

Natural enemy communities of aphids in alfalfa fields assessed through video recordings of sentinel cards in scenarios of contrasting aphid abundance

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Abstract

The first step to better understand the relationship between natural enemy communities and pest control is to know which, when, and how frequently different natural enemies interact with their prey. In alfalfa fields of central Chile, aphids are the most common pests and are consumed by predators such as coccinellids, syrphids, and spiders. In this study, through video recording, we analyzed how natural enemy communities visiting aphid sentinel cards vary between scenarios of low and high abundance of aphids in alfalfa in spring. On 15 occasions, during the day, we monitored the natural enemies visiting cards with sentinel aphids (60 cards per field; total 900) located in fields with high ($n = 6$) and low ($n = 9$) aphid abundance. We also analyzed whether the abundance of coccinellid species visiting sentinel cards was related to their abundance in each field. In 750 h of video recording, we found 2749 natural enemies visiting the sentinel cards; 86.2% of them were coccinellids of five species. Total natural enemies and coccinellid visits were three times higher in low than in high aphid abundance scenarios. In contrast, the species richness and diversity of natural enemies and coccinellids visiting cards did not differ between aphid scenarios. The abundance of coccinellids in the field was positively associated with the abundance of coccinellids visiting cards, for the three most abundant species. Our study shows that video recording is useful for identifying changes in the communities of natural enemies of aphids in alfalfa, providing important new insights into trophic interactions in field situations.

Keywords

Aphid abundance; Coccinellids; Video-recording; Sentinel cards.