

The use of invertebrate fauna for evaluation of olive grove management regimes in Cyprus

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Abstract

In recent years, new agro-environment programmes have increased in number globally, with the aim of conserving biodiversity in agricultural ecosystems whilst maintaining sustainable and economical crop production. In this paper, we determined the impacts of different management regimes on invertebrate fauna and diversity, in Cypriot olive groves. We analysed differences in invertebrate fauna and diversity of olive groves at high and low altitude with no management, groves with tillage only, or tillage, pesticide and fertilizer applications. Invertebrates were sampled from the canopy, soil beneath the canopy, and from the understorey vegetation. A total of 12,387 arthropods were recorded and identified from 18 different orders or higher taxa. We observed significant effects of management regime on the abundance of arthropods in olive tree canopies. For example, the number of arthropods were significantly higher in low altitude, uncultivated olive groves compared to the other three management regimes. We also observed that the Simpson's index of diversity for invertebrate orders was significantly higher in low altitude, uncultivated and tilled olive groves than the other two management regimes. Management had no impact on the number or diversity of invertebrates in understorey vegetation, while soil invertebrate abundance was lowest in high altitude olive groves but was not influenced by management in low altitude groves. Our results support the hypothesis that pesticide spraying reduces the abundance and diversity of invertebrates in olive groves, but also show that tillage has little impact on understorey invertebrates.

Key words: invertebrates, biodiversity, agricultural practices, olive groves, cyprus

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