

Sustainability in Prisons Project (SPP)

Beekeeping in Prisons Program Guide



SPP Beekeeping Liaison Gina Sibley shows off healthy bees at Cedar Creek Corrections Center. Photo by Sadie Gilliom.



SPP is a partnership founded by The Evergreen State College and Washington State Department of Corrections to bring environmental education, science, and nature into prisons. © 2017

SPP Beekeeping in Prisons Program Guide



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1. Beekeeping Introduction for Prison Leadership

Mission: To create and sustain beekeeping programs that engage incarcerated adults and corrections staff in quality environmental education and job skills experience, while also contributing to healthy pollinator populations.

Beekeeping is a high priority for SPP/sustainability programming statewide. These programs can satisfy multiple sustainability program requirements (see Policy 290.055.II) and **fully developed beekeeping programs will encompass the three components described below.**

1. Restoration and Conservation of Honeybees and Native Pollinators

We depend on honeybees for our food supply: of 100 crop species that provide 90% of our global food supply, 71 are bee pollinated (from <http://www.olympiabeekeepers.org/news-and-information/bee-a-pollinator/>). Without their help, we won't have crops such as apples, carrots, onions, melons, lemons, almonds, or cabbage. Meats and dairy depend on these insects too, because farm animals need plants sustained by pollinators to eat. Many native plants depend on native pollinators, so natural habitats are also at stake.

In recent decades, honeybee and other pollinators have been dying at a frightening rate, putting our food sources in jeopardy. We need healthy hives to conserve and restore bee populations. Pollinator health has become a national priority; as a hobby or career, beekeeping is gaining societal recognition and value.

2. Beekeeping Education and Certification

Beekeeping is inherently educational. To be successful, beekeepers must read widely, keep careful records, follow protocols, network with fellow beekeepers, and learn from methodical trial and error. To support this process, SPP-Evergreen will support new beekeeping programs by developing and identifying high quality guides to beekeeping and associated topics, helping to develop and support partnerships with beekeeping organizations, and—when and where appropriate—supporting scientific research trials within programs.

In partnership with Olympia Beekeepers, Cedar Creek Corrections Center has successfully piloted beekeeping certification in-prison, and others are following suit. Following about 10 hours of classroom time, qualified volunteers from the local beekeepers associations have provided Washington State Beekeepers Association apprenticeship-level certification to classes of inmates and staff. The formal education is an asset to the in-prison beekeeping program, and

also helps to build participants' resumes. Volunteer beekeepers benefit as well—they give community service hours to advance their own certification.

3. Contributions to the Nearby Community

Prison beekeeping programs also may produce products to give back to visitors and community organizations. Several programs already produce lip balms, lotions, candles, and other products made from wax and honey. Our longer-term goal is to expand existing, and create new programs to provide the following:

- Hive boxes made from reclaimed wood (pallet wood is discouraged)
- Local queen bees bred by prisons with support of partners
- Established healthy hives for donation to schools and other non-profits

Prison programs also may conduct observations and research that informs regional knowledge of best practices; this contribution is sorely needed.



WSP beekeepers learn from Mona Chambers a professional beekeeper who helped teach the certification course at the prison. Photo by Ricky Osborne

Program Expectations and Challenges

COSTS

Prisons are expected to finance beekeeping equipment from their Operations Budgets, and startup costs are ~\$2000. (If this cost is prohibitive, contact SPP Program Manager Kelli Bush to determine if SPP-Evergreen funding may be available: bushk@evergreen.edu.)

Beekeeping certification is currently \$5/student, and that cost should be paid by the students from their own funds. SPP will consider written scholarship requests submitted by students unable to pay.

SAFETY

There is no way to entirely eliminate the chances of bee stings in association with the program, but there are ways to greatly minimize the risk. Recommended honeybee varieties are very docile, and unlikely to sting a person unless agitated by unusual circumstances. Each facility should have an established safety protocol for response to insect stings (yellow jacket and hornet stings are most common) and can rely on that protocol for any honeybee stings. Detailed safety protocols particular to keeping honeybees have been developed by beekeeping and corrections partners, and will be provided by SPP.

BEEKEEPING IS TRICKY

The honeybee crisis is not easy to solve: there is no simple or single *right* way to keep bees. Expect to lose hives to disease, pests, and mysterious causes. To reduce losses, encourage comprehensive education, partnerships with beekeeping experts, monitoring, and record keeping in all program participants to maximize successes and learning opportunities. SPP will maintain a Washington State protocol for beekeeping in a prison environment. We'll ask you to review and add your best practices to the protocol, allowing us to learn from each other across the state.

It can be challenging to accommodate hands-on experience for all who want it. Honeybees require careful and particular handling, and an experienced beekeeper must be present for any interaction with a hive. In the winter, hives largely remain closed; any check or treatment must outweigh potential damage to the hive's core temperature. The time to work with the bees is also the time that community beekeepers are busiest with their own hives.

We will seek out creative solutions to increase program access for inmates and staff and encourage opportunities such as lectures, workshops, and reviewing books, articles and films as a way to engage participants in beekeeping education.

Support available

SPP-Evergreen supports beekeeping programs statewide, and is your outside-prison point of contact. We will provide protocols, educational resources, and help establish partnerships with organizations and individuals who can contribute. We also will help track and report on your efforts, so that we can broadcast and celebrate your successes widely. Some examples of media and outreach attention on beekeeping:

<http://seattle.suntimes.com/sea-news/7/79/192577/bees-behind-bars-give-prisoners-a-second-chance>

<http://sustainabilityinprisons.org/beekeeping-programs/>

<http://sustainabilityinprisons.org/blog/2014/11/13/first-beekeeping-certification-in-prison-for-spp-wa/>

Next steps

Let us know if you're ready to consider starting or expanding a beekeeping program, and what questions you have. Bee in touch (sorry!):

Joslyn Trivett, SPP Education & Outreach Manager trivetti@evergreen.edu

Emily Passarelli, SPP Green Track Coordinator passaree@evergreen.edu



The new honeybee program at AHCC has excellent support from a community volunteer; he has generously donated materials, bees, and expertise. Photo by DOC staff.

2. Beekeeping Introduction for DOC staff liaison

Expectations of Beekeeping Liaisons

First off, thank you so much for supporting the program. We really appreciate everything you do. Beekeeping is a Sustainability in Prisons Project (SPP) program, and you can call on Evergreen’s SPP staff to assist you when you need it—don’t hesitate to ask. This protocol will give you a rundown of what a beekeeping liaison does and a general introduction to beekeeping in prisons.

We ask beekeeping liaisons to serve as the **point of contact for all aspects of a beekeeping program**: direct work with the bees, beekeeping education, and contributions to the community (described in greater detail in [Section 1](#)). This work includes:

Cultivating partnerships. All [three components](#) of a fully-developed beekeeping program rely on partnerships. The program requires input from local beekeeping experts, the statewide beekeeping association, SPP-Evergreen staff, and—like all SPP programs—staff and inmates across the facility. Embrace working across differences, and find the common ground that will make the program succeed.

Reporting. SPP-Evergreen staff prepare a quarterly report that includes beekeeping program activities and achievements. Please respond within the requested timeline to requests for reporting updates. SPP-Evergreen staff will develop a form to track beekeeping contacts (inside and outside prison), number of hives, names and DOC numbers of inmates participating and certified, names of staff participating and certified, and program highlights such as honey harvested, products made/distributed, and any special events.

Academic quality of educational materials and presentations. Monitoring quality of educational components, and addressing concerns. See [Section 2](#) for more details, and ask SPP-Evergreen staff for support!

Program safety and security. Promoting the facility’s safety plan for the program including: screening out sting-allergic program participants; following practices that limit chances of stings from honeybees and hornets; and provide adequate first aid treatment when stings occur. See [Section 3](#) for more information.

Equipment security. Creating and implementing an plan for beekeeping equipment control and requesting clearances for any donated equipment. See [Section 4](#).

Beekeeping and pollinator-friendly practices. Beekeeping is tricky, and a successful program requires a “student” mindset. We ask that you commit to ongoing learning from experts and resources, and from experiences within the program. See [Section 5](#) for a very basic overview of beekeeping and pollinator-friendly practices, and be excited to learn much, much more!

Honey-Beekeeping Education and Certification

Identify Local Beekeeping Experts

Education and certification *require* input from experienced, knowledgeable beekeepers. Programs without expert support are unlikely to succeed. Instructors for the Apprentice program (see Certification, below) must be member of a beekeeping association recognized by the Washington State Beekeepers Association (WASBA; <https://wasba.org/>). For accessibility and region-specific knowledge, nearby experts are best, of course.

Ask SPP-Evergreen staff to make the initial contact with the local beekeeping association. We can also help find local private beekeepers who can provide valuable information and may want to supplement your program. Several prisons have private beekeepers on staff—ask around! Keep in mind that during the spring and summer beekeepers are especially busy and will be less responsive and available.

Certification

Becoming a certified beekeeper in Washington State requires beekeepers to take a ~20 hour course in the classroom. For incarcerated students, WASBA has offered to reduce course costs from \$20 to **\$5/person**. This \$5 covers: the class materials (workbook), beekeeping iron-on patch, and certificate. Typically, students have paid their fee themselves from their own funds. However, students who are willing to demonstrate financial need in a written statement will be considered for scholarships through SPP-Evergreen.

After completing the class, the beekeeper will earn the title of “Apprentice.” There are two more levels of beekeepers in Washington. So far, no inmate has gone beyond Apprentice, but SPP and WASBA will pursue how to make it possible. In general, most beekeepers are either Apprentices or Journeyman—there are only 5 Master Beekeepers in the state of Washington!

1. Apprentice
 - a. 15-20 hour class (10 lessons) required.
 - b. No hands-on experience required.
 - c. More info at <https://wasba.org/master-beekeepers-program/apprentice/>
2. Journeyman
 - a. Must have achieved Apprentice level.
 - b. Paid membership in Washington State Beekeepers Association (WASBA).
 - c. Minimum of 3 years’ experience.
 - d. Must pass a field test at the applicant’s apiary.
 - e. Obtain 30 public service points; WASBA says public service within a prison community can satisfy (need to determine particulars).
 - f. More info at <https://wasba.org/master-beekeepers-program/journeyman/>
3. Master Beekeeper (remember, only 5 in WA right now!)
 - a. Must have achieved both Apprentice and Journeyman level.
 - b. 6 years of experience.
 - c. Public Service

- d. A body of research papers and presentations
- e. More info at <https://wasba.org/master-beekeepers-program/master-beekeeper/>

Ordering Student Workbooks. Every student must have their own workbook. A PDF workbook is included in the \$5 fee. Typically, the workbooks can be printed off or ordered through Emily.

Arrange purchasing approval for student workbooks with your facility business office. Once you have received approval, send an email to Emily indicating how many workbooks you need. Once your order has been processed, you will receive an invoice. Payment must be made by check to: *Washington State Beekeeping Association*

Scholarships

If a student is unable to pay the \$5 fee but is interested in taking the class, the student may write an essay explaining their interests in beekeeping. Students can give the essays to the beekeeping liaison at each facility or mail to SPP. SPP will reserve funds to help pay class fees.

Space & scheduling. Liaisons are in charge of finding a room that will work well as a class room and developing a class schedule that works well for them, volunteer instructors, and the students. If interested in looking at past schedules, please email Emily.

Liaison with students. Liaisons are the point of contact for incarcerated students. We often need your help to get new educational materials to those students, and to share with us their input and ideas for program development.

Pollinator-friendly Education and Certification

There is no formal curriculum for pollinator-friendly education, but an abundance of guides exist; see the [next section](#) for three recommendations. The Pollinator Partnership (great website; see <http://www.pollinator.org/>) offers “Farms an online, self-certification program for which many existing prison campuses are contenders. In December, 2016, they list these criteria for certification (consult <http://www.pollinator.org/bff/> for possible changes):

1. Offer forage providing good nutrition for bees on 3-6% of land.
2. Plant continuous bloom of a variety of flowering plants throughout the growing season, especially in early spring and late autumn in temperate regions.
3. Offer clean water for bees.
4. Provide a variety of habitat for nesting and mating, through features such as hedgerows, natural brush, or bufferstrips.
5. Practice Integrated Pest Management (IPM); reduce or eliminate the use of chemicals.
6. Pay the annual \$35 certification fee.

If you are interested in pursuing certification at your facility, please be in touch—SPP-Evergreen would love to support and celebrate your efforts.

Printed References: books and journals

SPP recommends the following titles:

Title	Contents	Author	Approx. Cost	Example Source
The Backyard Beekeeper	Written for small-scale beekeepers, covers all the basics, plus how to make products from beeswax.	Kim Flottum	\$19	Link
The Beekeeper’s Handbook	A very readable guide for both hobby and professional beekeepers; many illustrations and diagrams; step by step instructions for set up, harvesting honey, and managing pests and diseases.	Diana Sammataro & Alphonse Avitabile	\$17	Link
Pollinator Friendly Gardening: Gardening for Bees, Butterflies, and Other Pollinators	A gardener’s guide for creating habitat for favorite pollinators; includes plant selection, hardscape design, habitat structures, and growing practices.	Rhonda Fleming Hayes	\$16	Link
Attracting Native Pollinators: The Xerces Society Guide, Protecting North America's Bees and Butterflies	This guide is focused on native pollinators: native bees, butterflies, flies, and others that keep plant and animal communities healthy; great photos and illustrations.	The Xerxes Society	\$20	Link
Bringing Nature Home: How You Can Sustain Wildlife with Native Plants, Updated & Expanded	Offers practical ways for any gardeners to create crucial wildlife habitat and support biodiversity; full of beautiful photos.	Douglas W. Tallamy	\$15	Link
Honey Bee Biology and Beekeeping	Standard textbook used to teach college and beekeeping students about bees and beekeeping; likely the most complete guide—WSP’s program says this is the best book!	Dewey M Caron	\$80	Link
Approx. Cost for All			\$167 + Tax	

Suggested Scholarly Articles

Frisch, K. V. (1973, December 12). *Decoding the Language of the Bee*. *Readings in Zoosemiotics*, 141-156. doi:10.1515/9783110253436.141

Frisch explores a bees' intricate waggle dance in this article. He explains how the bees move in specific angles to communicate with other bees where the location of a new potential hive could be or a food source. The dance not only accurately communicates the location of the food or hive, but also the amount of energy required to get there. This article is an excellent source for anyone interested in learning more about this intricate form of communication. Though it is an older article, this article is written by the scientist who discovered the waggle dance and this article is written in an easy-to-read narrative.

Genersch, E. (2010, January 9). *Honey bee pathology: Current threats to honey bees and beekeeping*. *Applied Microbiology and Biotechnology*, 87(1), 87-97. doi:10.1007/s00253-010-2573-8

This article outlines the main pathogens and parasites that are causing significant declines in bee populations. The article takes the reader through the symptoms the hives experience, how the hive becomes vulnerable to the pathogen or parasite, and some remedies and solutions. Genersch also briefly discusses the social and economic impacts beekeeping has recently had. This article comes from a peer-reviewed scholarly journal.

Hasegawa, Y., & Ikeno, H. (2011, May 16). *How Do Honeybees Attract Nestmates Using Waggle Dances in Dark and Noisy Hives?* *PLoS ONE*, 6(5), 1-7. doi:10.1371/journal.pone.0019619

Hasegawa and Ikeno discuss bee's waggle dance as it pertains to attracting nest mates. This article explores the importance of sound rather than vibrations or odors. This article would be useful to anyone interested in learning more about the waggle dance. This article was also published by PLoS ONE, a peer-reviewed open access journal. The author is affiliated with the Honda Research Institute in Japan.

Lecocq A, Kryger P, Vejsnæs F, Bruun Jensen A (2015) *Weight Watching and the Effect of Landscape on Honeybee Colony Productivity: Investigating the Value of Colony Weight Monitoring for the Beekeeping Industry*. *PLoS ONE* 10(7): e0132473.

doi:10.1371/journal.pone.0132473

This article explores the importance of hive weight. The authors found that weighing the hives allowed them to see and describe patterns of productivity. Patterns of hive weight gave the authors clues on what environmental factors have significant influence on bee productivity. For instance, they found that bees kept in urban areas were heavier (therefore, healthier) than bees kept in agricultural and mixed habitats. PLoS ONE, the journal this article was published in, is a peer-reviewed open access journal. All but one of the authors are professors at the University of Copenhagen and Aarhus University. The last author is a member of the Danish Beekeepers Association. This article could be very useful to those looking for another method of monitoring their bees' health.

Phillips, C. (2014, August 14). *Following beekeeping: More-than-human practice in agrifood*. *Journal of Rural Studies*, 36, 149-159. doi:10.1016/j.jrurstud.2014.06.013

Phillips looks at beekeeping through a combination of more-than-human studies and social practice theory, rather than as contemporary agrifood production. The paper discusses beekeeping production as well as sustainable and just beekeeping options. This article would be a good resource for those interested in interdisciplinary studies of bees, particularly from a social science side. The article was published in *Journal of Rural Studies* and the author is from the Centre for Critical and Cultural Studies in Australia.

Reybroeck, W., Daeseleire, E., Brabander, H. F., & Herman, L. (2012). *Antimicrobials in beekeeping*. *Veterinary Microbiology*, 158(1-2), 1-11. doi:10.1016/j.vetmic.2012.01.012

This article discusses the effects of using antimicrobials in beekeeping. Bees are subject to pathogens, parasites, and other threats. Some antimicrobials can be successfully used to protect the bees against some threats, however, the authors found that using antimicrobials can result in high concentrations of residues in the honey. While the concentrations of antimicrobials decrease as time goes on, residue can still be detected in honey. In many countries, this means the honey is inconsumable. This article is from the journal *Veterinary Microbiology*, which is a scholarly journal. Three of the authors work with the Institute for Agricultural and Fisheries Research in Belgium, while the fourth works for Ghent University. This article is useful to anyone interested in understanding the effects of antimicrobials on bees.

Zacepins, A., Brusbardis, V., Meitalovs, J., & Stalidzans, E. (2014, December 14). *Challenges in the development of Precision Beekeeping*. *Biosystems Engineering*, 130, 60-71. doi:10.1016/j.biosystemseng.2014.12.001

This article explores Precision Beekeeping, a beekeeping management strategy which involves monitoring individual bee colonies to minimize resource use, by decreasing stress and unnecessary activities, and maximize bee productivity. The article walks through what to look for, what data to collect, and how to interpret that data. This article would be useful to anyone who is interesting in learning about different management strategies. The article was published in the journal *Biosystems Engineering*. All of the authors work for the Department of Computer Systems in Latvia.

Recommended monthly journals:

American Bee Journal

This has been providing beekeeping articles to beekeepers and scientists since the mid 1800's. "Readership is concentrated among hobby and commercial beekeepers, bee supply dealers, queen breeders, package-bee shippers, honey packers, and entomologists." ([American Bee Journal](#), 2016). 1 year subscription costs \$28.00.

Bee Culture

"Bee Culture magazine offers articles, advice and information for every level beekeeper, from

not-yet-started to the commercial operator. We cover every aspect of how to keep bees, make your own equipment, new products on the market, a national honey report and honey market survey every month. Our regular contributors - scientists, researchers, beekeeping authors, beekeepers, extension specialists – are all known across the U. S. and internationally for their expertise and contributions to the industry.” ([Bee Culture](#), 2016). 1 Year subscription costs \$25.00.

Who buys these things?

As funding allows, SPP will supply copies of these books to beekeeping programs—for easy access by program staff and incarcerated participants—and to the host prison’s general library. Please contact SPP staff at Evergreen to make a request. SPP-Evergreen staff can also print and deliver beekeeping articles; please let us know which ones you want!

Free references and resources, are available at the links below:

<http://www.xerces.org/pollinators-pacific-northwest-region/pollinator.org>

Please let SPP know what books work and which don’t. We want to recommend and provide the most useful resources, and any feedback is helpful.

Hives

Identify the number of hives desired.

You absolutely want to **start out with more than one hive**. When starting beekeeping, hives fatalities can be rather common. If you only buy one, then you will not have anything else to compare the hive to. It may be more difficult to identify problems with the hive. In addition, if one hive is struggling and another is thriving, you can potentially exchange resources (like honey or brood) from the stronger colony to the weaker one. Therefore, start with a **minimum of two**. However, the number of hives desired depends on how much time and resources are available.

Time Commitment

How much time you dedicate to beekeeping is entirely up to you. One extreme is that you can install your package in the spring and basically do nothing more with your bees, to the other extreme of inspecting your hives every week. **A good management practice is to inspect your hives every two weeks**. This should only take about 10 minutes per hive.

But, here's what happens for most folks just getting started in beekeeping: They love it so much, they are always in the hive. Looking at it, pulling frames out, searching for the queen and showing friends and relatives. It does disrupt their activities, so it is best to **limit your inspections** to twice a month. While not ideal, disruption in the hive caused by more frequent

checks may be worth the experience you gain by observing up the hive. With the more hives you have, the more you can inspect different hives and enjoy learning.

Beekeeping Liaisons Contact Information

Please see the attached contact list of designated Beekeeping Liaison at each facility. Notify Emily and Joslyn (also on the list) to correct any errors and when a Liaison position is re-assigned. Please feel free to communicate with each other; other liaisons may know of simple solutions to problems you are having!

Name	Institution	Email	DOC Position	Phone
Leonard Mayfield	AHCC	llmayfield@doc1.wa.gov	Lieutenant	(509) 244-6740
Mike Rainville	AHCC	marainville@DOC1.WA.GOV	Correctional Unit Supervisor	(509) 244-6894
Faye Nicholas	CBCC	fanicholas@DOC1.WA.GOV	Custody Officer 2	(360) 963-2000
James Leinan	CBCC	jrleinan@DOC1.WA.GOV	Custody Officer 2	(360) 963-2000
Amanda Granados	CCCC	amgranados@DOC1.WA.GOV	Classification Counselor 2	(360) 359-4149
Dorothy Trainer	CRCC	djtrainer@doc1.wa.gov	Environmental Specialist 5	509-544-3520
Caitlin Ribera	LCC	crribera@DOC1.WA.GOV	Secretary Supervisor	360-260-6300 x214
J.C. Miller	LCC	jcmiller@DOC1.WA.GOV	CPM	360-260-6300 x203
Lonn Turner	MCC-WSR	lsturner@doc1.wa.gov	CI Manager	(360) 794-2435
Michele Wood	MCC-TRU	miwood@doc1.wa.gov	Associate Superintendent	360-794-2605
William Anderson	MCCCW	wlanderson@DOC1.WA.GOV	Correctional Unit Supervisor	(360) 277-2478
Ed Baldwin	SCCC	edbaldwin@doc1.wa.gov	Ground/Nursery Specialist	(360) 537-2431
Dean Mason	WCC	damason@DOC1.WA.GOV	Associate Superintendent	(360) 432-5938
Paula Andrew	WCCW	prandrew@doc1.wa.gov	Training Assistant	(253) 858-4215
Ronald R. Benjamin	WSP	rrbenjamin@doc1.wa.gov	Custody Officer 3	(509) 526-3610x2010
Jonathon P. Fischer	WSP	jpfischer@doc1.wa.gov	CC3	(509) 526-6370

Other Beekeeping Contacts

Name	Institution	Email	DOC Position	Phone
Julie Vanneste	SPP WDOC	jvanneste@doc1.wa.gov	SPP Sustainable Operations Manager	(360) 725-8396
Joslyn Rose Trivett	SPP Evergreen	trivettj@evergreen.edu	SPP Education & Outreach Manager	(360) 867-6735
Emily Passarelli	SPP Evergreen	passaree@evergreen.edu	SPP Green Track Coordinator	(360) 867-6765

We appreciate all your efforts implementing the Beekeeping programs. Please be in touch at any time that we can support and recognize your efforts.

3. Beekeeping Safety

Bee Safety Overview

There is no way to entirely eliminate chances of bee stings in the program, but there are ways to greatly minimize the risk. Key considerations:

- The recommended honeybee species is very docile and unlikely to sting a person unless stepped on with bare feet or trapped inside clothing.
- All beekeepers should wear full-length protective bee suits; see [What to Wear](#).
- **Your facility will rely on the same safety protocol for honeybee stings as it does for yellow jacket stings;** keep in mind that yellow jacket/hornet stings are generally more likely, and more painful. Sting protocol is on the next page!
- Give staff and inmates at your facility ample time to get used to the idea that bees are coming, and that safety is part of the plan. If you have bees coming in May, put up posters (see [Outreach](#), page 21) or fliers the fall or winter beforehand. Send out informative emails to all staff, and include the safety plan. Buy your hive boxes a few months early, and put them in place—that will give folks the chance to get used to their presence first, before they are full of bees.



Honeybees on a protective glove cause the beekeeper no concern. Photo by Lucas Foglia.

Treating Bee Stings & Allergic Reactions

If the person stung shows **severe allergy symptoms** that includes **swelling in the mouth, neck, and especially their wind pipe (anaphylaxis)** and/or any of the following:

- Difficulty breathing or wheezing
- Tightness in the throat or a feeling that the airways are closing
- Hoarseness or trouble speaking
- Nausea, abdominal pain, or vomiting
- Fast heartbeat or pulse
- Skin that severely itches, tingles, swells, or turns red
- Anxiety or dizziness
- Loss of consciousness

immediately request emergency response from facility health care staff. Epinephrine injectors are standard equipment in health care emergency bags. Epinephrine treats immediate, life-threatening symptoms.

DOC plans to update policy to allow for non-health care staff to use epinephrine injectors, but at this time, only medical staff are permitted.

If the person **does not** have severe allergy symptoms:

1. Remove the Stinger

- a. Scrape the area with the edge of a credit card or straight edge object to remove it.
- b. Don't pinch the stinger or use tweezers -- that can inject more venom.

2. Control Swelling

- a. Ice the area.
- b. If you were stung on your arm or leg, elevate it.
- c. Remove any tight-fitting jewelry from the area of the sting. As it swells, rings or bracelets might be difficult to remove.

3. Treat Symptoms

- a. For pain, take an over-the-counter painkiller like acetaminophen or ibuprofen.

- b. A mixture of baking soda and water or calamine lotion on the sting site can be soothing. Anti-histamines (like Benadryl and Zyrtec) help to calm allergic reactions, but are not carried by health care staff. Programs may purchase single dose packets of chewable antihistamines, but must *not* be given *instead of* Epinephrine.

4. Follow-Up

- a. It might take 2-5 days for the area to heal. Keep it clean to prevent infection.

What Other Facilities have done: stings and allergies

We asked facilities to describe what steps they're taking to ensure the safety of those around. Here's what they had to say:

Stafford Creek Corrections Center

"Not much issue with safety." "A couple of inmates [working in the program] have been stung during my year employed here and it was of no consequence although I always follow up to make sure they had no reaction to the sting. The stings happened when the inmates were not completely suited up in their bee protection gear or they were not wearing gloves."

Washington State Penitentiary

"We have been keeping bees now for two years at WSP/MSU ...We have not come across bee stings at this point; however it is on our radar. We have a medical hospital on our prison grounds. Our offsite crews run into bee stings often during the summer and it has not appeared to be an issue as of yet. We may have the offenders sign some sort of release of liability should they volunteer and chosen for the beekeeping program."

Their beekeeping program has a locked cart dedicated to the program, and their suits and allergy treatment are in the cart.

Cedar Creek Corrections Center

"We require everyone involved in directly dealing with the bees to have suits on. Also, we know of people in the institution that have allergies, so we usually notify them in advance. If we see people anywhere near the bee area we warn them as well. We [working in the program] have all been stung. One of my techs developed an allergy and is no longer allowed to be anywhere near the bees."

"My first experience when I opened up a bee box I found out it is very important to have all the zipper points of your bee suit zipped up and covered with the flap that is provided. I found out that day I was not allergic to them."

"Another one is when the weather is warm and the bees are very active wear your suit they are very protective of their hive. Some times when the weather is cooler you can seek a peek into your hives without the bees flying and stinging you."

"I have gotten stung many times. There are some spots on the body that are more sensitive the others such as lips, eyes, nose, under the arms that some swelling may occur."

Airway Heights Corrections Center

From an email sent to all-staff:

“Knowledge and education is the most important part of any safety plan. When it comes to bees, understanding that there is a difference between wasps/yellow jackets and honeybees is very important. Most people believe all bees are the same, however, honeybees are not usually aggressive. Honeybees rarely sting and are docile, social insects that are generally so preoccupied with their work that they hardly notice a human’s presence. Airway Heights will be prepared for the presence of honeybees by having a safety plan in place which will address the following concerns:

- The bee hives will be located behind the J-Building gardens. This area will provide access to a water source while being in close proximity to both the Main and MSU gardens. It will also be out of the way of normal foot traffic.
- We will be working with our Medical Department to ensure our on-site medical personnel are aware that we have live bee hives on site.
- For staff working within the secure perimeter, situations regarding allergic reactions to bee stings, would continue to be able to store emergency auto-injectors (Epi Pen) in Master Control for immediate dispatch and delivery to the affected employee.
- In the future, any staff or incarcerated individuals working with bees will be required to wear the proper protective clothing after weeks of education and safety classes including:
 - Full body bee suit with veil and bee gloves. Incarcerated individuals who ultimately are allowed to participate in the beekeeping program will be pre-screened for bee allergies and Roots of Success requirements prior to participation.”

What to Wear

One relatively easy way to keep bees from becoming defensive is to consider what you’re wearing. **The best-dressed beekeeper wears light-colored smooth fabrics.** Strong colors, especially red and black, can cause bees to become agitated. The hooks on bees’ feet can become caught in fluffy fabrics, such as sweaters, flannel and athletic socks.

Your charges are quite resourceful and can use gaps of less than 3 millimeters to find their way into your clothing. To keep them from crawling up your pant legs, **tuck your trousers into your boots or socks.** Be sure that any gaps are closed. You can even use tape or elastic bands on your pants and sleeves.

Because scents and pheromones are so important to life in a bee colony, they also are an easy way to cause a defensive response. When you're on the way to visit your bees, **avoid fragrances** (hair products, perfumes, aftershave or deodorant) and other odors or fumes. Avoid consuming bananas before opening a hive; the honeybee's alarm-pheromone smells similar to bananas and they can potentially respond like it's an alarm when smelling banana on a beekeeper's breath!



How to Move

Calm, sure movements are best. Stay relaxed. Don't work too fast or with quick jerky movements. Bees are sensitive to vibrations, so bumping or banging on the hive can set off their defensive response.

Tuck or tie back long hair, both to keep it out of the way and to keep it from moving wildly in the wind.

When handling bees, it's important to remember that each hive is moody, behaving differently on different days. Don't assume that the way a hive behaved in the past is the way it will behave today.

Timing is Everything

When opening a hive, choose a day that is bright, sunny and warm. Rainy or hot, muggy days can make bees more defensive. Thunderclouds or storms are to be avoided, as environmental factors during these times may make bees more irritable. Also, more bees are likely to be in the hive during a storm, which means more hanging around with the express purpose of defending the hive.

Working the hive on a colder day can be dangerous for the bees. The way bees stay warm is to bunch together in a complex cluster. Honeybees begin to cluster if the temperature drops below about 57 degrees. If you work the hive after the cluster has formed, you may cause the bees to become disorganized, and they may not get their cluster rebuilt before the temperature drops, causing the hive to be more susceptible to the cold. **If you must manipulate them during colder weather, do so in the morning to give them plenty of time to get their cluster organized again before temperatures plummet.**

The optimum time for hive management is during nectar flow, when most of the bees are gone from the hive collecting nectar. This occurs when the most flowers are in bloom and producing nectar and pollen for the bees to use. The timing varies based on your climate. Check with your local beekeepers association or extension agent to find out when nectar flow happens in your area.

Outreach

For new programs, and based on a success story from AHCC, we recommend an all-staff email to describe your beekeeping plans. Identify expected benefits to staff, inmates, and the community (see Section 1, starting page 3), and plans that will maximize safety and security—feel free to use/adapt text from this section in your message.

Another option for preparing for the bees' arrival: SPP can provide posters that focus on or includes beekeeping safety. If interested, please contact Emily passaree@evergreen.edu and Joslyn Trivett trivettj@evergreen.edu. A sample of a poster used at Clallam Bay:



The Sustainability in Prisons Project

We bring restoration & education into prisons.
A partnership founded by The Evergreen State College
& Washington State Department of Corrections

Keeping honeybees at Clallam Bay Corrections Center

Aren't bees dangerous??

Honeybees rarely sting. They eat only flower parts, and sting only when attacked. Stinging is a honeybee's last resort, because stinging ruptures her body—she dies soon after. Yellow jackets and other kinds of hornets, however, are aggressive meat eaters. They can sting many times, and it hurts much worse than a bee sting.

 <i>Bumblebee</i>	 <i>Hornet</i>
 <i>Yellowjacket</i>	 <i>Honey Bee</i>

If you got stung it was probably a yellowjacket that did it (bottom left.) Photo from organizedchaosonline.com.



Cedar Creek Corrections Center beekeeping team stands among hives; the prison has kept bees for years, and in early 2016 graduated its 2nd class of offenders and staff certified as Apprentice Beekeepers. Photo by SPP program coordinator Fiona Edwards.

Start learning about honeybees & you might not want to stop...

- Honeybees are very social: they put group needs far above individual needs
- Likely, you never have seen a male honeybee; all honeybee workers are female!
- Bees collect both pollen and nectar from flowers; protein-rich pollen is fed to larvae (baby bees), and nectar is fed to adults (after they turn it into honey)
- Mix royal jelly into a larva's food, and she will become a queen; when 2 or more queens are born at once, they will fight to the death
- Honey is safe to eat without processing, and never goes bad; it is antibacterial and tastes like the flowers it came from.

An incarcerated beekeeper works with a visiting agent; they use smoke to calm the bees as they examine frames from one hive—the bees build honeycomb on the frames to store food and raise babies. Beekeeping programs rely on visits from expert beekeepers who can provide education and give you the best chances of success. Photo by Benj Drummond.

Why we need more honeybees

About half of a produce department is pollinated by honeybees and other pollinators. Without their help, we don't have apples, carrots, onions, melons, lemons, almonds, or broccoli. If you aren't much of a plant eater, know that even beef and dairy depend on these insects, because cattle need plants to eat.

In recent decades, honeybees have been dying at a frightening rate, putting our food sources in jeopardy. We need more healthy hives to conserve and restore bee populations. Beekeeping is becoming ever-more important hobby, and a valuable career choice.



Bees almost never sting when they are swarming (swarming means looking for a new hive). In fact, they are so pre-occupied with their work that they won't even notice a human kiss. Photo by Washington State Penitentiary staff.

→ Learn more at sustainabilityinprisons.org & [facebook.com/sustainableprisons](https://www.facebook.com/sustainableprisons) & <http://www.doc.wa.gov/sustainability/default.asp>

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We also recommend printing and posting signs of severe allergy symptoms and notice to call emergency response (see [Treating Bee Stings](#), above, starting page 17).

4. Beekeeping Equipment and Equipment Security

Obtaining Equipment

Beekeeping requires very specialized equipment. The hives themselves must be made from clean, chemical-free wood, and to very precise measurements; a dedicated prison woodshop could manufacture on site to save costs.

Various pest controls must be included—it is too easy to lose hives to yellow jackets, rats, and mites, so make pest control and monitoring a regular part of the program.

Honey extraction requires additional equipment, but facilities tend to assume that honey will be part of the program. Other supplies are needed to create products from honeybee wax.

Larger suppliers of beekeeping equipment include:

- Mann Lake
- Brushy Mountain
- Betterbee
- Kelley Beekeeping
- Tractor Supply Company
- Western Bee Supply
- Dadant
- Glory Bee
- Walter T. Kelly
- Bee Thinking Hives
- Mother Lode Products

Known Washington State-based suppliers are

- Ballard Bee Co.
- Coastal Farm & Ranch
- Belleville Honey
- Sunny Bee honey Co.
- Northwest bee Supply
- Stedman's Bee Supply
- Tarboo Valley Bees
- Trees 'n Bees

The equipment list below is provided as an example; it shows start up plans and cost for LCC, where they purchased equipment for six hives.

Example equipment purchase, 6 hives (bees not included)

June, 2016

Item	Number needed	Cost each	Example Cost	Example Vendor	Notes
Basics					
Hive kit (Langstroth medium)	6	127	\$762.00	Link	With exact plans, skills & precision, possible to build
Hive tool (HD-570)	4	6.95	\$27.80	Link	Pry bar to get hive open
Bee brush (HD-660)	2	5.1	\$10.20	Link	
Sugar (25-lb bag)	12	12.99	\$155.88	Link	Bee feeding during lean times
Hive entrance feeder (FD-100)	6	3.95	\$23.70	Link	
Safety					
X-Large Bee Suit (CV-315)	1	79.95	\$79.95	Link	Range of sizes to furnish program long-term
Large Bee Suit (CV-310)	2	79.95	\$159.90	Link	
Medium Bee Suit (CV-305)	1	79.95	\$79.95	Link	
X-large gloves (CL-148)	1	22.95	\$22.95	Link	
Large gloves (CL-147)	2	22.95	\$45.90	Link	
Medium gloves (CL-146)	1	22.95	\$22.95	Link	
Smoker (HD-560)	1	32.95	\$32.95	Link	Smoke makes bees docile
Yellow jacket trap	4	9.82	\$39.28	Link	Predators of bees & humans
Yellow jacket attractant refills	5	5.59	\$27.95	Link	
Pest control					
Mouse guard (HD-591)	6	4.95	\$29.70	Link	One for each hive, winter months
Hop Guard 12 pack (DC-301)	1	48.95	\$48.95	Link	Mite control
Honey-related					

Extractor (HH-162)	1	429.95	\$429.95	Link	Extracts honey from frames
Queen Excluder (HD-122)	6	14.95	\$89.70	Link	Keeps queen out of honey frames
Mason Jar (12-pack) (CN-123)	5	8.45	\$42.25	Link	To put honey in!
Example Total			\$2131.91		



Cover and Inner Cover

Supers

Hive Body

Bottom Board and Reducer

Figure by Anthony Pickard.

Beekeeping Equipment Security and Storage

Most beekeeping tools are generally treated like any other tool in a prison setting. They are inventoried and tracked, and typically left in a locked cabinet or shed. In Washington, **the hive tool—a specialized pry bar—is considered a Class A tool.**

What Other Facilities Have Done – Equipment Security

Washington Corrections Center for Women – Has a small shed to hold tools and bee suits. No formal checking out system, but shed is locked when not in use. The only tool which was inventoried and tracked is a 6” pry bar, but still stored with the rest of the tools.



Beekeeping program cart at WSP. Photo by Ricky Osborne.

Washington State Penitentiary - WSP has a wheeled, locked cage that holds the beekeeping suits. Each suit is assigned to a student for better tracking. All equipment is held in the shed near the hives. At Washington State Penitentiary every tool is inventoried and numbered. Tools live in a locked cabinet which is located in the beekeeping liaison's office. Equipment is hung on the wall and outlined for tracking. None of the tools used at WSP are considered a Class A (dangerous) tool.

Larch Corrections Center – Larch will have a caged area near the bees to hold all non-restrictive equipment (e.g. buckets). This will be locked when not in use. Items that could be restrictive, like beekeeping suits, and any equipment that can be used as a weapon, will be kept in the beekeeping liaison's office until a better solution is found. This is not ideal as it takes over some of the liaison's working space.

5. Hives, Buying Bees, Feeding, & Pollinator-Friendly Practices

Hive Specifics

Types

There are several different types of hives. However, if you're not an expert beekeeper, it is highly recommended that you start with the **industry standard, 10-frame Langstroth medium hives**. Medium hives are a max of 65 lbs, while deep hives are 3 inches deeper and weigh between 80-100 lbs. It is generally easier to have all hives the same size, but mixing and matching is possible. There are many alternatives to Langstroth hives, but most beekeepers have advised against trying them; if you would like to experiment, please contact us to discuss research design.

Number

You absolutely want to start out with two or more hives. When starting beekeeping, hives fatalities are common: **expect 1 out 3 hives to die**. Losing an entire program at once would be very discouraging for all involved, so start with more so this is unlikely!

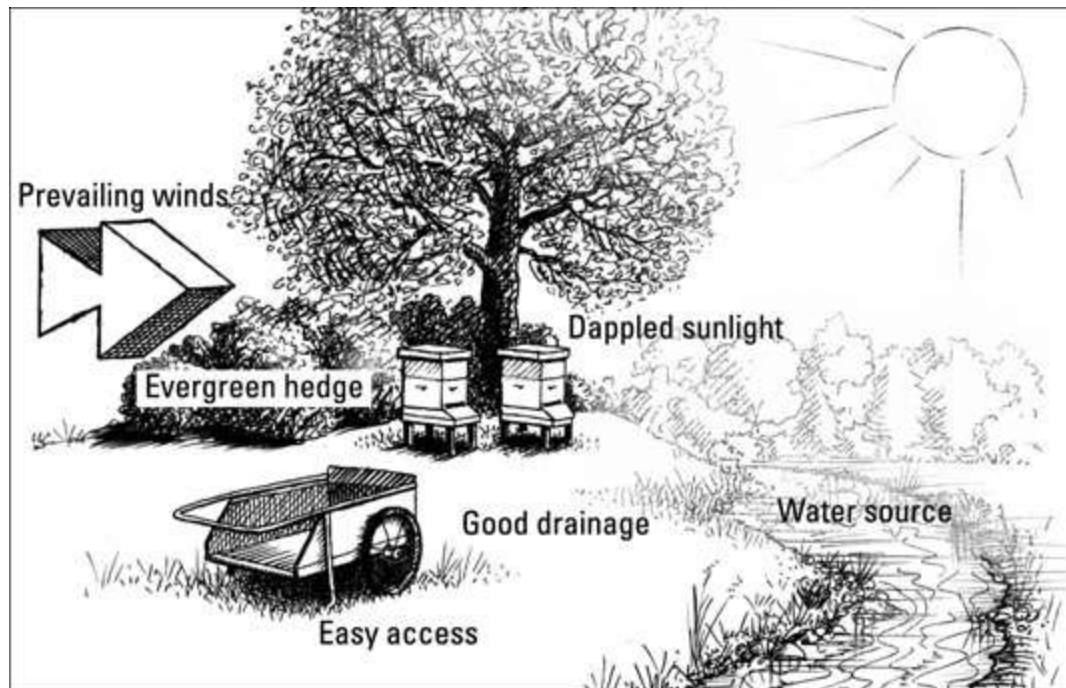
Multiple hives allows you to compare hives to each other, and thus learn more quickly. More hives also gives eager beekeepers more chances for hands-on time with the bees (see *Time*, below). **We recommend 3 or more hives to start**. However, the number of hives will depend on resources available.

Time considerations

How much time you dedicate to beekeeping is entirely up to you. One extreme is that you can install your package in the spring and basically do nothing more with your bees, to the other extreme of inspecting your hives every week. **A good management practice is to inspect your hives every two weeks during the spring and summer**. This should only take about 10 minutes per hive. (See [Timing is Everything](#), page 20, for more information)

Here's what happens for most folks just getting started in beekeeping. They love it so much, they are always in the hive. Looking at it, pulling frames out, searching for the queen and showing friends and relatives. All this looking disrupts the bees' activities, so it is best to limit your inspections to twice a month. **The more hives you have, the more you can inspect different hives on different days and get more out of your program.**

Location



Information from: <http://www.dummies.com/how-to/content/pick-the-perfect-location-for-your-beehive.html>

The ideal hive location has easy access (so you can tend to your hives), good drainage (so the bees don't get wet), a nearby water source for the bees, dappled sunlight, minimal wind, and access to bee-friendly plants. Keep in mind that fulfilling all these criteria may not always be possible. No worries — the bees are forgiving. Do the best you can by following these basic guidelines:

1. Face your hive to the **southeast**. That way your bees get a sunrise wake-up call and start foraging early.
2. Position your hive so that it's **easily accessible** come honey harvest time. You don't want to be hauling hundreds of pounds of honey up a hill or down a fire escape on a hot August day.
3. Provide a **windbreak** at the rear of the hive.
 - a. You can plant trees to block the wind or you can erect a fence made from posts and burlap or even use bales of hay to block harsh winter winds that can stress the colony.
4. Put the hive in **dappled sunlight**. Full, direct sun all day long causes the hives to get very hot in the summer. The bees will spend time trying to regulate the hive's temperature,

when they could be making honey. You also want to avoid deep, dark shade because it can make the hive damp and the colony listless.

5. Make sure the hive has good **ventilation**. Avoid placing it in a gully where the air is still and damp. Also, avoid putting it at the peak of a hill, should you live in a region where the bees will be subjected to winter's fury.
6. Place the hive **absolutely level** from side to side, with the front of the hive just slightly lower than the rear (a difference of an inch or less is fine), so that any rainwater drains out of the hive (and not into it).
7. Locate your hive on **firm, dry land**.
8. In a country setting, you can place mulch around the hive to prevent grass and weeds from blocking its entrances.

Space between multiple hives

6 - 8 inches is a minimum. And if you have a bit more space, give them a foot or two. Don't place them too far apart or else you'll be making too much to work them. If you have more than 4 or more hives, make a "U" shape bee yard, like a horseshoe shape apiary yard. This helps the bees identify their hive quickly, by position, and provides a little wind break for landings and takeoffs.

Buying Bees: Nucs, Packages, Swarms, Established Colonies

WASBA recommends the Carniolan Honey Bee (*Apis Mellifera Carnica*) for Washington State; it is a dark, gentle bee, well suited to the cooler climates of the Pacific Northwest. When ordering your bees, you can choose between a nucleus (nuc) hive, a package, an established hive, or a swarm. **Ask your local beekeeping expert for what they recommend, and the best supplier for purchasing.** General guidelines are given below, and some suppliers can be found here: <http://www.pugetsoundbees.org/queen-bees-and-nucs/>.

Nucs, or nucleus hives, are a more expensive and relatively easy way to start a new hive. They are created from one, well-established hive, and **the bees inside have already accepted the queen and begun producing honey and brood.** Nucs usually only consist of 5 frames of brood and bees and a queen (this is smaller than a full hive of bees), but contain all of the components needed for a new and successful hive.

- Generally comes with 3 pounds of bees, plus 5 frames of brood.
- Queen usually starts laying eggs immediately.
- Usually about a month ahead in growth and honey production compared to a package
- Price slightly more expensive than packages

- May be available in spring *and* summer

A **package** is a collection of bees put together from different established hives. This is the more common, and less expensive way to start a new hive. Starting a hive from a package requires more patience, giving the colony time to accept the queen and then for her to start laying eggs. A package will dwindle in strength for approximately 24-28 days before new bees begin to hatch.

- It can be as long as 5 days after installing package bees before the queen begins laying eggs to produce new bees, especially if you are installing the bees in brand new equipment with no drawn comb.
- The brood then takes 21 days to mature and hatch as new bees. Hive growth simply cannot occur until new bees are hatching.
- Packages only available in spring—even if you could get one later, not a good idea to start a hive from a package later in the growing season, because bees will not have enough time to produce and prepare for fall and winter.

Established colony: The easiest method of starting your own hive is to purchase one that has already been established and fostered by another, more experienced beekeeper. This will ensure your colony will survive and thrive, as they have already been producing workers and honey by the time you get them.

Another option is to **capture your own bees** in the wild. Though bees are often at their gentlest when swarming, **this method can be dangerous and difficult if the bees are out of arm's reach. Only attempt this with the presence of experienced beekeepers.**

You also have the option of setting **swarm traps or bait hives**. Great information about this can be found here: <http://www.bushfarms.com/beesferal.htm#baithives>

Feeding Bees

The best way to feed your bees is to **grow pollinator-friendly plants** within their foraging range. Recommended planting guides can be found in the list of [books and journals](#) (page 10). Many of recommended plants benefit native pollinators as well. Guides are also available online from <http://pollinator.org/guides.htm>, <http://www.xerces.org/pollinator-conservation/plant-lists/> and <http://www.permaculture.org/pollinator-friendly-permaculture/> .

When installing bees from a package, you will need to feed them a sugar-water mixture until they are creating food and thriving on their own. After the hive is established, it's likely you will only need to spend a few hours per year handling and keeping the bees. Typically, you'll only

need to feed them in early spring up until the first few weeks of May (depending on how the bees are doing). **If your bees are thriving and making their own food, don't feed them.**

RECIPES

Sugar syrup can be made in three different formulas, each has its own special purpose and is used at a specific time of the year. We recommend using white granulated cane sugar. **Avoid brown sugar, beet sugar, powder sugar, or honey.** Remember the bee keeper code: never feed the bees while honey supers are in place.

Spring: March-April-May

1:2 This formula is a very light syrup. It is made using one part of sugar to two parts of water. For example, 1 pound sugar to 2 pounds of water. It is used in late winter and early spring to stimulate the queen to lay eggs and helps the bees draw more comb.

Summer; June-July-August

1:1 this formula is a medium weight syrup. It is made using one part of sugar to one part of water. For example, 1 pound of sugar to 1 pound of water. It is used as an artificial nectar to feed brood larvae in spring and summer or to get the bees to draw more comb.

Fall Sept-Oct-Nov

2:1 this formula is a very heavy syrup. It is made using two parts of sugar to one part of water. For example, 2 pound of sugar to 1 pound of water. This is used in fall or early winter as honey substitute to feed your bees. The bees should add weight and will use these stores throughout winter.

Making the syrup: All three syrups are simple to make. Add proper weight of sugar to warm water and stir until dissolved. Never cook your sugar. Just get all the sugar dissolved with none on the bottom. Let cool and then feed.

For more information:

<http://www.apishive.com/honey-bee-health-2/how-when-and-why-to-feed-your-honey-bees>

Pollinator-Friendly Practices

About 15 percent of pollinator-dependent human crops is provided by native bees. Of course, native pollinators are also vital to the health of many native plants, and healthy native communities are dependent on these insects' health. Many North American native pollinators

are at risk of extinction; see “Red Lists” for bees, butterflies and moths at <http://www.xerces.org/endangered-species/>.

The best way to support native pollinators is to create pollinator-friendly landscapes. Many herbs and flowers appropriate for prison plantings can provide food and shelter to both honeybees and native pollinators (more details available [above](#)). Easy-to-make habitat nest boxes can further improve the environment for native insects. Also consider whether the campus has sites where “natural” conditions can be provided: undisturbed soil, grass, and shrub areas, and rotting logs and stumps. An overview article is available online: [How to protect native bees?](http://www.xerces.org/wp-content/uploads/2009/01/how_to_protect_native_bees.pdf) (http://www.xerces.org/wp-content/uploads/2009/01/how_to_protect_native_bees.pdf)

Glossary of Terms

Anther – The part of a flower’s stamen that holds pollen.

Apiary – An area that contains a collection of honey bee hives.

Bee Brush – A brush designed to sweep the bees out of the way that will not injure them.

Brood – Bee eggs and larvae.

Carniolan Honey Bee (*Apis Mellifera Carnica*) – A dark, gentle bee well suited to the cooler climates of the Pacific Northwest. Overwinters in smaller clusters than Italian Honey Bees.

Cell – An individual compartment in the bees’ comb.

Diapause – A delay in insect growth while it waits out unfavorable conditions; similar to hibernation.

Drone – Male honeybees; typically, a few hundred drones live surrounding the queen, and they have no stingers.

Foundation – A sheet embossed with a honey comb pattern for the bees to build their comb in. The foundation is installed into a frame and placed in the hive body. Older style foundation is made of beeswax; newer style made of plastic coated in beeswax.

Frame – Rectangular structure of wood framing the foundation sheets; the series of frames provide the main structure inside the hive.

Grafting – This is the process of taking an egg or a larvae from the brood nest and placing it into an artificial queen cup.

Ground nesting – Bees that dig nests in the ground.

Hive Body – This is the bees’ home, basically just a box that holds the frames that the bees build in.

Host plant – A plant preferred as a source of food by caterpillars; the adult female must lay her eggs on or near a host plant for her species.

Invasive species – A (usually non-native) species that can crowd out or compete with native species.

Italian Honey Bee (*Apis Mellifera Ligustica*) – the most commonly kept breed of honeybee in the U.S.

Kenyan Bar Hive – An older style of hive rarely used anymore in the U. S. These hives are one piece, no foundation is used; the bees build directly on the bars.

Langstroth Hive – The most commonly used in commercial operations in the U.S. These type of hives are stacked on each other and have 8 to 10 removable frames per section.

Nectar – Sugar rich fluid produced by flowers that is a food source for pollinating animals.

Non-native – A species of animal or plant that does not occur naturally in an area; brought to the area by humans intentionally or accidentally.

Nuc – A small 4 or 5 frame hive body usually used for transporting small colonies of bees. A regular hive have 8 to 10 bodies.

Pheromone – A scent excreted by the bees that they use to communicate. The bees' nasonov gland excretes an orientation pheromone. Another type of pheromone is excreted by the poison sack when the bee stings signaling the other bees to sting.

Pistil – The female part of the flower, usually made up of a swollen base (ovary, later becoming the fruit), a stalk (style), and a pollen-receptive tip (stigma).

Pupation – The act of changing from a larva (e.g. caterpillar) to an adult.

Queen – The egg-laying female in a social bee colony.

Queen Cell – This is a finished queen cup after it has a larva, royal jelly, and has been sealed by the bees for the pupa stage. It looks like a Peanut.

Queen Cup – This is a larger than normal cell (still open) made for producing a queen. The bees make these on their own when they want a new queen, or an artificial one may be introduced.

Queen Excluder – A device with openings too narrow for the queen to pass, placed to prevent her from laying brood in certain parts of the hive.

Royal Jelly – Food produced by the nurse bees to feed the queen and the brood.

Smoker – This is a piece of equipment used to burn grass, pine needles, pine cones, or burlap. It is used to apply smoke to the hive just before opening it. The smoke sedates the bees.

Social – Insects that live in colonies and work together to build and defend nests and feed and raise offspring; honeybees are social insects.

Solitary – Insects that build and defend nests without working with other insects; the great majority of native bees are solitary.

Stamen – The male part of a flower, usually made up of a filament with an anther at the tip.

Stigma – The tip of the female part of the flower that is receptive to pollen.

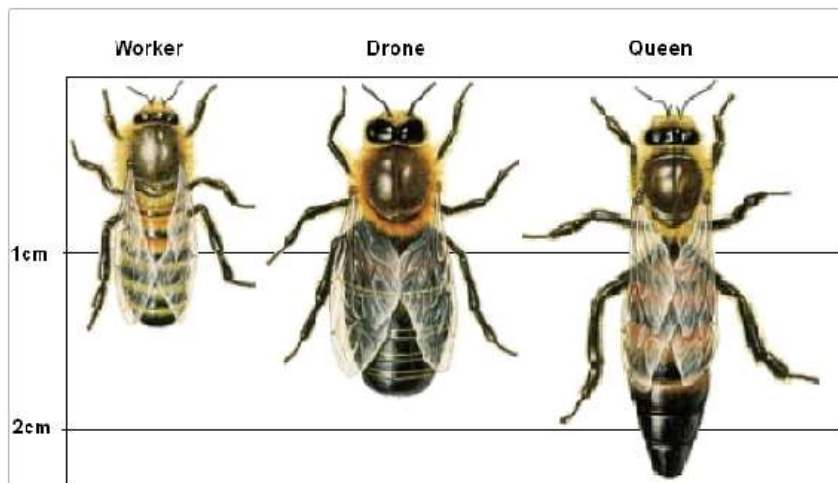
Super – A box with frames in which the bees store honey, placed above the frames containing brood; a "queen excluder" prevents brood within the super.

Swarm – This is when the bees decide they need to leave the hive because the colony is overcrowded. They make a second queen and when she emerges the older queen takes off with half of the colony to find a new home. The bees are extremely gentle when they are in swarm mode.

Taxonomy – The theory, practice, and process of classifying organisms in established categories.

Wood nesting – Insects that make nests in or on woody stems, logs, and stumps.

Workers – Worker honeybees are non-reproductive female bees; they make up the vast majority of bees in a normal and healthy colony, and have a stinger.



Honeybee Comparison. Digital image. *Barnsley Beekeepers Association*. N.p., n.d. Web. 23 Aug. 2014. <http://barnsleybeekeepers.org.uk/bee_sexes.html>.

Contributors

The efforts, knowledge, and vision of many people are represented in this guide. Special thanks to the folks listed here.

Editors

Emily Passarelli

SPP Green Track Program Coordinator
The Evergreen State College

Joslyn Rose Trivett

SPP Education & Outreach Manager
The Evergreen State College

Contributors

Ronald Benjamin

Custody Officer 3
Washington Corrections Penitentiary

Jim Lynch

SPP Senior Advisor for Conservation
Biologist, Joint Base Lewis-McChord Fish & Wildlife

Kelli Bush

SPP Program Manager
The Evergreen State College

Louis Matej

Master Beekeeper

Mona Chambers

Professional Beekeeper

Jim Miller

Master Beekeeper
Miller Homesteads

Gary Clueit

President
Washington State Beekeepers Association

Anthony Pickard

Offender Workforce Development Specialist
Washington Department of Corrections

Renzy Davenport

Beekeeper
Olympia Beekeepers Association

Laurie Pyne

President
Olympia Beekeepers Association

Glenn Epling

Officer
Cedar Creek Corrections Center

Gabriel Quitslund

Sales Manager
Bee Thinking

Jonathan Fischer

Classification Counselor 3
Washington State Penitentiary

Gina Sibley

Classification Counselor 3
Washington Corrections Center

Rebekah Golden
Education Coordinator
Bee Thinking

Steve Sinclair
SPP Co-Director & Assistant Secretary, Prisons Division
Washington State Department of Corrections

Carrie LeRoy, Ph.D
SPP Co-Director & Member of the Faculty
The Evergreen State College

Edward Tharp
Horticulture Instructor
Washington Corrections Center for Women

Carrie Little
Farm Manager
Mother Earth Farm

Kelly Thompson
Washington State Beekeepers Association

Paul Longwell
Journeyman Beekeeper
Olympia Beekeepers Association

Julie Vanneste
Sustainable Operations Manager
Washington State Department of Corrections



Technician Anglemeyer demonstrates beekeeping techniques for King5 News at CCCC. Photo by Kelli Bush.