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MALKA QUEENS

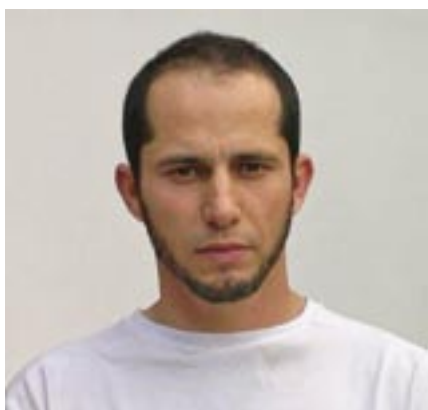
Martin Braunstein & Sonia Elena Verettoni, Argentina
www.malkaqueens.com



MALKA QUEENS is a queen rearing company located 10 miles southeast of La Plata city in the province of Buenos Aires in central Argentina. Our website www.malkaqueens.com provides thorough details about our company mission and vision.

It is a family owned business run by Martin Braunstein (38) and Sonia Verettoni (39). Five employees complete our team. We started to raise queens back in 1989. However, it was after a three-year working experience in the USA with some of the largest American queen breeders, that we were able to develop our present extensive breeding methods.

We currently operate 700 Langstroth colonies and 3,000 mating nucs. Each mating unit has an internal division which provides room for two separate compartments. Each of the two divisions has enough space for three half-depth, half-length Hoffman frames and an internal Doolittle feeder. We start grafting by September 15th and quit



Martin Braunstein



Sonia Verettoni



Italian queen

by the end of March. In an average year we have between 10 to 12 rounds of cagings with a percentage of mating success from 60% to 75%.

Argentina has been traditionally known as one of the largest producers of honey all over the world. During the last 10 years, Argentina was three times the world's largest exporter of honey. The total number of registered colonies is now 4 million and the average production is 30 kilograms per hive, although many migratory commercial beekeepers have yields per colony of up to 100 kilograms per unit. The productivity of Argentine honeybees speaks for itself about the high quality and genetic make-up of our strains of bees.

Although a major exporter of honey, Argentine queens were not part of the export trade until 1999 when we made our first shipment to France. Since then, we have opened new markets in eight foreign countries. Our participation in Apimondia 2003 (Slovenia) and in Apimondia 2005 (Ireland) was a big boost to our business. Our customers take advantage of the opposite seasons between the northern and southern hemisphere. We start shipping our queens to Middle East and North African countries during late January, and to Europe from early March until mid-April, matching the end of summer in Argentina and the end of winter in the northern hemisphere.

The export and import of queens and packages used to be a business more focused between Australia, New Zealand and Hawaii on the supply side and the European Union, Canada, Middle East and Far East on the demand side. Nevertheless, recent findings of the Small Hive Beetles (SHB – *Aethina tumida*) in Australia along with fears about the possible presence of other pests such as the Asian *Tropilaelaps* mite, have created a niche for an alternative southern hemisphere supplier like Argentina.

North America was hit by acarine dis-

ease (tracheal mites) in 1984, then in 1987 it was shocked by the discovery of varroa mites. In 1990 an undesirable species, the Africanized Honey Bees (AHB), made its way into Texas and finally *Aethina tumida* in 1998 was found in Florida and South Carolina. All of these threats were experienced in a short period of 14 years that changed American beekeeping forever. On the opposite side, Argentina (which is free of the SHB and *Tropilaelaps* mite) had a much more gradual contact with new pests and predators. This provided time for a proper adjustment of our industry to the recent globalization of pests and diseases.

During 2006 it will be the 30th anniversary of the appearance of varroa mites in Argentina, and during 2007 it will be the 50th anniversary of the introduction of Africanized bees into South America: a good time therefore to have a balanced assessment of the past, present and future of beekeeping in our country.

Tracheal mites were noticed in Argentina during the early 1950's, but according to beekeeping literature and statistical information of that time, this parasite never provoked a massive death of colonies as it did in North America and in the UK (Isle of Wight Disease). I believe that our leather-coloured Italian strains of bees displayed a higher resistance than the prevalent golden and yellow Italian strains which are popular in the USA. Brother Adam Kehrle (1898-1996) –the famous Benedictine monk of Buckfast Abbey– was aware of these differences and he clearly pointed out the higher susceptibility of the Italian Golden to acarine.

Africanized honey bees (AHB) were found in Argentina back in 1968 in the subtropical province of Misiones next to Brazil. However, during these 38 years their expansion was surprisingly limited only to the subtropical region of Argentina with a clear distinction between a rainy and dry season. All attempts, either purposeful or accidental, to bring AHB into the tem-

perate humid pampas (prairies) with four clear defined seasons and with plenty of moisture all year round, were unsuccessful. This brought the attention of renowned American researchers such as Dr Alfred Dietz (Professor Emeritus – University of Georgia – USA) who wrote several research papers (see Bibliography) about the possible expansion of AHB in the temperate regions of the USA compared to a similar environments in Argentina.

Now in year 2006, the only true AHB populations are some feral hives located in the rainforests of subtropical north-eastern and north-western Argentina. Commercial beekeeping in those regions is negligible, with only a few aboriginal communities keeping a small number of colonies with AHB traits. Migration of commercial beekeepers – to or from those areas – is very difficult because of the distance from the prairies.

We dare to say that Argentina is now the largest non-European reservoir and sanctuary of European honey bees in the southern hemisphere. Our large genetic pool of more than 4 million colonies vastly exceeds the 600,000 Australian numbers and the 280,000 New Zealand hive count. Argentine beekeepers are very proud about this fact. Back in year 2001 an initial molecular DNA determination through PCR (Polymerase Chain Reaction) was performed on Argentine bees in Spain at the University of Murcia (see full article at www.malkaqueens.com/espanol/exporta/ciencia.htm) This research showed that only one out of 26 samples was non-European while the remaining 25 proved to be European honeybees.

During year 2005, new DNA and much more extensive testing was again performed in the Province of Buenos Aires where 60% of the total number of Argentine colonies are present. The results have not been officially published yet, but the European researchers of Murcia University (Spain) were able to corroborate the over-



Drone brood



Drone hive with coloured drone frames



Ready for shipping

whelming dominance of European genetics.

During year 2004 the province of Buenos Aires made an extensive survey to determine the absence of both *Aethina tumida* (Small Hive Beetle) and the *Tropilaelaps* mite in its territory (<http://www.malkaqueens.com/espanol/exporta/rel-evamiento.htm>). This study was made according to OIE (World Animal Health Organization) guidelines. As a result, at the OIE General Assembly of May 2005 held in Paris, the province of Buenos Aires was granted SHB and *Tropilaelaps*-free status.

Importers of queens and packages produced in the Buenos Aires Province now know that the most important beekeeping province in Argentina has made a special effort to certify the totality of its territory free from these two exotic pests. We are not aware of any other federal state in another exporting country doing such an extensive survey. Meanwhile, most of the other 23 federal provinces are currently performing similar health surveys to determine their status. Eventually, all of Argentina will achieve an OIE recognition as being free of these pests. A subsidy from our Federal Investment Council (www.cfired.org.ar) was made available to all provinces to help them finance their research.

Our bee breeds

Italian Bees

Most Argentine beekeepers prefer the traditional Ligustica / Italian leather-coloured strain. This type of bee is truly adapted to mild winters and long summers with an extended period of honeyflows. Back in 1990 we developed our initial genetic pool when we imported pure queens from the main queen breeders in Italy. After 1992 we added some Italian queens bred in the USA. Thus we achieved a strain which we now call the Italo-American which combines the best features of both European and North American

breeding efforts. The worker offspring of these queens do quite well under temperate and Mediterranean climates. These queens are very prolific and build up very fast in late winter and early Spring. Our Italian strain is very gentle, displays good hygienic behaviour and, if properly fed after the honey harvest, its wintering is very acceptable.

Caucasian X Italian Bees

Carnica bees are only popular in the cold and mountain region of Patagonia in southern Argentina. However, recently the use of hybrid bees has become a worthwhile alternative. This is particularly the case when pure Caucasian queens are crossed with Italian drones, and this hybrid we have produced is known as CAUCASIT. The first trials with this cross were made back in the early 1960s. However, at that time it was rather difficult to obtain pure breeder queens from the Caucasus region of Georgia, thus these efforts were interrupted for a few years. Since 1998 we re-started to propagate this cross which is surprisingly productive.

In our opinion, the majority of traditional beekeeping books have mistakenly classified the Caucasian bees as a race adapted to cold winters and high altitude climates. However, quite the opposite is true. Believe it or not, its homeland - the Caucasus region (Republic of Georgia) - has a subtropical environment where the prevalent agricultural crops are sugar cane, citrus groves and tobacco. Thus we conclude that Caucasians are a strain which evolved into a subtropical environment.

We graft from pure Caucasian queens, later on the pure Caucasian virgin queens get mated with pure Italian drones. This explains the IT (last two letters) of our breed name CaucasIT. The offspring of these queens display an amazing F1 hybrid vigour. Eventually, when superseded, unlike other hybrids, the upcoming generations (F2, F3 and so on) do not show neither

any exaggerated swarming tendency nor a stingy temperament.

Although our CAUCASIT bees are not as prolific as our Italian queens, their longevity, hardiness and gathering ability under extreme conditions compensate for any noticeable difference. These hybrid bees excel in areas of hot and humid weather where honeyflows are short and/or unpredictable.

Those beekeepers willing to try CAUCASIT bees will have to consider a larger than usual brood chamber. Pure Caucasians, as well as the hybrids, have a strong tendency to store honey in the broodnest. Unless enough room is provided there might be a certain amount of congestion. On the opposite, honey storing in the broodnest prevents most commercial beekeepers from the traditional heavy sugar syrup or high fructose corn syrup (HFCS) feeding which Italian bees normally need.

Buckfast X Italian

Another interesting cross is the Buckfast x Italian, which seems to meet the expectations of many of our foreign customers. These are multihybrid bees which are the result of the pioneer breeding work of Brother Adam who travelled all over the Mediterranean countries to gather different races of bees present in France, Italy, Greece, Turkey and Northern Africa. His aim was to put them together into a «perfect bee».

The colour variation in this strain is remarkable. It is usual to see either light-colored queens, striped queens, or completely dark queens. No doubt this is result of the wide genetic pool used to keep the variability of the Buckfast strain. Nevertheless, their wintering ability and spring build-up is uniform regardless of their colour.

In our role, as exporters of queen bees, we must meet the particular demand of our different customers. We cannot therefore impose on them a particular strain of



left & centre Making beeswax queen cups by dipping. right Queen cups ready for priming and grafting.



left Sonia priming the queen cups. centre Larvae are selected from our Buckfast Breeder Queen right Sonia grafting the very young larvae.



left Accepted queen cells. next Candling queen cells to check viability. next Cutting ripe queen cells. right A hatching virgin queen.



left Our mating nucs. centre, right and below Stocking Mating Nucs - the bees have been 'paralyzed' with carbon dioxide making them easy to handle. below, centre Catching and caging queens. below, right. Queen bank.



our preference. We must be able to satisfy each regional and specific demand, with a strain of bees suitable to the particular environment of each customer. As you can imagine, the needs of a beekeeper in Germany are not the same of a beekeeper in Syria or Lebanon, so we must provide different genetic alternatives.

Much has been written about breeding efforts. One feature we don't often see mentioned though is the necessity for a high degree of orientation. This particular trait has the highest impact on a queen breeder. The percentage of mated queens is the single most important cost production item for a queen company. Certain strains have a much lower sense of orientation. We notice this handicap, to our cost, in the failure of virgin queens from certain crosses, when they do not return to their mating nucs after the nuptial flights.

Selection, raising and mating of queens

To keep a top-quality and healthy strain of Italian bees, we use what we call the 'Open Population Breeding Program'. This involves choosing 25 to 35 of our best over-wintered queens and using them as breeders for the season. At the same, we get another 25 to 35 Italian queens from other reliable breeders which are used as drone breeders. This way we keep inbreeding away and are able to keep a strong and vigorous strain. We keep several single-story colonies with two to three frames of drone foundation. This helps to saturate the neighbourhood of our mating yards with chosen drones.

Artificial or instrumental insemination is a very powerful tool for scientific and research purposes. But it is very expensive for a medium-sized queen company like us. For commercial queen breeders, we think that faster and better results can be achieved by crossbreeding two or more geographical races of bees with high levels of compatibility. Of course, not all hybrids are good, the AHB are a good example of poor performance, so one must be very careful when selecting lines for crossbreeding.

In the case of our Caucasit strain, we trust our different Georgian suppliers who are capable of providing different strains every second year. We import about 20 queens each time, directly graft from them and let the pure Caucasian virgins mate with our Italian drones. The same procedure is made with our Buckfast x Italian cross. Since we don't belong to the Buckfast fraternity of breeders, we resort to importing selected queens from a reliable

Buckfast propagator.

Hygienic behaviour, understood as the uncapping and removal of diseased and/or dead brood, has long been considered a very desirable trait to select for. However, we noticed that a strong selective pressure towards this trait is coupled with a noticeable decrease in honey production. Our conclusion is that bee breeders must exercise a very prudent approach when selecting this behaviour.

As you can see, in today's global world and competitive environment we must be very honest and down-to-earth in our breeding aims and ambitions. We are not scientists but take the best possible advantage of serious research to breed the best possible strains of bees.

Queen cell production

In early spring we use a closed swarm box as a starter. During 24 hours, about 3 kilograms of bees will be forced to accept 135 grafts on 9 bars of 15 cells. The only brood available are the grafted larvae so acceptance is usually high. By late spring when the weather is more stable we switch to an open starter, but the quantity of cells is the same.

After pulling out the accepted cells from the starters, we put them into our cell-builders for nine days. These colonies are queen-right with a excluder dividing two hive bodies. The queen is kept below, and above the excluder we raise three or four frames of unsealed brood every week. On the tenth day after grafting, the ripe queen cells are removed and placed overnight in an incubator. On the 11th day, they are introduced into the mating nucs.

Our method of stocking mating hives has drawn the attention of many people. Indeed, we owe a great debt of gratitude to Mr Bruno Pasini and Mrs Maria Teresa Falda, innovative Italian queen breeders who together developed this new technique. It involves the use of CO₂ to anaesthetize—or better said to temporarily paralyze—the worker bees. Basically, we shake bulk package bees which are placed into a large screened box. This box is then placed into a sealed container which is filled with CO₂. This gas expels air in the bees tracheae so workers become paralyzed for a few minutes. It's about the same effect observed when doing artificial insemination on queen bees.

We scoop up about 300 grams of 'paralyzed' bees, and give them a drawn comb, a queen cell and some sugar syrup. This mating unit is then left in a cool room for 24 hours. In the evening on the day after stocking the nucs, they are taken to one of

our mating yards and their entrances are opened.

The first caging of queens is done 17 days after the introduction of the queen cells. We take advantage of this opportunity to equalize with brood and bees all the queenless units. One day later, when introducing a new queen cell, we feed sugar syrup. All subsequent cagings are done in a 17-day cycle. Unless a heavy honeyflow is in progress, all our nucs are fed otherwise they may abscond.

The possibility of breeding a varroa tolerant bee.

We wish it were possible to find a silver-bullet and therefore be able to breed a bee truly resistant to varroa very soon. However, it is evident that selective pressure in the hands of queen breeders and researchers has so far been unsuccessful in achieving this goal. However, no doubt this will be a reality some time in the future.

The disastrous events which happened after the introduction of the African bees in South America back in 1957 have clearly shown that these bees are not any more resistant to varroa than any other European honey bee. If breeding a varroa-resistant strain of bees was as easy as crossbreeding AHB with a productive and gentle European bee, we would already be rich. Unfortunately, there is nothing valuable in AHB to select for a varroa resistant strain of bees.

Some researchers have mistakenly assumed that the AHB are either resistant to and/or tolerant to mites. According to our experience, this is not true at all. It is just that their excessive swarming and absconding behaviour allows them to leave behind the infested colony and parasitized brood so the AHB swarms are able to start a new colony with lower mite levels of infestation.

Our impression is that resistance or tolerance to varroa will eventually come out from a combination of shorter brood cycle, suppressed mite reproduction in brood cells, a reasonable amount of hygienic behaviour and better grooming by means of stronger jaws in worker bees.

As a footnote, I would like to comment on a quite interesting observation about pure Caucasian bees. Over the years, we noticed that when grafting from pure Caucasian breeders, the queen cells would hatch 10 days after grafting. Meantime, both Buckfast and Italian virgins regularly emerged on the 11th day after grafting. We presume this shorter brood cycle is also evident in the Caucasian worker offspring.

The major problems facing queen breeders today

The safe overseas shipment of queens and packages is a huge challenge. We depend on the expertise of major international airlines and associated freight forwarders. Any international consignment of bees must be done strictly following Chapter 61 of IATA – LAR Code (Int'l Air Transport Association – Live Animal Regulation Code). Since honey bees can very seldom be insured, extreme care must be taken when getting a shipment ready.

As of year 2005, any wood packaging must also comply with a new FAO regulation called NIMF 15. It establishes certain hygienic requirements so the wood packaging should be sterilized with ethylene oxide or irradiated, to prevent the transmission of fungal and bacterial plant diseases. Otherwise, transport may be denied.

When shipping bees by airfreight we seldom have a direct flight to the final destination. Thus, most of the times one or more connecting flights are necessary to reach our most distant customers. Each transit country has particular regulations to allow the transshipment of the bees. This normally involves a fax pre-alerting the Border Inspection Post at each airport requesting permission. In this regard, the OIE has made a very clear recommendation in the 'Terrestrial Animal Health Code' stating that shipments of queens with attendants should be exempted from transit inspections. (See CHAPTER 1.4.2. entitled 'Animal health measures applicable during transit from the place of departure in the exporting country to the place of arrival in the importing country' (http://www.oie.int/eng/normes/mcode/en_chapitre_1.4.2.htm). Along with this, a multilingual animal health certificate is issued by SENASA (www.senasa.gov.ar our Federal Animal Health Inspection Service) attesting to the veterinary requirements demanded by the importing country.

Another major challenge for a queen breeder today is to compete in a global world, where exotic pests, diseases and undesirable genetics may also become global. We have the unfortunate example of the introduction of *Aethina tumida* into Australia in October 2002 and also the surprising detection of varroa mites in New Zealand in April 2000. Although both countries are islands with strong quarantine inspection services, nevertheless, these pests found their way in despite the strict regulations. Now we must also prevent the spread of *Tropilaelaps* mite which is present in South East Asia. However, we consider the worst threat is represented by *Apis mellifera* cap-



At the airport ready for forwarding to our customers.

ensis, the Cape bee. If this strain of bees was accidentally spread either in Europe or America, then we predict it will be the end of beekeeping as we have practised it for centuries.

After suffering the importation of mites through illegal smuggling, and unwanted genetics, pests, and disease through other actions, many beekeepers are understandably concerned by the prospect of allowing ANY foreign bee imports. Many of the bad consequences of illegal imports have already happened, but only a few of the potential benefits have ever been realized. We are sure that the legal importation of queens and packages represent the other side of the equation.

It is very difficult to blame a legal importation for the introduction of a new pest. Someone might say that the suspected presence of SHB in an importation of American queens into Portugal during 2004 is an exception to this rule. Well, we don't think so. There is no scientific research whatsoever demonstrating that the trade of queen bees - with hand-caught attendants - might be a vector for the spread of SHB. However, package bees are another matter.

European beekeepers are justifiably concerned about the possibility of getting new pests with imports of both packages and queens. During year 2003, the adverse reaction of hobbyist beekeepers was almost unanimous about shutting the door to all imports regardless of their origin. On the other hand, European professional beekeepers preferred a more prudent approach which consisted of strict animal health certification to prevent the introduction of SHB and *Tropilaelaps*. However, the current EU legislation (Dec. 2003/881/CE & Dec. 2005/60/CE) establishes requirements which are against WTO rulings, because they ignore existing differences between both infested and uninfested countries. It is not fair for a country which is free of pests to be treated the same as an-

other country where diseases and parasites are present.

After the European Commission passed these two pieces of legislation, the importation of package bees into the EU was completely banned regardless of the origin of the importation, never mind that the exporting country was free of the target pests. And worst of all, since then queen imports are now required to have a compulsory lab tests of all escort worker bees and the shipping cages. This process is very expensive and difficult to put into practice. Indeed, we expect to have an easier and less restrictive access of our queens into the EU in the near future. Argentina has made a very important effort to guarantee both the health status and genetics of its exports. It is not fair that the EU ignores our hard work to comply with its regulations.

Hope to meet you in Apimondia 2007 at Melbourne (Australia)!!!

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