

BC Bee Breeders

This is the continuation of a series which highlights members of the BC Bee Breeder Association.

Heather Higo

I run a small bee breeding operation in the Fraser Valley in conjunction with the UBC Beeomics project bees that I am also managing. I started with bees as a Biology undergrad in 1987 when I was hired by Margriet Dogterom for 6 weeks to be a field assistant (feeding bees, recording experimental data, etc) in the Winston lab, and enjoyed it so much that I am still with them. I learned my beekeeping skills from many mentors, and began queen rearing as the SFU bee research technician in the 1990s.

From a science perspective, honey bees are a great model system to work with due to their manageability and interesting social structure. What I have enjoyed most about the bees over the years are the continual opportunities to ask new questions and learn each time I go in the field, in addition to their providing me with a strong connection to our natural environment throughout the seasons. Nothing compares to the positive feelings you get as you enter a bee yard in early spring and the bees are returning with pollen from their first spring foraging trips. It's what makes all the hard work so worthwhile!

I focus on queen production and hope to incorporate queen overwintering in the future, following the methods in a study by Margriet Wyborn (now Dogterom), Phil Laflamme, and Mark Winston that I assisted with at SFU in 1988-1990. They achieved an average of 60% queen survival with no deleterious effects on queen productivity the following year with 24 or 48 queens stored in cages in large queenless banks for 6 months, a system which would allow us to keep surplus local well-mated late summer queens and have them ready for nucs or packages in March or April when they are most in demand. (Wyborn, MH, Winston, ML, & Laflamme, PH, 1993: Mass storage of honey bee queens during the winter. *Can. Entomol* 125:113-128).

I select for several traits in my bees, including gentleness, hygienic behaviour, overwintering ability, honey production, and spring build-up. To test for hygienic behaviour I use the liquid nitrogen freeze patch test along with UBC proteomic marker selection. I am also incorporating the marker-selected hygienic behaviour queens that were mated in isolation on Bowen Island for the UBC Marker Selection Project.



A once-only bear visit to one of our Beeomics project yards (that hasn't had bears in the 20+ years I've had bees there). Likely a young bear, it knocked one colony over, chewed the bottom bars off a couple of frames and left claw marks in the one I am holding up, but the colony survived, is still in the project, and the bear hasn't been back since!

I generally sell just newly mated queens, unless I am successful in the future with overwintering queens in banks. My queens are open mated, but I make sure there are ample



Tagging queens.



drones from selected lines in the area by keeping drone parent colonies in 3 bee yards within a 3 km radius.

My mating nucs are mostly 2-3 frame nucs in 3-way deep boxes with the middle entrance facing the rear (see photo with robbing screens in place).

I plan to also try using shallow 4-way boxes in the future as they require fewer bees for each queen and could also be used for overwintering individual queens after the nucs have built up throughout the summer – Liz Huxter has used the 4-way mating nuc and overwintering system successfully for many years.

I make my own wax cups and most of my grafting is done in the bee yard. I have used many starter/finisher methods, but currently favour single queenless starter boxes created from large 2 box colonies from which I have removed the queen and frames of open brood, leaving most of the nurse bees behind. I find this method to be fail-proof and easy to maintain with the regular addition of young newly emerged workers from support colonies.

My queens are either used in my own operation or sold mostly in the Fraser Valley but I do occasionally ship small numbers to the Interior of BC; I produce about 200 queens per year. My standard 4-frame nuc would consist of 2 frames



of brood and 2 frames of honey and pollen, all fully covered in bees.

Optimistically, the first round of queens is ready by the end of May. If banking over winter becomes a successful option, then in the future queens from the previous summer will be ready in April.

Marty Van Herk Bear Creek Honey

I began beekeeping as a hobby during my teenage years in the Netherlands. My extended family were commercial fruit growers and kept their own hives for pollination. Even as a young child, I was fascinated with bees and beekeeping. Once I immigrated to Canada, I continued beekeeping and eventually managed a commercial operation for 3 years. In 2003, I had the opportunity to purchase the business.



For many years we pollinated blueberries and cranberries and did our own queen rearing. Heavy use of chemicals by the berry growers and the damaging effects these chemicals had on our bees were contributing factors in our decision to redirect our focus from pollination to nuc production and sales. Our goal is to consistently breed high quality queens from our own hardy stock.

We have incorporated Minnesota hygienic and Palmer stock for their overwintering qualities, mite resistance, hygienic behaviour and honey production. We breed for better wintering ability with minimum brooding & store consumption, hygienic behaviour, fast spring buildup, honey production, gentle behaviour, multiple queens per hive and with preferably dark colouring. We document each hives' characteristics throughout the year, and utilize isolated mating yards that are stocked with our best drone mother hives for raising our next generation breeding queens.

We use a capped brood pin method to test for hygienic



behaviour. This is done by puncturing cappings of worker brood with a fine pin to kill the larva beneath. After 24 hours, the number of cells uncapped and cleaned out are counted and recorded. This gets repeated under different environmental conditions and colonies which have cleaned at least 90% of the cells within 24 hours are considered



hygienic. This form of hygienic behavior has been shown to be a significant factor in resistance to varroa, as well as American foulbrood, and especially chalkbrood.

In the spring we select the top 10 highest ranking colonies based on breeding selection for that year's queen breeding stock. The bees from our 10 outyards are rotated on a yearly basis to keep our gene pool diversified. All the queens we sell are produced and raised ourselves in that calendar year. In our mating setup, we use 5 frame nucs and



mini mating nucs.

In our operation we combine Brother Adam's method of starter and finisher in one hive. This method allows us to raise the highest quality queen cells by assembling a very strong queenless starter/finisher hive with an abundance of nurse bees. This method has proven to be extremely reliable.

Our goal is to produce and sell 700 to 1000 nucs annually - our main focus is nuc production. Surplus

queens will be sold as they come available. Our usual sales market is BC and the Prairie provinces. We sell standard 5 frame nucs with at least 3 frames of brood and 2 frames of combined honey/pollen/brood, and they are available from mid to end of May, depending on spring weather.



Steve Clifford Clifford Honey Farm

I kept bees in Saskatchewan for 40 years. I managed 1800 for 12 years and then reduced it to 4-500 after the border with the US closed to package imports. In 2016, I moved 160 colonies to the Sunshine Coast just to ruin my retirement, which is working well. In May of 2017 I sold the balance of his operation in SK at auction, and the bees tested 0 varroa. I moved 60 colonies to the Coast in Oct '17, once again they tested at 0 varroa. Inspectors in SK tested with the jar method both times, spring and fall 2017; 0 mites both times. I've used 1 Apivar strip spring and fall for several years with great results. I tested with double jar this fall and had 0 mites; I used 1 Apivar strip anyway. Chicken, I guess.



Feeding bees.

I was selling 4-5000 cells in SK each season, but have handed that over to young lad who worked for me for 11 years and he's doing well with it. I hope to find a few commercial guys in BC who are tired of paying \$40-60 for offshore queens. As far as genetics go, I guess they're mine, I haven't bought queens in quite a while. The only queens I've bought lately have been with down under packages. I gave that up - way too expensive and poor results. I try to pick out really good queens from my operation and make more of those.

I focus on the hives that winter well, the ones that come out of winter heavy and strong, with lots of everything - stores, bees brood, pollen; ones that you look at early in the spring, smile, and keep going. I select bees that are quiet, with no aggression. I always mark the exceptional honey producers and watch for them in the spring.

Six years ago, I was working on a breeder/cell builder when I noticed a varroa mite on a bee. As I watched, another

bee walked up, bit the mite off her hive mate and walked away! I got out my magic marker and wrote MITE BITER on the hive. I grafted from that one lots that spring. I'm convinced that this behaviour has lots to do with finding 0 mite counts.

I sell overwintered queens, but not until May when I can requeen colonies with my own cells. I can make splits/nucs with purchased queens earlier.

I use six frame nuc boxes and find that they are very versatile. The 6 framers just seem to thrive no matter what. You can split them; raise queens in them. I cut plastic queen excluders down and super them for honey, and had them 5-6-7 high last summer with lots of honey.

I learned a very simple, straightforward cell builder setup during my queen rearing years in Texas. It employs a two story queenright hive and a double screen. The day I graft into the hive I have an inside feeder of syrup, 2 pollen combs and heaps of bees, including lots of young ones, in the bottom chamber. A double screen with the entrance to the rear goes on next. On top of the screen go 9 frames of brood, queen and adequate bee cover. The old bees leave the top chamber and drift back to the front entrance. The bees in the bottom box, suddenly hopelessly queen- and broodless, will jump on grafted cells and feed them readily. A frame of grafted cells goes in-between 2 combs of pollen, next to the feeder. The box is otherwise empty; crowding is good.

Heat goes up through the screen and helps the top chamber through the night. The next morning, the hive is reversed: 2 combs of young brood are placed next to a frame



of cells, and the screen is replaced with a queen excluder. I now have queen and brood in the bottom box, excluder, 2 combs of pollen, a frame of cells and 2 brood combs in the top box. They have to be strong, and if so, they will finish the cells well. You can't get greedy: I put 1 frame with 40 cells and count on getting 30; usually I get more than 30 and seldom less. If hives have adequate strength, cells will be well fed and become large; nobody likes to pay for small, runty cells. This has worked everywhere I've done it. If a honey flow causes problems with comb building, I add frames of foundation to mitigate this, or honey super if I have to.

I will build nucs to suit - 2, 3, 4 frames of brood, whatever the customer wants. My stock is available in May.

Wendi Gilson Black Horse Apiary

As a farmer at heart I've always been in love with honey bees and other pollinators. Beekeeping is the poetry of agriculture, and some farmers call bees "God's little angels".

In 1997 I took a correspondence course given by Mark Winston through UBC. All the material (of which there was a great deal) and all our correspondence was through Canada Post, there was no online component at that time. My favourite book became Mark Winston's *Biology of the*



Getting ready to graft.

Honey Bee. I kept it with me – reading it while I waited for the ferry, to pick up kids, before sleep, whenever there was any little moment. I also carried on with several correspondence courses in botany through UBC, because beekeepers need to be botanists too.

Black Horse Apiary (est. 2012) is a small scale sustainable apiary based on Salt Spring Island. I've been keeping bees since I took Winston's course in 1997 and will always be grateful to the beekeepers, bee inspectors, scientists and the bees themselves, who have helped me along my way.

I also am currently working to help prevent the spread

of disease and offer education outreach as Apiary Inspector for Vancouver Island (VI) and the Gulf Islands. We also facilitate an Apprentice Beekeepers program each year, with plans to expand it to VI through the collaborative bee breeding/education project, Ethical Bees.

At Black Horse Apiary we breed bees from our own foundation stock which has been developed over the years. Our selection criteria are focused on overwintering ability, disease resistance, propolis and honey production, and temperament. We cull colonies that are not thriving. From time to time we bring in queens with desired genetics from selected breeders on VI and the mainland.



We use hygienic testing (frozen brood removal/liquid nitrogen), frequent varroa monitoring (sugar shake or alcohol wash) as well as detailed data collection to define particular traits.

We record apiary location and establishment, hive orientation (sun or shade), whether they are treated and details of the treatment, amount of honey, hygienic score and temperament, among other things.

In our operation, breeder queens and drone mother colonies are in separate yards. Our collaborative work with neighbouring beekeepers is essential for hybrid vigour or line breeding as required. On Salt Spring Island we are a fairly close knit group of neighbouring beekeepers. The awareness and education level is quite high among the established beekeepers, and we are pretty good at working together and with the general public.



Mating nucs.



We like using cloake division boards for cell starter/finishers and 2 or 4 way mating nucs in the mating yard. We sell between 40 - 50 5-frame nucs, overflowing with bees, brood, and food each year.

We also sell about 50 hand delivered queens per year to VI and the Gulf Islands. We don't have any plans to expand at this time although that may change. Our idea is that bigger is not always better. ☼

