

# Queen Rearing in Hawaii

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THE Kona Queen Company overlooks the Kealahou Bay, which is located on the Kona Coast of the Big Island of Hawaii. This beautiful bay, partially encircled by a dramatic cliff covered by blooming opuna, and a shoreline of kiawe trees, is the sight where Captain Cook arrived with his sailing vessels the H.M.S. Discovery and Resolution in 1778, looking for protection from storms so that he could repair his ship.

In 1976, less than 200 years later, the Kona Queen Company began their operation just above this historic bay, because it was thought that the Kona Coast would be an ideal location to rear queens the year round. With temperatures that average nearly 75 degrees F. during the four seasons, coupled with the varied flowers that bloom constantly, conditions are almost perfect for queen rearing.

The season actually begins in the middle of January when it is time to make up the two-frame nucs. The bees that will make up these nucs are kept in what are called double-ups. The double-ups hold eight small frames and one division feeder and are two to

three supers high. They build up on Mauna Kea, which at 13,900 ft. elevation, is the largest of the two snow-capped volcano craters on the island. The bees are actually kept at the lower elevation of 6,000 ft., on terrain that looks much like the surface of the moon, were it not for the black color of the lava rock. The bees store honeys from the lehua bloom of the ohia trees, the mamane trees, and also the white clover. The double-ups are then loaded and brought down to the Kona Coast where they are placed on the 10 locations of nuc yards. The bees are then distributed into split nuc boxes that hold a frame of brood and a frame of honey and a division feeder on each side. This can be a very tedious job because the queens from each double-up must be found as the frames are distributed. Occasionally, the weather becomes cool and rainy and the bees get cross, letting the beekeepers know about their mood. After each yard is stocked, they are then given a 10-day-old queen cell and a feeder full of Fumidil-B treated sugar syrup, and left for 14 days before being caught.



Catching queens in a permanent nuc yard overlooking Kealahou Bay

Because of the time and expense of stocking the nucs each year, Gus Rouse, the Kona Queen manager for the past two years, has experimented with a permanent nuc yard. With this system, every other nuc is combined with its neighbor, the divider board is removed, and a queen is introduced. This permanent nuc is fed during dearth periods, because if conditions aren't exactly right, the bees will readily abscond; possibly because the climate is so temperate they are confident of finding greener pastures without perishing. In fact, Gus claims that bees actually will stay overnight on a flower if it starts to rain in the evening and fly home in the morning because the temperature is so mild.

When it is time for setting up the permanent nuc yard to raise queens, all that is required is that four frames are taken to stock the neighboring nuc and a divider board and extra feeder placed in the permanent nuc. This was the second year with this system, and although there was some problems, they produced strong nucs with little labor.

The breeder queens are selected from one of Jim Powers' Apiaries in North Dakota, Arizona or Hawaii on the basis of honey production. While Kona queens have an excellent record of honey production, they have, in the past, had the reputation for being too aggressive. This was partly due to the fact that the Kona Queens mated with the feral drones on the island which come from the German black bee stock. This problem has been changed with the addition of Weaver Queens as the drone mothers. These queens are chosen for their gentleness, size, and compact brood pattern, and it is this marriage of Powers and Weaver stock that makes for a successful queen.

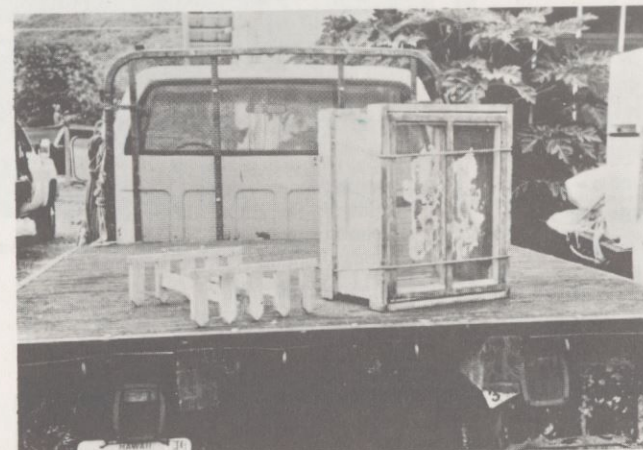
The larvae are grafted at about 12 to 24 hours into cell cups of about

Loading drone hives on the moon-scape of Mauna Kea



25 to a frame. They are then placed in a modified swarm box that was designed by Gus Rouse. The box is made up of a deep super that has fitted screened lids on the top and bottom and are held in place by elastic bands. Twenty-four hours before use about 10 pounds of young bees are shaken into these boxes. A specially designed rake slips over the four honey frames inside so that the box can be placed on end to provide optimum ventilation while traveling. Once they arrive at the grafting yard, the rake is removed, the frames are slid together and the bees are given a division feeder of syrup. The next day between one to four grafted frames are placed between the honey frames and are left for 24 hours. The bees are allowed to fly during this time to collect nectar and pollen, but a piece of queen excluder over the entrance hole prevents any queens from entering and destroying the cells. Although this system was used exclusively with success in the past two years, it has proved too costly to buy shook bees, so Gus, who is an innovator, went with another system.

This time he made up one deep super of six frames and a feeder on a bottom board. He placed a queen-



Swarm box and rake designed to hold securely four frames and bees during transportation and provide adequate ventilation.

right super of bees and brood on top and divided them with a queen excluder. On the day before they are to receive a graft, they are smoked down to the lower chamber and the upper box that has the queen is placed on another hive stand with the entrance facing the opposite direction. With this method the beekeeper must check to see if the queen is wandering on the excluder and if she is, she must be caught and placed in the super that was set off to the side. Marking the queens beforehand helps considerably with this problem. The only real problems with this system are the un-

they do not dry out.

The cell finishers are headed by Weaver queens. They are made up of one medium super on the bottom to hold extra honey stores with one deep super for the brood nest. Each cell finisher has at least one frame of drone comb to ensure adequate population of selected drones for fertilization. Above the queen excluder is one deep super which contains three honey frames and in the center, three frames of unsealed brood, which are worked up every nine days from below. Every fourth day a new graft of 25 cells is placed between the unsealed larvae and the bees are fed syrup in a division feeder. There are never more than 50 cells in the finisher at any given time to ensure that the cells will be well fed and cared for. The cell frames are marked with colored tacks to determine their age, and on the tenth day after graft, the cells are pulled, smoked, and brushed free of bees. They are then loaded into deep supers and placed into a cushioned storage box on the tank truck and driven to the nuc yards. Great care must be used here when handling because any sudden bump may cause the mature cells to produce a queen with deformed wings or even prevent her

Kona queen manager Gus Rouse standing by tank truck. Lower tank holds sugar syrup; upper box holds supers of cells.





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from emerging. The lava rock makes it exceedingly difficult just to walk, let alone carrying a super full of cells. Driving on this surface must be done in four wheel drive, while moving slowly in low gear to keep from jarring the cells.

Before the cells are distributed to the nucs, all the queens are caught from the boxes the same day, taking care to kill all virgins that have not mated. The nucs must then be equalized and contain at least one frame of brood. Someone then checks the cells for size, culling all runt cells. The feeders are given sugar syrup and one cell is gently placed between the two frames. If any nucs are short on population they are given a dipper full of old grafting bees from the swarm box described earlier. The first and last nucs are marked with their emergence date so they will be caught at the right time.

Though the Kona Coast is not always the greatest honey production area on the Big Island, it is ideal for queen production because there is always at least a minor honey flow to keep the bees busy. There is also a reliable source of pollen to keep the cells well fed from the legume akoo which blooms a spherical white flower on the island. Each time it rains in the winter and spring, the coffee orchards appear to have fresh snowfall with their blooming white flowers, always giving the bees a timely shot in the arm. Avocados grow everywhere, producing a strong honey flow along with the macadamia nut trees. Other plants that can be counted on with regularity have such unusual names as opuma, christmas berry, lehua, kiave and lantanna.

With almost perfect weather all year and nectar coming in most of the season, one might ask are there any problems Kona Queen has in rearing queens? Though the area is much like paradise, it does pose a few problems for the queen breeder. Ants can be listed as the chief predator. One ant race possessing a black head and thorax and a red abdomen crawls up the nuc legs in hoards, eating the brood in just a night or two. While this ant is mainly carnivorous, another tiny black ant seems to like the honey. This problem largely can be overcome if the legs of the nuc are greased with Tanglefoot and the yard is sprayed once each season with insecticide. Absconding is another frequent problem facing the Hawaiian beekeeper. If the nuc is kept in by rain a few days and runs low on stores, or sometimes seem-



A fine frame of large sealed queen cells ready for mating nucs

ingly for no reason whatsoever, they will leave. If not replaced with bees immediately, the wax moths will move in and destroy the comb. Although there is some AFB and EFB on the island, it is not a serious problem. Chalkbrood does occur with some frequency, mainly weakening the nuc populations, but it doesn't pose any serious threat, and there is no evidence that queens carry the disease. Because of the warm temperatures and high moisture levels, dry rot is a big problem with the woodenware. Supers seem to crumble to ash, like they have been burned right out in the yards. To help prevent this costly problem, the supers must be dipped in a hot paraffin bath to first permeate the box, then a cooler dip to coat the outer part. Paint alone just does not do the job. Weeds are also a constant problem, especially during the rainy season. A pigweed that has nasty thorns can not only cover a nuc box from view, but can make life very difficult for the queen catcher. And lastly, the cost of supplies is much higher here than for the mainland beekeeper because everything must be shipped from so far away, and even with all the sugar cane that is grown here, the price of sugar is higher.

Last year the Kona Queen Company sold around 27,000 queens, while this year that figure was increased to 32,000. Of course, they have a certain advantage in that they can send queens as early as the middle of February for those pollination operations in northern California and still be able to ship in

late November. Since the queens are sent priority mail, they can arrive anywhere on the mainland within three days. With the constant improvements the current manager has made in the two years he has run the outfit, the quality of Kona Queens seems assured.

### Not-Quite-Real Honey Seized

Some 1,700 cases of honey and molasses were confiscated from the Raccoon Mountain Honey Company in Pisgah, Ala., in late June by state and local law enforcement authorities.

Although the honey and molasses are not considered health hazards, the products contained corn syrup and are mislabeled, authorities reported.

Jimmy Chergotakos, enforcement officer for the Alabama Department of Agriculture and Industries, Food and Drug Division, said the seizure was the largest of its kind ever in Alabama.

He said the action was taken after state laboratory tests showed the Raccoon Mountain Special Blend Honey and Mountain Pure Cane Molasses "was adulterated with corn syrup."

The company's products are distributed in several states.

A case was described as twelve 20-ounce jars and amounted to "several thousand dollars worth," Chergotakos said. "It is a tractor trailer load."

Chergotakos, who works in the field of consumer protection, said the defendant in the case is Raccoon Mountain Honey Company "allegedly owned" by Kenneth Farmer of Pisgah.

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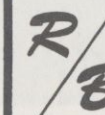
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