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RDAR funding award supporting U of L research into health of queen bees and their colonies

Queen bee might sound like a nice title to hold but when it comes to honey bees, the title carries the responsibility of being the sole reproductive female in the colony. With queen health so critically linked to the success or failure of a colony, it's a lot of pressure.

A new study by University of Lethbridge biological sciences researcher Dr. Shelley Hoover is examining the linkages between queen health and colony success, and the factors that mediate these relationships. The project, *The Royal Treatment: Improving honey bee queen health as the basis of integrated colony health*, is supported by a four-year, \$496,513 funding grant from Results Driven Agricultural Research (RDAR).



“Dr. Hoover’s research aligns with a critically important priority identified by Alberta’s bee producers on the availability of a sustainable source of high-quality queens, supporting overall hive performance,” says Clinton Dobson, RDAR research director. “RDAR is pleased to partner with the Alberta Beekeepers Commission to accelerate this area of research and ensure that Alberta’s Beekeepers and the honey industry reach their full potential here in Alberta.”

Alberta beekeepers, who account for 40 per cent of all the honey bee colonies in Canada, have faced very high levels of winter colony loss in recent years. In 2019-20 alone, they reported a 41 per cent colony winter morbidity rate.

“Imagine if the cattle producers lost 40 per cent of their cows over winter, it's huge,” says Hoover, who recently joined the U of L after spending the previous eight years at the Lethbridge Research and Development Centre. “Beekeepers are able to make replacement colonies in a way other livestock producers can't because a big colony can be split, but you need a queen to do that.”

Queen health is critical for colony success and Hoover says beekeepers cite poor queens as one of the most common reasons for winter loss.

“Queens are really the heart of the colony,” she says. “They're the mother of all the workers in the colony.”

While many biotic (parasites, pathogens) and abiotic (weather, pesticides) stressors contribute to colony mortality, queen health has received surprisingly little attention.

“One reason is it's difficult to do the research in a non-disruptive way. When we study parasites and diseases, we usually have to kill the bees to take a sample and analyze,” says Hoover. “It's much less disruptive to take a sample of 30 worker bees than it is to take a queen. It makes it very difficult to measure colony productivity and queen health without destroying the queen so you can get the information you need.”

Hoover's research will support the work of undergraduate, graduate and post-doctoral students and focus on three key objectives.

Specifically, the proposed project will examine methods of requeening, as well as storing locally produced queens. Secondly, the project will examine the linkages between queen health and reproduction, queen pheromones, worker behaviours, and colony performance with the goal of providing beekeepers on-farm methods by which they can evaluate queens before introducing them into colonies. Finally, the study will provide beekeepers with specific queen management recommendations.

“We've always worked really closely with beekeepers and they've been extremely supportive,” says Hoover, who has about 100 colonies of bees on campus at the U of L. “This project is directly in collaboration with the Alberta Beekeepers Commission.”

Grace Strom, a High River beekeeper who also sits on the Alberta Beekeepers Commission (ABC), says Hoover's work has been invaluable to beekeepers as they look to continually advance their knowledge.

“I am thrilled Dr. Hoover continues to support beekeeping in the province of Alberta through her very valuable research on queens,” says Strom. “Dr. Hoover has listened well to the needs of beekeepers and continues to focus her work on meaningful ways of improving hive health. We are confident her research will lead to more sustainable beekeeping in the province.”

To view online: <https://www.uleth.ca/unews/article/rdar-funding-award-supporting-u-l-research-health-queen-bees-and-their-colonies>

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