



Twelfth International Symposium on Pollination (ISPXII)



16 - 20 October 2023

Kirstenbosch Botanic Gardens, Cape Town, South Africa

CONSERVATION OF POLLINATOR HABITAT IN A VITICULTURAL LANDSCAPE THROUGH FALLOW MANAGEMENT AND RECULTIVATION

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ABSTRACT

In the Moselle Valley (SW Germany), a region appreciated for high-quality wine production, bush encroachment on abandoned vineyard fallows deteriorates habitat quality for the characteristic xerothermophilic insect fauna. Two options for counteracting succession exist: fallow management and recultivation with grapevines. Therefore, we compared different treatments for managing open and flower-rich vineyard fallows (annual mulching and sowing of wildflowers) from 2012 to 2020, sampling bee, butterfly and Auchenorrhyncha populations. Moreover, we compared a novel vineyard design with greened embankments to conventional vineyards without embankments.

While fallow treatments had no effect on butterfly and Auchenorrhyncha taxa richness and abundance, sowing was associated with significantly higher numbers of sampled bee individuals compared to plots without sowing, but only when plots were also mulched. Significantly more butterfly individuals and species were sampled in all fallow treatments compared to adjacent vineyards.

The number of species and individuals of wild bees and butterflies was significantly higher in vineyards with greened embankments compared to conventional vineyards without embankments. This also held true for the number of specialised and endangered species. The communities of wild bees and butterflies differed remarkably between both vineyard structures.

We conclude that vineyard fallow management can promote bee and butterfly communities in viticultural landscapes. Since Auchenorrhyncha were indifferent to fallow management, these measures are not likely to compromise plant protection in terms of increased disease vector populations. Moreover, we assume a great synergistic potential of vineyards with greened embankments to reconcile agricultural use and biodiversity conservation, because vine production in these vineyards is less cost-intensive than in conventional vineyards.