

Abstract:

In Ontario, 40 to 45 percent of bees die annually [3]. A large percentage of these deaths were reported to be caused by varroa and associated viruses, weather, and starvation [1]. These causes of death can be prevented or even cured using industry-standard products only if the colony health indicators and symptoms are discovered early and addressed. Beekeepers typically perform inspections to gauge the health of their colonies and identify issues. Still, these inspections do not happen often, ranging from once a week in the spring to just once during winter [2]. Because of this, problems that arise between inspections are left to wreak havoc on the colony until the next inspection. This request for proposal identifies the beekeepers' lack of access to the current status of their colonies as an area for potential innovation. Working with the Urban Toronto Beekeepers Association, this document provides further insight into the opportunity through synthesizing secondary sources and community members' lived experiences. The goal derived from the community's needs serves as a way to gauge the current status of their hives to enable them to respond to emerging problems early and prevent colony deaths. The objectives derived from this goal focus on addressing this opportunity while retaining reliability and the safety of both the user and the colony. Proposed solutions to this opportunity shall collect data from the colony and regularly provide users with accurate evaluations of the colony's health while being safe to use and not disrupt the bee colony when functioning.

References:

[1] Government of Ontario, "2023 Apiculture Winter Loss Report | Annual Apiculture Winter Loss Reports | ontario.ca," *www.ontario.ca*, Mar. 12, 2024. <https://www.ontario.ca/document/annual-apiculture-winter-loss-reports/2023-apiculture-winter-loss-report>

[2] Learn from Ecrotek, "How Often Should I Inspect My Hives? Ecrotek," *Ecrotek.co.nz*, 2025. <https://www.ecrotek.co.nz/learn/articles/detail/how-often-should-i-inspect-my-hives>

[3] University of Guelph News, "Canadian Beekeepers Face Devastating Colony Losses. A U of G Expert Explains Why," *U of G News*, Apr. 29, 2022. <https://news.uoguelph.ca/2022/04/canadian-beekeepers-face-devastating-colony-losses-a-u-of-g-expert-explains-why/>

All vocabulary used in this document is defined explicitly in section 8.5.