## PP-459 [Bee Biology]
## Insights into probiotic-based disease management from a 24-week field trial in California

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Managed honey bee (Apis mellifera) populations play a crucial role in supporting adequate pollination of food crops but are facing unsustainable colony loss as the result of rampant disease spread within agricultural environments. Antibiotics have failed to resolve the issue so far, whereas mounting evidence from in vitro experiments suggest that select lactobacilli strains (some of which are symbionts in honey bees) can inhibit a broad range of important pathogens via multifaceted mechanisms. Focusing on three select strains of lactobacilli (LX3), our group has performed several probiotic field studies in distinct regions across North America. Cumulative evidence indicates that the LX3 strains can significantly improve resistance to disease outbreaks, partially mitigate the negative effects of antibiotics in bees, and increase queen egg laying – the latter of which has the potential to increase the number of bees present in a hive and thus overall pollination capacity which is relevant to agricultural crop yields. Furthermore, our studies show that certain effects derived from LX3 treatment are directly dependent on the way in which the strains were administered to the hive. This highlights that consideration of delivery method is essential for deriving an expected probiotic benefit in honey bees. Overall, the collective scope of this work is expansive and broadly relevant to microbial disease management in terrestrial ecosystems.