Spatial Distribution and Management of Asian Citrus Psyllid and its Natural Enemies in Citrus Blocks

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Summary: Asian citrus psyllid (ACP) is an economically important pest and huanglongbing (HLB) disease vector. Therefore, its management is critical. Asian citrus psyllid adults flying into citrus blocks are likely to colonize the perimeter trees first and use those as a breeding ground before further spreading into the block. These colonization and distribution patterns may have implications for its management. Therefore, four commercial citrus groves were investigated using multiple sampling methods to assess the populations of ACP and its natural enemies in the block perimeter and interior in southwest Florida between 2020 and 2022. Exclusion techniques were employed by enclosing the shoots with developing colonies of nymphs in sleeve cages or not to evaluate the reduction in the immatures that remained exposed to natural enemies. Parasitism by *Tamarixia radiata* was also assessed in the perimeter and interior of the blocks. A consistent abundance of ACP adults was observed in the perimeter zone (32 m) of the study fields than in the interior zone located 51 m further from the inner edge of the perimeter zone into the field. In sticky traps, ACP adult captures were 36-57% more in the perimeter than in the interior across four groves during four seasons. The predators such as ladybeetles, lacewings, spiders, and parasitoid *Tamarixia radiata* were common throughout the blocks but relatively high in the perimeter at certain times, with much less magnitude difference between border and interior than ACP. Findings suggest that spraying block borders instead of whole blocks will be useful in suppressing ACP and reducing insecticide use, while untreated interior providing refugia to conserve beneficial organisms for supplementing mortality in ACP populations.

Take Home Message:

- ACP populations were more concentrated in the block perimeter than interior.
- Predators and parasitoid were abundant throughout the blocks, relatively more in the perimeter than interior.
- Spraying block perimeter will help suppress ACP and untreated refugia in the interior will conserve and promote biological control.

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