

PROJECT REPORT

Feasibility/Business Plan to Develop a Tech-Transfer Program for the Honey Bee Industry in Manitoba

Executive Summary:

As part of the feasibility/business plan to develop a honey bee Tech-Transfer Program in Manitoba, a detailed survey was sent to the membership of the Manitoba Beekeepers' Association (MBA) as well as some of the regional associations (RRAA, BABA and SCBA). It was important that both the commercial and hobby beekeeping sectors be considered in this project. A total of 85 beekeepers responded to the survey, 38% of the respondents would be considered commercial beekeepers (≥ 50 colonies) and 62% would be considered hobby beekeepers with less than 50 colonies. From the results it became clear that both commercial and hobby beekeepers practice beekeeping primarily for honey production (94%) and very little income is earned for pollination rental (5%). Approximately 25% of the beekeepers reported producing and selling queens and/or bees as a secondary source of income from their bees. This demonstrates that a Manitoba Knowledge, Research Transfer Program (KRTP) (a.k.a. Tech-Transfer program) should prioritize honey production and secondly queen production when developing activities or focus areas for the program.

The results of the survey were interpreted through four guiding themes, which helped organize how the information could be implemented into activities. The themes were Education/Training, Research, Monitoring/IPM Recommendations, and Communication. The survey topics varied from pest management, human resources, marketing, breeding and pesticides etc. Many of the questions involved the respondents' ranking the importance of the topic on a scale of 1–5; with 5 being most important and 1 being not important.

In the theme of Education/Training, most of the respondents ranked education and training as mid to high importance, but there were differences between the beekeeper groups in terms of what type of training they considered important. Full time beekeepers put a much higher priority on Advance beekeeping workshops including priorities for Integrated Pest Management, Queen Production and Breeding. They also showed more interest in human resource and off-shore labour training, but put a low priority on beginner, intermediate, and local beekeepers presentation. Whereas, Sideliner and Hobby beekeepers rated local beekeeper presentations and beginner to advance workshops as high priority, but workshops on human resources and offshore labour were rated as low priorities. All respondents put low priority on pollination workshops.

Based on these outcomes, the KRTP will need a diverse series of training workshops and materials in order to target and satisfy the wide ranging demand for education by the Manitoba beekeeping industry. These survey results will be used by the MBA to determine what workshop should be incorporated into the business plan first and which ones can wait. In discussion with beekeepers about training events, the general consensus was that beekeepers would be willing to pay for their training, so training and education can potentially become a revenue generating component for the KRTP.

Regarding the theme of Research, respondents prioritized pest and disease management research over all other research topics. Commercial beekeepers also placed a higher priority on research to optimize honey production than hobby beekeepers. All other categories were shown to be of mid-range priority. Research on pollination was generally considered low priority. Varroa

mite was identified as a top research priority. American foulbrood was also identified as a priority disease for developing better management strategies. Nosema and tracheal mites were mid-range research priority. Small hive beetle, wax moth and predators were of lower priority.

There was little difference between commercial and hobby beekeepers in regards to research topics. There appeared to be some topics such as honey contamination and adulteration that were ranked high in terms of importance by some respondents but low by others, thus giving it a mid-range score. Those that rated it as high importance could potentially be coordinated to contribute additional funding to insure the research is conducted.

In relation to the theme of Monitoring and Integrated Pest Management (IPM) Recommendations, all groups set a high priority on pest and disease monitoring as a service provided by a proposed KRTP. Large commercial beekeepers also prioritized resistance testing for varroa mite treatments, and bee breeding.

Providing monitoring services in conjunction with IPM recommendations has proven to be an effective tool for managing pests while creating a low impact on colony health and the environment. By contracting with beekeepers, on a fee based service, KRTP staff could provide individual clients with measured steps relating to seasonal influences, infestation severity and the use of appropriate methods of controlling the pest for that time of year and infestation levels. Expanding the program to include hygienic testing and other stock improvement testing for beekeepers that are breeding their own stock could also be considered fee for service activities for the KRTP

In regards to the Communication theme, all groups gave low importance to call in services for management recommendations. Sideline and hobby beekeepers gave a higher priority to online communications for management recommendations. The majority of respondents indicated that the Manitoba Beekeepers Association and commercial beekeeping sector should be the top priority for the KRTP communication and collaborate. Respondents also indicated a high priority for the KRTP to communicate and work with the Manitoba Ministry of Agriculture and University of Manitoba.

Although there was consistency in priority setting between commercial and hobby respondents, there does appear to be a need to bridge gaps in communication and relationships between large commercial, sideline and hobby beekeepers. It may be important for the KRTP to play a role in bridging this gap, at the very least not making it worse. The KRTP should therefore attempt to communicate with all the various beekeeper sectors, large and small.

There was mid-range importance given to communication and collaboration with out-of-province stakeholder groups such as the Canadian Honey Council. Although the priority for the KRTP would be to work primarily with Manitoba stakeholder groups, several comments were made about being open to collaborate with out-of-province groups. For example, one respondent provided the following comment: "Working close to home in Manitoba should be the starting point of a KRTP, but as the program grows, it can start to reach out beyond its borders".

Based on the overwhelmingly positive response regarding developing a KRTP for the honey bee industry in Manitoba, the Manitoba Beekeepers' Association has decided to proceed with the development of a business plan based on the four theme areas (Education, Research, Monitoring, and Communication). The business plan and proposed budget will be submitting during the October 1st, 2019 intake date to Ag Action Manitoba – Industry Development program with partial implementation of the business plan in 2020 and full implementation in 2021-2023.

Introduction:

The Honey Bee Industry in Manitoba consists of over 900 beekeepers and 116,000 colonies and is valued at \$30 Million annually for honey and an additional \$120 M for the added value to crops that benefit from honey bee pollination. There are approximately 225 commercial beekeepers in Manitoba that are responsible for producing 95% of the 19 million pounds of honey produced in Manitoba annually. In addition to Manitoba's commercial beekeeping industry, Manitoba also has a thriving hobby beekeeping sector. This sector not only bring value to the industry through additional honey production but also through greater public interest, pollinator advocacy and value-added innovation. There are many factors that affect the health of honey bees, including pests and disease, quality and availability of forage, climate and weather, pesticides and beekeeping practices. Modern beekeeping requires dedication to learning about the nature and behaviour of bees.

The province's extension and training services have shifted over the years from a one-on-one advisory/training model to a broad outreach model. Although the government supports beekeepers through research funding and programing, getting the results of research outcomes and its practical application to beekeepers is also a growing concern. With the growth and diversification of the beekeeping industry, the province no longer has the capacity, on its own, to meet the needs of the provincial beekeeping industry. Industry struggles to keep up with demand for information and training.

The beekeeping industry in Canada currently has five industry lead provincial TTPs (e.g. Alberta, Atlantic, Ontario, Quebec and Saskatchewan). Additionally, there are five TTP teams across the US who are nationally coordinated through the Bee Informed Partnership. Collectively these TTP teams work directly with beekeepers to monitor hives, analyze and disseminate information, provide education and training through workshops & courses, and the development of fact sheets and publications. The scope of the teams' objectives includes improving honey bee health, managing diseases and pests, investigating bee nutrition, developing and answering research questions, and overall improving beekeeping management and reducing operating costs.

The main objective of the project was to determine the feasibility of a TTP for Manitoba's honey bee industry. In order to determine the feasibility, the beekeeping industry was surveyed to determine what aspects of a TTP would be most valuable to beekeepers. This feasibility portion of the project is considered phase 1 of developing a TTP for Manitoba's beekeeping industry. The business plan will outline options of activities that a TTP can undertake, along with estimated operational costs and level of support, in terms of user importance and financial sustainability. The feasibility aspect of the project will guide what aspects should be done first and what aspects should be postponed until greater support can be secured. A 3rd party contractor developed and conducted the feasibility survey but the Manitoba Beekeepers' Association decided how to implement the business plan and pursue phase 2 of developing the TTP.

Feasibility Survey Results:

The purpose of the survey sent to Manitoba beekeepers was to consult and collect information from industry to develop a feasibility and business plan to initiate a Tech-Transfer Program in Manitoba. For the purpose of the survey and for the remainder of the report, the Tech-Transfer program (TTP) will be referred to as the Knowledge Research Transfer Program (KRTP). The survey was emailed out to the membership of the Manitoba Beekeepers' Association

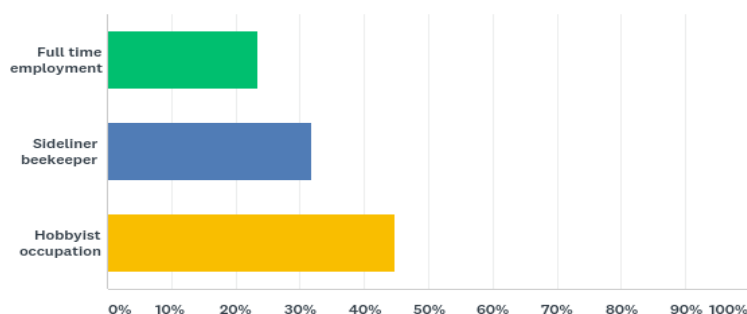
(MBA) and three regional beekeeper associations; Red River Apiarists' Association (RRAA), Brandon Area Beekeepers Association (BABA) and South Central Beekeepers Association (SCBA). Hardcopies of the survey were only mailed out to MBA members.

A total of 85 beekeepers responded to the survey. To understand the current Manitoba beekeeping industry dynamics, 3 questions were asked:

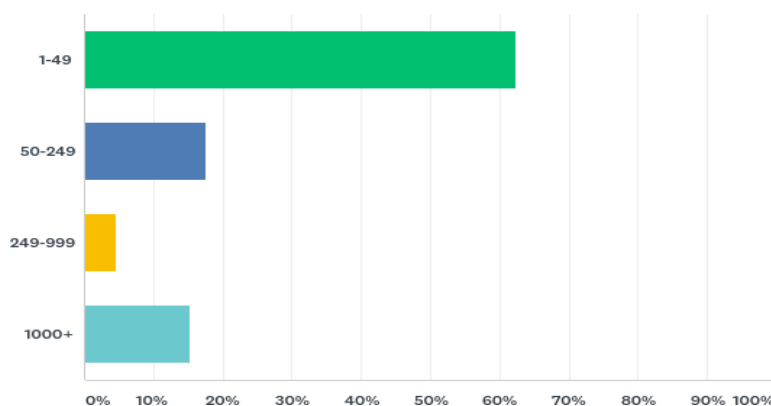
- What proportion of respondents are full time, sideliner and hobbyist beekeepers
- How many colonies are held by each of these categories
- What are the main production objectives for these beekeepers

Of the respondents, 38% were commercial beekeepers with 50 or more colonies and considered themselves either full time or a sideliner beekeeper. Although some beekeepers with less than 50 colonies considered themselves sideliners, by definition in the *Livestock and Livestock Products Act*, a beekeeper with less than 50 colonies is considered a hobby beekeeper. Sixty-two percent (62%) of the respondents by definition would have been considered hobby beekeepers.

Q1 Do you consider your beekeeping operation to be:



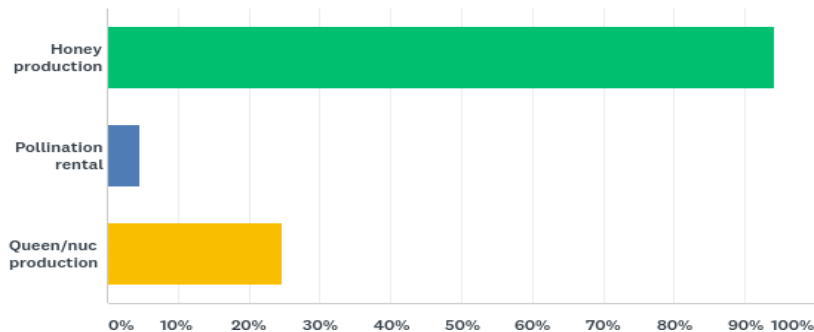
Q2 How many colonies do you manage



Across the group of respondents, there was consistency in their production goals. Honey production dominates the production objectives in Manitoba at 94%, with queen and bee sale production listed at 25%. Pollination services represents a very small part of the Manitoba beekeeping industry. This demonstrates that a Manitoba KRTP should prioritize honey production

and secondly queen production when developing training and best management strategies.

Q3 What is your main beekeeping production objective? Check all that apply

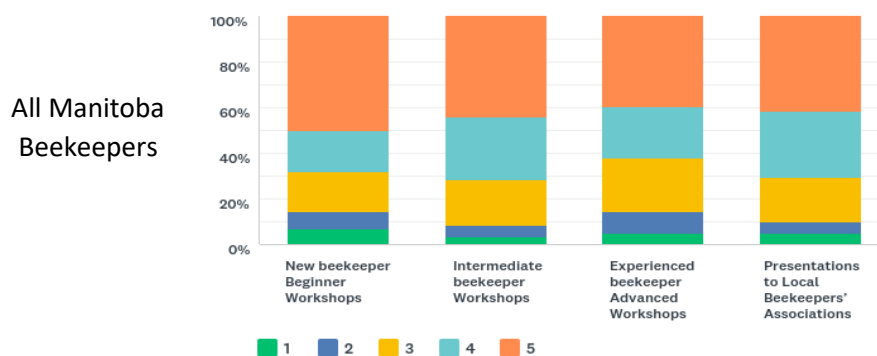


Priorities for Beekeeping Workshops and Presentations

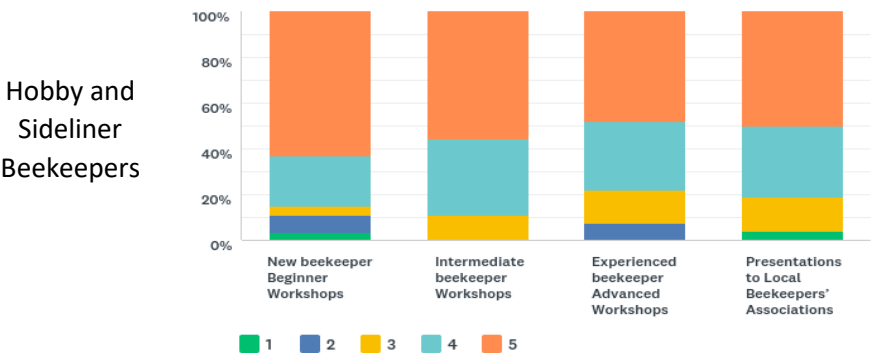
Overall all proposed training had a mid to high importance rating. There was a difference between Full time and Sideliner/Hobbyist priorities on training. Full time beekeepers put a much higher priority on Advances workshops including priorities for Integrated Pest Management, Queen Production and Breeding, and showed more interest in human resource and off-shore labour training. Full time beekeepers put a low priority on beginner, intermediate and local beekeepers presentation.

Sideliner and Hobbyist rated local beekeeper presentations and beginner to advance workshops as high, however specific workshops on offshore labour was rated as low priority. All respondents put low priority on pollination workshops. This would infer that at Tech Transfer Program will need a diverse series of training workshops and materials in order to target and satisfy the demand by the Manitoba beekeeping industry. These survey results can be used by the MBA to determine what workshop development should come first by priority.

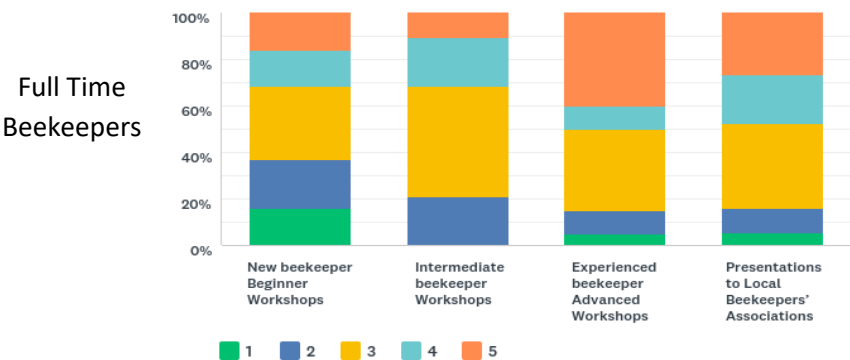
Q4 How would you rate the importance of the following education activities for a KRTP for Manitoba beekeepers? (Rated on a scale of 1-5; 5 being most important and 1 being not important)



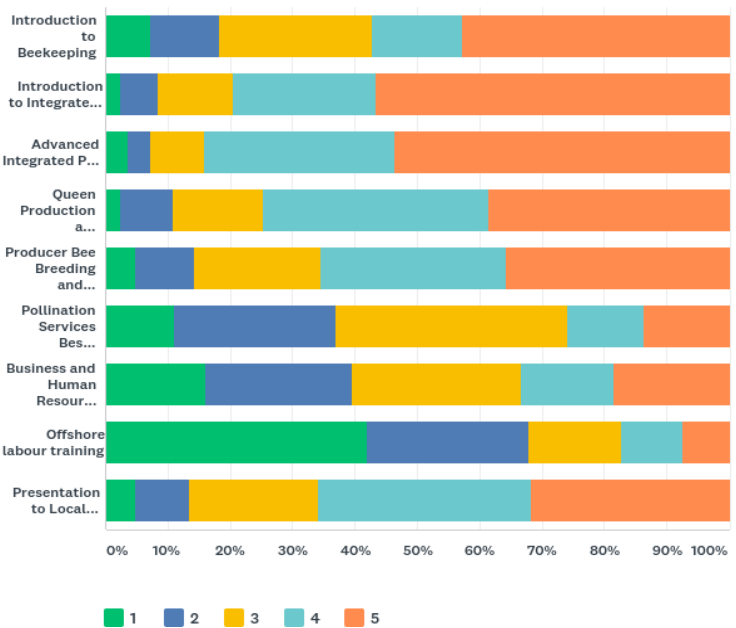
Q4 How would you rate the importance of the following education activities for a KRTP for Manitoba beekeepers? (Rated on a scale of 1-5; 5 being most important and 1 being not important)



Q4 How would you rate the importance of the following education activities for a KRTP for Manitoba beekeepers? (Rated on a scale of 1-5; 5 being most important and 1 being not important)



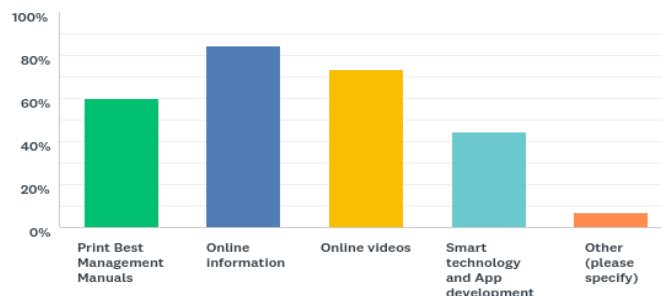
Q5 How would you rate the importance of the following workshops provided by a KRTP for Manitoba Beekeepers? (Rated on a scale of 1-5; 5 being most important and 1 being not important)



Materials To Be Produced

There was consistency in the results for the material based information to be produced for beekeepers. There was a much higher demand for online materials including videos and written material. There was a lower response for print compared to online materials, and overall lower interest in smart technologies and app development.

Q6 What resource materials would you like to see developed by a Knowledge and Research Transfer Program in Manitoba? (Check all that apply)

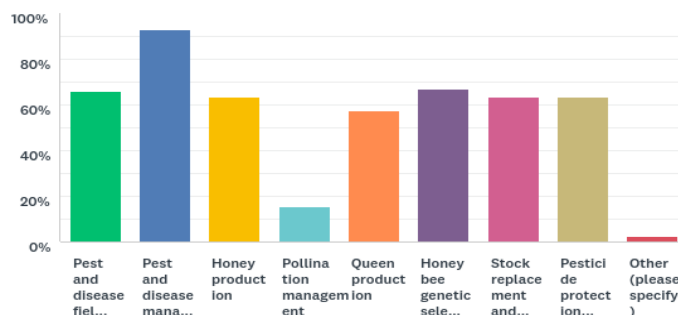


Applied Research Priorities

Overall respondents prioritized Pest and Disease Management research over all other options. Full time beekeepers also placed a high priority on research to optimize honey production. All other categories were shown to be of mid range priority. Pollination was once again show to be of low research priority.

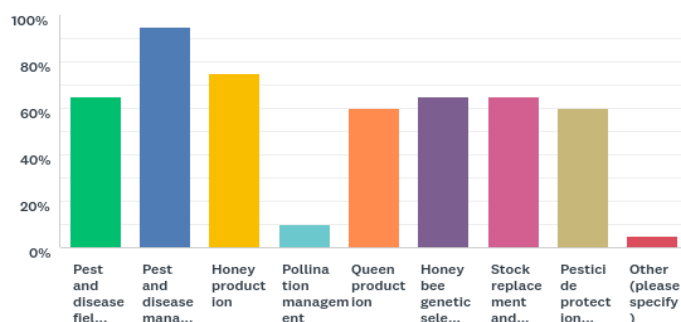
Q7 What applied research areas are priorities for a KRTP to be involved in? Check all that apply

All Manitoba Beekeepers



Q7 What applied research areas are priorities for a KRTP to be involved in? Check all that apply

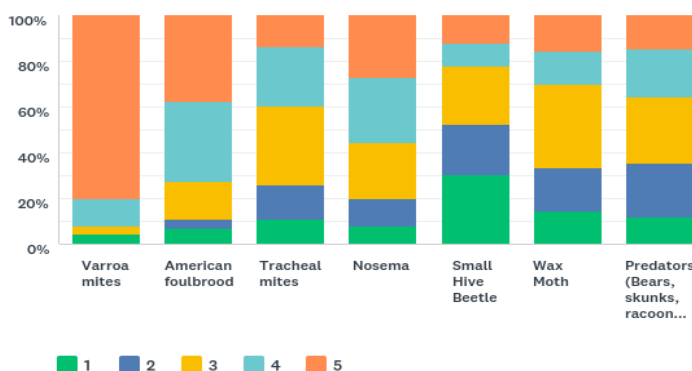
Full Time Beekeepers



Pest and Disease Research Priorities

Responses were consistent in priorities for pest and disease management research. Varroa mite were identifies as a top research priority. American foulbrood was also identified as a priority pest to develop management strategies. Nosema and tracheal mites were mid priority. Small hive beetle, wax moth and predators were of lower priority.

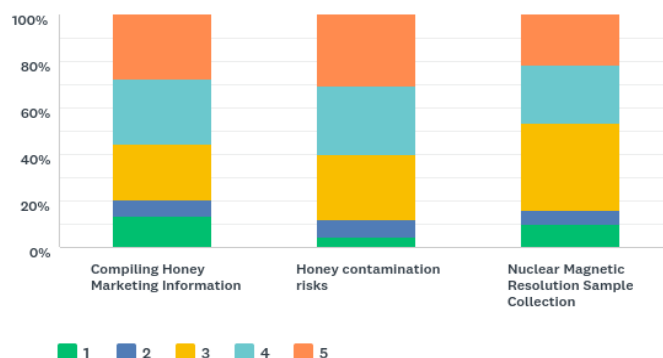
Q8 How would you rate the priorities for honey bee pest and disease best management practices by a KRTP? (Rated on a scale of 1-5; 5 being most important and 1 being not important)



Honey Marketing

There was little difference between Full time, Sideline and Hobbyist beekeepers in priority for the options offered in the survey and on average rated mid range as a research priority. There may be more interest in these activities, especially in the topics of honey contamination and adulteration as there was somewhat even split in rates (3-5) that resulted in an mid range score. Those that rated as high (5) may be more vocal on this priority.

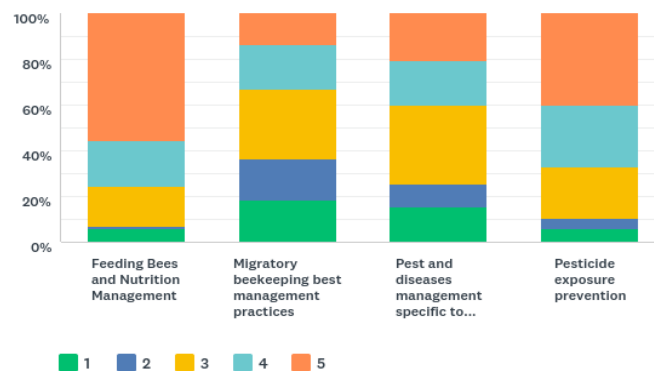
Q9 How would you rate the importance of the following honey marketing activities as part of the mandate of the KRTP? (Rated on a scale of 1-5; 5 being most important and 1 being not important)



Pollination

Consistently through the survey pollination information and research has been a low priority. The survey question specifically on pollination reiterate the opinion that these themes are of low priority. The topic that rated the highest for pollination research and knowledge transfer was in regards to nutrition management. Information related to nutrition could also be applied to other production priorities.

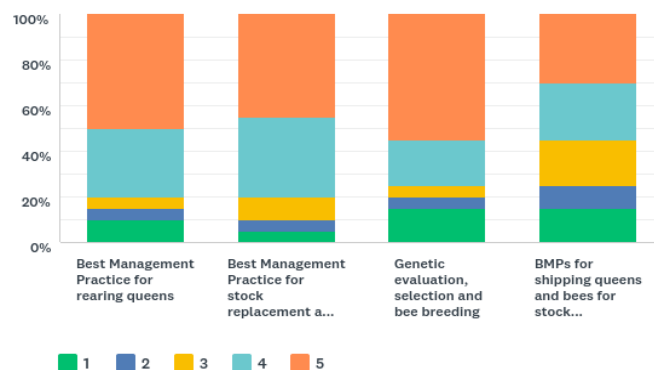
Q10 How would you rank the priorities for pollination best management practices by a KRTP?
(Ranked on a scale of 1-5; 5 being most important and 1 being not important)



Queen Rearing, Bee Breeding and Stock Replacement

There was consistent response in priorities and high priority responses for best management practices for queen rearing, bee breeding and stock replacement and expansion. There was a slightly lower importance given to BMPs in regards to shipping queens and bees for stock replacement.

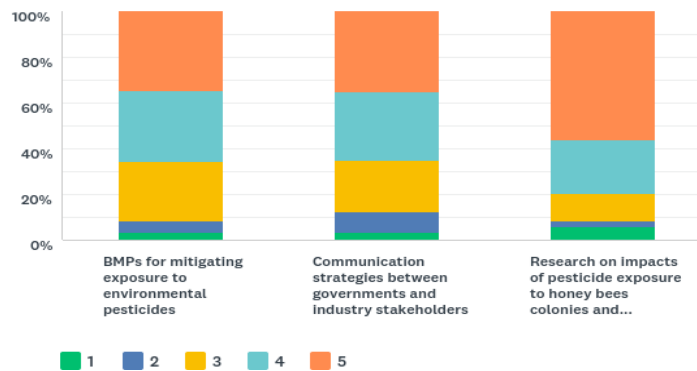
Q11 How would you rate the priorities for honey bee queen production and stock replacement by a KRTP? (Rated on a scale of 1-5; 5 being most important and 1 being not important)



Pesticide Exposure Prevention

There was overall higher priority stated for this topic for hobbyist, then slightly lower for sideline beekeepers and mid range priority of full time beekeepers. The general importance and need for research and information to mitigate pesticide exposure to honey bees can shift depending on the pesticide and how it is applied, at any point in time.

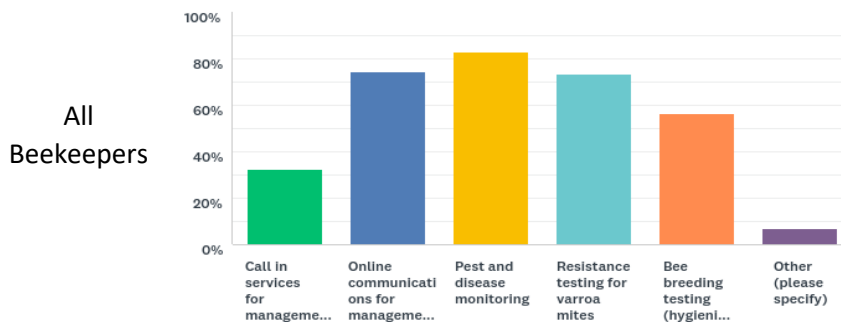
Q12 How would you rate the priorities for honey pesticide exposure best management practices by a KRTP? (Rated on a scale of 1-5; 5 being most important and 1 being not important)



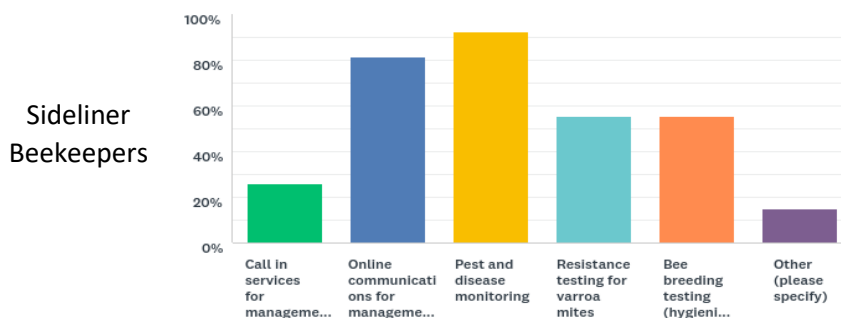
Services Provided

All groups set a high priority on pest and disease monitoring as a service provided by a Tech Transfer Program. Full time beekeepers also prioritized resistance testing for varroa mite treatments, and bee breeding. Sideline beekeepers and hobbyist beekeepers gave a higher priority to online communications for management recommendations. All groups gave low importance to call in services for management recommendations.

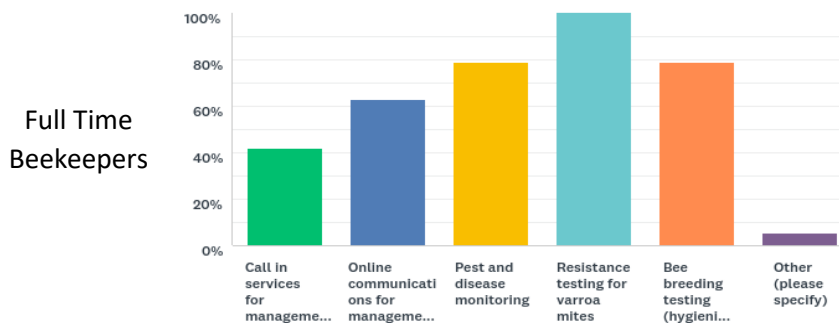
Q13 What services would you like a KRTP to provide to the Manitoba beekeeping industry? (Check all that apply)



Q13 What services would you like a KRTP to provide to the Manitoba beekeeping industry? (Check all that apply)



**Q13 What services would you like a KRTP to provide to the Manitoba beekeeping industry?
(Check all that apply)**



Communication and Collaboration

There was a firm confirmation that the Manitoba Beekeepers Association and commercial beekeepers should be top priority for the Tech Transfer Program to communicate and collaborate with closely. After that communication with the Manitoba Ministry of Agriculture and University of Manitoba was high priority. There was mid priority given to communication and collaboration with the Canadian Honey Council and other Manitoba Agriculture stakeholder groups.

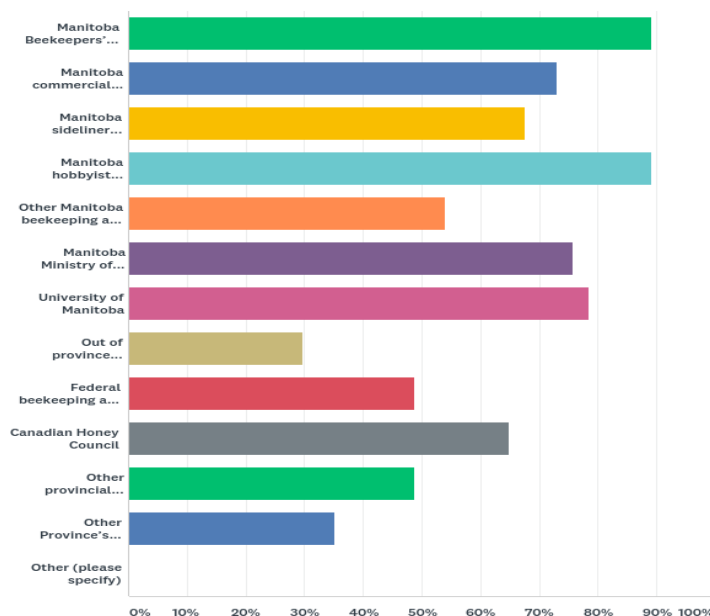
There was a mid range to lower priority given to communications and collaborations with out of province tech transfer programs, academic institutions and stakeholders. There was a difference in priority for communication with sideline and hobbyist beekeepers. Although all groups prioritized commercial beekeepers, Hobbyist beekeepers prioritized themselves and lower to sideline beekeepers, Sideline beekeepers prioritized themselves and lower to hobbyist. Commercial beekeepers had low priority for sideline and hobbyist beekeepers.

Although there was consistency in most other categories there does appear to be a need to bridge gaps in communication and relationships between commercial, sideline and hobbyist beekeepers. It may be important for the MBA to play a role in bridging this gap between beekeeper groups to continue the support from hobbyist and sideline beekeepers for commercial beekeepers.

There was a priority to work within Manitoba stakeholder groups in general, however a comment in the survey was made that working “close to home” in Manitoba should be the starting point of a KTRTP; as the program grows it can start to reach out beyond its borders.

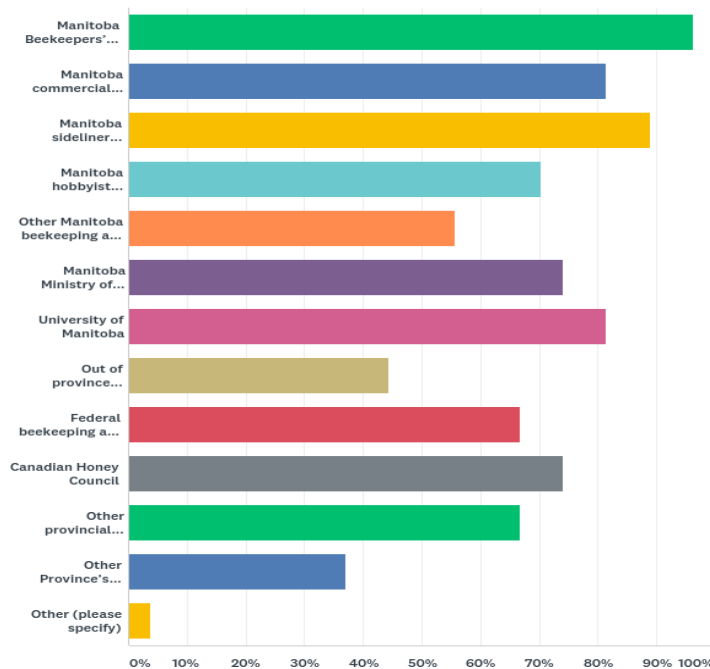
Q14 A KRTP will need to communicate and work with other industry stakeholders to delivery project objectives. From the list below please check all that are important for a KRTP to communicate and collaborate with.

Hobby
Beekeeper

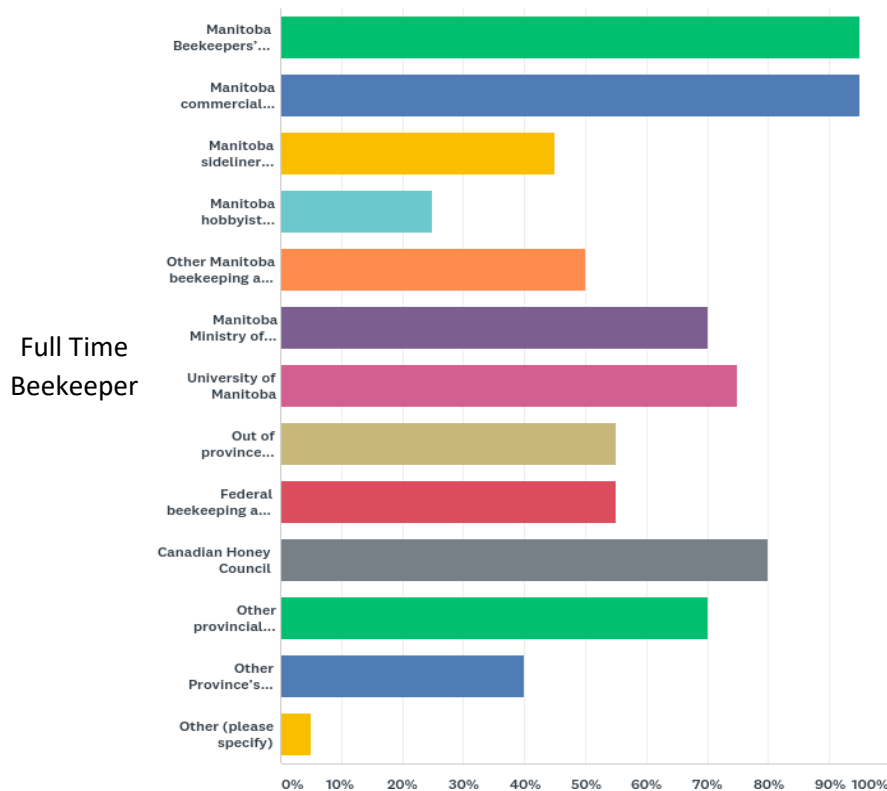


Q14 A KRTP will need to communicate and work with other industry stakeholders to delivery project objectives. From the list below please check all that are important for a KRTP to communicate and collaborate with.

Sideline
Beekeeper



Q14 A KRTP will need to communicate and work with other industry stakeholders to delivery project objectives. From the list below please check all that are important for a KRTP to communicate and collaborate with.



Summary of Priorities

The purpose of this survey was to identify a starting point and priorities for a potential KRTP program for the Manitoba Beekeeping industry. This survey showed that training through workshops to the diverse levels of beekeeping (Full time, Sideliner, hobbyist) is needed. Along with baseline BMPs for beekeeping, a focus on Integrated Pest Management should be a priority.

Expanding the program to queen production, bee breeding and stock replacement should also be considered important future work by at KTRP. The topic of pollination services and BMPs is not a priority for the Manitoba Beekeeping industry at this time. Other themes highlighted through this report are of interest to the Manitoba Beekeeping industry and a KRTP could expand into these areas.

Respondents showed a desire for a “home grown” KRTP, that would work most closely with the Manitoba Beekeepers’ Association. The main collaborators would be with the commercial beekeeping sector, the Manitoba Ministry of Agriculture and the University of Manitoba, with close communications with sideline and hobbyist beekeepers. Once these baseline communications and collaborations are established by a Manitoba KRTP, they could then expand to other stakeholder groups and in and out of province.

