

"It is only in the past twenty years that American bee-keepers have known of the existence of any other than our native, or dark-colored, bees. Classical scholars familiar with Aristotle and Virgil have doubtless read of the different varieties described by them, but would scarcely imagine that the beautiful golden bees of Virgil's song have perpetuated their race in such purity that their descendants are to-day bred as a distinct variety in our apiaries."

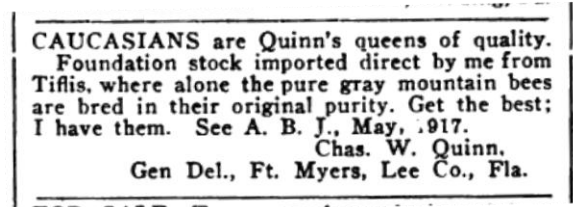
-- L.C. Root, "Chapter II: Italian Bees", *Quinby's New Bee-Keeping: The Mysteries of Bee-Keeping Explained* (1911)

In the common lexicon, honey bees are sorted into "races", just like humans. For some reason, we use "breeds" for the same type of divisions in dogs and cats but not honey bees. "Races" and "breeds" are called "subspecies" by scientists, a term that somehow isn't nearly as exciting. Regardless of the word choice, these describe the same level of biological division. In scientific nomenclature, we express the genus (*Apis* for honey bees), followed by the species (*mellifera* for Western honey bees), then the subspecies/race (*carnica*, *ligustica*, etc.)

Beginner bee books all discuss different races of honey bees, their traits and which ones would be best for you and me. Unfortunately, hardly any books except the most recent, most informative ones contain information that is truly useful. For example, Caucasian bees are always included in the classic bee-race list, but they are no longer commercially available for sale anywhere in the United States. There are other little tidbits that often go unmentioned as well. However there are certain things that new beekeepers, in fact any beekeeper who is in the market for queens or bees, should know about honey bee races.

The history of honey bee races in the US

Honey bees first came to what is now the US in 1622, having been imported to Jamestown, Virginia by English colonists. Those bees were *Apis mellifera mellifera*, the native bee of England and much of Western Europe,



An ad in the October, 1917 *American Bee Journal* offered pure Caucasian queens, *Apis mellifera caucasica*.

known as the Black Bee or the German Bee. Contemporary reports say that these were somewhat nasty creatures, quick to sting, swarmy and not particularly resistant to disease. Inclination toward swarming was desirable in those days because beekeepers made increase by catching natural swarms rather than by making splits as we do today.

The Black Bee loved America and thrived. It spread across the continent in step with the spread of European settlers. In fact the honey bee was called "the white man's fly" by Native Americans; they learned that when honey bees would begin to show up, settlers weren't far behind.

Italiani che amiamo!

Shift to Europe and the Napoleonic Wars. Swiss Captain Baldenstein, stationed in Italy, became enthralled with the Italian honey bees (*Apis mellifera ligustica*). After the wars ended, he returned to Switzerland and in the 1840s sent men to Italy to acquire colonies for him. He wrote glowing reports about their characteristics in the European beekeeping journals. Johann Dzierzon read about them and imported some for himself. He also wrote in the journals about how wonderful the Italian bees were. His reports caught the attention of Samuel Wagner (first editor of *The American Bee Journal*), L.L. Langstroth and others, who began attempts to import them into the US. The earliest efforts either mostly or completely failed, but eventually a transport protocol was discovered by Charles Dadant and others that proved sufficiently successful.

The arrival of Italian bees roughly coincided with the introduction of Langstroth's movable frame hive. Soon all "enlightened" beekeepers

were keeping Italians in Langstroth-inspired equipment. In fact L.C. Root devoted an entire chapter to Italians, and only Italians, in the edition of Quinby's New Bee-Keeping that my introductory quote came from.

Italians were much gentler and more productive than the Black Bees, plus they were golden yellow. This last point should not be understated: the fact that the New Bee was a different color let beekeepers know for a fact that their bees were Italians and not Blacks or hybrids, and that they were getting their money's worth.

Having perfected the art of importation, lots of honey bee races were brought to the US in the late 1800s. These included the so-called Punic bee from Tunisia (*Apis mellifera intermissa*), the Cypriot bee (*Apis mellifera cypria*) and the Syrian bee (*Apis mellifera syriaca*), the latter being the one that Samson encountered in Judges 14. These three turned out to have nasty dispositions and/or didn't thrive here. However the Carniolan bee from what is now Slovenia (*Apis mellifera carnica*) and Caucasian bee from Georgia/Armenia/southeast Russia/northwest Turkey (*Apis mellifera caucasica*) proved to be extremely gentle, well suited for our environment and highly productive.

No bees allowed!

In 1904, "Isle of Wight disease" began wiping out apiaries in Europe. The cause was attributed to tracheal mites and the affliction was renamed "acarine disease". In 1922, rightfully fearing what would happen if tracheal mites were to cross the Atlantic, the US passed the Honey Bee Act and banned importation of live honey bees from nearly all foreign countries. (The ban worked well, keeping tracheal mites out for the next 62 years.) This effectively put a bubble around the US, restricting us to the four honey bee races that were already well established here: the traditional Black Bee, which thrived in feral populations; Italians; Carniolans and Caucasians. Varroa mites have wiped out the feral Black Bee and Caucasians have passed out

of fashion and into obscurity, leaving us mostly with Italians and Carniolans. But since honey bee queens mate with one to two dozen drones and we don't have many isolated enclaves to ensure racial purity, our bees, like ourselves, are by this time undoubtedly Italian-American and Carniolan-American, homegrown blends rather than something that can be rigorously matched up with their European namesakes. In addition, genetic research at NCSU shows that in the US, we have ended up with distinct "western" stock and "eastern" stock within the higher-level bee races.

In the Southeast, Italians overwhelm Carniolans in terms of number of colonies; in fact Carniolans are a rarity in our area. In many other parts of the US, particularly the Northeast and north central states, Carniolans are the preferred darlings.

Johnnie come lately

We can add Russian bees to our modern mix thanks to the US Department of Agriculture. In an effort to introduce enhanced mite resistance into our bee genetics, the USDA brought Russian bees to their Louisiana research station in 1997. After several years of tight quarantine and breeding research, qualified commercial queen breeders were provided Russian queens to continue the breeding program and make Russians available to anyone who wants to buy them.

There is argument about whether Russians are just a strain of Carniolans or are a different race entirely. I've kept both and to me they do seem to have subtly different characteristics. So for now we'll side with the "separate race" camp. But it's true that Russians are largely similar to Carniolans in their habits and appearance. For example, they are extremely thrifty, shutting down brood rearing during dearths. They overwinter with smaller clusters than Italians. They don't crank up brood production into full gear until spring actually starts, but then they build up explosively. Russians have certain traits that affect management, for example the time spent for queen introduction must be delayed much

longer than for Italians or Carniolans. They will build queen cells “just in case” or maybe “for fun”, without actually finishing them, which leaves beekeepers unsure of whether the bees truly intend to swarm or not. Their thriftiness in dearths with respect to brood-rearing may be desirable but they also refuse to construct comb in the absence of a strong nectar flow, even when fed. Also, my early-generation Russians were a bit “spicy”, much less docile than Italians, but I’ve been told that bad dispositions have largely been bred out of them since then.

One point about Russians that their breeders emphasize is that for best results with respect to achieving lower Varroa mite infestations, the entire bee yard must be comprised of Russian bees. Actually this recommendation should extend to the whole bee community surrounding Russian colonies. The reason for this is that while Russians may be able to help keep Varroa mite numbers from getting out of control as quickly as they do in non-Russian colonies, they can only do that if the infestation rates are at reasonably low levels to begin with. Think of a rowboat with a leak in the bottom: we may be able to somewhat control the water level by bailing water out with a teacup, but only if the starting water level isn’t very high and only if somebody else isn’t dumping water into the boat by the bucket-load behind our back. When a few Russian colonies are surrounded by “dirty” colonies, they cannot maintain their fight against the mites for long, because mites keep flooding in from the surrounding colonies as Varroa overtakes them.

The unmentionables

When discussing US honey bee races we must be honest and mention the red-headed stepchild, so-called African bees (*Apis mellifera scutellata*). There are many bee races in Africa but *scutellata* are the ones we got, so they get the name “African”.

They crossed the Mexican-US border in 1990 and are definitely a part of our American mix in the Southwest (southern California

across through Arizona, New Mexico and Texas to western Louisiana) and Florida (mostly in the central and southern half). In addition to being extremely mean tempered, these bees tend to swarm constantly and are poorly suited for productive management in our area. Apologists will say that they can be worked if certain important management changes are made, and that’s true. However anyone in North Carolina who has the choice between owning European colonies and African colonies would be an absolute fool to choose African colonies. I’ve handled African bees in the Caribbean and their cousins, *Apis mellifera adonsonii*, in [west Africa](#), so I have an informed opinion on this subject. These bees may be possible to work but they are no fun whatsoever. Want to bring the local kindergarten class to visit your bees? Forget it. Like to work in your hives wearing nothing but a t-shirt and shorts? Never again. Want to keep them in your suburban backyard? I can almost hear the anti-bee legislation being typed up now.

It is against the law to sell African bees in North Carolina but that doesn’t mean they can’t be acquired. Bee suppliers in Texas ship them all over the US. Please, please, please do not buy Texas bees! Their potential for undesirable qualities far outweighs any desirable traits they may have.

You may notice that I refer to these as “African bees” and not “Africanized bees”. When they first started heading toward the US after their introduction into Brazil in the late 1950s, everyone hoped that they would hybridize as they moved north, eventually ending up as a mild-mannered genetic melting pot. However what actually has happened is that while they do hybridize in the overlap with established bee populations (e.g. Italians) in the leading edge of their migration, the hybrids aren’t as “fit” as the pure Africans and they don’t persist in the population. We end up with pure-race Africans back-filling the population as the migratory wave moves forward. So once they are well established in an area, the bees are genetically African, not Africanized hybrids.

Strains and variations

In addition to the high-level races of bees we have in the US, we also have specially-bred strains. The old beekeeping books talk about Midnites, Starlines and others, which were hybrids and no longer commercially available. Today all the talk is about strains that have been developed to enhance hygiene, thereby providing above-average protection against disease and Varroa mites.

Minnesota Hygienics

Marla Spivac and Gary Reuter, both at the University of Minnesota, used selective breeding to develop a strain of Italian bees that exhibits highly hygienic behavior. Hygienic bees will remove larvae or pupae that they sense may be ill or distressed. Hygienic colonies have less American Foulbrood and chalkbrood, and fewer Varroa mites, than non-hygienic ones.

As they explained in an article in [American Bee Journal](#) (December 2008), Spivac and Reuter did not intend to develop a commercially-sold line of honey bees. Instead they wanted to demonstrate a proof-of-concept than anyone can select for hygienic bees in any bee population, because, they said, “the hygienic trait is found in all races and stocks of bees. It just needs to be enhanced through some simple selective breeding.”

They proved their point, but people haven’t followed up with their own widespread selective breeding programs. So Minnesota Hygienics remain a unique, commercially-available strain.

How can we tell if bees are exceptionally hygienic? Spivac and Reuter said, “There is a relatively easy field test for the hygienic trait. A portion of sealed worker brood within a colony is freeze killed [using liquid nitrogen], and the amount of dead brood that is uncapped and removed is recorded. If a colony removes >95% of the freeze-killed brood within 24 hours over two repetitions, it is considered hygienic. The rapid removal of freeze-killed brood is correlated with the removal of diseased and mite-parasitized brood. It is then easy to raise queens from colonies that are hygienic.”

Unfortunately, selecting queens that produce hygienic progeny is only part of the equation. Spivac and Reuter go on to explain, “Now here is the catch: A queen raised from a hygienic colony must mate with drones from other hygienic colonies for the colony to express the trait (the hygienic trait is recessive). If the queen mates with 20 drones, over half of them should carry the hygienic genes. This way over 50% of the worker bees in the colony will be genetically predisposed to detect and remove diseased and mite parasitized brood quickly and this is a high enough percentage for the colony to show resistance to diseases and mites.”

This means is that if we have Minnesota Hygienic queens and they swarm or are superseded, and the new virgins mate with any ol’ traveling salesmen in the neighborhood, the recessive trait will be lost in the next generation. So we’ll either need 1) a sophisticated breeding program with lots of hygienic drone-mother colonies in an isolated area, 2) skills and equipment to do Instrumental Insemination so we can control the genetics without any doubt, or 3) never raise our own hygienic queens, always purchasing one from a certified Minnesota Hygienic breeder when the situation warrants.

Varroa Sensitive Hygiene (VSH)

The Minnesota Hygienic trait is general against any brood malady. Jeff Harris, John Harbo and their colleagues at the USDA Research Station in Louisiana have selectively bred bees that specifically reduce the reproductive rate of varroa mites. Bees with the trait remove pupae that are infested with virile mites, leaving non-reproductive mites alone. This trait was originally called Suppressed Mite Reproduction (SMR); this term has been replaced with Varroa Sensitive Hygiene (VSH). The trait can be selectively bred in any race.

The VSH trait doesn’t depend on a single gene. It is genetically “additive”, neither recessive nor dominant. So the progeny of pure VSH virgins and run-of-the-mill drones should still have some level of VSH behavior, although

it will inevitably be diluted after descending several generations from the pure stock.

Important caveat

Minnesota Hygienics and VSH bees are not magic and they don't solve our Varroa problem. Instead they can help. If we can keep bees that reduce Varroa mite levels, then hopefully we may only need to apply treatments once a year in the fall, instead of two or three times per year. That's the realistic goal for the foreseeable future.

I encourage everyone to experiment with mite-resistant stocks, purchasing them from certified, reliable sources. But if we do that we must periodically test Varroa mite levels to monitor how well the bees are performing. If they are not living up to expectations, apply an effective, legal miticide to the colony – don't let the poor bees suffer and die a miserable death, spreading mites around your neighborhood as the colony collapses and is robbed out. After cleaning up the colony with respect to Varroa mites, replace the queen with a new one from a reliable hygienic supplier. This way we can still pursue our goals while not harming other beekeepers with "mite bombs" from failing colonies. Without this level of oversight and active management, a well-intentioned beekeeper will become a big part of the problem instead of a part of the solution.

Also know that the limitation I mentioned for Russians with respect to having all bees in the area having the same genetics also applies to any Varroa-resisting trait: if neighboring beekeepers ignore or don't effectively control Varroa mites, our high-priced, good-intentioned Varroa-fighting bees will be overwhelmed by their collapsing disease- and pest-ridden ones. See "[I Don't See Any Mites](#)" for related information.

Cordovan Italian

Cordovan is a recessive color variation in Italians. The cordovan color can exist in other races as well, but is most often specifically bred for in Italians.

Cordovan bees, especially the queen, are a

beautiful pale yellow color. The color is more or less consistent over the whole body, not in distinct stripes. This color trait can be used as a breeding marker when experimenting with other traits, but mostly it is just a very interesting quirk, a way to have bees that are unique among your bee buddies. Cordovan Italians are not inherently any different than non-Cordovan Italians.

Buckfasts

Lastly I'll briefly mention Buckfasts, since they continue to generate discussion and interest. Buckfasts are a hybridized strain of leather-colored Italians originally developed by Brother Adam at England's Buckfast Abbey. Brother Adam travelled all over Europe, the Mediterranean and Africa [in search of the best strains of bees](#) (he published a fascinating book with that title describing his journeys). He maintained a "base stock" of bees and interbred them with all sorts of races in order to create high-production hybrids. These did well in his part of England. The hybrids rarely "bred true" (producing offspring with the same characteristics as the parents); that's why his system of maintaining a base stock was so important to his success with hybrids.

Brother Adam died in 1996 at the age of 99. The Abbey no longer breeds Buckfast bees, but they are very popular in several Scandinavian countries where their breeders follow strict protocols to ensure purity.

Buckfast sperm was brought to Texas by special permit in the 1960s. From that, Texas bee producers claim to have a Buckfast strain. However, after nearly 60 years these are quite far removed from their "Buckfast" lineage, especially since they are bred in African bee territory. I cannot believe that they bear a close relationship to Brother Adam's bees... in fact I doubt that the bees at Buckfast Abbey itself still retain a very close relation to his famous bees without Brother Adam's vigilant oversight.

So in my opinion, as far as US bees are concerned, Buckfasts are an interesting historical sidenote along with Midnites and Starlines. Don't bother trying to acquire them;

they don't actually exist here. If you are looking for a bee race different than what everybody else has and with an interesting back-story, try Russians.

Recommendation for the brand-new beekeeper

If someone is starting out as a brand-new beekeeper and asks what race of bee to buy, my advice is simple. Do what Langstroth, Quinby, Root and almost everybody in North Carolina have done: buy Italians. There is a reason they have done so. Italians are quick to build up their population, they eagerly construct comb and they are gentle. They are readily and cheaply available from lots of sources early in the year.

Once the colony is well established, either in the first fall or the second season, the queen can easily be replaced with a Russian, Hygienic or VSH variety if desired. Within two months, the entire colony will be the progeny of the new queen. This strategy results in a win-win: we quickly get a large, self-sustainable colony and then transition to a colony with the genetics we desire long-term.

It's also important to note that the traits that are important to us, such as gentleness, productivity, overwintering ability, varroa tolerance, etc., can vary much more between two different colonies of the same race than they do between the races themselves. So while purported race characteristics can give us a general expectation, that expectation can prove to be completely wrong for any particular colony.

A final word on Varroa resistance

The Holy Grail of modern beekeeping is to develop a honey bee that is resistant to the debilitating damage caused by Varroa mites and the deadly viruses that go along with them. Just as we have developed tomato plants that don't succumb to common diseases, we'd like honey bees that are able to laugh off the Varroa mite

complex. Is that possible? I don't know of any breeds of dogs that have inherent resistance to fleas, ticks and the diseases they vector, or horses that are naturally immune to equine encephalitis, but there is academic evidence that some honey bees in some situations are able to coexist with some varroa mites, at least for a reasonable amount of time. Notice that there are three variables in that equation: the bees, the situation and the mites. Separating the effect of those three in reports of positive results is a difficult task. What we desire is a super-bee that wins over Varroa mites in all situations and with all mite populations. And we really want the super-bee trait to persist in the bee population, reliably passed on from mama bee to her offspring, generation after generation. As of today, this super-bee definitely *hasn't arrived*.

What we can do is look for a bee strain with verifiable evidence that it may do better (don't take Billy Bob Beekeeper's word for it), and then try it in our bee yard. Test it out; don't assume that it is better. All we can hope for is colonies that do better... and better... and better over time. While all this testing and improving is going on, control mites with legal miticides, following the label directions to the letter. Remember that the goal isn't to pollute your neighborhood with mites; it is to have better (and living) colonies -- ones that may, perhaps, require fewer annual treatments or more benign treatments.

Does that sound like a reasonable approach?

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