

## **Canadian Tech Transfer Teams for Apiculture:**

### A Summary of the Four Tech Teams in Canada

By Robyn McCallum, Nicolas Tremblay, Hannah Neil, and Les Eccles. 2017.

There are currently four technology transfer teams for apiculture in Canada that work directly with beekeepers to analyze and disseminate information. The scope of the teams includes improving honey bee health, managing diseases and pests, investigating bee nutrition, developing and answering research questions, and more.

A brief survey was conducted among the four teams to determine the similarities, differences, opportunities, and challenges facing the teams. Six questions were asked:

- 1) Which year was the team established?
- 2) What is the funding structure for the team?
- 3) What are the main goals for the next few years?
- 4) What are some major accomplishments of the team?
- 5) What are some of the challenges facing the team?
- 6) Are there opportunities to collaborate with other Canadian tech transfer teams?

The responses were compiled and are discussed below:

Table 1. Summary of the Structure of Canadian Tech Transfer Teams for Apiculture.

Consideration	Team			
	Atlantic	Ontario	Quebec	Saskatchewan
Number of beekeepers in province/region	1,045	3,351	992	1,150
Number of hives in province/region	47,762	105,431	57,743	112,000
Year team established	2016 (newest)	Early 1990s (oldest)	2006	2010
Funding structure	Federal government, Pan-Atlantic fund, Oxford Frozen Foods, Jasper Wyman's and Son, Nova Scotia Beekeeping Association, New Brunswick Beekeeping Association, Prince Edward Island Beekeepers Association, Bleuets NB Blueberries, Wild Blueberry Producers Association of Nova Scotia, Prince Edward Island Blueberry Growers Association, NB government, NS government, PEI government	Ontario Ministry of Agriculture, Food, and Rural Affairs (OMAFRA) for 3 main projects (training and workshops, resistant Ontario resistant honey bee selections (ORHBS) program, supporting information for regional beekeeping associations), additional projects via provincial and federal funding partners	Funding now comes from contracts with beekeepers, contracts with blueberry and cranberry producers for hive strength inspections during pollination, research projects, teaching. Note: Contract producers can receive funding for services by the Ministry of Agriculture from Quebec (MAPAQ from Agri-conseils).	Saskatchewan Beekeepers Development Commission, funding via Agriculture Research Branch of Government of Saskatchewan, other projects funded externally, e.g. from Agriculture Development Fund (ADF) and Agricultural Demonstration of Practices and Technologies (ADOPT), reporting to steering committee

<p><b>Main goals for the next few years</b></p>	<p>Rearing local queens, improving varroa mite management, studying pollination efficiency for wild blueberry, mitigating spring dwindle</p>	<p>Varroa management tools, bee breeding, industry training</p>	<p>Continuing to help producers, implementing ApiExpert (techno-economic tool) in more businesses and making it more useful/applicable, continue projects on pollination, developing a new application of ApiProtection (this would allow beekeepers to mark bee yards but only allow agronomists and veterinarians from MAPAQ to see, helping guide decisions about pesticide recommendations)-this will launch April 2018</p>	<p>Probiotic feed supplements and their relationship to <i>Nosema ceranae</i>, oxalic acid vaporization in the spring, assay of beekeeper-applied acaricides residues in brood wax, demonstration of Kenyan top bar and flow hive technologies</p>
<p><b>Major accomplishments</b></p>	<p>Successful workshops and bee schools, miticide efficacy and resistance testing, pollination stocking density trial, nosema lab diagnostics provided to beekeepers, sampling</p>	<p>Suite of online and in-field workshops for beginner and advanced beekeepers, ORHBS program, BMPs, testing novel varroa treatments</p>	<p>Keeping hives alive and strong throughout the season in the northern part of Quebec, particularly for wild blueberry pollination, managing nosema without antibiotics, controlling</p>	<p>Consistently sold-out beginner beekeeper courses in Regina and Saskatoon, intermediate and advanced queen rearing courses, hygienic testing via liquid nitrogen</p>

	for National Bee Health Survey		varroa using only organic treatments, developing and supervising two inspection teams for hive strength during blueberry and cranberry pollination, creating more than 50 articles dedicated to producers, making the “CRSAD services-conseils” profitable.	demonstrations, queen replacement methods demonstrations, multi-year research project on varroa management and size/timing of nuc establishment (final report in 2018)
<b>Challenges</b>	Varroa mites, spring dwindle, small hive beetle, low prices of wild blueberries are impacting pollination contracts, securing funding for beyond 2018	Varroa treatments mid-season are needed, continual development of bee breeding for resistance bees, ensuring new beekeepers access credible information	More personnel (currently only one consultant) to expand scope of tech transfer team work, increase collaboration between veterinarian team and tech transfer team	Dealing with varroa, productive but small industry, difficult to attract technical assistants to the tech team, have been without team lead for past two years
<b>Opportunities to collaborate with other Canadian tech transfer teams</b>	Miticide projects	Miticide projects	Open to collaboration	Miticide projects-application methods and timing, differences in feeding methods (e.g. barrel feeding) and supplements



## Discussion

### *Year Established*

Ontario's tech transfer team has been in existence since the early 1990s, while the other three tech teams began in the last twelve years. By establishing a community of collaboration, perhaps we could draw on the experience of the Ontario team to learn from past successes and challenges.

### *Funding Structure*

There is wide variation in the funding structure among the four tech transfer teams in Canada, but all teams actively seek funding to fulfill their research and extension goals. There seems to be strong provincial support for all of these programs, and the Atlantic team appears to have the highest industry funding. Atlantic and Quebec are engaged across multiple sectors (e.g. wild blueberry, cranberry (Quebec) and beekeeping industries). Significant time is spent applying for funding to continue the teams.

### *Main Goals for the Next Few Years*

Improving varroa management is at the forefront for many of the teams across Canada, coupled with improving feed supplements and further investigating *Nosema ceranae*. Queen breeding was mentioned by both the Atlantic and Ontario teams. Pollination was highlighted by the two eastern teams as it relates to wild blueberries.

### *Major Accomplishments*

Design and delivery of various beekeeping courses were highlighted as major accomplishments for many of the teams. Quebec highlighted their involvement in technology, particularly 'apps' for beekeepers and in organic treatments for pest and diseases. Ontario's work with ORHBS was emphasized.

### *Challenges*

Technical and structural challenges were highlighted. Varroa mites continue to be a major challenge for beekeepers across Canada, and research is needed on emerging miticides and their delivery, efficacy, and potential resistance. Additionally, spring dwindle, pollination, and bee breeding were mentioned.

All of the tech transfer teams face pressures to secure funding and have enough resources (particularly personnel) to carry out the team's mandate.

### *Opportunities to Collaborate*

All tech transfer groups responded they were willing to collaborate across Canada, particularly on miticide projects. It seemed as though many groups were unaware of typical industry practices across the country (e.g. prevalence of various feeding methods in different regions, most commonly used miticides among regions, queen

breeding) and a national survey to capture the similarities and differences, successes and challenges, may be valuable.

## **Recommendations**

The development of a Tech Transfer Team Committee as part of the Canadian Association of Professional Apiculturists (CAPA) may facilitate increased communication among the teams. Tech teams are encouraged to become active and engaged in this forum.

There appears to be numerous beekeeping courses and workshops being developed and delivered independently across the country. Communication among the tech teams may allow for sharing of curriculums and cost reduction, particularly for webinars.

Each tech transfer team is engaged in relevant and innovative research in the field of beekeeping. Steps to share results and promote recommendations may be advantageous across regions (e.g. pollination stocking density trial in NB may be relevant to Quebec; probiotic work in Saskatchewan may be applicable across Canada).

Promoting and presenting tech transfer team successes and challenges at annual CAPA meetings may increase communication and heighten awareness for teams in the industry. Further promotion at industry-level events, such as beekeeping or fruit-growing meetings, may be advantageous. Compiling successes and future directions of tech transfer teams, and sharing this with government partners, should be considered.

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