite population development in raspberry.
- Develop standardised procedure to identify and assess levels of post-harvest rot fungi in European raspberry plantations and evaluate current low-input fungicide treatments.
- Develop standardised sampling procedure for introduced predatory mites.
- Develop monitoring system to detect weevils (results not reliable).
- Develop methods to manage and understand two-spotted spider mite population development in raspberry.
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**Management of two-spotted spider mite**

- Integrated spider mite (Tetranychus urticae): Important pest in European raspberries in some parts of Europe.
- Biological control: Introduction of a natural enemy, Amblyseius andersoni.
- Control: Application of a mixture of predatory mites, Typhlodromus pyri and Euseius finlandicus.

**Native predatory mites**

- Phytoseiulus persimilis - also feeds on pollen and on yellow spider mite (Tetranychus urticae).
- Amblyseius cucumeris.
- Amblyseius californicus.
- Phytoseius plumifer.

**Introduced predatory mites**

- Phytoseius persimilis - also feeds on pollen and on yellow spider mite (Tetranychus urticae).
- Amblyseius cucumeris.
- Amblyseius californicus.

**Post-harvest rot development of standardized sampling procedure**

- New harvest rot (grey mould) (Botrytis cinerea and other fungi) responsible for poor shelf-life and quality.
- Control: Use authorised materials and fungicides.
- New standardised assessment available for soft fruit growers/packers.

**Training/information dissemination**

- Growers and extension officers trained in monitoring and sampling.
- Demonstration workshops held in all participating countries.
- Demonstration fields suffered standardised monitoring and sampling.

**Raspberry cane midge**

- This zone shows the distribution of the raspberry cane midge in Europe.
- In Italy, France, and Switzerland, the midge is widespread.
- The midge is not present in Finland and Scotland.

**Weevils recorded**

- The midge is a major pest in Northern and Central Europe.
- The midge is not present in Southern Europe.
- The midge is present in Italy, France, and Switzerland.
- The midge is not present in Finland and Scotland.

**Raspberry beetle monitoring threshold**

- Monitoring important to detect early establishment in plantation.
- Adults and larvae damage plant growth.
- Adults can contaminate fruit.
- Adults emerge from soil, adults may fly to other areas to feed. Raspberry beetle trapped before and during flowering, and percent larval infestation.
- Threshold (provisional): 5 adult beetles per trap between emergence and first flowers.

**Weevil population development**

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- Adults emerge from soil, adults may fly to other areas to feed. Raspberry beetle trapped before and during flowering, and percent larval infestation.
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**Native predatory mites**

- Amblyseius andersoni - major pest in Northern and Central Europe.
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