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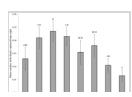
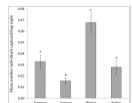
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## Impact of field-edge habitat on mammalian wildlife abundance, distribution, and vectored foodborne pathogens in adjacent crops

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### Highlights

- Hedgerows were associated with greater wildlife abundance and diversity.
- Hedgerows did not generally yield greater wildlife incursion into field interiors.
- Hedgerows did not have any noticeable impact on foodborne pathogen prevalence.
- In tested crop systems, hedgerows did not increase human-wildlife conflict concerns.

### Abstract

Field-edge habitat is important for enhancing biodiversity and associated ecosystem services on farms for long term agricultural sustainability. However, there is some concern that this habitat will increase wildlife activity and damage to adjacent crops. Wildlife incursion into production areas may also pose food safety risks. A two-year study in walnut orchards and processing tomato fields in the Sacramento Valley, California, documented variable use of farm fields by mammalian wildlife. This depended on field-edge habitat (restored hedgerows versus conventionally managed field edges where vegetation was mostly controlled), wildlife species present, season, and crop monitored. In walnut orchards, deer mice (*Peromyscus maniculatus* Wagner, 1845) were found throughout the orchard, while house mice (*Mus musculus* Linnaeus, 1758) exclusively used hedgerows. In tomato fields, deer mice were more common in field interiors during spring, but used field-edge habitats more during summer; the opposite was true for house mice. In general, deer mice preferred more open sites, while house mice were most numerous in areas with thick cover. Both desert cottontails (*Sylvilagus audubonii* Baird, 1858) and black-tailed jackrabbits (*Lepus californicus* Gray, 1837) showed affinity to hedgerow portions of fields, although this association was stronger for cottontails. Overall, we documented greater mammalian species richness and abundance associated with hedgerows. However, this increase in diversity did not generally lead to greater wildlife incursion into adjacent crops. In walnut orchards, *Salmonella* and non-O157 STEC were detected from 2 (1%) and 4 (2%) individual rodents, respectively ( $n = 218$ ); no detections occurred in tomato fields. A subset of fecal samples ( $n = 87$ ) from rodents captured in walnut orchards were positive for *Giardia* (25%) and *Cryptosporidium* (24%) but prevalence was not associated with field-edge habitat type. Overall, there does not appear to be a substantially greater risk of crop loss or contamination of foodborne pathogens in crops bordered by hedgerows in our study in

the Sacramento Valley, although potential damage could vary by the stage and type of crop and wildlife species present.

## Keywords

Field-edge habitat; Foodborne pathogens; Food safety; Lagomorph; Mammalian wildlife; Rodents

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