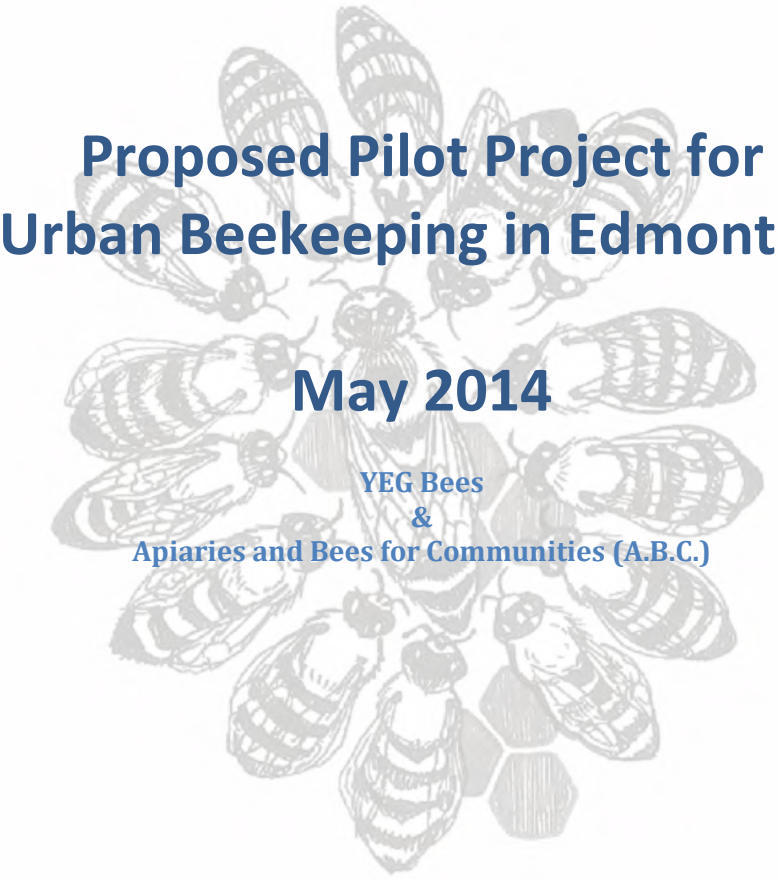


Proposed Pilot Project for Urban Beekeeping in Edmonton

May 2014

YEG Bees
&
Apiaries and Bees for Communities (A.B.C.)

Executive Summary

Objective

Our objective is to obtain permission to implement a small-scale pilot project to explore the benefits and challenges of urban beekeeping in Edmonton with the guidance of a community organization, Apiaries and Bees for Communities (ABC). Subsection 27(1) of bylaw 13145, Animal Licensing and Control Bylaw, includes a provision whereby the City Manager may grant permission to keep bees within the municipality.

Introduction

Through this proposal we, YEG Bees, seek permission to place two hives placed in one residential backyard. These hives will be used to educate community members by providing Edmontonians with a rare chance to experience urban beekeeping via our educational field days and "bee day" talks at local elementary schools. This pilot project has obtained consent and support from neighbours adjacent to the proposed residential site (Appendix 1) and letters of support from a number of Edmonton-based organizations (Appendix 2). Materials provided within this proposal will answer important questions the City of Edmonton may have as well as offer paths forward following the successful implementation of the pilot project.

Honeybees, and other pollinating insects, are vitally important to the life cycle of most horticultural plants and agricultural crops. Many communities have passed or changed bylaws legalizing and regulating urban beekeeping. Urban beekeeping has been legalized in cities with massive population densities like New York City, Chicago, Boston, and Los Angeles counties with tremendous success. When these cities marshaled in the legalization of urban beekeeping, their intent was to support the local food economy, establish appropriate regulation for a growing community of hobbyists, and to support and protect honeybees. Urban beekeeping exemplifies the move towards local agriculture, sustainable practices, and stewardship for the environment within an urban environment.

Urban beekeeping is a safe and collaborative hobby that brings communities together by forging strong relationships based on ethical animal husbandry and connections with the land, weather, and seasons. Honeybees have been kept for hundreds of years for honey production because their behaviour is predictable, efficient, and calm. Currently in Alberta, anyone who keeps bees or owns beekeeping equipment anywhere in Alberta must register with Alberta Agriculture every year by June 30 (in Alberta, the Bee Year is July 1 to June 30), as managed by the Provincial Apiculturist for Alberta, Dr. Medhat Nasr. Unregistered owners are subject to fines under the Alberta Bee Act.

The City of Edmonton has a strong history of civil engagement and community participation in public land use from community gardens to tree planting programs along the North Saskatchewan River. We feel that our pilot project would help Edmonton usher in advances in innovation by engaging with citizens to take part in the growing urban agricultural movement underway. Integrating honeybees into an urban landscape fits very well in to the city's *fresh* mandate. In fact, *fresh* includes a recommendation to "examine opportunities for citizens to keep bees by partnering with local non-profits" (*fresh,* p. 35). Through this pilot project, the city has a safe, small-scale strategy for broadening support and education around urban bees that will allow for building capacity to support further expansion of beekeeping in the City of Edmonton.

Background and Supporting Documents

Contents

Appendices

1) YEG Bees and the ABC

YEG Bees was formed in 2014 by a group of Edmontonians who are concerned about honeybee health and interested in urban beekeeping. Since its formation, YEG Bees has been creating dialogue and sharing information about urban beekeeping through active Twitter (@YEGBees) and Facebook (www.facebook.com/yegbees) accounts. YEG Bees has made several community-based educational presentations including an Edmonton Awesome pitch party, NextGen's Dark MEAET at Latitude 53, and the 2014 Eat Alberta conference. We also have an upcoming presentation at a NextGen Pecha Kucha night (June 6) and a potential NerdNite presentation in the fall. Two members of YEG bees have taken Level 1 beekeeping certificates from Apiaries and Bees for Communities, one has completed the Beekeeping for Beginners course from the Provincial Apiculturalist for Alberta, and two have completed a Beekeeping 101 course from Patti Milligan (Lola Canola). These five trained members of YEG Bees will care for the pilot hives.

Apiaries and Bees for Communities (ABC), a Calgary-based urban beekeeping initiative, will support the pilot project. Starting up in 2010, ABC is focused on developing educational and mentorship opportunities with programming offered across Alberta for urbanites to get engaged in beekeeping practices. Programming includes teaching 200+ new beekeepers, selling out over 40 unique programs, as well as collaborating with organizations like the Calgary Zoo, TELUS SPARK!, and Mount Royal University. In their five years of development, ABC has participated in the development of urban beekeeping programming in Calgary, Cochrane, Edmonton, Red Deer, Portland, Boulder, Massachusetts, New York City, and Los Angeles. In Alberta, ABC has brought over 300 colonies of bees to the province for new beekeepers from Sweetacre Apiaries and Tony Lalonde Apiary, and is eager to see sustainable beekeeping practices permeate from the heart of urban centers. ABC recognizes the challenges municipalities face in developing eco-friendly communities with the inclusion of honeybees and balancing the necessary risk mitigation and enforcement of their integration to the urban space. For more information on the organization and their programming, go to www.backyardbees.ca.

2) Pilot project – what can we do for you

Site selection and hive care

The purpose of this small-scale pilot project is to explore the benefits and challenges of urban beekeeping in Edmonton. The project, managed by a volunteer project coordinator from YEG Bees, would comprise of two hives placed in one residential location with neighbour consent.

The pilot site will be located in an RF1 zone, in the backyard with a newly fenced garden area. The hives will be separated from the main yard by a chain link fence, and separated from neighbouring yards by a 5-foot wood fence.

The five beekeepers identified in the previous section, plus an experienced mentor will care the hives. The hives will have a 7 to 10-day inspection rotation to ensure hive health and reduce the likelihood of swarming or absconding (colony abandons the hive). The beekeepers will record key metrics about each hive through each inspection, which will be compiled for the final report on the pilot project. All hives will be leased and registered by ABC to be covered under their 5 million dollar liability insurance policy but the proceeds of the hive (wax, honey, equipment, bees) will be owned by the beekeeper.

Public education and information sessions

At the beginning of the pilot project, the community league for residential site will be contacted to arrange for an information session for its members. Additional information will also be available as documents that can be emailed to community league members or published in the local community league newspaper. The focus of the pilot is educating Edmontonians about urban beekeeping. As such, the educational efforts will include:

- **Educational outreach to schools**: Currently we have "bee day" presentations to grade 5 & 6 classes at Hardisty K-9 School and St. Richards Elementary School, focusing on urban agriculture and honeybees. We would contact other local schools to arrange similar presentations.
- **Educational opportunities with NAIT:** Site visits to the pilot location from first year Biological Sciences Technology students to learn about urban beekeeping and the science of honeybees
- **Community garden partnerships**: Information sessions will be arranged with two nearby community gardens. Information booth and presentations will be given at a neighbourhood fall gardener's swap.
- **Community field days**: funded by NextGen, community members can participate in hands-on hive inspections at the pilot location and learn about beekeeping in an urban environment. The first community field day is scheduled for early June for all adjacent neighbours.
- **Edible garden tour**: The site is currently a stop on an edible garden tour in August; information about urban honeybees and a brief tour of the hives would be incorporated into the presentation.
- **Pecha Kucha Night 19**: YEG Bees will be presenting at NextGen's PKN 19 on June 6, promoting urban beekeeping to an audience of 700.
- **Education through social media:** active Facebook (www.facebook.com/yegbees) and Twitter accounts (@Yegbees) will serve to educate people about urban agriculture beekeeping as well as recruit participants for the field days.

Data collection, community surveys and final report

A final report will be created using metrics collected from each hive and survey feedback from site participants, beekeepers, and community members. Hive data will be collected via a wireless hive monitoring system, Arnia. Real-time data gathered will include hive temperature, humidity, and bee activity will allow us to remotely monitor the hive health and potential for swarming (see Appendix 3). Data will also be collected during weekly hive inspections, looking for varroa mite counts, queen health, brood growth, and other critical information. Field day and school bee day participants will fill out feedback forms. Community survey data will be collected at the end of the beekeeping season, in November, regarding their views of the pilot project as well as feedback on their awareness of bees in the neighbourhood. The final report for the pilot will be prepared by December 1, 2014.

3) Anticipated challenges

Urban beekeeping requires responsible management to avoid creating nuisance and/or safety problems for residents or pest concerns for local beekeepers. The three primary challenges that could occur during this pilot project include:

- Absconding, swarming, and swarm capture;
- Pest or disease transmission between hives;
- Education and awareness about bee safety; and

- Beekeeper unable/unwilling to continue apiarian duties.

Absconding, swarming, and swarm capture

At various stages in the development of a hive, a part or whole of the colony may permanently vacate. Swarming occurs when only portion of the colony leaves and is usually associated with reproduction and hive growth. Absconding occurs when the entire colony vacates and is less likely to occur in well-managed hives. While swarming is the natural means of reproduction of honeybee colonies, it is possible to control or manage swarming behaviour. For example, despite more than 200 hives inside the City of Edmonton, there were only three swarm calls in the 2013 beekeeping season.

While the word swarm may conjure images of a large mass of angry bees, bee swarms are actually very docile because they are focused on establishing a new hive. It is considered good practice in beekeeping to reduce swarming by employing several techniques. They may remove frames of brood comb making nucs (nucleus or starter colonies) or by shaking package bees (usually for sale) from hives. Other effective swarm prevention practices include regular inspections for indication of swarming, brood chamber manipulation to make sure the queen has room to lay, adequate ventilation in the hive, and replacement of old or failing queens.

Our pilot project will address swarming by purchasing one extra hive body to catch a swarm if it happens and by regularly inspecting the hives to split colonies that show indications of swarming behaviour.

Pest or disease transmission between hives

Effective beekeepers minimize threats to bees from disease and pests, ensure hive health, maximize honey quality and prevent cross-hive contamination. All beekeepers must be able to recognize and manage several honeybee diseases and pests, some of which are contagious to other bees. A key responsibility is to help minimize disease and improve safety for commercial apiaries surrounding Edmonton. Our pilot project will prevent disease by:

- Regularly inspecting the hives for evidence of disease;
- Communicating with the provincial apiculturist for up-to-date about pests, prevention, and treatment of the many issues that may arise;
- Applying integrated pest management (IPM) strategies address any diseases or parasites that may be found in the hives; and
- Supervision by a mite biologist (Dr. Heather Proctor) from the University of Alberta to inspect mite moults for presence of Varroa

Education and awareness about bee safety

Honeybees are much more docile than a paper wasp or yellow jacket typically found around back yards in Edmonton during the summer. Bees are fuzzy, vegetarian pollinators which sting only once and die shortly thereafter. Wasps are smooth-bodied, poorly pollinating omnivores that can sting multiple times without dying. While wasps and yellow jackets are attracted to backyard barbecues by meat and sugary sodas, bees prefer the nectar from flowers. The negative perceptions that some people have of bees are often due to misinformation and can be decreased through dissemination of information, educational programs and by raising awareness. For example, the fears of an entire community may be assuaged simply by conveying that honey bees are very docile and that humans are more likely to be allergic to peanuts than to bee stings (1 in 1000).

Our pilot project will address education-related issues by:

- Emailing information to neighbours through the community league;
- Publishing beekeeping information in the local community league newspaper;
- Offering a beekeeping information session in each community league including pamphlets for display in each community that will host bee hives;
- Communicating information about beekeeping through our Twitter and Facebook accounts;
- Ensuring that neighbours are surveyed in all locations adjacent to beekeeping property; and
- Allow community members to participate as observers in a hive inspection.

Beekeeper unable/unwilling to continue apiarian duties

In the unlikely case that all five pilot project beekeepers are unable or unwilling to continue their duties, the hives will be relocated another location outside of the city with the support of the ABC. This site, which is owned by a beekeeper that has agreed to take the hives, has been already identified. One of the reasons a group will manage the hives is to ensure there is adequate time and energy to care for the hives; furthermore, all five pilot participants are very informed about the demands of beekeeping. For these reasons, it is highly unlikely that this will be the case for the duration of the pilot project.

4) Measuring benefits and success

Although the global plight of the honeybee is reason enough to encourage bee-friendly initiatives, urban beekeeping is not without anthropocentric incentives. We anticipate that the pilot project could offer the City of Edmonton numerous benefits including:

- Greater awareness in the City of Edmonton about honeybees and their importance to food supply;
- Increased yield in urban food crops by supporting pollinators within the city limits. With the spread of urban community gardens, urban hives are in a position to support that growth with their services; and
- Support of the City of Edmonton's *fresh* initiative, which recognizes the importance of food and urban agriculture as an opportunity to increase the sustainability and quality-of-life of their communities, as well as a means for economic development.

Following completion of the pilot project, a survey will be used to collect feedback from residents within the participating communities. The survey will be designed to measure the costs and benefits associated with keeping bees in the urban environment from the perspective of Edmonton residents. Examples of questions that will be included on the survey include:

- Were you aware that there was a honeybee pilot in your neighbourhood?
- Did you notice an increase in honeybees in your yard or area this year?
- Were you or anyone in your family stung this year by a bee that left its stinger behind?
- Did you see any swarms of bees?
- Are you supportive of urban beekeeping given that the pilot has run through the summer?

Three key areas will be assessed to evaluate the success of the pilot project. First, feedback from the community survey will provide information on the overall perceived impact of urban beekeeping. It is vital to have community support and awareness of the project. Second, should any issues arise from the test sites (e.g., swarming, bees using inappropriate water sources), assessing if the problem was addressed in an immediate fashion. Finally, success for the pilot project will also be measured in terms

of the health of the hives. The hives should be disease-free, and any issues addressed by using integrated pest management.

5) Why urban beekeeping is important

Urban beekeeping is a growing phenomenon throughout the western world in the past 15 years, beginning in Europe and moving in to North America around 2004 in the wake of media coverage of massive commercial honeybee losses and Colony Collapse Disorder (CCD). Pollinating insects, such as bees, are vitally important to the life cycle of most horticultural plants and agricultural crops. Urban apiculture as a hobby can contribute to more productive harvest from backyard, street and community gardens. It is estimated that the pollination services provided by bees are often 60-100 times more valuable than the market price of honey. There are many reasons to support and facilitate urban beekeeping including greening your community, supporting your local food economy and supporting honey bee health.

a) Greening your community and supporting your local food economy

A large proportion of programming offered by the City of Edmonton has increasingly had a community-focused approach. Initiatives such as *fresh* and the increased support for local agriculture through the large number of Farmers Markets in the city, as well as growing number of community gardens suggest that Edmonton is well on its way towards a more community focused food economy.

With effective municipal and community support, Edmonton can begin to rebuild its rich beekeeping heritage, which saw over 2,000 hives within city limits during World War II. Bees also play a valuable role to the biodiversity of the urban environment. As pollinators, they contribute to the production of fruits, vegetables, and seeds, which provide a food source for birds and other insects that can increase the yields of Edmonton's local food economy.

b) Supporting honeybee health

Alberta produces 40.7% of Canada's honey surplus annually grossing over 40.5 million lbs. of honey. This honey surplus is produced by over 250,000 colonies managed by a mere 789 beekeepers (Agricultural Statistics, Government of Alberta). The beekeeping industry is extremely industrialized and focused around the Peace River region. Due to pressures of global competition, honey prices have dramatically decreased and beekeepers have had to increase their honey yields annually to produce a profit. These challenges are forcing commercial beekeepers to transfer that pressure on to their honeybees, which has contributed to increased cases of disease within their colonies. The industrial food complex is creating a feedback loop that is making it harder and harder for beekeepers to take care of the animals that they love the most: their bees. Urban beekeeping offers opportunities for hobbyists to try alternative care methods that commercial apiaries cannot afford to attempt for fear of failure. As well, urban beekeeping increases the awareness and support of our commercial beekeepers by decreasing the distance between farm and fork.

Increasingly North America and the world are facing significant challenges with the disappearance of bees, known as Colony Collapse Disorder (CCD). While widely publicized, its roots are uncertain. What is clear, however, is that increasingly honeybees are facing a more challenging environment to gather nectar for honey. Issues that negatively affect colonies include:

- The increased presence of pathogens and pests in the colonies such as the varroa mite;
- Increased pesticide usage, both around the colony and more generally throughout agriculture;

- Increasingly flowerless landscapes with plants like dandelions and clover selected out of the urban and agricultural ecosystem by herbicides;
- Agricultural monocultures where only one crop is planted over very large areas, meaning bees do not have enough food diversity to build a surplus throughout the spring, summer and fall for winter; and
- Industry and management practices such as migration, nutrition, and medical treatments.

Urban centres can provide micro-climactic environments, which can buffer seasonal weather extremes. As well, the diversity of flora in urban areas protects honeybees from the adverse effects associated with monocultures. The products of hobby beekeeping provide a local source of food, wax and other bee products. For some beekeepers, it may also provide a small amount of income. Because honeybees typically forage for nectar within a 4-6km radius, there is an opportunity to create geographic honey profiles for the various neighbourhoods in Edmonton. By supporting the development of local bee culture and having hives throughout the city we are increasing the productivity of our cities gardens and increasing awareness of the importance of the honeybee as pollinators and honey producers. Urban beekeeping is an opportunity to improve the rigor of Alberta's bee populations while potentially providing unique sweet rewards throughout Edmonton.

c) Local stakeholder support

Urban beekeeping is part of a growing movement of urban agriculture, including small-scale farms, fruit orchards, and local food production. Through the early stages of our promotion, many connections have been made with organizations such as Shovel & Fork, Operation Fruit Rescue Edmonton, Slow Food Edmonton, and Edmonton Permaculture. It is our intention to continue collaborating with these urban agriculture organizations to promote beekeeping in the City of Edmonton. Some of these organizations have written letters of support for this pilot project proposal, attached in Appendix 2.

6) Taking the sting out of an antiquated bylaw

Many Canadian municipalities already permit urban beekeeping, and thus a precedent has been set in regards to an updated bylaw. Many of the examples from other cities include the number of hives permitted on specified zoning areas, and property sizes. For instance, the City of Vancouver permits up to two hives on residential sites zoned for single and double family houses on a parcel of land up to 10 000 square feet. Saskatoon simply requires that anyone keeping bees should do so in a manner that prevents aggressive behaviour of the bees. Detailed information regarding current Canadian urban beekeeping bylaws can be found in section 7.

7) References & Useful Links

Alberta Bee Act: http://www.qp.alberta.ca/documents/Acts/B02.pdf
Vancouver Urban Beekeeping Regulations: http://vancouver.ca/people-programs/beekeeping.aspx
Beekeeping Resources in Getting Started: http://www.backyardbees.ca/abcworks/getstarted
Canadian Urban Beekeeping bylaws: http://www.urbanbeenetwork.ca/index.php/urban-issues/bylaws
Alberta Agricultural Statistics: http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/sdd12807

8) Glossary

Apiary: is also known as a bee yard, and is a place where beehives of honeybees are kept. Traditionally beekeepers (also known as apiarists) paid land rent in honey for the use of small parcels. Some farmers

will provide free apiary sites, because they need pollination, and farmers who need many hives often pay for them to be moved to the crops when they bloom.

Community Hive: www.thecommunityhive.org . A website dedicated to connecting those interested in learning new skills of self-sufficiency and providing a forum as well as information about honeybees and honeybee keeping in the city of Calgary. By doing so, we hope to help create the Hive Mentality within our communities. Focused on urban and hobby beekeeping, we are eager to offer opportunities for community members to share their interests, passions and skills through the Plan-Bee Swarm Catchers group, the Community Hive Chat Room and through the annual Collaborative Purchase of Honeybees.

Community Hive Discussion Board: Including topics such as "new to beekeeping", swarm catching, equipment design, equipment purchases and ways for bee keepers to keep in touch and learn, as well as announcements about what is going on the discussion boards, the Community Hive Discussion Board is an automated tool to capture and disseminate information and bring bee-keepers who may be geographically dispersed together.

Collaborative Purchase of Honeybees Process:
ABC is bringing in 176 colonies of honeybees to Alberta for the Community Hive Collaborative Purchase. Bees are purchased from Sweet Acres Apiaries in BC, who specialize in raising quality local honeybee stock, selling both mated queens and nucleus (starter) colonies. The Exam and Application Process is administered online through the Community Hive. Individuals can take the exam twice anytime between February 1-28th, 2014. All questions are sourced from the Beekeeping in Western Canada textbook that comes with the ABC Level One Beekeeping Course. Applicants with over 80% will be accepted for application review of the purchase up to limit of ordered colonies. Applications are weighted including willingness for applicants with less than 1 year experience may be matched with a mentor, and applicants willing to mentor may be matched with a mentee.

Colony: A group of honeybees in which some honeybee species of the subgenus Apis live and raise their young. Natural beehives are naturally occurring structures occupied by honeybee colonies, such as hollowed-out trees, while domesticated honeybees live in man-made beehives, often in an apiary. A colony is made up of a queen, who lays eggs in the hive, male drones who live to mate with a new queen, and workers, who are all female and do all of the work in the hive. The beehive's internal structure is a densely packed group of hexagonal cells made of beeswax, called a honeycomb. The bees use the cells to store food (honey and pollen) and to house the "brood" (eggs, larvae, and pupae).

Inspection Reports: Regular hive inspections are a requirement for our pilot project and are a best practice for beekeeping. Inspection reports include basic information such as date, time and weather, but have further detail around the presence of eggs, the queen, brood, pollen, nectar, or capped honey on them. It also captures any manipulations of the hive conducted, as well as records of treatments and feeding, tracking colony temperament, swarming behaviours, and honey harvests. There are a number of available applications that can support this type of reporting.

Mentorship: Mentorship has a long history at the ABC This pairs an experienced beekeeper with a less-experience beekeeper that has completed the requisite training. This allows for the effective transfer of knowledge as well as allows new beekeepers to develop the confidence to effectively manage their hives.

Swarm: Swarming is the natural means of reproduction of honeybee colonies. A new honeybee colony is formed when the queen bee leaves the colony with a large group of worker bees, a process called

swarming. In the *prime swarm*, about 60% of the worker bees leave the original hive location with the old queen. This swarm can contain thousands to tens of thousands of bees. Swarming is mainly a spring phenomenon, usually within a two- or three-week period depending on the locale, but occasional swarms can happen throughout the producing season. Colonies are established not by solitary queens, as in most bees, but by these swarms which consist of a mated queen and a large contingent of worker bees. This group moves *en masse* to a nest site scouted by worker bees beforehand. Once they arrive, they immediately construct a new wax comb and begin to raise new worker brood. This type of nest founding is not seen in any other living bee genus. Bees swarm for many reasons, but the primary one is a lack of space within the hive.

Swarm Capture: A swarm of bees sometimes frightens people, though the bees are usually not aggressive at this stage of their life cycle. This is principally due to the swarming bees' lack of brood (developing bees) to defend and their interest in finding a new nesting location for their queen. This does not mean that bees from a swarm will not attack if they perceive a threat; however, most bees only attack in response to intrusions against their colony. Swarm clusters, hanging off of a tree branch, will move on and find a suitable nesting location in a day or two. In Calgary there are two organizations that support the capture swarms that are cast by feral honeybees or from the hives of domestic beekeepers, and for ABC the activities are coordinated through the Community Hive. Swarm capture by ABC in Calgary requires that the bees are not sold and that the beekeeper capturing the swarm has the equipment to do so.

Volunteer Project Coordination: Responsible for supporting the development, kick-off, implementation, community engagement, reporting and wrap-up of a pilot project for the hives. They are the primary contact person for this pilot project.

Appendices

Appendix 1: Neighbour consent form

Appendix 2: Stakeholder support for the pilot and urban bees

Appendix 3: Arnia System Information

System Overview and Operation

Hive Monitor

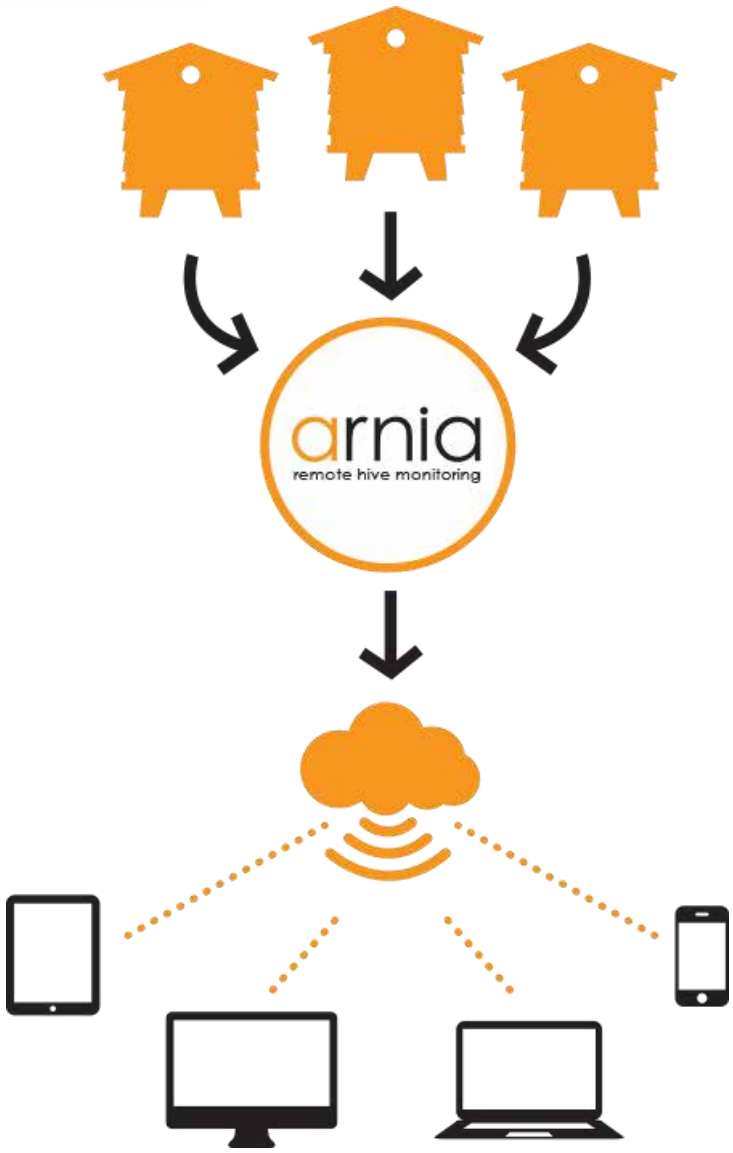
One Hive Monitor is fitted to each hive to be monitored. This records hive temperature, hive humidity, brood temperature, hive acoustics (including flight noise, fanning noise and hive activity). It also detects if the hive is moved or knocked over. The monitor is a small black box only 15mm thick and is easily placed either just inside the hive entrance below the brood frames or mounted to a dummy board. It is powered by 4 x AAA batteries and transmits the data collected wirelessly to a Monitor Gateway.

Monitor Gateway

One Monitor Gateway per apiary is located within 30m of the bee hives that are fitted with hive monitors. This collects data from all the hive monitors and transmits it to Arnia's secure central server for storage and analysis. The Monitor Gateway is battery powered and has its own transmission capability using the 2G GPRS network. No power or WiFi is required in the apiary.

User Interface

Users log in to a personal account from any internet enabled device to access data on their hives through the Arnia User Interface. No additional software is required. The data is presented with clear, easy to read graphics so you can see at a glance the current situation in your hives. Access to current and historical values enables you to generate graphs for selected periods thus allowing trend observation and comparative analysis of data within a colony as well as between different colonies.



arnia
remote hive monitoring

Hive Monitoring Features

Monitoring features		
Apiary Temperature	Records ambient temperature in the apiary. Display graphs of historical temperature data over time to assess long term trends.	✓
Theft (Hive Moved)	Detects if a hive is picked up and moved and automatically sends an email alert.	✓
Vandalism (Hive Tipped Over)	Detects if a hive falls over and automatically sends an email alert enabling you to take immediate action. Protects against vandals, strong winds or animals that can knock a hive over.	✓
Hive Temperature	Check current temperature within the hive and produce easy to read graphs to track temperature changes over time. Compare temperatures between different hives over time	✓
Hive Activity/Foraging	Monitor hive activity and identify weak/low levels of activity and foraging. At a glance you can see and compare current activity of different hives in the apiary. Display graphs of historical hive activity and compare hives.	✓
Fanning	Identify when the bees are fanning. Display graphs of fanning activity over time; compare fanning activity between different hives. This is a useful indicator of bees processing nectar or ventilating the hive	✓
Colony Development	Monitor colony development, spring build up and reduction over the year. Compare build-up between different colonies and hive positions. Identify weak colony build up.	✓
Hive Humidity	Check current humidity within the hive and produce easy to read graphs to track humidity changes over time. Compare humidity levels between different hives over time. Helps identify if ventilation is required.	✓
Brood State	Monitors brood temperature and brood humidity. Enables the beekeeper to remotely assess the state of the brood.	✓
Queen Status	Indicates when there is a break in the brood. Identifies when the queen has stopped laying and the colony has become broodless.	✓
Queen Mating	Identifies when the queen has mated and starts laying. Helps identify the likelihood of drone rearing queens or the possibility of early supersedure.	✓
Bees Robbing honey from other hives	Identifies a sudden increase in daytime flight activity. Identifies low night activity against high daytime activity Beekeeper can take timely preventative action by restricting the entrance to protect the weaker colony.	✓
Swarm Management	Provides indication of potential swarming so that the beekeeper can take preventative action.	✓

Apiary Weather Station

All Arnia bee hive monitoring packages provide ambient apiary temperature data. However if you wish to receive more detailed weather data from the apiary you can add a weather pack accessory. This includes a self-emptying rain gauge and sunshine sensors to provide a full remote apiary weather monitoring station which will monitor sunshine hours and rainfall (mm) as well as ambient temperature.

Apiary Weather Station Features and Benefits		
Remote Weather Monitoring	Monitors ***ambient temperature***, ***sunshine hours*** and ***rainfall.*** Access weather data remotely at any time from any internet enabled device.	✓
Data Analysis & Download	Analyse historical data and generate graphs for selected periods. Data can be down loaded from any internet enabled device.	✓
Fully Portable	Helps the beekeeper to evaluate the ideal location for an apiary (sunnier/warmer locations).	✓
Integrates with Arnia hive monitors	Identify changes in weather conditions that could affect bee activity/health. Compare weather data with hive monitoring data.	✓

Hive Scales

Our electronic hive scales are an optional accessory for beekeepers who wish to monitor hive weight. They integrate with our hive monitoring system enabling comparison of hive weight data with hive conditions, weather conditions and colony activity and status.

You can access your hive weight data remotely at any time from any internet enabled device along with your hive monitoring data. This means you can accurately map the nectar flow and honey production during the spring and summer and monitor stores throughout the winter (no more hefting!). Arnia hive scales have a number of unique features and benefits:

Arnia Hive Scales Features and Benefits		
Instant Alerts	Configure the system to send you email alerts when pre-determined weights are met. Can provide warning if store levels are too low or when the super is full.	✓
Data Analysis & Download	Access to current and historical values enables the user to generate graphs for selected periods allowing trend observation. Data can be down loaded from any internet enabled device.	✓
Low Profile	Only 3.5cm high, no need to adjust your hive stands. Very unobtrusive.	✓
Unique 'Doughnut' Design	Hollow centre allows debris to fall from the hive and maintains ventilation through open mesh/ tube floors.	✓
Multiple load cells	4 load cells enables highly accurate measurement of uneven loads.	✓
Wireless	No cables or wiring. Very easy to install, simply place the hive on the scales.	✓

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Hive Scales

Hive Scales:

Unique 'open floor' allows debris to drop through and maintains ventilation. 4 load cells (one in each corner) enables accurate measurement of uneven loads (to a resolution of 10g). Low profile (3.5cm). Wireless operation.