

ABUNDANCE AND DIVERSITY OF WILD POLLINATORS IN AVOCADO ORCHARDS IMPROVES WITH PROXIMITY TO NATURAL HABITAT

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ABSTRACT

Insect pollination is known to increase avocado yields with both managed honeybees and wild pollinators likely playing an important role. In Chile, the rapid expansion of avocado orchards has resulted in diminishing a highly diverse natural habitat and this is potentially impacting the abundance and diversity of wild pollinators and thus avocado production. This study aimed to understand how proximity to natural habitat affects the composition (abundance, richness, diversity, and visitation rates) of wild pollinators in avocado orchards in Chile. The study was across 3 farms in 2020, with 3 transects on each farm. Transects were 300 meters long and were ran from the field border into the orchard center. Two borders were next to natural habitats and 1 border had a non-natural habitat to act as a control. Each transect had 5 observation points at 0m, 50m, 100m, 200m, and 300m, and observations were carried out throughout the pollination season recording pollinator species and abundance. The results showed that distance from the edge had a significant effect on the abundance of wild pollinators, pollinator richness, and pollinators visitation rate, however, the relationship was nonlinear with significantly higher occurrences at the edge of the orchard compared to all other distances. Habitat type was shown to have a significant effect on pollinator diversity, with higher diversity along natural habitat transects in comparison to control transects. Further studies are required to understand how differing wild pollinator composition affects avocado production; however, these initial findings suggest that pollinator management could be improved by increasing the quantity of natural habitats areas in avocado orchards.

Keywords: *Persea americana*, Pollination Services, Wild Pollinators, Natural Habitat

1. INTRODUCTION

It is well established that insect pollinators improve the yield of avocado *Persea americana*. Honeybees *Apis mellifera*, are frequently introduced into avocado orchards and pollination exclusion trials have shown that without the presence of managed pollinators, avocado yields are significantly reduced. It is also probable that wild pollinators make a significant contribution to avocado pollination and yield. Several studies have shown, that for many insect-pollinated crops, wild pollinators provide a more efficient and comprehensive pollination service in comparison to managed honeybees (Garibaldi et al., 2013) and, studies on avocados have shown that wild pollinators are highly abundant on avocado flowers and can be effective pollinators (Dymond et al., 2021).

Chile is a globally important avocado growing region and, in recent years, production has significantly increased. However, this has led to environmental concerns as natural habitats