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**Agroscope**

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# Interaction between pathogens and vinegar flies in the transmission of sour rot on grapes

**Background:** Sour rot is a devastating disease on grapes that can cause major economic losses to winegrowers. It relies on a complex interaction between microbial pathogens (e.g. different yeast species and bacteria), aerial vectors (e.g. *Drosophila suzukii*, *D. melanogaster* and other vinegar flies) and suitable weather conditions (e.g. precipitation, humidity and temperature). Although it was demonstrated in the laboratory that *D. suzukii* can trigger sour rot development (Rombaut *et al.*, 2017), its actual role and importance in the outbreak of sour rot in vineyards is poorly understood (Ioriatti *et al.*, 2018).

**Aim:** This Master thesis aims first to better understand the interaction between vinegar flies, such as *D. suzukii* and *D. melanogaster*, and the microbial community (e.g. yeasts and acetic acid bacteria) and second to decode the factors triggering the development of sour rot on grapevines.

**Approach:** The attractiveness of the implicated fungal and bacterial microorganism to vinegar fly species will be tested in olfactory choice experiments using for example y-Tubes or multiple-choice arenas in the laboratory. Moreover, survival time and infectiveness of fungal and bacterial spores on vinegar flies will be studied under standardised laboratory conditions.
The factors triggering sour rot development will be examined on potted grapevines in the greenhouse by manipulating the presence of infectious vectors as well as temperature and humidity within cages.

**Interested in conducting your Master thesis in an applied, agricultural research institute:** contact Dr Patrik Kehrli, Deputy-Head of the group Entomology in Field Crops and Viticulture, phone +41 58 460 43 16, patrik.kehrli@agroscope.admin.ch, Agroscope Changins, 1260 Nyon

Ioriatti C., Guzzon R., Anfora G., Ghidoni F., Mazzoni V., Villegas T.R., Dalton D.T. & Walton V.M. (2018). *Drosophila suzukii* (Diptera: Drosophilidae) Contributes to the Development of Sour Rot in Grape. *Journal of Economic Entomology* **111** (1), 283-292.

Rombaut A., Guilhot R., Xuéreb A., Benoit L., Chapuis M.P., Gibert P. & Fellous S. (2017). Invasive *Drosophila suzukii* facilitates *Drosophila melanogaster* infestation and sour rot outbreaks in the vineyards. *Royal Society Open Science* **4** (3), 170117.