

# DEPARTMENT OF AGRICULTURAL, FOOD AND NUTRITIONAL SCIENCE

## MSc Thesis Seminar

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Date: **Friday, August 4, 2017**  
Time: **9:00 a.m.**  
Location: **318J Agriculture/Forestry Centre**  
Title: **Assessing native bee biodiversity in Alberta's grasslands: Influence of regional differences and relative grazing on bee community assemblages and the investigation of prospective indicator strategies for native bees**

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### ABSTRACT

Bees are a key component of terrestrial ecosystems and provide valuable ecosystem services to both natural and agricultural landscapes. It is estimated that 87.5% of native plants benefit from pollination, including 1/3 of global food crops. Additionally, pollination by bees provides maximized yields for commercial pulse crops, which has significant economic benefits. Unfortunately, bees are in decline. With an increasing demand for higher crop production to support the growing human population, the need for conservation efforts to maintain native bee populations is becoming increasingly important. In this study, I investigated how two major agricultural practices (grazing by livestock and production of canola, *Brassica napus*) in Alberta affected native bee pollinators and assessed whether an apex group of the bee community (cleptoparasites) could be used as an indicator taxa to predict the size and species richness of the non-parasitic bee community. I evaluated bee responses to changes in the flowering plant community and land use type, across a large environmental gradient over a two-year study period. I used rangeland health assessments to determine the condition of grasslands from grazing and compared bee community abundance, richness, diversity and evenness of sites with varying health across four study regions. Grazed sites that were considered healthy had higher bee abundance, richness and diversity than grazed sites that were unhealthy, suggesting that grazing can be beneficial to the bee community when managed appropriately. Cleptoparasites were useful for predicting overall bee community abundance in both grasslands and canola fields when environmental conditions were unfavorable, however when floral resources were abundant this relationship was lost. In addition, cleptoparasite richness did not predict bee community richness. Overall, the cleptoparasite guild was not an effective indicator taxa for the larger bee community in this study system. Results from this work suggest that assessing bee communities for conservation, and implementing effective monitoring schemes is a complex task. Finding alternative strategies, including the investigation of prospective indicator taxa is important, but managing for biodiversity through responsible land use is essential. This study demonstrates that cattle producers can aid in conservation efforts for native bee communities through responsible range management.