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Using cover crops to control *Lobesia Botrana* in organic vineyards

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Abstract

This paper presents a part of the obtained results in the Project BIOVINE, funded by the H2020 program ERA-net, ORGANIC CORE co-fund and the European Commission co-fund, achieved by the two stated research institutes. In one section of the BIOVINE project, we aim to develop new viticultural systems based on increased plant diversity within vineyards intending to plant cover crops species with repulsive or insecticide effect for the control of arthropod pest *Lobesia botrana*. *Lobesia botrana* is a major pest in European vineyards that can cause an economic damage of a quantitative reduction of the harvest in spring due to the consumption of inflorescences and the infestation of berries over the summer, which enhances the risk of the development of pathogens such as *Botrytis cinerea* that decreases considerably the quality of processed wines. An extensive systematic literature search was performed to identify plant species suitable for repelling *Lobesia botrana*, and for conserving and promoting beneficials. SCV identified *Allium sativum*, *Armoracia rusticana*, *Artemisia absinthium*, *Lavandula angustifolia*, *Tagetes* sp. and *Tanacetum cinerariifolium* as potential candidates to repel *L. botrana* from grapes. In autumn 2018, SCV prepared extracts of these plant species and provided them to Agroscope. Over the winter, Agroscope tested the efficacy of these plant extracts in laboratory settings. The tested extracts had neither a strong effect on the survival of *L. botrana* larvae, nor did they repel larvae from feeding. However, *Allium sativum*, *Artemisia absinthium*, *Lavandula angustifolia*, *Tagetes* sp. and *Tanacetum cinerariifolium* repelled *L. botrana* females from egg laying. Considering the results obtained by Agroscope, plant extracts from *Artemisia absinthium*, *Tagetes* sp. and *Allium sativum* were prepared and tested by SCV in 2019. In an experimental vineyard in Murfatlar (Romania), the three extracts were applied either on their own or in a mixture of all three together at the ripening phase (BBCH 83-85). Pheromone traps were used to observe the impact on the adult pest population of *L. botrana* and observations were made on the bunches in order to calculate infestation level. Treatments in which the *Artemisia absinthium* extract was applied on its own or in the mixture recorded the smallest number of adults. Moreover, only 0.25% of grapes were infested by *L. botrana* in the mixture treatment, whereas 3.8% of grapes were attacked in the treatment with the *Tagetes* sp extract. We therefore conclude that the mixture of *Artemisia absinthium*, *Tagetes* sp. and *Allium sativum* might have an interesting potential to protect vines against by *L. botrana* infestation.

Keywords: biodiversity, pest, biological control, plant extracts