Bee Improvement and Conservation

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Editorial

The next month sees two important conferences on the dark bee: the BIBBA Conference in the Isle of Man and the SICAMM Conference at Lunteren, the Netherlands.

Both should provide much important material for future issues of Bee Improvement. We hope that this material will be supplemented by more articles from BIBBA members, so that at least three regular issues a year can be published — see the article from our President, Jo Widdicombe. Requests will go out to particular individuals, but of course it is open to any member to submit an article on a subject of their choice.

Queen rearing and mating provide the subjects of several articles in this issue, giving food for thought for anyone planning for next year.

Philip Denwood
Editor

Contents

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Bee Improvement and Conservation

The Journal of the Bee Improvement and Bee Breeders' Association (BIBBA), founded in 1964 for the conservation, restoration, study, selection and improvement of native and near-native honey bees of Britain and Ireland.

President: Jo Widdicombe
jowid@idnet.com

Chairman: Phil Khorassandjian
chairman@bibba.com

Treasurer: Iain Harley
treasurer@bibba.com

Secretary:
secretary@bibba.com

Membership Secretary: Nick Mawby
membership@bibba.come

Editor: Philip Denwood
magazine-editor@bibba.com

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From the President

Now we have to look at the next 12 months and what we are going to do. I believe we should be aiming for 3 magazines per year, one every four months.

From the President: BIBBA, BIM and Buzz

It is not a new phenomenon for BIBBA to struggle with its publications, in fact this problem goes back for as long as I can remember. It is easy to be critical of BIBBA and question what we are getting for our money. We are an organisation of some 380 members, some of which have stuck with BIBBA for a very long time. The reason for this is not, I suspect, because of what we, as members, get out of it, but it is more a case of supporting BIBBA because of what it stands for. The message is as relevant today as it has ever been, that is, that importing foreign strains of bee does not result in an improvement in the quality of our bees. To improve our bees we need to look towards working within a strain and the easiest way to do that is to work with the dominant strain, the native sub-species, Apis mellifera mellifera.

Nevertheless, however good the message, we, as members, want something for paying our subscriptions year in year out. The Bee Improvement and Conservation magazine (BIM) was created after years of very little communication with members. It was felt that if BIBBA was to be taken seriously, it should regularly produce a quality magazine which would gain respect for the organisation. However, regularity has been elusive almost entirely due to the lack of forthcoming material.

With the advent of electronic communication, it was felt that the gap in regular magazines could be filled, to some extent, by an e-newsletter, to be known as BIBBA Buzz (the brainchild of former Committee member, David Allen). A spin-off from Buzz has also been produced (BIBBA Hum) for distribution to non-members, so that we can advertise the views and activities of BIBBA and perhaps draw in a few new members. These newsletters are being edited by our Chairman, Phil Khorassandjian.

We are fortunate to have two highly skilled and efficient members for the production of BIM, Philip Denwood as Editor and Roger Cullum-Kenyon dealing with design and artwork. Regular production does require a supply of articles, etc. to be made available for publication. At the last BIBBA Committee meeting, I was very aware of the fact that another long gap in magazines had occurred and resolved to drum up material and get an issue out as soon as possible. I contacted a number of people and have to say that everyone responded very positively and produced articles, photos and so on in a very short timescale.

Now we have to look at the next 12 months and what we are going to do. I believe we should be aiming for 3 magazines per year, one every four months. I suggest we have definite deadlines for copy (1st October, 1st February and 1st June) for magazines to come out in early November, March and July. This proposal has yet to be approved by Committee but, if agreed, would provide targets and deadlines so essential for regular publication.

With 380 members it should be easy to produce enough copy for a magazine every four months. Ideas for broadening the content a little and thus making the magazine of more interest and appealing to a wider audience will be gratefully received. If people do not like what is printed they will be welcome to produce something from their point of view.

I will be sending out a request to some members, almost at random to see if they can contribute something for the next issue, but even if you are not asked this time, feel free to submit something to me, or direct to the Editor.

NB *Next issue could contain reports from the Isle of Man Conference so now is your chance to act as a reporter!*

Jo Widdicombe
President

BIBBA 53rd Annual General Meeting 2017

Notice is herby given to all Members' of the Association that the **53rd AGM** of the **Bee Improvement and Bee Breeders' Association** will take place at **Harper Adams University** Newport, Shropshire TF10 8NB on **Sunday 9th April 2017**

From the Chairman

Another use of technology has been to develop the email-based BIBBA Buzz...

I have been told a few times in recent weeks that it's been a very strange beekeeping year, this year. I seem to recall having similar conversations last year; and the year before that. In fact, every year has its own surprises, challenges, successes and disappointments and that is what keeps most of us enthralled and captivated in our chosen pastime.

With BIBBA members spread throughout the world we will of course all have had very different experiences of our bees this year. Some of us have had a good year for honey, others for rearing queens, some will have found all their virgin queens mating well and others will have several drone layers. Hopefully we will all have had sufficient success to keep us buoyant and encourage us to carry on with even more enthusiasm next year.

As with bees, so with committees. We are now in our sixth month with the current committee this year and we have struggled to achieve some of the aims I hoped for when I was elected as Chair in April. The intervening months are of course the busiest in the beekeeping calendar so the lack of progress in some areas is perhaps understandable. It has sometimes been difficult to find dates for meetings that suit all but we have managed to use technology to an extent and have held several telephone conference meetings with great success. This has allowed us to maximise, within the current context, the involvement of all committee members in decision-making.

Another use of technology has been to develop the email-based BIBBA Buzz to communicate with our members on a more frequent basis than is possible with a printed magazine. We have enhanced this outreach with the introduction of the sister publication BIBBA Humm aimed at promoting our message to non-members. We now have a combined readership of BIBBA Humm and Buzz exceeding 1,000 beekeepers and are looking to increase that significantly in the coming year. The more beekeepers are made aware of the issues, the more they get involved in breeding groups and selectively breeding from their own queens.

The large part of our attention as a committee in the last few months has been given to the biennial conference on the Isle of Man. A huge amount of work has gone into the organisation of the three day event with an inspiring array of quality speakers and we have to thank not only our conference organiser for putting it all together but the whole committee for working as a team to make sure it happened.

I write this just days before the conference and I'm looking forward to an enjoyable and instructive three days. With twenty-five distinguished beekeepers giving 28 presentations over three days it promises to be a truly instructive, inspirational and enjoyable experience.

We owe a debt of thanks to our hosts of course – the Isle of Man Beekeepers' Federation and the Isle of Man Government that have supported us both in kind and with the organisation of the conference. Without their help and support the conference would not have been possible.

Phil Khorassandjian
Chairman

Seventy years ago

Two quotations

From The Lore of the Honey-Bee by Tickner Edwardes.
First published August 1908, Eighteenth Edition 1944

"All know the English honey-bee* — the Black Bee, as she is called, partly to distinguish her from her foreign rivals, and partly, it would seem, because she is not black at all, but a rich brown — but all do not know her origin. Probably she came to us from the tropics by easy stages, swarm outflying swarm, until the most adventurous crossed the English Channel in remote ages, when it was only a narrow race of water, or even before Great Britain was detached from the mainland".

"It was the black bee and not the motley-coloured Italian or other varieties, who came to us thus, for the same reason, probably, that the Celts came – because they were a hardy race, loving and being more fitted for the bracing northern atmosphere than the heat and languor of the south.

Modern bee-breeders who are trying so hard to acclimatise in Britain the golden-girdled or silver-fringed bee-races of other lands, might well ponder this fact. No keener controversy rages to-day among English bee-masters than this one of the relative merits of native and foreign stocks.

But assuredly Nature has not erred in this respect … The ages have evolved her from her tropic beginnings to make her what she is — a doughty, essentially British creature, thriving against all odds of fickle climate, when her more tender sisters from the south are hard put to it for a living. She has held her own against them, and more than her own. In bumper seasons, such as we get all too rarely, when in sober truth, the land is flowing with honey, there is little to choose between the

rival honey-makers. But through good and bad, early or late, for steady, dogged industry, invincible hardihood, tangible results, the English black bee has outdistanced all competitors. Thousands of years have gone to her making, and thousands more may conceivably fit the yellow-skirted Ligurian for British work. But labour for so remote a posterity were altruism meeter for angels than for men."
* *The same could, of course, be said for the Scottish, Irish or Welsh bee.*

From The Bee-Keeper's Guide by W. Herrod-Hempsall. *First Published 1938, Seventh Edition 1944*

"In establishing and managing an apiary, the maximum of profit, and the greatest comfort in carrying out the work can only be attained by scrupulously observing the following maxims:-

1. Use only a double-walled hive, and that of the same pattern only throughout the apiary, in order to secure that *sine qua non*, viz.,interchangeability.

2. Keep only the number of stocks that can be managed properly.

3. Stick to proved orthodox procedure, eschewing freak appliances and methods of management.

4. Breed your own STRAIN of bee to suit your own requirements and the district. This is the ALPHA and OMEGA of successful bee-keeping.

5. Purchase only essential requisites, and those of the simplest form."

How many of the above do we agree with today, seventy-five years after it was written? I have highlighted point 4 as of interest. It is hard to know exactly what Herrod-Hempsall's views on the native bee were but it appears he was keen on the development of locally adapted strains rather than the continuous import of new stock.

Jo Widdicombe

Queen raising 2016

Every beekeeper can raise queens and they probably do so every year

Now that this season will soon be coming to an end and the last of the young queens are introduced to their new colonies, we can reflect on the past year.

Spring was cool and the colonies were slow to build up, making it difficult to start raising queens. There is no point in starting until drones are seen in the hive and an adequate supply of nectar and pollen is available. We inserted the Jenter frame into the breeder colony on 19th May, and proceeded with our queen raising system as outlined below.

Every beekeeper can raise queens and they probably do so every year without giving much thought to the process. When bees swarm they always make provisions for a new queen by producing several queen cells.

When we make an artificial swarm we are creating the same situation and the bees respond by producing queen cells. If we make a nucleus from a strong colony, provided we include eggs or young larvae the bees produce a new queen. So raising queens is not beyond the scope of any beekeeper. Given the right conditions the bees will do the work.

The method I use will produce any number of queens and give you control over the timing of their emergence and the breeding stock you use.

Equipment required

One queen right production colony (box A, plus supers).

One spare brood chamber (box B).
Two multi-frame dummies to fill the space in the second brood chamber, leaving room for five frames.
One spare queen excluder.
Four frames of drawn comb or foundation.

The larvae can either be collected via a Jenter frame or by grafting. The benefit with the Jenter system is that you know plus or minus a few hours when the eggs are laid. With grafting it is guesswork and if the grafted

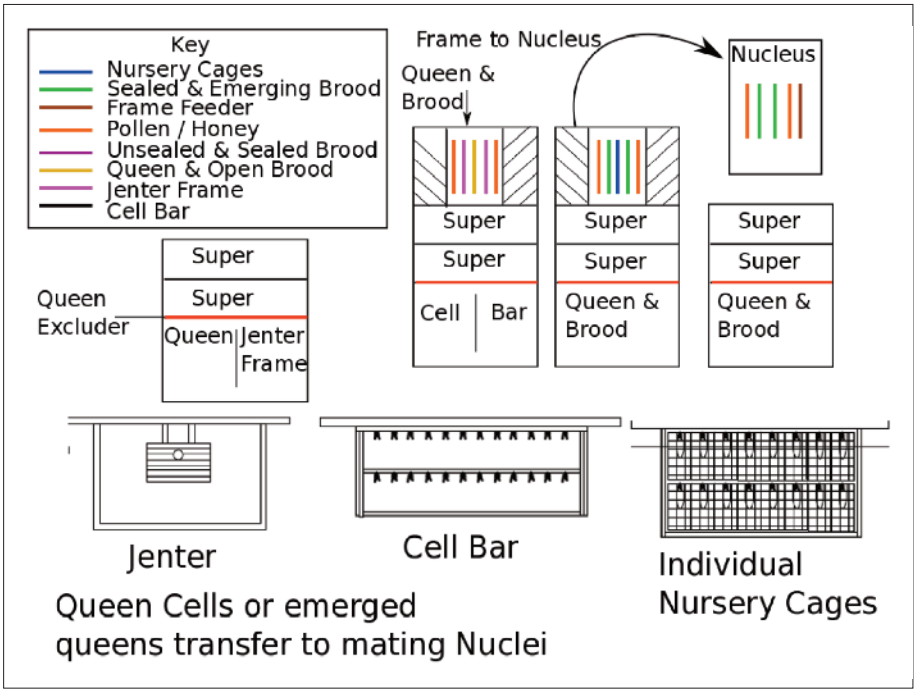

Fig. 5. Equipment and procedure for queen rearing.

larvae are too old they may not be accepted, or if they are they may be superseded within a few weeks.

How the system works

Day 0 — put breeder queen into Jenter frame in centre of brood box A. After 24hrs release queen from Jenter.

Day 4 — from box A, put two frames of pollen and food, two frames of sealed and unsealed brood, one frame of drawn comb and the queen into box B.

Make up the spaces at the sides of box A with frames of drawn comb leaving a space in the centre, and cover with a cloth.

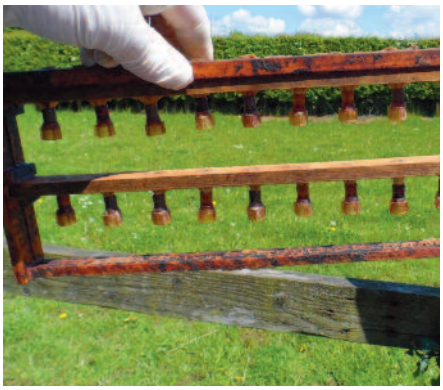

Fig. 1. Day 4: cell bars with larvae from Jenter frame.

Remove required number of larvae from Jenter onto cell-bars (Fig. 1). By this time the space in A will be full of young wax-building bees. Gently lower the cell-bar frame into this space, put queen excluder and supers on top, then the second queen excluder and box B.

Fig. 2. Day 9: sealed cell removed from cell bar into cell holder.

Fig. 3. Day 9: sealed cell put into nursery cage.

Day 9 — take sealed cells off cell-bar into nursery cages (Figs. 2, 3), return queen to box A, then put nursery cage frame into box B.

Fig. 4. Day 16: emerged virgins in nursery cages..

Day 16-17 — remove emerged virgin queens from cages (Fig. 4) into prepared mating nucs, take out to suitable mating site then check in 10 days for eggs and brood.

The frames from box B could be used to make up a standard nucleus using one of the young queens.

This year using this method we have successfully produced 50 good queens, ready to introduce into the hive and improve the quality of bee and produce. This could easily be increased and help to reduce importing poorer quality bees into the country.

Alan Brown

The Burzyan wild-hive honeybee *A.m.mellifera* in the South Urals

When the number of natural tree cavities declined sharply, beekeepers were forced to carefully treat the wild-hive bees more carefully…

The European dark bee *Apis mellifera mellifera*, a unique subspecies of honeybee *Apis mellifera*, is evolutionarily adapted to live in the continental climate of northern Eurasia with long cold winters. Nowadays this subspecies survives only in a few isolated reservation areas. The biggest areas are in Russia: about 300,000 colonies avoided spontaneous hybridisation in the South Ural area of Republic of Bashkirostan;

Fig. 1. a) Apiaries in the Shulgan-Tash State Nature Biosphere Reserve.

about 200,000 colonies in the Middle Ural area and about 250,000 colonies in Volga region of Republic of Tatarstan. We also have information about large populations of the

Fig. 1. b) Apiaries in the Shulgan-Tash State Nature Biosphere Reserve.

European dark bee in the Altai region of the Republic of Udmurtia. About 99% of European dark bees in the South Urals are kept in framed hives in apiaries (Fig. 1), and about 1% in

Fig. 2. a) Burzyan Wild-hive Honey Bees *A. m. mellifera*

natural and artificial tree cavities. The evolution of European dark bees was synchronous with the evolution of the widely spreading lime tree *Tilia cordata* and therefore the main forage crop for these bees is when these trees blossom (Fig. 2).

Fig. 2. b) Burzyan Wild-hive Honey Bees natural environment.

Scientists of the Biochemical Insects Adaptation Laboratory in the Ufa Scientific Centre of the Russian Academy of Science have been monitoring the gene pool of the Burzyan honeybees for the last 20 years using the polymorphism of loci COI-COII of mtDNA and microsatellite loci ap243 and 4a110 of nuclear DNA. This extensive research confirmed the pureness of the gene pool and that this gene pool is of the subspecies *A. m. mellifera*.

In 2011, at the request of the Institute of Beekeeping and the Shulgan-Tash State Reserve, bees from this population were classified as a separate breed: the "Burzyan wild-hive bee". This breed was registered under patent No.5956 in 14.06.2011 by the State Commission of the Russian Federation in the state register. According to artefacts found at the burial site of the Bahmutin culture near Birsk, beekeeping in the southern Urals started no later than the 5th-6th centuries BC among local Finno-Ugric tribes. Later, beekeeping was adopted by ancestors of the Bashkirs, who assimilated or drove away the Bahmutin people.

Fig. 3. a) Natural tree-cavity

Beekeeping could be practised without iron tools and the skills accumulated were passed on by many generations of tree-cavity beekeepers (Fig. 3).

Fig. 3. b) artificial tree-cavity hives

Bashkir beekeeping flourished in the 18th century. It took longer to develop than in Germany, Poland, Lithuania, Belarus and central regions of Russia, but they had a more perfect, convenient and reliable set of tools and accessories. With special land tenure rights, the Bashkirs could avoid compliance with the requirements of the Forest Service in Russia, which in 1882 had banned beekeeping in state forests as a source of forest fires.

In 19th century due to deforestation and the destruction of the cultural traditions by the migrant population, Bashkir beekeepers developed "koloda" beekeeping. A "koloda" is a man-made cavity within a section of tree trunk (Fig. 3b), which could be fixed high on a tree. Trees with kolodas were considered by Bashkirs as personal property and were marked with tamga" — a distinctive sign of tribal affiliation (Fig. 4).

Fig. 4. a) Boards with "tamga" signs from a local national museum

Every beekeeper knew his mark and did not touch the property of others, and these trees with kolodas and tamgas were traditionally kept by a family for generations.

Fig. 4. b) a tree with a "tamga" sign

In the second half of the 20th century Bashkir beekeepers started using movable-frame hives, which gave rise to modern beekeeping.

Fig. 5. Hard work of tree-cavity beekeepers: a) preparing a horse for the trip;

Despite its hard labour and low productivity, tree-cavity apiculture in remote areas of the South Urals still continues. Inspections of hollow tree hive bees require work as high as 16 metres, and because they are located away from populated areas,

Fig. 5. climbing a tree;

the beekeeper has to travel on horseback a distance of 40-50 km per day (Fig. 5).

The tools used by Bashkir beekeepers are mostly homemade but are similar to tools used in other countries. Tools unique to the Bashkir wild-hive beekeepers are the "kiram" and the "lange". A "kiram" is a braided leather belt up to five metres in length for climbing up a tree. A "lange" is a small portable platform or footrest (Fig. 5c), which is fixed on the trunk with a rope.

Fig. 5. working at hive level;

In previous centuries, when there were enough natural cavities in the trees with bees, Bashkirs, like beekeepers around the world, took all the honey from the colony in the autumn, and the bees were left without reserves and died. In spring, beekeepers would check these tree cavities, clean them and make them ready for a new occupants in the form of swarms. This "colony-killing" system was used until the 19th century and in some areas until the 1950's. The advantages of this system were that a new comb was created every year, the tree cavities rotted less and, as a result, bees were rarely sick, their body size did not decrease, and there was no inbreeding or degeneration.

Fig. 5. removing honey.

When the number of natural tree cavities declined sharply, beekeepers were forced to carefully treat the wild-hive bees more carefully and for the best colonies, to leave a sufficient amount of honey for the winter. As a result, colonies were able to live a long time in the same place — up to 18-25 years! Also, the beekeepers had to learn how to replace a comb and the life of the cavities was reduced.

Wild-hive bees in the Ural area also have many natural enemies that weaken the colony and cause their death. These are: brown bears *Ursus arctos*, pine martens *Martes martes*, forest mice *Apodemus uralensis*, great spotted woodpeckers *Dendrocopos major*, european bee-eaters *Merops apiaster*, greater wax moths *Galleria mellonella*, european hornets *Vespa crabro*, red wood ants *Formica rufa*, and red wasps *Dolichovespula rufa*.

They also have not avoided modern honey bee diseases and parasites, such as varroa mites *Varroa destructor*, nosema *Nosema apis*, chalkbrood disease *Ascosphaerosis*, American foulbrood *Paenibacillus larvae*, and European foulbrood

Melissococcus pluton. These are however more severe in modern, movable-frame hives than in tree-cavity hives. The population of tree-cavity bees has cyclical swings dependent on solar activity.

Fig. 6. a) Beekeeping tools fixed on a saddle.

Currently, dark European bees exist in the southern Urals in the Shulgan-Tash State Reserve where they live in natural and man-made tree cavities. The Reserve was established in 1958 and it covers an area of about 54,000 acres. The bees also live in the regional Altyn Solok Nature Reserve (an area of 222,000 acres, established in 1997), and the Bashkiria National Park (an area of 203,000 acres, formed in 1986).

At the end of 2014, these three national parks had about 1,200 trees with "koloda" handmade tree-cavity hives, but only 300 of them had bees. About 4,000 colonies were kept in apiaries with modern movable-frame hives and 200-400 colonies lived in natural tree cavities. In 2012, these Reserves were listed as especially protected areas, together with a number of others, and acquired the status of a biosphere by UNESCO called the "Bashkir Ural" complex with a total area of 855 thousand acres. The regional Altyn Solok Reserve is also protected by the Ministry of Environment of the Republic of Bashkortostan. Currently, in order to preserve the Burzyan honey bee, it is planned to expand the Shulgan-Tash Reserve in a north-westerly direction through undeveloped territory between the rivers Nugush and Uruk.

The staff from Shulgan-Tash, Altyn Solok and the Bashkiria National Park, together with local beekeepers, are constantly taking measures to increase the bee population and carry on selection work to improve the immunity, winter hardiness and productivity of the Burzyan bees.

Fig. 6. b) tools in use.

This policy of state-protected reservations allows us to save a unique population of these A. m. mellifera bees in Eurasia in the face of new threats of spontaneous hybridization and habitat destruction.

R. A. Ilyasov, M. N. Kosarov.
A. Neal, F. G. Yumaguzhin

Queen Rearing on the Isle of Man

First published in Bee Improvement No.1 1998

For many years, beekeepers in the Isle of Man have been involved in queen rearing programmes and in the 1970s BIBBA staged trials on the Calf of Man. In 1989 the Isle of Man Government listened to the concerns of the Island's beekeepers regarding bee diseases, in particular the scourge of beekeepers, varroa, resulting in legislation which prohibited the import of bees into the Isle of Man.

Since that time there have been one or two attempts to set up queen rearing apiaries and unfortunately they have not meet with much success, due mainly to the demands on the time of those involved. Eventually the team would dwindle to just one and that beekeeper became disconsolate and progress came to a standstill.

In 1997 a number of beekeepers in the Western Beekeepers' Association decided that the time was opportune to start queen rearing in earnest and we were provided with funds by the Association to purchase extra equipment to carry out the programme. From the outset, it was agreed that the members of the Association would be entitled to a specifically reared and mated queen for each of their colonies. Breeding queens had already been identified during the previous season.

What was believed to be an isolated mating apiary was located in a hilly area approximately 800' to 1000' above sea level, the contours on the map are so close together that it is difficult read the numbers. The site contained two triple chambered national hives for rearing the queen cells and a number of mating hives comprising some 14 full-sized nucs

and about 39 mininucs. The bottom chambers of the rearing hives were each given two frames of drone comb. After the apiary was set up in April, the weather deteriorated and we endured a cold spell until about two thirds of the way through the month of May.

The first batch of queen cells were installed in the rearing colonies, 20 in each colony at the end of May. All told we raised 7 batches of queen cells. The number of queen cells drawn was most disappointing, between the two colonies we would only get between 5 to 7 sealed queen cells, sometimes less, despite generous supplies of syrup. We were not overly concerned over pollen as we observed it going into the hives. We consoled ourselves that the queens in the rearing colonies were low swarming and the colonies were not inclined to draw many queen cells. The top brood chambers were regularly given brood transferred from the bottom brood chamber.

Matters changed somewhat with the last batch of larvae, just 20 cells were placed into one rearing hive and 19 cells were sealed. Immediately we reached the conclusion that there had been insufficient supplies of pollen reaching the workers in the top of the rearing hives. For the coming season we shall be prepared and feed pollen substitute and supplement. We have been advised that pollen supplement is superior to the pollen substitute.

All told we obtained 40 queens, the last 14 were used to over-winter the full sized nucs and will be available to the members in the spring when rearing commences again. We experienced queen losses from the mini mating nucs but not as much as originally expected.

Our practices for the coming season will be modified in the light of the experience gained last year. The breeding queens will be kept in full sized nucs located at the Island's experimental farm, together with the rearing colonies. Sealed queen cells will be transported to the mating apiary. At the mating apiary we will have four colonies for the provision of drones, they will be housed in separate hives. The breeding nucs, the rearing colonies and the mating nucs will be provided with generous amounts of pollen substitute or pollen supplement in addition to an adequate supply of syrup.

For 1999 we intend to gather our own pollen to ensure that early in the season generous amounts will be available wherever needed. We will pay particular attention to queen introduction, although last season most introductions succeeded, we consider that beginners luck played a large part.

Our plans for morphological assessment of the bees came to nought and we will start our own assessments which will be beneficial to our programme to improve the quality of our bees.

We hope that our colleagues in the Northern and Southern Associations in the Island will follow our example and form their own queen rearing teams which will speed up the regeneration of healthy, low swarming, industrious and thrifty bees suitable to conditions prevailing in the Isle of Man.

John Evans

Subscriptions

Subs are due 01.01.17

Please ensure that you pay your subscription to the charity promptly.

There's a renewal form printed on the back of the mailing sheet of your magazine.

Early payment helps our Treasurer Iain Harley and saves time and money in sending out reminders to late payers.

Contact Iain at: treasurer@bibba.com

The SMARTBEES Project:

Sustainable Management of Resilient Bee Populations

SMARTBEES is a collaborative research project involving 16 partners from universities, research institutions and companies across Europe. It is being co-ordinated by the Institute for Bee Research Hohen Neuendorf e.V. located north of Berlin in Germany with the UK point of contact being the NBU. The project is designed initially to run for four years commencing November 2014 with the possibility of extensions, subject to funding. How the UK will fit into this following the 'Brexit' vote is yet to be seen.

There are many aspects to the project based on finding solutions to colony losses caused by the *Varroa* mite and associated viruses and also to counteracting the systematic replacement of many native European sub-species of bees with just two specific races, namely *Apis mellifera ligustica* and *A.m.carnica*. It is this latter aspect which is particularly exciting as no attention has previously been given to other sub-species by any institutions or authorities, certainly not in the UK. In Ireland there has, perhaps, in recent years, been a bit more government interest and support. In the UK, support for our native sub-species, *A.m.mellifera*, has been left largely in the hands of amateurs and in particular to members of BIBBA. However a growing interest in 'local bees' and, in particular, 'native bees' means there is now increasing interest in our native sub-species.

The dominance in world beekeeping of ligustica and carnica is perhaps fairly easy to understand. In their pure state they are well known for their docility. Also these two breeds cross very well with each other being closely related; they tend to be compatible, both belonging to the same branch or lineage of honey bees,

namely branch C, which, in their evolution, migrated around the eastern Mediterranean. These two sub-species evolved in areas with reliable nectar-yielding conditions. They are prolific bees which are geared up for taking advantage when conditions are good. This is ideal for commercial honey production in the best honey producing areas of the world.

However by focusing our attentions on these two breeds, to the exclusion of all other sub-species we stand to lose an awful lot of genetic diversity. Although ligustica and carnica have proved so successful in the best honey producing areas of the world, it does not follow that they are the best bee to use in more marginal production areas like the UK and Ireland. The thriftiness of the native bee is an extremely important quality in poor to average seasons where it is not only the best strategy for survival but also can be good for honey production, as vast quantities of honey are not consumed even during bad spells of weather.

Research from the COLOSS project found that bees that were native and local to an area had better survival records than bees recently brought in to an area. It was this fact that alerted researchers to the importance of other sub-species of honey bee. Not only do they have important survival qualities but, with a bit of effort to conserve them and to select and improve them, their qualities could be developed to such an extent that a more sustainable future for beekeeping could be found.

Participation in the project, with regard to *A.m.mellifera*, involves the setting up of test apiaries, running three different strains in several apiaries for comparison purposes. Thus in an apiary of 12 colonies there would be four colonies descended from each of three different breeder queens. Some beekeepers have expressed concern at the apiary sizes being too large for available forage and, I think it has now been agreed that fewer can be used. However colonies can quickly be lost from the system with winter losses, swarming (although normal methods of control can be carried out) or colonies being overrun by varroa and therefore needing treatment which may bar them from taking any further part in the project. In Cornwall, we also feel that 12 colonies is generally too many for an apiary but have decided to run with that as we expect the number of participating colonies to quickly diminish.

Record cards have been issued for participants to use and they are similar in many ways to what many of us already use for our bees. There are differences, for example we like to assess qualities on a 1-5 basis whereas this system uses 1-4. The size of colonies, amount of brood, solidness of brood, defensive behaviour, calmness on the comb and swarming behaviour are all recorded. The level of Varroa infestation is also recorded.

It should also be pointed out that when the apiaries are set up, colonies are made up to the same strength and at the start of the project all colonies receive the same Varroa treatment so that infestation levels are equally low. As well as assessment of the above traits several experiments are to be carried out during the season. These experiments include checking natural mite mortality levels, checking mite levels using a sample of bees and icing sugar and testing levels of hygienic behaviour using a pin test.

The SMARTBEES project is one which, I feel, is well worth supporting; it is a huge step forward for there to be interest in and support for our native bee, not just from BIBBA members but from external official bodies. I am sure that a lot can be learnt from our involvement in this project and it could lead on to some interesting developments such as possibly a nationwide bee improvement programme, perhaps along the lines that have been adopted in Norway. It is very important that BIBBA is at the heart of any such developments.

Jo Widdicombe

BIBBA Conference 20-22 September Isle of Man

By the time you read this the Conference may be history; if not, then there is still time to book.

I intend to make fuller comment after the event, as I expect there will be much to report.

Bee Improvement for All (BIFA) Days

Owing to lack of time I am being helped by Kevin Thorn with the organisation of these. Discussions are being held with a number of hosting BKAs and there should be details on the BIBBA website when events are arranged.

To date there is only one BIFA day arranged. This is for Saturday October 15th in conjunction with the Cambridgeshire BKA.

If you would like one in your area then please contact me, even better if you can help arrange it. In the last three winters we have run 35 BIFA days, all of which have been well received.

Attendees are encouraged to rear their own queens by using both simple and advanced methods, rather than simply buying imported queens with their potential problems.

One and two day Bee Improvement courses

We are taking bookings from members and/or hosting BKAs who would like practical courses in their area for the summer of 2017. These are very popular, the first one this year sold out within 48 hours of releasing details! We arranged a second a few days later and that was soon sold out too.

We need about 6-8 colonies of bees and a few facilities. Attendees will learn how to assess a colony and record the results, a number of queen rearing techniques and much more, to help them improve their own bees and those of their locality. These courses get booked up very quickly, so again if you would like one in your area, please contact us.

To discuss further and to book any event please contact Roger Patterson Telephone: 01403 790 637 roger-patterson@btconnect.com or Kevin Thorn kevinthorn@me.com

Roger Patterson

Working for a better bee Wouldn't we all like that?

There are several key components in my opinion, to working for and achieving a better bee.

The answer for every beekeeper is yes — although its definition will differ for each.

The unifying aspect for us is that, in principle, we agree on what a better bee is. Such a fundamental agreement is vital, if we are to work together. And co-operation is without doubt pivotal in bee keepers developing and maintaining a strain of native/near native bee.

There are several key components in my opinion, to working for and achieving a better bee.

Starting Material: i.e. native/near native genetics

The starting point. Or is it? If all of us had near-pure *A.m.m.*, then surely BIBBA and its constitutional aims would not exist.

Some of us may well have something near-native to select to try to improve. And after all, that is the aim of BIBBA. To improve our bees and not just 'get' bees. To some degree that will depend on how many colonies you run — the more colonies, the more to choose from — and to some degree on your locality. I don't think it sustainable to attain a 'perfect' bee without working to get there. Consider a pyramid. Buying in the 'perfect' bee you will start at the top. But since there was no platform in getting there, subsequent generations cannot be maintained, as the very drones which were required to produce it simply aren't present: the product was bought in, but not the contributory parts. The pyramid (or strain) falls to pieces. By working with our bees, we constantly select and improve and hone exactly the traits we desire. Since we are selecting these traits and producing queens from them, then the drones can help propagate those traits and keep it sustainable: sustainability simply meaning the ability to carry on. And we can't carry on what we haven't started. If the choice is made to buy in as you have nothing worthy of selecting to improve, then I would urge beekeepers to obtain something relatively local to them in the UK, so the strain is adapted to the area. It may also be prudent to try to procure some virgin queens as well, so that their drones can help you continue a strain. This may well have to be repeated for a couple of years in order to build up a base level of decent stock. (See pyramid analogy.)

Developing Queens

The next question arising is, how to produce queen cells from your preferred colonies? So long as they are well nurtured and healthy, then it doesn't really matter how you get them. Whether grafting, cup kit or just simply removing a queen and cutting out. But most importantly, KNOW YOUR LIFECYCLES! Successful queen rearing relies on that fundamental knowledge. Do what works for you, the bees won't mind.

Assessing colonies

Once you have some bees with characteristics you wish to select and improve, you can develop their strain. A strain is defined by Beo Cooper (*The Honeybees of the British Isles,* 1986) as a group of colonies of bees with uniformly or fairly uniformly similar characteristics and which breed true to type. He went on to say that this strain can be maintained or improved through selective breeding. In order to do this, it is important that we can assess our bees methodically to record their traits. For this, a record card is an invaluable tool. There are plenty of templates you can use. The Galtee

Bee Breeding one is on the BIBBA website **www.bibba.com** under articles/downloads. Likewise, the BipCo record card is available on their website **www.bipco.co.uk** under 'news'. A simple numerical scoring system marked over some key characteristics can be collated into a mean average at the end of the season to compare those you wish to enhance. You can then reliably compare how different colonies performed and select those with higher marks in the categories you wish to prioritise. You can of course do morphometry and suchlike if you wish. But I have neither the time nor inclination to do so, for anything other than curiosity. The only numbers which directly concern me are those collated on my record cards, i.e. performance.

Personally, I prioritise brood pattern (Figs.1, 2) Broadly, that tells me that the bees are a) self-sufficient and b) healthy.

Fig. 1. This is a brood pattern I value ...

Fig. 2. ... as opposed to this, which I do not.

Honey bee breeding as we know is hard to control. So, with that in mind, I would urge bee keepers to focus on selecting and improving one trait first of all, rather than trying to fix too many qualities in. Particularly if you are only just starting out trying to establish a strain. So long as they are not devils, then work with that and expect variation. Selection from that variation is what leads to improvement. It is rare to find a colony with all the desired traits you wish. But you may well discover certain colonies which excel at different things. For example, one might be more prolific whilst also being self-sufficient, one might have good quality temper and one may be reluctant to swarm. Selection of these colonies (within a sub species) is to be favoured to encourage a diversity of drones to mate with the queens in your area and guard against a repetition of breeding too much from one source. This in turn may lead to a natural development of different strains. In my experience if you are open mating, however isolated, then this diversification happens naturally anyway and of course is nature's way of preventing inbreeding. There is plenty enough variation within the native sub species for this process to happen organically.

Protecting the strain: Sustainability: Bee improvement

When you develop a strain (Fig. 3) you may want to name it. I name mine by a name that will evoke the memory of their traits as the months pass. I won't share my names with you! It tells me something of the personality of that particular colony. Of course, you can also keep a notebook of their particular strengths.

Fig. 3. A strain — all daughter queens will be designated drone mothers, regardless of mating to maintain this strain. They are near uniformly alike helping consistency in breeding true.

I provide drone comb in all colonies of new daughter queens I have produced, regardless of mating, as their drones will be of the strain which I just selected (Fig. 4.) By propagating these, you are helping the strain to carry on. (Providing these daughter queens came from the strain. If a mother was selected as the best of mongrelised stocks, then due to the hybrid nature, the drones could well be wildly different for each daughter queen produced. In which case, you would need to be more selective.)

Fig. 4. This daughter queen will be a drone producer regardless of mating, to help sustain and protect the strain.

Do not worry if daughter queen matings were bad. In fact expect a proportion to be 'bad', depending upon the circumstance of their mating environment. The drones are still what you want. These colonies can be used as cell raisers, nuc material, honey producers — anything you desire: just simply not the next breeder queen. Never waste a decent colony. In my experience there are too many losses in queen rearing to make more.

Maintaining the strain

This really comes down to mating logistics. If not using AI, which most of us don't, then how do you make matings more favourable to your desired situation?

There is no simple answer and as with all bee keeping, it is up to the beekeeper to work with and adapt to their situation to make it so.

Isolation helps. I am lucky enough to have plenty of coastline. I use that to my advantage, essentially cutting off 'supply routes' of unwanted drones; in combination with adding drones of my choice on the land that does surround it.

Drone flooding is another important idea. Particularly if, as above, you can flood drones into a slightly inclement area, the queens are, in theory, less likely to venture so far wide when there are mating opportunities. These isolated areas need not just be coastal, they could also be in valleys, or in inclement areas which by nature there will be fewer bees inhabiting. The idea is that the wind and rain can be used to our advantage. Particularly as we are working with the native bee. When establishing a mating site, you observe the land in a different way than for a honey/welfare site. The site need only be temporary for summers, so if it is particularly hostile, then hives will be not be exposed to the vagaries of winter there.

There is also something to be said for staying away from known bad spots. Everyone has a bigger beekeeper or farmer near them who imports by the dozen/hundred. This may take time to learn if new to an area, which is where joining your local BKA and meeting fellow BIBBA members really helps.

With regard to meeting fellow BIBBA members, one beekeeper on his/her own may struggle, but by working together we can weigh things far more favourably to our desire. You can see a list of groups to see if an existing one is already local to you, on the BIBBA website under 'groups'. Not only can useful genetic material be swapped, traded or bought, but in setting up sites, members can create a ring of apiaries around and area and establish a mating apiary in the centre. This is particularly valuable if you cannot use exposed, or isolated land to your advantage. Surely there cannot be that many flat, sunny, dry areas in the UK though!

Essentially, a favourable mating site, flooded with selected drones must be the foundation of your queen rearing if you are to make bee improvement. Be prepared to travel to a suitable mating site. Establishing this as the core practice of your bee keeping, is what sets you apart from the average beekeeper leaving matings on an open whim. The very idea behind selection, is that you favour those genes. So every step must be taken to ensure they are propagated, over and above any other random gene pool. As mentioned above, use daughter queens as drone producers, regardless of mating.

The last key tools to nurture and develop are hard work, perseverance and patience — In abundance! — and expect setbacks and losses: nothing good comes without sacrifice, does it?

Hoping to meet some of you at a BIBBA gathering soon: please come and say hello!

Mark Edwards

Articles wanted

We are always looking for suitable articles and images related to *A.m.m* bees and beekeeping.

If you have been on a course, attended a lecture or are setting up an *A.m.m* breeding group, and wish to write an article about your experiences, then please write to our Editor – Philip Denwood, giving him a brief outline of your article, initially by email.

Contact Philip at:
p.denwood@yahoo.co.uk

Polynucs

My aim is to be able to overwinter nucs with some degree of confidence…

I have never really been in favour of polystyrene, preferring the strength of wood. I have two nucs that I made from marine plywood over 30 years ago to a pattern from our County Beekeeping Instructor Jim Crundwell, and they are still in perfect condition.

Last year BIBBA offered their members and groups 50% matched funding — up to £150 — for the purchase of equipment to be used for raising native, or near-native bees, so I decided to apply.

As wooden nucs are now so expensive, I used the money to buy 12 Maisemore polynucs which at £26 each cost me £312 at Beetradex in March. My aim is to be able to overwinter nucs with some degree of confidence which should allow me to start queen rearing much earlier in the season without having to break up production colonies.

I hope to raise sufficient queens to replace all my 'undesirable' queens in production colonies and then use that strength to produce queens and overwintered nucs for sale. I chose the Maisemore polynuc as it has six frames and a Miller-type overall feeder.

I must confess that I did not look at these nucs in great detail before purchase as I expected to find that they were well designed and constructed. That turned out to be a mistake.

The nucs have three faults in my view and at first I really wanted to return them for a refund; however, that would have meant sending them back to Maisemore — clearly not a viable option due to the cost. So I looked at ways of modifying them.

Problem 1: There is no bee space over the top of the frames, so putting on the roof not only squashed bees, but also meant that it was quickly propolised to the frames; given its rather flimsy construction I could see that it would eventually break when trying to remove it — especially on the first inspection in spring.

Solution: remove the 'runners' with a Stanley knife — a simple task, although it does mean that the lugs now rest flat on the rabbets and are not as easy to slide (Fig. 1). I may be able to lower the rabbets a bit at some time and fasten in new runners, but being in a hurry I did not have time to investigate that option.

Fig. 1. Frame runners removed to give a bee space over the frames.

Problem 2: The mesh floor has been set level with the bottom of the base of the nuc, leaving a deep well underneath the frames (Figs. 2, 3).

Fig. 2. Mesh floor showing deep well.

This makes for a very large space between the bottom of the frames and the mesh floor; of course, the bees immediately constructed wild comb on the bottom of the frames and on the mesh, some of it at an angle to

Fig. 3. Space between frame bottoms and mesh floor.

the frames, making them very difficult to remove! This also increases the danger of squashing the queen.

Solution: I coped last year by removing the wild comb,but this year I will make false floors, either from old queen excluders — as in this first attempt — or by purchasing some plastic ones. The new floor sits on the top of the existing floor and gives a sensible clearance under the frame (Figs. 4, 5, 6).

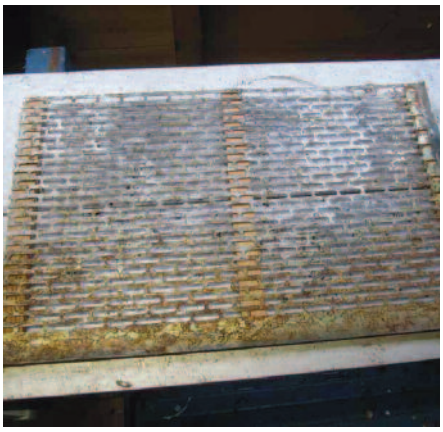

Fig. 4. False floor made of queen excluder.

Fig. 5. False floor in position.

Fig. 6. Space between frame bottoms and false floor.

Problem 3: The feeders are designed for feeding syrup — not the fondant that I prefer (Fig. 7). I could have put fondant in the feeders as they were, but in cold weather it is unlikely that the bees would come up to it.

Fig. 7. Fondant occupying one side of the feeder.

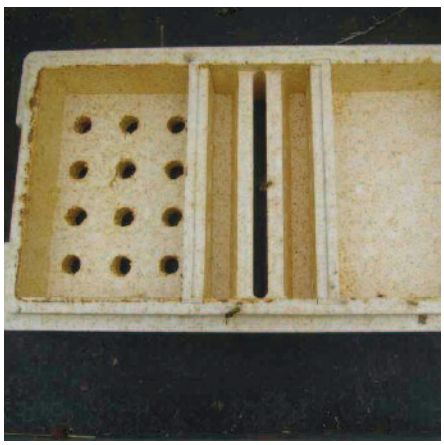

Fig. 8. Holes drilled in fondant side of the feeder.

Solution: I have drilled a dozen holes in one side of the feeder tray so that I can fill it with fondant and give the bees direct access from below; this is working very well (Figs. 8, 9). It does leave the other end of the feeder available for syrup should I want to use it, and thymol-based varroa treatment can be added in the central trough where the bees would normally come up to feed (the vapour then goes down through the central slot).

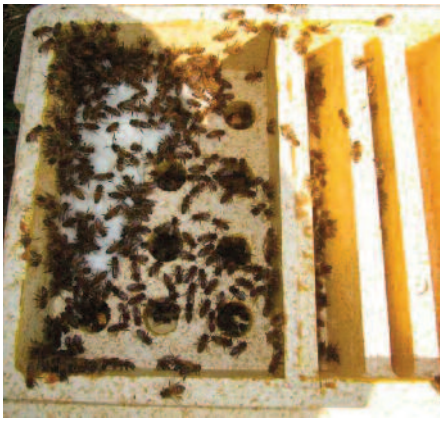

Fig. 9. Bees accessing fondant through holes.

So with three fairly easy modifications I now have nucs that should serve me well; we will see how they do over the winter, but with six frames and the ability to add fondant at any time, I think they should do well. One word of warning: you have to be very careful using your hive tool as the polystyrene is very easily damaged when levering frames together or apart.

Peter Edwards

Queen rearing at Keeper's Cottage

Stands for mating nucs were then installed — appropriately made from hexagonal paving slabs — and we were ready to start!

Fig. 1. Keeper's cottage.

It is now four years since Sue and I escaped to the country. The plan was to move somewhere that had character, outbuildings for a honey house, workshop and storage facilities, enough land for a mating apiary — and a little distance between us and neighbours so that we would not have to worry about anyone else when working bees.

We found the house of our dreams, with just under an acre of land, woodland on two sides full of bluebells in the spring, giving space for a mating apiary that we could flood with desirable drones — and the nearest neighbour a comfortable 100 yards away. The honey house, workshop and storage facilities were missing, but we liked the house and location so much that we decided that we could build a honey house and workshop, freeing up the double garage for storage.

Our house is Grade II listed, with the original cottage part dating from around from the mid 17th century, and this inevitably introduced delays for our plans. It took six months to get planning permission and listed building consent to extend the garage by adding on a honey house and to build a separate workshop. The weather — snow, ice and rain — then added further delays and it was a year before the work was completed. Queen rearing was definitely on the back burner!

We also had a considerable amount of work to do in the garden, with a massive leylandii, a fully grown ash tree and a stand old hawthorn to clear. A large log store then became an urgent necessity. Approximately half our land consists of a south facing slope of around 14º so we constructed 69 steps to give easy access, especially when we are very old! We planted a mixed orchard of nearly 30 trees and started converting the area to a wildflower meadow — not as easy as some might think! Stands for mating nucs were then installed — appropriately made from hexagonal paving slabs — and we were ready to start!

Last year (2015) we identified and installed five (now six) double brood drone rearing colonies and then started stocking the nucs. It was a frustrating business with queens failing to mate everywhere due to the appalling weather, but we ended the season with all nucs queenright and ready for winter.

As we all know, last autumn was too mild — we had to feed the nucs three times — and the winter and spring that followed were not helpful to say the least. The twenty-five nucs all overwintered successfully but then, instead of being used for queen rearing as planned, had to be used to re-stock production colonies where queens had failed due to poor mating last spring. The polynucs with their built in mesh floors and secure closures make it very easy to move nucs to out-apiaries and to bring re-stocked nucs back home. The nucs were re-stocked from colonies making preparations to swarm and, where possible, cells

Fig. 2. Mating nucs of various types in position.

Fig. 3. Another view of mating nucs.

from the more desirable colonies were used in them, but poor weather and a lack of sufficient drones has made 'serious' queen rearing very difficult again.

So here we are approaching the end of yet another season and although we have raised a reasonable number of good queens and nucs, this has been on an ad-hoc basis rather than the controlled programme that we anticipated. We have improved the quality of our drone rearing colonies and now have all the facilities and equipment in place ready for next year, we hope! Our Stud Book — now celebrating its eleventh anniversary — holds over 7000 separate assessment records, so we have no problem with selecting breeder colonies.

The question now is whether queens will again fail this coming winter following the poor mating weather in May and June. If we get reasonable overwintering, then all that we need is a bit of decent weather next spring — but never count your queens until they have mated and produced good brood!

Peter Edwards

Black bee rebel outpost makes territorial gains in foothills of Wales — with essential supplies parachuted in from BIBBA

Adaptation and resourcefulness is a key factor to beekeeping and I wanted to create the boxes cheaply.

Keeping bees since I was 15, now 30 years ago, I'd been quite content for most of that time producing a super of honey each season; that was my beekeeping. I became a queen-rearer in recent years through necessity, with my small apiary of five hives shifting from docile to completely insane within two seasons. Prising the crown board half an inch, bees would ferment over the sides like a badly poured beer, the air would darken and hundreds would enshroud my suit kamikaze-ing their way into every nook and crevice. The law of averages meant that at least a gross of stings would get through the suit each time. Hive inspection day would be accompanied by the sound of screaming neighbours who'd also get attacked. A retired builder from over the road, who also happened to be North Wales's former black belt karate champion, got stung along with his son. My personal safety in my apiary and beyond in the wider community was in peril. That day I was held at sting point in my suit by a thousand screaming bees for half an hour as I ran through bushes to shake them off my tail.

The native dark bee in my youth were the stuff of legends; one of the great environmental injustices, a subspecies of bee driven to extinction with a small band of bee hunters still in search of the holy grail; docile native bees clinging on in a secluded location far from humanity's reach. Quite naturally, having succumb to the propaganda that it was game over for our native bee, it was a revelation to visit Steve Rose at his apiary in 2012 where there wasn't just one native colony but over forty. It felt like the beekeeping equivalent of Jules Verne's characters witnessing the existence of pre-historic creatures after journeying to the centre of the earth. What, no gloves? No bee suit black with screaming bees? With hindsight and learning I can now see from the first abysmal wing plot Steve provided of my bees, that the problem I had was hybridisation between sub-species.

With Steve's help I quickly re-queened. The effect was immediate, even before new virgins were mated. Being a small apiary it was relatively easy to do but as we know, having native bees isn't a fixed point. Not wanting to return to beekeeping hell, I contacted BIBBA early this year about the *A.m.m.* rearing equipment grant. The 50% match by BIBBA of what I was to put in, meant that I could think a little more seriously about the range of equipment needed, as I was able to spend a touch beyond what would have been my spending comfort range. I was able to set myself up so that I could graft, incubate and test my own bees. A grafting tool, a bag of cell blocks, scanner, microscope slides, scissors to clip wings and a couple of mating hives and I was away.

To get my bees analysed and to see the fruits of my labour, the timing of Bangor University's wing morphology study in my area last year couldn't have been better. Whilst it was a wonderful opportunity —someone else doing the wing tests — I really needed to learn to do it myself. I've now seen one of the most dramatic changes in my apiary and I'd put it down to just one of the pieces of equipment from the list above: the Epsom Perfection V370 Photo scanner. On Amazon I was able to get one for around £80. Learning to do your own wing plots means you can

make informed breeding choice decisions in your apiary within the same season. Complementing last year's plots, done as part of the Bangor study, with a full set of my own plots on daughter queens this year, I've been able to assess my apiary's native drone percentages. The mother queen's percentage being equal to the drones of the daughters, means that all the low percentage *A.m.m.* drone producers can be identified and immediately improved. I prioritised half my apiary for re-queening this way this year.

Armed with up-to-date morphology results each time I've been able to replace a low percentage drone producer, during the season, with a high percentage female bloodline. I'm now looking towards next season knowing I've moved the mean average of A.m.m. drone percentage from 57% in June this year, to 63% in July and up the 68% in August. Re-queening another three colonies and I'll be over the 70% *A.m.m.* drone production all set up for next year.

In terms of raising the queens, there are a number of routes of course. For me, Steve Rose's cell raiser method that can be used over a queen right hive seemed the logical choice, as there was a local point of reference should I be faced with any challenges (full details available on the BIBBA website).

Fig. 1. Cell raisers, home built in Styrofoam RTM-X.

Adaptation and resourcefulness is a key factor to beekeeping and wanted to create the boxes cheaply. I had some Styrofoam RTM-X bought from SIG insulation left over from making some home-made nucs last autumn; used for overwintering small colonies. It worked very well as a medium for making half brood cell raiser boxes (Fig. 1). As for successes, I had good numbers of accepted grafts at the height of the season but the number slowly dwindled with very few grafts taking at the end of August. Last year my queens that mated late in the season produced higher percentage *A.m.m.* workers. *A.m.m.* drones living longer into the season does seem to be the case from what I've seen, so I'm treating August emerging virgins like gold.

Fig. 2. My native bees this year on freshly drawn out comb built on home pressed wax.

Quite understandably, I'm looking forward to next year. Whilst I haven't had the greatest number of grafts making it through to emerging and then mating, I'm more confident in what I'm doing off the back of applying for the BIBBA equipment grant. My ambition is to have queens over and above my needs so that I can share some of the best ones with people in my locality and with Steve Rose whose help has been invaluable.

One final note on keeping our native bees. What I now have in my apiary are a world away from the aggressive bees that nearly led to my giving up on beekeeping four years ago (Fig. 2).

Most winters I'd lose a colony, it seemed to be the accepted fact of beekeeping that your stocks die. Since keeping native bees I've only lost one colony and that had gone into the winter queenless. If we kept mammals or birds in a soggy field in Britain over the winter we wouldn' expect them to fare well.

Fig. 3. Emerged queens in cell cages.

Somehow we seem to think subspecies of honey bee, that have evolved over millennia within different eco systems, are all going to thrive in our unique British weather.

Hopefully the more beekeepers take back control of bee breeding, the better we'll be at changing beekeeping practice for good in Britain. The old slogan, 'think globally, act locally' provides, in my new-found experience, a route towards the success and sustenance of our native bees.

Eifion Williams

Bee Improvement and Bee Breeders' Association
Registered Office: The National Beekeeping Centre,
Stoneleigh Park, Kenilworth,
Warwickshire CV8 2LG

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