

# PRUNI-REPEL: Developing an innovative push-and-pull strategy

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European Stone Fruit Yellows (ESFY) is one of the most serious diseases in European fruit production. Infected *Prunus* cultivars yield poorly and lead to high economic losses. ESFY is caused by a specialized bacterium located in the phloem tissue of *Prunus* spp., the Phytoplasma 'Candidatus Phytoplasma prunorum'. It is spread by the phloem-feeding plum psyllid (*Cacopsylla pruni*) which acquires the bacterium by feeding on infected plants and is able to transmit it to healthy plants.

*C. pruni* is a homometabolic, univoltine jumping plant lice. Within one generation it is changing its host plant two times. After development of nymphal stages on *Prunus* spp., the young adults, called emigrants, migrate to overwinter on conifers (e.g. spruce). In early spring they come back (remigrants) to reproduce on *Prunus*.

Many insects use allelochemicals for localisation of their hosts. To take advantage of the olfactory orientation of *C. pruni*, the volatile organic compounds released by the different host plants are collected by headspace technique and analysed via GC-MS. Previous investigations showed that

*C. pruni* is more attracted by *Prunus* rootstocks than by cultivars. Due to differences in the emission of plant volatiles from *Prunus* rootstocks, *Prunus* cultivars and spruce potential attractants and repellents were identified. The effects of single compounds and mixtures on the behavior of *C. pruni* emigrants and remigrants were proven by bioassays, in a Y-shaped dynamic olfactometer.

In spring 2015 first field experiments were carried out to elaborate a push-and-pull strategy against *C. pruni*. A trap developed by the JKI Dossenheim was established as monitoring tool for psyllids.

To offend the vector from very attractive *Prunus* rootstocks, dispensers filled with a mixture of repellent compounds, were applied in the field. This application reduced the number of captured individuals of *C. pruni* emigrants in monitoring traps. Next step for developing an efficient push-and-pull system is to improve the formulation of the repellents and to find a highly attractive substance, to lure the plum psyllids into traps.