

# PRUNI-REPEL: Utilization of host plant volatiles for controlling the vector of ‘*Candidatus Phytoplasma prunorum*’

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The plum psyllid *Cacopsylla pruni* is a serious pest in fruit production. This phloem-feeding jumping plant louse is the vector of the phytoplasma ‘*Ca. Phytoplasma prunorum*’. A specialized bacterium located in the phloem tissue of *Prunus* ssp. which causes one of the most severe diseases in stone fruits, the European Stone Fruit Yellows (ESFY). Infected *Prunus* cultivars yield poorly and lead to high economic losses. During feeding on the phloem sap of infected plants the phytopathogenes are acquired by *C. pruni* and spread by transmission feeding of infected psyllids on healthy plants. To lower the possibility of Phytoplasma transmission and reduce the number of new infections innovative control strategies against the vector are required.

Phytophagous insects use different cues for identification of their host plants. In addition to visual stimuli also allelochemicals play an important role for host recognition and acceptance. This circumstance is used to elaborate a push-and-pull strategy against *C. pruni* with synthetic volatile organic compounds. Push-pull is a common technique in pest management. Cultivars are supplied with repellent stimuli to repulse the pests and

attractants are used to lure the insects away from the protected resource.

Within one generation *C. pruni* is alternating its host plant two times. After development of nymphal stages on *Prunus* ssp., the young adults, called emigrants, migrate to their overwintering hosts, spruce and other conifers. In early spring they return (remigrants) to reproduce on *Prunus*. This alternation of hosts leads to a change in the preference for olfactory stimuli during the life cycle of *C. pruni*.

Due to the volatile blends emitted from *Prunus* rootstocks, *Prunus* cultivars and spruce, different mixtures of potential repellents against remigrants and emigrants were identified.

In 2015 first successes have become apparent using repellents against *C. pruni* in a field experiment. The number of captured emigrants was reduced by the application of dispensers with a mixture of repellent compounds in attractive *Prunus* rootstocks. In 2016 the ability of repellents to inhibit the attraction of host plants was evaluated by bioassays in a Y-shaped dynamic olfactometer. A new formulation for repellents was tested under laboratory and field conditions.