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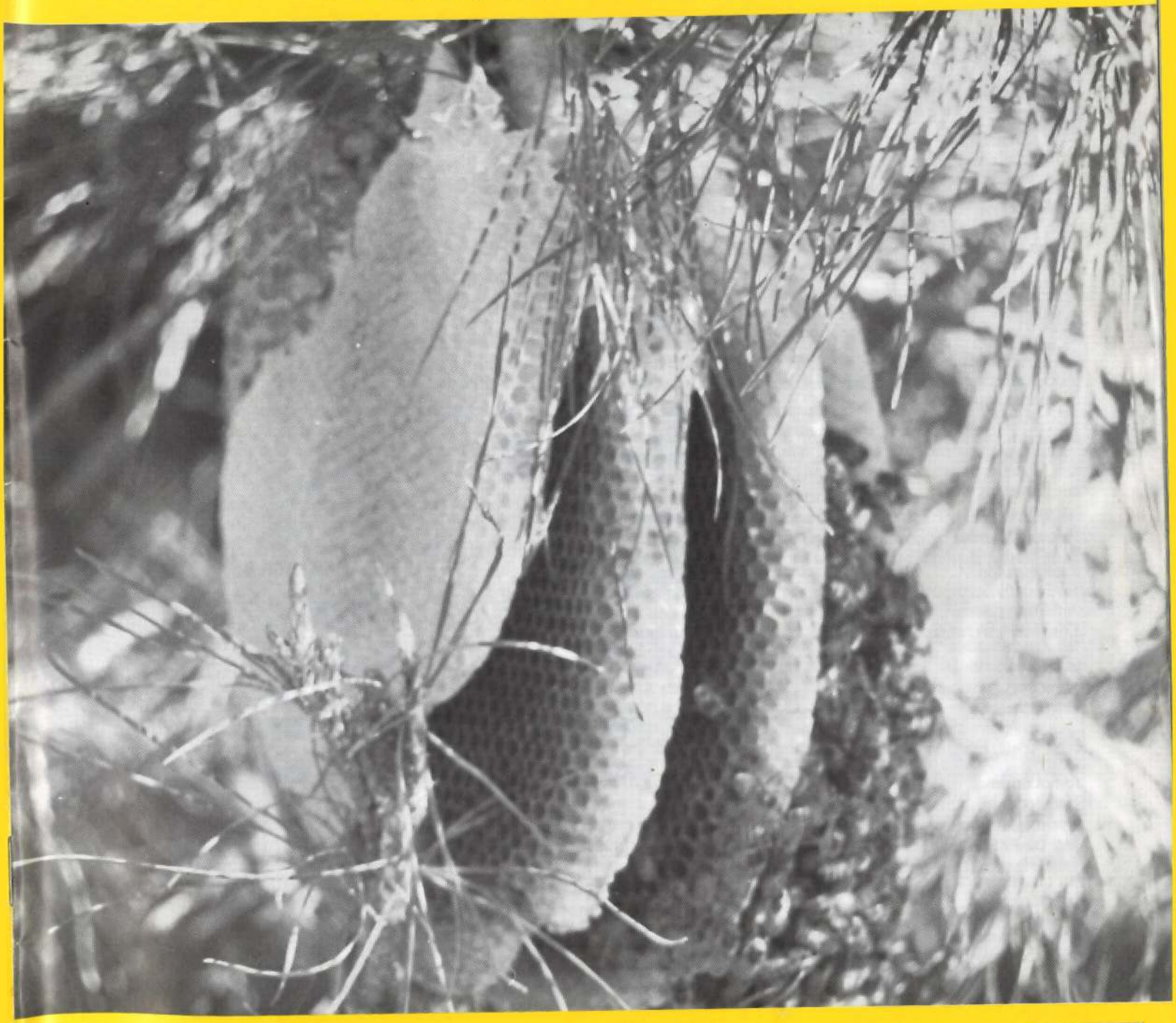

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President's Notes

Terry Gavin

Noted on the wall in Tim Leslie's office:- IF YOU ARE GOING THROUGH HELL, KEEP GOING. Hell arrived in the form of varroa jacobsoni on April 11th. NBA Executive agreed that a presence would be set up at both Wellington and Auckland with Executive members in both places. Lin McKenzie and I arrived at the survey headquarters during the morning of the 13th to a hotel room equipped with a phone and Lin's cellphone. Agriquality NZ Ltd and MAF were in the same boat. What a shambles. However, I must agree that order soon came out of chaos with Agriquality putting six teams of one authorised persona and two beekeepers each in the field by about 2.00pm in the afternoon of the first day.

Numbers of teams increased day by day with beekeepers being approved as authorised persons, under the Biosecurity Act. The maximum number of teams was, I think, twenty-five. The response from the beekeepers was magnificent. Everyone arrived each day and did as they were asked by the organiser. Not a complaint was heard. The beekeeping industry must be grateful for the dedicated work done by these beekeepers as this outbreak will affect us all.

The first job appeared to be to establish the northern and southern boundaries. Remarkably the survey established the mite were in four patches, being Orewa-Kumau north of Auckland, South Auckland, Pukekohe and Hauraki Plains. At the time of writing these notes, further surveying within the infected zone still has to be done to ascertain if there are areas not infected within the zone. The southern North Island has been surveyed in the likely danger areas. The reports of positive tests at Opitiki, Ohope and Rotorua were of great concern until further tests proved these three sites negative.

April 24th saw a meeting between NBA Executive and nine beekeepers from throughout the country to endeavour to agree on a policy given the information available at the time. The following resolution was agreed:-

ON THE INFORMATION AVAILABLE AT PRESENT WE CONSIDER ELIMINATION IS STILL POSSIBLE, WE NEED TO KNOW MORE ABOUT THE SPREAD.

It was also agreed that an NBA presence in Wellington needs to be maintained for a further three weeks.

April 25th and 26th saw the development of an industry Economic Impact Assessment for Varroa with submissions called for from all interested parties. Jane Lorimer, in association with Cath Petrey, of Federated Farmers, correlated all the information supplied to present to MAF on the 27th so that this information could be added to the submissions supplied by horticultural and agricultural industries so that a paper can be presented to Cabinet for consideration on May 1st.

Excellent work has been done by Don Bell and Tim Leslie in Wellington with visits to Ministers of Agriculture and Biosecurity. The deputy Prime Minister has also been visited and briefed. Barry O'Neil, Biosecurity Director expressed a wish that industry would be within the decision making loop at all times and MAF and NBA have been in constant consultation during this emergency. Also, representatives of allied, beneficiary industries in both horticulture and agriculture have been briefed with the Executive Board of Federated Farmers and Heads of Sections also being brought up to date. The above work has been a full time effort by Don and Tim with a massive amount achieved.

A program is being put in place to ascertain whether EFB, Tracheal Mite or Tropolaelaps mite has piggybacked in with the varroa. As you are aware, both EFB and Tracheal Mite require laboratory examination to confirm or not their presence.

What is ahead? Government has approved a further $1.3 million to complete the survey and prepare proposals of the options available to us on how to handle the varroa incursion. The entire industry and most of all the beekeepers in the infected area are understandably anxious for decisions to be made so that each and everyone of us can plan for the future. However, I am certain that varroa is going to cost us all financially and, even if the mite is eradicated, beekeeping will never be the same again.

I hope that next month I can give you positive answers as to the direction the industry is going with varroa. At this stage, May 1st, eradication is our preferred option.

Letters to the Editor

Dear Sir

Over the good many years that I have been a beekeeper I have met some very fine people and a lot of these same people have given their time to be on the Executive. Like most of us they have not always got it to our personal way of thinking but they have given it their best shot. Why anyone would like to stand today with all the rubbish that has been going on lately I would not know but I appreciate the fact that they do and I wish them well. To the main opponent of them I suggest you take up golf, bowls or go fishing, but for god's sake get a life. Most of us are behind the Executive, we might disagree with them at times but we support them and public diatribe we are sick of. To those who stand good luck, to the critics go away.

Reuben Ellis
Nelson

Cover photo: Courtesy of Owen Jones, Waipawa, Central Hawke's Bay.

The New Zealand BeeKeeper

THIS ISSUE

No new varroa sites in over 4,000 hive tests

The project examining apiaries and hives to the south of the varroa Infected Zone was completed this week by teams working from Gisborne, Napier, Palmerston North and New Plymouth. Field teams have been sampling 138 apiaries, mainly in the southern Buffer Zone and Surveillance Zone, and have so far found no evidence of infection in the 4,415 hives tested.

Since 11 April, when varroa was first detected in Otahuhu, field teams have inspected 1,187 apiaries and 20,902 hives. As of 29 April, there are 85 infected apiaries owned by 29 beekeepers. All these are in the Infected Zone designated by MAF on Friday, 28 April in an announcement of a review of the movement restrictions in the North Island controlled area. MAF programme coordinator Dr Matthew Stone says that the figures for apiary visits and testing are impressive and a testament to the efforts of the teams involved. Staff from MAF and AgriQuality NZ Ltd, and volunteers from the National Beekeepers Association, have been working long hours for almost three weeks to establish how far varroa has spread.

Recently MAF, in consultation with the National Beekeepers Association, reviewed the movement restrictions in force in the North Island controlled area. The original controlled area designated by MAF on 12 April (subsequently reviewed on 15 April to encompass the whole of the North Island) has now been designated the Infected Zone. All of area to the north has been designated the northern Buffer Zone, and there is a wide southern Buffer Zone extending down to a line dividing the North Island from Mount Taranaki to the East Cape, following named district boundaries. The rest of the North Island to the south of that line is now designated the Surveillance Zone. The South Island is currently designated a Disease Free Zone, although surveillance following up the telephone survey of South Island beekeepers is required to verify that status.

Dr Stone says the prohibition on movements of bees and materials presenting possible risks from the North to the South Island remains. Movement is allowed within the Surveillance Zone, but movement into, within and from the Buffer and Infected Zones remains prohibited unless by movement permit. An 0800 line has been established to ease the permitting process. That number is 0800 109-383, and it should be operational from Monday, 1st May.

Exports of live bees has resumed with the shipment of a consignment leaving for Canada. The bees are being sourced from the Buffer Zone (by permit) and the Surveillance Zone, in order to meet export certification requirements of having originated from hives known to not be infected with varroa.

900 of 1300 South Island registered beekeepers have now been contacted by phone to identify movements from the North Island. It is hoped that the remainder will be contacted over the next day or so, although it appears that around 2-3% of the people on the register will not be contactable, or have exited the industry. So far 39 traces from the North Island have been identified, although none are known to be high risk. All traces will be followed up in the next few days as an urgent priority.

Information on the varroa mite is available on the MAF website.
Contacts:
John Hayes, Communications Adviser, MAF: (04) 4744-268 or (04) 904-1827.
Lin McKenzie, National Beekeepers Association Executive Member: 025 357-970.

Varroa in feral bees a challenge

MAF and the National Beekeepers Association agree that the probability that varroa is present in feral bees is one of the technically challenging issues faced when the control options are being considered.

A swarm of feral bees found in a wall of a beekeeping equipment factory within the infected zone has been shown to be infected with varroa.

"The issue of our ability to control varroa in feral bees will need to be carefully considered when control options are being evaluated," said Dr Stone. "From the outset we have assumed that the distribution of varroa in registered hives, the ones we can easily locate and test, would reflect distribution in other bee populations, including unregistered hives and feral bees. This is one of the issues that makes this operation particularly difficult."

"We have some evidence of the validity of that assumption, and intend to do further sampling from feral bees in the cluster areas. This may provide us with information regarding whether spread is occurring by natural means or by beekeeping activities."

Seven new infected places have been identified in the Infected Zone (cumulative total now 103), owned by three new beekeepers (cumulative total 32). Two of the newly identified beekeepers are hobbyists with a single site each.

The movement permit free-phone operation (800 109 383) has begun work with 56 requests for permits received yesterday, and the first permits for movements have been issued under the movement restrictions reviewed on Friday evening.

Dr Stone said MAF is emphasising that there is no charge for testing of hives for varroa. Dr Stone said that MAF has received reports from beekeepers suggesting that MAF is charging $65 for testing. It is possible that beekeepers have been confused by the recent mailout of invoices by the National Beekeeping Association collecting levies under the American Foulbrood Pest Management Strategy. 23,673 hives on 1,290 apiaries have been inspected. Information on the varroa mite is available on the MAF website.

Frank reflects...

by Frank Lindsay

April 2000 has been quite a month with all our focus on one thing, the Varroa Mite. The 11th of April will go down in the history of New Zealand beekeeping. Whether it will be remembered as the date varroa was first discovered and changed our beekeeping practices forever, or whether it will go down as the date that the eradication of the mite started, time will tell. At the time of writing this, the decision had not been made.

Whatever direction the MAF and the Government take, from now on beekeeping has changed. No longer can we just leave our bees to do their thing and collect honey when we feel like it. Hives will have to be monitored more closely and those not going ahead will have to be investigated. Disease checks in the spring and autumn will now have to include checks for mites. We will have to pay closer attention to those hives that die out during the winter and determine why they died. Whatever happens, we will all need further education and ongoing practical advice to assist us to live with these mites.

Some of you will be directly affected with movement controls and may be asked to depopulate your hives if the likelihood of eradicating the mite is feasible. Killing a hive that has been a source of wonder and a good family provider is not an easy thing to do. We can all remember the first hive we killed and burnt with AFB. It does not sit easy in the stomach. Then there could be a long wait until you can start again. A very hard and trying time.

If the infestation is too great to be controlled, then we will have to live with it. If this is the case then the rest of the country will, in a few years, have to adopt beekeeping practices that include the use of chemicals to keep their bees alive. From overseas experience, those that don't, soon loose their hives.

I have read the articles circulated to NBA branches and picked out a few points of interest. But before we all go racing off and making changes, we will have to learn about the mite's life cycle and an easy way to measure mite numbers in hives. We will also need information on the population dynamics of this mite for each part of New Zealand. Normally a single mite can reproduce itself 10 fold in a year.

An extract from "Managing Varroa by MAFF (UK).PB2581

When mite numbers are low, there is no obvious effect on the colony, and infestation is often unnoticeable. But heavily infested colonies may show severe reductions in brood rearing and foraging. Mite populations will increase in poorly managed apiaries until they reach levels that the colonies can no longer tolerate. Colonies then seem to loose social organisation and disband (referred to as colony collapse). The size of the mite population that causes collapse varies greatly between colonies (the reason for this is not fully understood) but may be as low as 2,500 mites.

Mite Invasion

The movement of mites in large numbers from heavily infested or collapsing colonies into others nearby, spread by bees plays a key role in rapid mite build-up. It can occur at any time of the year when bees are active.

Colonies rob collapsing colonies in the apiary, or in nearby apiaries. Bees from collapsing colonies abscond from their hive

Bay of Plenty Branch Autumn Field Day

Date: Saturday, 3 June 2000

Where: HortResearch, Te Puke Research Orchard
No 1 Road
Te Puke

Venue will be signposted

Time: 9.45am - 3.30

Before the Varroa Outbreak the main topic of the day would have been 'Pollination'. The Outbreak meant a change to the program to accommodate for how varroa will/ can influence the pollination service and in general the beekeeping industry.
We endeavour to include an expert panel discussion on the impact varroa might have.

At the lunch time break there will be sausages etc available.
Entry will be $5 per person.

Any queries: Please contact Gerrit Hyink
Phone/Fax: (07) 549-1223
Email: hyink@xtra.co.nz

with the robbing bees causing the mite population to increase very rapidly in the robbing colonies.

In areas of high colony density with heavily infested colonies, the rate of mite invasion can be extremely high, and populations may build up to damaging levels within a season.

Not a nice thought considering the outbreak is in a heavily bee populated area. What we require is an inexpensive test that can accurately determine mite numbers and with this information, predict the best time to initiate control methods. Several methods are used overseas to identify mites in hives. These range from:

- Removing 100 drone brood pupa with a cappings scraper,
- Puffing in pipe tobacco smoke and closing the hive for 15 minutes. Mites drop on to a paper sheet or sticky board,
- Apistan strips with a sticky board,
- Essential oils for detection and control as practiced by the Connecticut beekeepers,
- A shake method. 200-300 bees from off the brood frames are shaken in a jar containing a tablespoon of icing sugar for a few minutes to dislodge the mites. The jar is covered with a mesh and the contents tipped on to a piece of paper and examined, and the bees are returned to the hive.

Mites are hard to find when they are in very low levels. The most effective method being strips and sticky boards, (our present system of checking) however this method is quite costly. (A sticky board consists of a card or sticky plastic insert covered by 3-5 mm mesh which slides in the front of the hive covering the existing floor. The mesh prevents the bees from removing debris so an accurate count can take place. Mites drop on to these and are examined in 24 hours and again after several days).

The UK Ministry recommend to their beekeepers they use either, strips and sticky boards, drone brood uncapping or counting natural mite drop over a period of time. They have had a few years to work out the population dynamics and with computer modeling have produced charts and a handy monitor disc that given a certain population of mites, determines the number of days in which treatment must take place.

While we wait for a decision, there are things that can be done to prepare for a possible mite invasion. Varroa prefer drone brood to breed in, and as part of the initial control, we should endeavor to replace our brood frames, (except for one or two frames) with beautifully drawn worker comb. During the summer the drone comb can be inspected for varroa. Once numbers increase, every week or once a month, depending upon your situation, remove a drone comb frame, cut out or remove the brood, (or freeze for 48 hours). Then return the frame for the bees to clean out/rebuild so the queen can lay in it again.

If you have been following a management practice of replacing 2-3 frames each year in the brood nest, no change, however for those that haven't, perhaps they should consider ordering replacement frames and get them drawn out above the brood nest this summer.

Another recommendation is to designate which, are your honey supers. No longer should these to be interchanged with those in the brood nest, for after a while, brood nest frames could contain a residue from the chemical treatments.

Honey will have to be removed earlier so strips or other control methods can be used to keep mites at manageable levels.

For those with only a few hives, there are a number of control methods one can adopt. You have the advantage of observing your colonies a lot more frequently and therefore will notice changes in them. Hence, an integrated biotechnical control method (inexpensive but time consuming) can be practiced on them.

One research article from the UK indicated that apparently 40 percent of mites are not initially killed when the strips are put into the hive. These mites fall to the bottom board and wait for a bee to come along to catch a ride back into the brood nest. Another article suggested that beekeepers could change the design of the bottom boards to give a 50-mm deep, screened off section at the bottom for the mites to fall into. Putting a ring of Vaseline around the edges can further increase the efficiency of the bottom board as a trap.

One German beekeeper has planted a bed of Nasturtium around his hives and has had no further problems. This is known to work for codlin moth on apple trees, so he tried it for varroa mites and apparently it works for him. Sounds too good to be true but might be worth scientifically checking.

None of the methods mentioned here kill all the mites in a hive. They control them leaving 1-10 percent of mites to repopulate the hive again so it's important to vary the treatments to prevent any chance of the mites developing resistance. The best treatment method is a combination of biotechnical methods and varroacides.

The second year after mites arrive, feral colonies, unmanaged and abandoned hives will become a potential source for re-invasion. Where possible these hives should be destroyed, given away or sold. There after re-invasion is reduced if the same treatment methods are used over a wide area.

This is only a sample of what we will all have to look at if we cannot stop the mite. Fortunately we can call on the research of many other countries to help us. There still will be beekeepers. Lets not get too carried away just yet and concentrate on bringing our hives through to the spring.

Things to do this month: Winter down. Dispose of the honey crop. Scrape propolis off frames. Grade and sort combs into brood, honey and damaged frames. Fumigate for wax moth, check for wasps and control the growth around hives. Plan for the next season. Sit your Deca competency test.

Frank Lindsay

Honey Bee Biology

The Drone: A Misunderstood Male

Part 1

The poor misunderstood drone, a creature easily regarded as lazy and worthless, a mere parasitic leech on an otherwise productive colony. Since it is true that drones do not forage for nectar, and they lack pollen baskets, wax glands and stingers, it seems natural to think they contribute little to the welfare of the colony. And when these seemingly ill-equipped bees "beg" for food from their hard-working sisters, drones appear out of place, the buffoons of the beehive. In large numbers, drones seem wasteful and a substantial drain on a colony's honey supply. Such has been the way people thought about drones in times past. But these are misconceptions, though regrettable some still persist today. My goal in this article is to show more accurate ways to think about drones.

Early evidence for the way people regarded drones comes from old apicultural literature. For example in 1609, Charles Butler, an Englishman, published the Feminine Monarchy, an extensive and valuable account on beekeeping with skeps. This work included a chapter on drones. Butler considered drones necessary for breeding and warming the hive. He agreed with others that drones were idle creatures and described them in a disparaging tone. Consider the following where I quote him, only changing the spelling from its original English form, which is difficult to read, to its modern equivalent:

...yet is he [the drone] but an idle person living by the sweat of others brows. For he worketh not at all, either at home or abroad...

Even his description of the drone's flight is less than complimentary:

In the heat of the day he flies abroad, aloft, and about, and that with no small noise, as though he would do some great act: but it is only for his pleasure.

Perhaps, as people understood their world in terms of an agrarian society ruled by a monarch, the drone had no place. The queen bee was anthropomorphized as a ruler, which had the additional effect of legitimizing the existence of a political monarch as a condition of nature (and thus people should naturally be subservient to their ruler). Those who spent long hours in the fields tending crops (or others who watched that work) could identify with worker bees toiling among the flowers. But in this scheme of things, drones do not seem to occupy an obvious vital position (although some people likened them to nobles). Through the years, the low opinion of the drone persisted among some beekeepers. In its extreme form, beekeepers in the past even trapped and killed drones. Occasionally, this practice occurred in America.

In 1855, Clark Wheeler of Little Valley, New York, published a rare little book with the verbose title: *The Beekeeper's Guide or Practical Remarks on the Most Advantageous, Easy, and Profitable Management of Bees to Accompany and Explain the Eclectic Hive and Drone-Trap*. Evidently, Wheeler had a very dim view of drones:

...among bees, the male or drones is idle, cowardly, and inactive, taking no part whatever in labour of the community, and destitute of the defensive weapon peculiar to its species. That they consume the wealth of other bees is evident from the fact, that they never light upon flowers for the purpose of collecting honey...

Wheeler also blamed drones as an indirect cause of swarming and the reason bees cluster on the outside the hive. He also thought they were an obstruction to the other bees moving about in the hive.

Before full sheets of worker-size comb foundation restricted the amount of drone comb in the hive and consequently drone production, colonies could produce drones in large numbers (even though the worker bees still regulated their number). Some beekeepers in times past thought controlling the numbers of drones was necessary as this excess was not needed in mating queens, partly because they assumed the queen mated with only one drone.

Special traps were designed to remove drones from the hive. (These devices differed from the queen-drone traps used as a potential swarm control measure that came later.) In 1845, Wheeler had secured a patent on a drone-removing trap. Even a decade later, his hive design, called the Eclectic hive, still incorporated such a trap, which is touted in the title of his book (see Figure 1). After trapping several thousand drones, Wheeler advised killing them by burning, drowning, or starvation, further echoing his disdain for drones.

Past and present drone misconceptions are probably fueled by the term "drone" itself. In addition to meaning a male honey bee, the word also means an idle person who lives off others, a loafer. Another use of the word drone is a pilotless aircraft operated by remote control, in a sense suggesting mindless stupidity. The connotations imbedded in the term "drone" as well as anthropomorphizing drone bees as lazy, etc, are very misleading, making it difficult to understand their true nature. A better approach is to study drone biology scientifically, which forces these misconceptions to fade. So let's take this approach and briefly survey the scientific literature concerning drones. Hopefully, we will begin to see the drone not as a lazy ill-equipped misfit, but rather I think, as a creature specialized for mating. Also, understanding drone biology has a practical component. Sometimes it indicated certain conditions in a colony, which is helpful in honey bee management.

Drone rearing begins in the spring well in advance of virgin queens produced during swarming. Larger colonies can rear about 1500 drones. The number of drones reared partly depends on the amount of drone comb (because not all of it may be used). Honey bees also regulate the number of drones in the colony by various tactics: by placing limitations of the construction of drone comb, by regulating the amount of drone brood, and through the eviction of adult drones(1). Furthermore, in managed colonies, worker-size comb foundation limits drone comb and consequently drone production. It is interesting to note that one study comparing colonies with restricted and free drone production found no significant differences in their honey production(2).

Drones typically develop from unfertilised eggs placed in cells slightly larger than worker cells. Laying workers and failing queens produce drones that may develop in worker cells, resulting in worker-size drones. These small drones generally

indicate a queen problem. (For additional details see "Laying Workers: An Introduction to Their Biology and Photographing Their Egg-laying Behaviour," American Bee Journal, December, 1996. Pgs 845-849.)

Drones emerge in about 24 days following oviposition, becoming sexually mature at least 12 days later. Workers feed younger drones, who beg for food in the broodnest, while older drones feed themselves from honey cells. Even when still sexually immature, drones start flying at about eight days old. Initial flights are short, serving as an orientation to the hive. When drones search for virgin queens, the flights last longer, averaging about 25-27 minutes with several flights in an afternoon. Drone flight normally begins around noon with most flights occurring from 2.00-4.00pm.(2)

Drones do not fly to random places away from the hive, but rather drones from different colonies accumulate in certain regions that persist from year to year, even when queens are not present. These regions are called drone congregation areas. The flying space of a drone congregation area typically varies from 98-656 feet in diameter (30-200 meters) with a height of 33-131 feet (10-40 meters). Although the number of drones in a congregation area is quite variable, one such area had approximately 25,000 drones from more than 200 colonies(3).

Modern technology has shown the dynamical nature of the drone's flight pattern between the drone congregation areas. Using X-band radar, which tracks large groups of flying drones, scientists have found drone flyways that connect nearby congregation areas. The drone flyways form along prominent features on the land (tree lines, etc.). The drone congregation areas tend to form where the drone flyways branch. Presumably, the drones are accumulating in the congregation areas as they re-orient and select their next flight direction. In addition to mating in the drone congregation areas, mating could also occur in the flyways, even though the actual flight pattern of the virgin queen is still unknown(4).

The queen and drone meet in the air; after making contact, mating occurs in a couple of seconds. As they mate, the drone becomes paralyzed. He falls away and dies shortly afterwards. The queen typically mates with more than one drone on a mating flight, and she may take more than one mating flight early in her adult life. Older studies estimated an average of 7-17 drones mating with a queen3. More recent studies, using precise DNA techniques, indicate that queens mate with 15-20 drones, and possibly this range is an underestimate5. Interestingly, another recent study, again using DNA techniques, but on the Cape honey bee in South Africa (Apis mellifera capensis) showed those queens mate 24-44 times6. We now realize that queens require many drones for proper mating - a finding far removed from the simplistic notion of a single drone mate as assumed by our beekeeping predecessors.

As far as we know, the drones of honey bee, Apis mellifera, do not actively participate in any colony function. Mating seems to be their sole function, and we have grown accustomed to this fact, but nature has a surprise for us. In another species of honey bee found in Japan (Apis cerana japonica) we find some intriguing drone behaviour. The drones of this honey bee pollinate oriental orchids. These drones are attracted to the flowers during mating flights, and may even form what resembles little clusters on the plant(7).

In part two of this article, we look at more drone biology, including the eviction of drones from the colony, how they are anatomically designed for mating, current issues concerning the health of drones, and some interesting pictures.

Acknowledgments:

The author thanks Suzanne Sumner for her comments on the manuscript.

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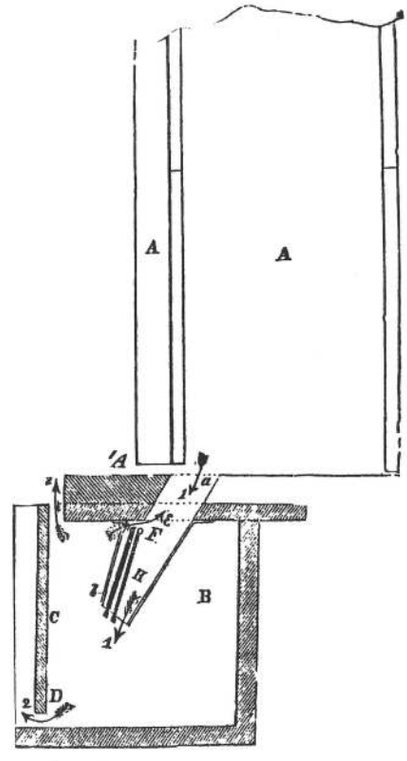


Figure 1. Wheeler's drone trap. Patented in 1845, this trap removed drones from a colony. This diagram is from his book published in 1855. The trap (marked B) is attached below the hive (marked A). The hive entrance (marked 'A) is only large enough to allow the smaller workers to pass. The drones, attracted by light from a window in the trap, pass through the one-way tube (marked F) and cannot escape. Workers entering the trap can exit through small holes (marked 2).

Marketing

At the time of writing this report I'm not sure what the final decision is on the varroa question.

I'm not a beekeeper, but I have an enormous affection for them as a group. This is a terrible 'blow' to the industry, to the very self-image we have had as the New Zealand beekeeping industry.

It's like an age of innocence has been lost.

As regards 'control' versus 'eradication'; I don't know what the right answer is: and there are strong passionate arguments from both the 'control' and 'eradicate' camps.

That's something that the industry and its technical advisers will have to decide. What is certain is that regardless of the decision, beekeeping as a way of life and as a business will continue.

And some will find or create opportunities and others won't.

I was asked to give my assessment on the economic impact of varroa. I spoke with a number of beekeepers and sent in my perspective.

That has been combined with the opinions of other sector leaders and industry experts: and the NBA Executive and MAF will develop a broad overview of all the variables: and make a decision. Whatever the decision, once it is made, we can then look at the shape of our industry and the marketing strategies appropriate.

I was particularly distressed to hear the television news reader quote the Minister of Agriculture as saying it was believed that the disease had been brought in by beekeepers.

If so, that person or persons may well keep bees, but is not by my definition, a New Zealand Beekeeper.

The name and the occupation stands for much more than that person deserves.

But I am also concerned the issue was raised. Until there is proof that it was deliberate or accidental it is unfair on the industry to suggest "beekeepers" did it.

Set out below is the information sheet I sent to various media the night it was announced on television. My main concern was to ensure that consumers did not suspect that there was something wrong with honey itself.

I was pleased to hear one announcer say to the other "absolutely not" when the question of honey being contaminated was raised.

Some beekeepers may disagree with my thoughts that we haven't fully capitalised on our clean green image. I'd welcome debate on it: and remember that with or without varroa we still have some very significant clean green values that are worth fighting for.

Copy of Information to Media:

1. This outbreak has nothing, absolutely nothing to do with the quality of the honey in our supermarkets! That honey is still pure and healthy: nothing has changed! (Because the varroa mite hurts the bee larvae, it does not affect the honey itself.)
2. New Zealand does not use antibiotics in its hives: if that changed, and such a change is maybe years away, then we would simply be doing what the rest of the world already does: again it would not affect the honey itself! But note: there are no antibiotics in New Zealand honey now, and none planned for the future.
3. The price and availability of honey: the New Zealand honey industry is a free-market, so price is a matter of supply and demand. Crops over the last few years have been average: and there are only average stocks in reserve. Some beekeepers will expect a disruption to their production, especially if hives are depopulated: so we can expect beekeepers to hold on to reserves and prices to firm as a result.
4. In the long term the outbreak will have no effect on export volumes or prices! This is because very little New Zealand honey was ever sold at a premium because of the 'clean green image'. It's been an opportunity never really capitalised on, and maybe now lost, but it was only an opportunity! The New Zealand honeys that have been achieving premium prices on the international market are those with special health values identified by the New Zealand Honey Research Unit, and those with special gourmet flavour values. (And varroa makes no difference to either of those values.)
5. The presence of varroa will affect some industrial activity: especially the export of live bees. This is very serious for the few beekeepers concerned but represents less than two million dollars a year of actual industry business turnover.
6. The New Zealand beekeeping industry is worth an estimated two billion dollars to the New Zealand economy. The presence of varroa could affect New Zealand's pollination and pastoral industries. Clover pasture, for example, the mainstay of our sheep industry, is pollinated by honeybees. And the New Zealand kiwifruit industry relies heavily on honeybee pollination. A reduced beehive population in New Zealand will affect those industries: and for that reason government needs to assist the New Zealand beekeeper to if possible eradicate the outbreak or to control it as best as possible.

Onto happier 'stuff': I gave a talk to the Marlborough Accident Clinic Nurses last month (April).

Using Peter Molan's research combined with a honey tasting and a display of manuka honeys; it was enjoyed by them all.

Three days later I get a phone call from the patient of one of the accident clinics asking for advice on honey for an incurable leg ulcer: we're now working with the nurse and the patient.

When Sandee and I were last in the States we met with the National Honey Board again at a Chef Conference: they gave us copies of a just printed information leaflet on the nutrient value of honey.

As we are often asked for this I have decided to publish it even though it applies to USA honey. But with it being an average of over 300 different floral sources of honey available in the States it should apply here as well.

Just make sure you refer to the USA source if using it!

Nutrient	Av. amount per 1 tbsp (21g)	Av. amount per 100g
Water	3.6g	17.1g
Total carbohydrates	17.3g	82.4g
Fructose	8.1g	38.5g
Glucose	6.5g	31.0g
Maltose	1.5g	7.2g
Sucrose	0.3g	1.5g
Total fat	0	
Saturated fat	0	
Cholesterol	0	
Sodium	0.6mg	2.85mg
Dietary Fibre	0	
Protein	0.15mg	0.7mg
Vitamins		
Thiamin	<0.002mg	<0.01mg
Riboflavin	<0.06mg	<0.3mg
Niacin	<0.06mg	<0.3mg
Pantothenic Acid	< 0.05mg	<0.25mg
Vitamin B6	<0.005mg	<0.002mg
Folate	<0.002g	<0.01mg
Vitamin C	<0.1g	0.5g
Vitamin A	0	
Vitamin D	0	
Vitamin E	0	
Minerals		
Calcium	1.0mg	4.8mg
Iron	0.05mg	0.25mg
Zinc	0.03mg	0.15mg
Potassium	11.0mg	50.0mg
Phosphorous	1.0mg	5.0mg
Magnesium	0.4mg	2.0mg
Selenium	0.002mg	0.01mg
Copper	0.01mg	0.05mg
Chromium	0.005mg	0.02mg
Manganese	0.03mg	0.15mg
Ash	0.04g	0.2g

Total Kilocalories per tablespoon 21g = 64

Total Kilocalories per 100g = 304

Antioxidants: Generally darker honeys and those with higher water content have stronger antioxidant values.

And now, another recipe garnered by Sandee: this is simple but superb!

Honey Poached Feijoas

Have you a Feijoa tree at your place, if so this is a great recipe by Allyson Gofton for making feijoas that bit special. (You'll be pleased to see Allyson suggesting specific honey varieties!)

12 feijoas
2 cups water
1/2 cup clover, rata or honeydew
1/2 cup sweet white wine or orange juice
grated rind & juice of one lemon

Heat the water, honey, wine and lemon juice in a saucepan and boil for five minutes.

Add the peeled feijoas. (As you peel them place under water or they will brown).

Simmer the feijoas for about 10 mins or until tender.

Remove the fruit and boil the remaining syrup to reduce by one third. Stir in the lemon rind.

Cool before placing the fruit back into the syrup to serve at room temperature, with clotted cream.

And that's all for this month: my favourite honey? One from a healthy and positive New Zealand beekeeping industry: and there's lots around!

Bill Floyd

Why Some Bee Eggs Don't Hatch

Suppose you have two queens, one, queen A, that lays 1400 eggs every day. And the second queen, B, lays 1300 eggs every day. Now then, of the 1400 eggs laid by A, suppose that 12% of them do not hatch and queen B has 2% of her eggs that do not hatch. Queen A then has 1232 worker larvae and queen B has 1274 larvae. These figures are not unreal. In fact, if you have several colonies of bees, you can determine the rate of egg hatch in your bees.

This information is not new. It was discovered in 1948 by Dr O Mackensen with his experiments on inbreeding queens and measuring the egg hatch, but this was not published until 1951. Mackensen postulated a series of "sex alleles" to explain the tremendous reduction in viability of the eggs when he artificially inseminated (AI) virgin queen bees with their brothers. Here is how it acts in actual practice and it has been repeated so many times now that almost all bee scientists accept Mackensen's hypothesis as fact.

To be a queen or worker from fertilized eggs, there have to be two different sex alleles in the egg, one from the queen and the other from the drone with which she mated. The queen mother has two sex alleles, too. Let's label them as "a" and "b". She mated in the air and at least one of the drones carried the allele "c". All eggs laid then would be fertilized by sperm with the "c" allele and 50% of the eggs laid by the queen would carry the "a" allele and the other 50% the "b" allele.

But things get much more complicated very quickly because of two important factors. The first is determined by the number of times a queen mates, or to put it another way, how many different drones leave their sperm inside the queen's vagina that get to the spermatheca? The second factor is how many of these sex alleles are there in the mating population?

We don't really know the answer to either one of these two important questions and, in fact, either one may be different in the many different environments across the USA. There have been three studies of queen bee mating in the USA, one by me in Louisiana, one by GH Cale, Jr, of Dadant & Sons Inc, in Illinois and the third by D Peer in Wisconsin. Results were very similar, indicating about 10 drones left sperm with the queen. Another study made in Brazil, using a different subspecies of bee found the queen mating with 18 drones.

There have also been four studies of the number of sex alleles in a mating population. The first was done by

Laidlaw in Brazil, the second by Mackenzen in Louisiana, both finding about 12 sex alleles in their populations. A count made by Adams in Brazil estimated 17 and a count by Woyke of the bees on the Kangaroo Island Bee Sanctuary of Australia at only six. The average number of eggs failing to hatch on that island was 25%.

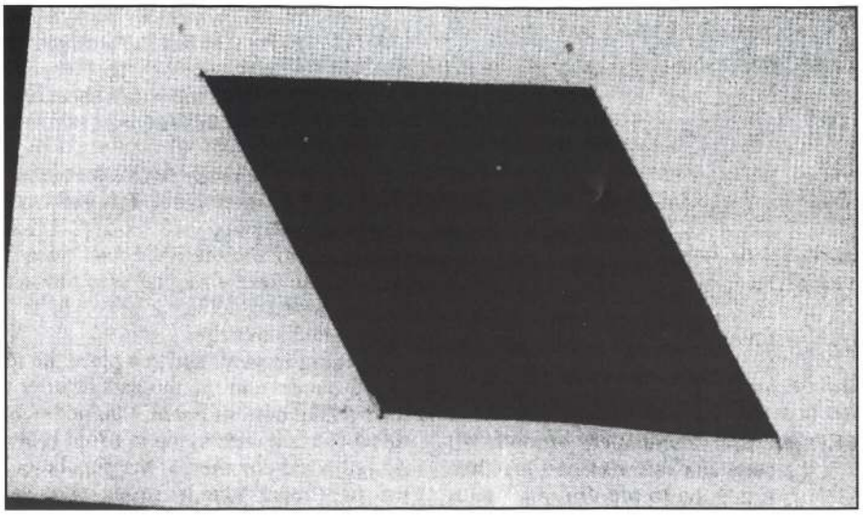
Now you can begin to see the implication. If a queen is capable of laying 1400 eggs and 12% don't hatch, the number of adult bees emerging is 1232 bees per day. Assuming a life span of 35 days, the adult bee population would be 1232 x 35 = 43,000. But if all eggs hatched and the queen was laying 1400 eggs daily, you would get an adult population of 49,000.

Since the honey production of a colony is based on its population of adult bees, the second colony would out produce the first one here considerably.

Fifty years ago Dr GH Cale, Jr of Dadant & Sons Inc, selected queens that laid more eggs. Then he controlled the sex alleles so that when the queens were mated with drones, all the sex alleles were different. The queens of his selection not only laid more eggs, all of the eggs hatched and the colonies headed up by those queens out produced all other queens on the market. This was the beginning of the successful Starline and Midnite Bee Breeding Program.

Egg hatch or viability is not a difficult thing to measure. In fact, when a queen is just beginning her egg laying is the easiest and best time. The reason for this is that you want the queen to have nearly perfect areas of comb to lay eggs in. What you do is to take advantage of the fact that queens lay all their eggs in one area of a comb before moving on to another area. Most good queens keep their brood together. When they get older, they begin making mistakes laying eggs, which is another reason for checking viability in young laying queens.

See the photo of the card laid over the comb. It exposes exactly 100 cells. Move the card over the comb until you find the very best area of brood where all the larvae are exactly the same size. If the larvae are the same size, they will be very nearly the same age. The preference is for one to two day-old larvae. Then, you count the cells in the 100 cell area that are NOT occupied with that age larvae. Subtract those empty cells, cells with



The rhombus here measures exactly 100 cells. Keep a card like this handy in the beeyard to check queen quality.

pollen or honey or cells with as yet unemerged bees from 100. This gives you the figure of the queen's viability.

Trying to gauge viability measuring sealed brood is useless because when the eggs laid fail to hatch, the queen will immediately fill those empty cells with new eggs. This results in sealed brood being in actuality, several different ages. I agree that solid sheets of sealed brood look beautiful, but they do not necessarily represent high egg viability.

Now, to make the card so it covers exactly 100 cells, you can, of course, just start cutting until you have a hole that exposes exactly 100 cells. I have done that many times. Or, you can do as I did on this three inch by five inch card (7.6mm x 12.7mm). Get a good empty comb and measure horizontally 10 cells. Mine measured 2 1/8 inches (54mm). Draw a line on the card exactly that length with a point at each end. Put a protractor on each point and make points 120 degrees parallel with each other. Draw lines 2 1/8 inches to each point. You now have a nearly exact rhombus. Lay it on the comb surface to see if you made a mistake in measuring. I have also made cards with the hole in the shape of a hexagon. Holes were cut with five, six and seven cells on each side. Unfortunately, none of these holes come up with exactly 100 cells exposed, requiring a bit of arithmetic to determine the percent viability.

Different bee comb foundation manufacturers make slightly different impression designs on the beeswax and most beekeepers buy their equipment from several different suppliers, so when using the card, make sure that it exposes 100 cells. Take the card with you to the bee yard. Keep it in your shirt pocket, so as you examine each hive, you can make viability estimates. This is one of the easiest and most accurate tests you can make of your queens. Use if frequently.

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IMPORTANT NOTICE:

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World Sugar Situation

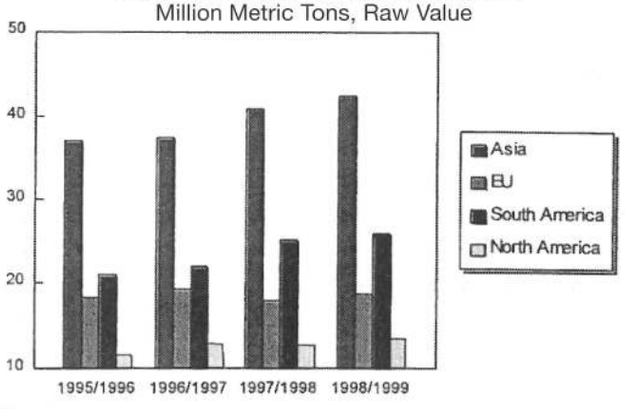
World centrifugal sugar production in 1999/2000 is forecast at a record 133.9 million metric tons, an increase of three percent above the previous year's output. This forecast is the sixth consecutive year of increased world sugar production. Projected increases in 1999/2000 in Brazil, the European Union, India, and Australia were only partially offset by expected lower output in Turkey, Poland, South Africa, and Ukraine. World sugar consumption in 1999/2000 is forecast at 130.5 million tons, a four percent increase from the previous year's level. Consumption increases are expected in almost every region, with the largest gains in Asia and Africa. World trade is forecast to increase three percent to about 36.7 millions tons. Increased exports from the EU, Brazil, and Australia will be offset by declines in Poland, South Africa, and Cuba. The export situation remains difficult, due to the high carry over stocks and low world prices.

Summary

Production

The 1999/2000 world centrifugal sugar production has been revised upward to a record 133.9 million tons (raw value), up two percent from the May 1999 forecast (Circular Series FS 1-99) and three percent above last year. Sugar produced from sugarcane is forecast a record 97.2 million tons, four percent above last season, and sugar processed from sugarbeets is forecast at 36.6 million tons, slightly down from last year. The largest upward production change since the May projection was made for Thailand, up 770,000 tons, while the largest downward revision was for Pakistan, down 640,000 tons.

Sugar Production in Largest Regions
Million Metric Tons, Raw Value

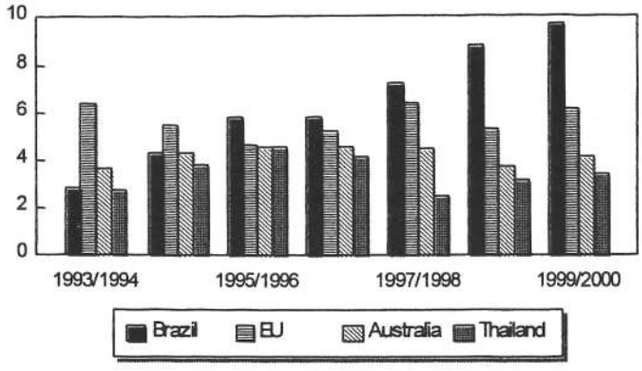


Trade

In 1999/2000, world sugar trade is forecast at 36.7 million tons, approximately three percent above the previous year's shipments. Brazil and the European Union are expected to account for much of the increase, both are forecast to increase exports by almost 1.0 million tons. Smaller gains are forecast in Australia and Thailand. South Africa, Cuba, Guatemala and Poland are all forecast to reduce exports in 1999/2000. The leading exporters will continue to be faced with an oversupply situation in 1999/2000, which has led raw sugar prices to very low levels. The current market conditions are forcing net exporting countries to make difficult decisions, such as holding high stocks, controlling production more aggressively, or continuing to export at minimal margins.

Leading importers of sugar in 1999/2000 are Russia, Indonesia, the United States, Japan, South Korea and the European Union. Russia is expected to remain the world's largest sugar importer, however at much lower levels than in 1998/99. Despite the relatively low price of sugar, many of the main importers of sugar are facing financial or political problems, which is limiting their uptake and causing increased uncertainty in the markets.

Sugar Production in Largest Regions
Million Metric Tons, Raw Value



Consumption

World sugar consumption in 1999/2000 is forecast at a record 130.1 million tons, almost four percent above the previous year's level. This increase is expected to be driven by Asia, Africa, and the Middle East. Growth in consumption is expected to continue to rise in the near future as many countries with recent economic or political trouble resume growth. Consumption has returned to a growth trend similar to 1994/95 and 1995/96, which was interrupted as financial crisis hit many developing countries. Consumption stagnated in 1998/99 and grew only 1.7 percent in 1997/98.

Stocks

Global sugar stocks are forecast to grow by 10 percent to a record 34.4 million metric tons. This would mark the second straight year of double digit growth in stocks. Stocks have grown rapidly in several South American and Asian producing countries, namely Brazil, India, and Thailand and also in the world's largest importer, Russia. The production and high stock situation has prolonged the world oversupply situation and thus, the low world sugar prices.

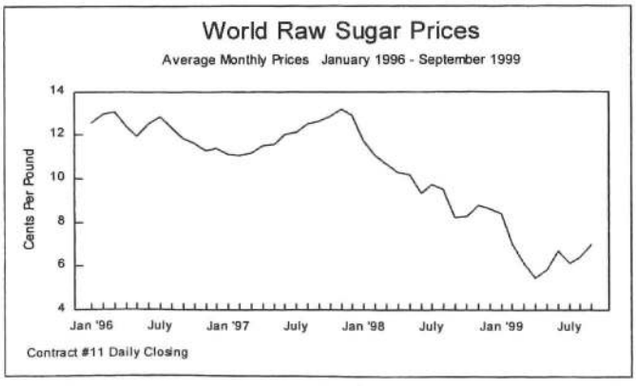
World and Domestic Sugar Prices

World prices for raw sugar (fob Caribbean Contract No 11) average 6.55 cents per pound during the first nine months of 1999 and 9.69 cents per pound in calendar year 1998. The price for Contract No 11 raw sugar has declined steadily for the past four years, with an exceptionally sharp decline in March and April of 1999, as many large producers had increased production, while many large importers were still facing financial difficulties. Additionally, many exporters were using the export market to satisfy immediate financial obligations or to avoid keeping large stocks, which helped to keep the market depressed. Beginning in September, the market leveled out after a small recovery. As the market was able to evaluate the continuing global surplus of sugar, the price held steady at 6.75 to 7.15 per pound. The average prices for 1995, 1996, and 1997 were 13.44, 12.24, and 12.06 cents per pound, respectively.

World refined sugar (CIF, London, Contract No 5) prices averaged 9.55 cents per pound in the first nine months of 1999. The average price in 1998 was 11.59 cents per pound. Refined sugar prices have mirrored the decline of the raw sugar prices, falling since August of 1997, but recovered slightly in mid-1999.

United States raw sugar prices (nearby futures, CIF duty-free paid, New York, Contract No 14) averaged 21.86 cents per pound through the first ten months of 1999. However, as signs of a larger United States domestic 1999/2000 cane and beet crop began to emerge, prices started to decline to significantly below 20.00 cents per pound.

In the United States, wholesale refined sugar prices have held steady at an average of 26.93 cents per pound for the first ten months of 1999. Refined sugar prices averaged 26.12 cents per pound in 1998, compared to 27.09 cents per pound in 1997.



Situation and Outlook in Selected Countries

North America

United States

United States sugar production in 1999/2000 is estimated at 8.1 million tons, an increase of six percent over last year's production. The increase in production is due mainly to an increase in sugar produced from sugarcane in Louisiana, where output is expected to be up 25 percent from last year.

United States exports in 1999/2000 are forecast at 159,000 tons, a decrease of 24 percent from year's level. United States exports are mainly refined sugar, with Canada, Mexico, and Jamaica as the largest export markets.

For Fiscal Year 2000, the United States Trade Representative has allocated 1.14 million tons of raw sugar imports under the raw sugar tariff rate quota (TRQ). The FY 1999 TRQ ended at 1.16 million tons of raw sugar imports. The 150,000 ton January, March, and May tranches were canceled because the 1998/99 United States stocks-to-use ratio forecast in those issues of the USDA's World Agricultural Supply and Demand Estimates report was greater than 15.5 percent.

Canada

Canadian sugar production in 1999/2000 is expected to increase by six percent to 138,000 tons. The increase is due to an 18 percent increase in Alberta, the main producing province.

With only minor production of domestic beet sugar, Canadian demand is met primarily through imports of raw sugar. Raw sugar is imported and then processed into refined sugar. Total imports are forecast to remain at 1.1 million tons on 1999/2000, the same as the previous year. Refined sugar imports generally enter under a duty drawback program with anti-dumping duties refunded if the sugar is incorporated into products that are subsequently re-exported. These imports are forecast to continue at the same level.

Mexico

Mexico's 1999/2000 sugar production is expected to total 5.2 million tons, up slightly from the May forecast, but four percent above the 1998/99 revised output. Weather for the current season has been favourable for sugarcane development and sugarcane yields are expected to be higher. Sugar outturn was revised downward last year because of lower sugar mill yields and reduced sugarcane production because of dry weather during the growing season.

Exports in 1999/2000 are forecast at 900,000 tons, an increase of 80 percent from the previous year's revised forecast. The 1998/99 export estimate was revised downward by more than 45 percent as the industry did not meet its established goal due to the low world prices. The Mexican sugar export forecast is highly dependent on the production of sugar and the substitution of alternative domestic and imported sweeteners. However, compensatory duties on HFCS may reduce the level of imports from the United States, lessening the amount of import substitution.

Domestic consumption of sugar is expected to remain flat in 1999/2000. Many factors have weakened consumer purchasing power, and thus, domestic demand for sugar in Mexico. The Mexican sugar industry maintains that sugar consumption in Mexico is not growing in large part due to substitution of alternative domestic and imported sweeteners.

Caribbean/Central/South America

Cuba

Cuba's 1999/2000 sugar production is forecast at 4.1 million tons, up eight percent from the previous year's estimate. Output has been increasing significantly since the disastrous crop of 3.2 million tons in 1997/98. However, July/December spring planting of sugarcane fell far behind plan as heavy rains caused a delay in seeding operations. This would impact the 2000/2001 crop as these seedlings require 18 months to mature. Hurricane Irene was blamed for the excessive rain, but caused very little damage to the 1999/2000 crop.

Cuban exports of sugar in 1999/2000 are expected to decrease slightly to about 3.0 million tons, due to increased competition in the world sugar market. However, the export forecast for 1999/2000 was revised up by 25 percent from the previous forecast as higher than expected production will lead to a larger exportable surplus. The Cuban Sugar Ministry had set a goal of boosting production to 6.0 million tons by 2001, but low levels of planting, slow germination, and financial problems will make this goal difficult to reach.

Dominican Republic

Sugar production in the Dominican Republic in 1999/2000 is estimated at 440,000 tons, up 11 percent from the revised harvest of last season. The state owned sugar mills will become privatised before the beginning of 2000. It is expected that sugar production will begin to show considerable growth after privatisation, not only with the mills involved, but also the installation of a new private mill which will begin operations next year.

In 1999/2000, exports are forecast at 190,000 tons, which is five percent below the previous forecast. The problems encountered in Dominican production have necessitated the import of raw and refined sugar for each of the past three years. Imports in 1999/2000 and 1998/99 have been crucial in order for the Dominican Republic to meet domestic consumption needs and fulfill their part of the United States raw sugar TRQ. The Dominican Republic is the largest supplier of sugar to the United States under the TRQ, authorised to export 185,346 tons of FY 2000. The United States also represents the Dominican Republic's largest export market.

Guatemala

Sugar production in Guatemala is expected to total 1.5 million tons, a six percent decrease from last year, due to a 10 percent decline in planted area.

Exports of sugar from Guatemala are forecast to fall in 1999/2000 to 1.02 million tons, due to smaller exportable supplies. The export forecast in 1998/99 was reduced to 1.12 million tones, also due to the reduced availability. Main non United States export destinations include Peru, Russia, Canada, Chile and Mexico. Guatemala's initial allocation under the United States raw sugar tariff rate quota for FY 2000 is set at 50,549 tons.

Brazil

Brazil's sugar production in 1999/2000 is estimated at a record 19.2 million tons, nearly the same as the May forecast, but up five percent from the previous crop. The projected increase is due mainly to high alcohol stocks, steady international demand, and higher domestic sugar prices.

Brazil is forecast to export a record 9.7 million tons in 1999/2000, an increase of 10 percent from the previous estimate.

Additionally, the 1998/99 estimate was raised by six percent as shipments were higher then expected. The actual export level in the coming year will depend on world raw sugar prices and the ability and willingness of key trading partners to import more sugar. Exports to markets in the Middle East and East Asia were strong during the first part of the 1999/2000 marketing year. The quantity of Russian imports will be important in the 1999/2000 as higher prices and large stocks may dampen Russian demand compared to the feverish 1998/99 pace. However, despite some industry concern, the imposition of the season import tariff by Russia did not entirely stop the importation of Brazilian sugar. The level of Russian imports after November 30, when the seasonal tariff is dropped, is expected to pick up and will provide a key to Brazil's overall 1999/2000 exports outlook. Brazil's main export destination is Russia, but other key markets are the United States, the United Arab Emirates, and Egypt.

In July, the Brazilian government re-organised the domestic regulatory sector, transferring both the Department of Sugar and Alcohol (DAA) and the Alcohol Interministerial Committee to the Ministry of Agriculture. The Brazilian Government continues to take measures to support its alcohol program, which promotes the consumption of both hydrated and anhydrous alcohol. The Brazilian Government recently purchased more than 400 million litres of hydrated alcohol during May to August of 1999, in order to create and maintain strategic and operation stocks. Government purchases have been carried out to relieve the market of excess alcohol stocks, create a more stable market, and ensure sufficient supplies for government enforced fuel mixing programs.

Other important changes in the alcohol industry have included the establishment of the "Bolsa Brasileira de Alcool" and "Brazil Alcool SA" Bolsa Brasileria de Alcool was created in May of 1998 to focus on centralizing the fragmented sales channels in the domestic alcohol market. Brazil Alcool SA was an enterprise founded by alcohol producers to manage the excessive domestic supply of alcohol by maintaining strategic stock levels. The company has stocked almost a billion litres of anhydrous and hydrated alcohol to be sold on the international market. The sales channel consolidation of Bolsa Brasileira de Alcool and Brazil Alcool SA and government purchases have helped to pull prices out of the recent depression in the domestic and international alcohol markets and have revitalized the sector.

European Union

Total sugar production in the European Union in 1999/2000 is expected to total 18.7 million tons, two percent above the May forecast and five percent more than last year's outturn. The increase is attributed to nearly ideal weather during the growing season. Yield increases in 13 of the 15 member states indicate a yield increase of seven percent. However, the 1999/2000 output will fall short of the record 19.3 million tons produced in 1997/98.

Sugar in the European Union is produced under a system of quotas. This policy is generally designed to support internal prices to ensure producer returns, maintain refining capacity, restrict imports to specified trading partners, and subsidise exports of domestically produced sugar. EU member states are allocated an "A" and "B" production quota, which is established until 2000/01. Any sugar that is produced by any member of the EU that is in excess of its yearly quota is considered "C-sugar". A and B sugar production are used for domestic consumption and as subisdised exports, while C-sugar must be exported into the world market without a subsidy or carried over into the next marketing year. Discussions are now beginning on the formulation of the future sugar regime in the EU. Though no revolutionary changes are expected from internal reform, discussions of sugar in the WTO may impact the EU sugar program in the future.

Exports from the EU in 1999/2000 are forecast to increase 16 percent to 6.1 million tons. Exports from the European Union are mostly in the form of refined sugar. Additionally, due to the low world prices, export subsidies provided for sugar exports have increased significantly in the past two years. The largest EU sugar markets are generally in the Middle East and Northern Africa. The five largest markets in 1997/98 were Algeria, Syria, Israel, Iran, and Russia. Imports in 1999/2000 are forecast at 1.9 million tons, slightly less than 1998/99. Imports into the EU primarily consists of about 1.3 million tons of preferential white sugar imports, either duty-free or with a reduced duty. Almost 70 percent of the EU's imports come from Mauritius, Swaziland, Guyana, Jamaica, and Fiji.

Eastern Europe/Former Soviet Union

Poland

Poland's sugar production in 1999/2000 is estimated at 1.8 million tons, down seven percent from the May forecast and 19 percent less than was produced last year. Dry weather in July and August will result is reduced yields and a smaller crop for processing.

Poland's sugar export forecast for 1999/2000 was reduced by 15 percent to 277,000 tons due to a smaller crop and the low international price for sugar. This is down 30 percent from the 1998/99 export level. One third of the 1999/2000 exports are expected to be subsidised with WTO-allowed export subsidies. Most of this sugar is shipped to Former Soviet Union countries, mainly Uzbekistan, Russia, and Belarus, which now face difficult economic problems. Exports of sugar containing foods are expected to continue to encounter difficulties due to current market weakness in the Former Soviet Union countries.

Russia

Sugar production in Russia is estimated at 1.45 million tons, up 32 percent from the May forecast and last year's outturn. The main reason for the projected rise is the replanting of 90,000 hectares, due to a May frost, resulting in a total planted area of 900,000 hectares compared to 820,000 hectares last year. In addition, yields are up to 16.5 tons per hectare compared to 13 tons per hectare in 1998. High quality seed from Denmark in the spring of 1999 is cited as the reason for increased yields.

Russia's imports in 1999/2000 are forecast at 3.7 million tons, a 30 percent decrease from the previous year's revised imports. Imports are expected to be limited due to somewhat higher prices and large carry over stocks from 1998/99. The imports for the 1998/99 season were raised 54 percent from the previous forecast as record low world prices stimulated purchases. Stocks have soared the past two years to about 2.6 million tons as a world price for raw sugar remains very low and Russian production remains inadequate.

A seasonal tariff is in effect from August 1 until November 30 for raw sugar and January 31 for white sugar. The seasonal tariff rate is 45 percent for both raw and white sugar and will then drop back to five percent for raw and 30 percent for white sugar. In response to the impending restrictions, Russian imports in the early part of 1999 came in at a faster than expected pace. Despite the seasonal tariff, some sugar continued to flow into Russia from Brazil and other suppliers. Raw sugar imports are expected to pick up sharply as the tariff is reduced and refiners start to demand more raw sugar inputs.

Ukraine

Sugar production in the Ukraine in 1999/2000 at 1.8 million tons is unchanged from the May forecast, but down 10 percent from last year. Ukrainian sugar producing areas suffered from freezing temperatures in May which caused serious damage to emerging sugarbeets. Although replanting occurred in some areas, it was not sufficient to offset the damage caused by the freeze.

The Ukrainian sugar beet industry continues to be plagued by costly and inefficient production processes and processing facilities. Despite the fact that sugar beet production has not given positive returns in the past two years, the Government of Ukraine still advises farmers to maintain the present acreage

planted. Continuing debt problems are expected to limit farmers' access to herbicides, pesticides, and adequate amounts of seed.

As a result of continued low production, exports are forecast at a record low of 50,000 tons in 1999/2000. Ukraine exported 1.6 million tons in 1996/97, but has not recovered after a series of poor crops. Ukrainian imports are forecast to grow to about 400,000 tons. Imports are generally raw cane sugar, which is refined in more than 70 factories. Most imports come from Brazil, El Salvador, and Cuba, which have access to a preferential tariff. Russia is traditionally the main importer of Ukrainian sugar, but in 1999/2000 exports are expected to be limited to government-to-government agreements using sugar as repayment for resources supplied by Russia and other Former Soviet Union countries.

Africa/Asia/Middle East

India

India's sugar production in 1999/2000 is estimated at a record 18.4 million tons, three percent above the May forecast and six percent more than last season. The expected increase is attributed to relatively attractive cane prices and timely rains.

The government procures 40 percent of the sugar produced by the mills as a levy, which is distributed to consumers at subsidised rates through the government-operated Public Distribution system. The mills can then market the remaining amount of sugar in the open market.

Imports of sugar are expected to fall sharply from one million tons in 1998/99, to a forecast 200,000 tons in 1999/2000. The Government of India raised the import duty on sugar three times between October 1998 and October 1999. The current duty equals 27.5 percent ad valorem, plus a countervailing duty of rs. 850 per ton, which is reportedly equivalent to the local taxes applied on domestic sugar. The increased duties have squeezed the margins on imports of sugar, despite the current low international price. India's imports come primarily from Brazil, Thailand, and Pakistan. Exports in the past two years are now mostly under preferential quota levels to the European Union and the United States.

Pakistan

In Pakistan, sugar production in 1999/2000 is estimated at 3.2 million tons, 17 percent less than May projection and down 15 percent from the previous season. The decline in projected output is due to a 10 percent reduction in area and lower yields because of low monsoon rains in July and August.

In the 1999/2000 marketing year, Pakistan's exports of sugar are expected to be limited to 200,000 tons. Many industry observers expected Pakistan to have difficulty exporting sugar, given their relatively high production costs and the high level of competition in world markets. To promote sugar exports, the Government of Pakistan provides an export subsidy of approximately $90 per metric ton to help export stocks that have accumulated over the past several years.

South Africa

South Africa's 1999/2000 sugar production is estimated at 2.7 million tons, up four percent from the projection in May, but down six percent from the 1998/99 season. The decline from last year was due to drought which stressed sugarcane.

South African exports have been revised upward by 13 percent to 1.3 million tons. South Africa's main export destinations are South Korea, Japan, and Russia. South Africa's Department of Trade and Industry, which oversees the sugar industry, continues to support maintaining a tariff for imported sugar and a single channel for export marketing. South Africa recently notified the WTO of an export subsidy of R 18.7 million for more than 26,000 tons of sugar. The Government of South Africa claims that this subsidy is producer financed, but detailed information on this system is not yet available.

Thailand

Thailand is expected to produce a record 5.8 million tons of sugar in 1999/2000, 15 percent above the May forecast and seven percent above last year's revised output. The higher expectations are due to the earlier onset of the 1999 monsoon rains, optimal rainfall in the principle growing area, and minimal pest and disease presence in cane fields.

Sugar exports for the 1999/2000 season are forecast at 3.4 million tons, an increase of six percent due to the stronger production. The 1999/2000 export forecast was revised upward by 13 percent from the last report as a result of the higher than expected exportable surplus. Japan, South Korea, and Malaysia are the major buyers of Thai raw sugar. Indonesia is the major purchaser of Thai white and refined sugar. The weak international sugar market will also push Thailand to increase stocks 35 percent to a record 1.6 million tons.

Turkey

In Turkey, sugar production in 1999/2000 in forecast at 2.0 million tons, down 19 percent from May and 25 percent from last year. The decline is a reflection of Government policy changes made in 1999 that placed strict controls on production. Farmers will receive the full support price only if they produce at their assigned production tonnage.

Turkey's exports are forecast to remain at 400,000 tons for a second year. However, due to the lower level of production, stocks are forecast to decrease by about one half, to 430,000 tons. Turkish export destinations primarily include Georgia, Azerbaijan, and Syria.

Oceania

Australia

Sugar production in Australia for 1999/2000 is estimated at 5.4 million tons, three percent more than the May projection and 10 percent more than the previous season. Increased area and higher yields in central and southern Queensland will more than offset lower production in northern Queensland.

Australian sugar exports in 1999/2000 are forecast to rise to 4.2 million tons, up 12 percent from last year's shipments. Korea became the top importer of Australian sugar in 1997/98, with Japan, Malaysia, and Canada as the other most important export destinations. Due to the world oversupply problem that has resulted in heavy export competition and low prices, Australian sugar stocks are forecast to rise 47 percent to 545,000 tons in 1999/2000. Australian stocks have risen more than 200 percent in the past two years as a result of the depressed world market.

The FAS Attache Report search engine contains reports on Sugar for more than 45 countries including those described above and China, Indonesia, and Colombia.

THE ARRIVAL OF THE MITE

We woke one sunny morning and switched the wireless on
To hear the latest news and talk from the information zone.
It was the year two thousand, and the day was legs eleven,
The month, it was the fourth month, of time, between earth and heaven.

We were, of course, still in bed, we are not early risers,
And the news we heard was tragic, for Arnie and his team of advisers.
The dreaded varroa jacobsoni, had entered this truly great land,
And who had dealt the apiarists, this very useless hand.

The mystery was how it had come, to decimate the bees
And right on top of NBA sending bills for their apiary fees.
Had it come by plane, or cargo ship, or even acid rain,
It might be talked about for years, with the answer still the same.

Nobody said it was down here, but up in Jafa fields
Where the dollar works by mobile phone and the culture is in yields.
It surely shook up MAF, who were working overtime,
No shuffling papers back and forth, but out there in the clime.

They cordoned off South Auckland, and then went further south
No one could move their hives or bees until it was sorted out.
How many apiary sites were struck by this vicious little mite,
The hobby folk all huddled round in a circle very tight.

They met at their monthly meeting five days after it was known,
The day of the honey competition, where the victors were then shown.
They put their heads together and came up with a plan,
To help the hives extinguish, this brute, if they only can.

I thought about this problem, and heard that it was said,
The little pests hadn't been on show, in Aussie or our New Zealand
But the thing that really bugs me most, now that it has come,
Have we been beaten again by the Aussies, and have they really won?

On further thought, I went right back to the basics of our time,
To the 'good old book', there in chapter one, were the creatures of all kind,
And I'd learnt of the plants, and the seed bearing trees, which I use each day when I cook
Was it Adam or Eve ate the apple? Gosh it's there in that old time book.

Perfect varroa control?

Actually no, but now that I have your attention let me go on. Pettis and Shimanuki at the Beltsville Bee Research laboratory in the USA have developed an idea from the simple observation that where a hive is fitted with a varroa floor some of the mites which land on the tray under the wire mesh are still alive.

In fact they found that in an untreated colony about 40 percent of the varroa falling down were still alive; it is not clear whether these are just unfortunate or whether they are being dislodged by bee grooming. There seems no reason to doubt that when these mites land on an ordinary, solid floor they simply climb back on to the next passing bee and carry on as usual.

To investigate this the researchers used an observation hive which had a rectangular tunnel leading from the brood chamber to the outside. Pieces of mesh were put over 9cm square holes in the tunnel floor and boxes containing live varroa fixed underneath. Thus simulating varroa on a tray below a varroa floor. If the depth of the box was 1/4" or 1/2" then 20 percent to 30 percent of the mites were able to climb back up to the bees but when the depth was 2" none of the mites reached the bees. It seems likely that the varroa are able to detect the movement or smell of bees nearby and are attracted to them, but if the bees are not close then they conserve energy by waiting.

Some preliminary experiments carried out by Bob Ogden and myself for DARG last summer lead to a similar conclusion. In this case the tray of a varroa floor was divided into four equal quadrants and two diagonally opposite ones were surrounded by a smear of Vaseline (petroleum jelly). Counting showed that many more varroa were trapped inside the Vaseline barrier than on the uncoated quadrants. The simplest explanation is that many varroa were able to walk off these areas back to bees, while the greasy layer discouraged those who encountered the Vaseline; perhaps the smell made it difficult for them to smell the bees above.

Dr Steve Martin's work suggests that during the summer months the natural mite drop is about one thirtieth of the mite population (we have no indication of whether this figure assumes a sticky floor to trap the mites). If we can retain about a quarter of these who would otherwise have escaped back to the bees then we are reducing the varroa population by roughly one percent each day. The few results from DARG suggest that with varroa floors on ordinary hives pretty well all of the live varroa get back to the bees so it seems worth stopping them from doing so.

Over the few months of summer this will not be enough to prevent all harm to the bees, but it will certainly reduce the harm done, especially by the spread of viruses. So it seems that either varroa floors should have a long drop, about 2" between the mesh and the tray or the edges of the tray should be smeared with Vaseline. Of course you will still need to clean the tray at each inspection to keep the wax moth at bay. These results need to be checked.

Brian Gant

WHEN THE LAST BEE DIED

Betty Lies

When the last bee died,
Nobody noticed.
Nobody put on black or made a dirge for the death of honey.
Nobody wrote an elegy to apricots,
No one mourned for cherries.

When the last bee died,
Everyone was busy.
They had things to do,
Drove straight to work each morning,
Straight back home each night.
The roads all seriously hummed.
Besides, the pantries were still packed with cans of fruit cocktail in heavy syrup, deep freezers full of concentrated grape and orange juice, stores stocked with artificial flavouring.

When the last bee died,
Nobody saw the poppies winking out,
Nobody cried for burdock, yarrow, wild delphinium.
Now and again a child would ask for dandelions, quickly shushed:
That pest!
And everyone is fine.
The children healthy, radish-cheeked.
They play she loves me/she loves me not with Savoy cabbage leaves, enjoy the telling of the great myths, peach and peony.
No one believes in apples anymore.

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The Mead Page

Is there a Morning-After for the Mead Tippler?

We are told that the great ancient civilisations loved wine, woman and song, and naturally paid the price for their overindulgence. We read about the Vikings not attempting their marauding campaigns without being intoxicated by mead. They are said not to be able to bring back any fair maiden if they didn't have a swig before departing; it was most likely due to their state of mind that all maidens seemed fair.

The Greeks seem to have come up with the first idea for preventing hangovers. They apparently believed that amethysts could counter the headiness and therefore studded their goblets with the precious stones. The Romans, who could certainly match the Greeks when it came to orgies of feasting and drinking, were the first people to make a study of the hangover. Pliny the Elder, AD 23-79, is said to be the first recorder of remedies. In one of his books he states that hangovers can be avoided by wearing a necklace of parsley when retiring to bed after a heavy drinking session, or cured the following morning by swallowing two raw owl eggs in wine. Another cure he noted was swigging down a mixture of garlic and warm olive oil - the garlic to purify the blood and the oil to soothe the quesy stomach. While the parsley necklaces have now gone out of vogue as a curative, the raw egg, olive oil and garlic have all become staple ingredients in several recommended cures.

I have heard many claims from mead makers, who claim that mead does not give a hangover. This is one area I have no authority on as I have never drank enough mead to find out if it gives a hangover. During my latter years as a teenager was the last time I ever suffered from a hangover. I never enjoyed losing control of my senses, nor do I enjoy headaches, having suffered for most of my life with migraines, so I made a commitment to myself not to over indulge if I could help it. So far so good, I have enough power to say stop.

It is quite possible that the lighter younger meads provide a commendable degree of tolerance in punishing the indulger of excess mead. In all alcoholic beverages reside impurities known as congeners. It is these same impurities which give the drink its character, and finally the interest to the drinker. Hence there is a need to arrive at a delicate balance to include as many of the aromatic congeners as possible, while excluding the noxious ones. The Mead Master's task is further complicated because these congeners vary widely, and include aldehyes, phenolics, and more or less aromatic esters. Up to 200 congeners may be in a mead that has been aged in wood. However they are still not fully understood and we are still learning how it affects the final product.

Evidence suggests that the richer, darker meads contain a lot more congeners than the paler varieties. There is the belief that the congeners, or should I say the multitude in numbers of these congeners are responsible to some degree for the hangover. True it may be, but, conversely, there is no guarantee that drinking only light mead will avoid a hangover.

Strangely enough, research into one of the world's most common maladies has not been undertaken by science in the same manner as other oddities. In fact, the medical profession mostly see it as something for which the victim has only himself to blame. So the hangover remains a universal problem that has to be faced by most people at one time or other in their lives, mead drinkers included.

Eddy Lear, PO Box 75979, Gardenview 2047
Acknowledgement: South African Bee Journal

Checking Hives

Photo taken at the Wairarapa Hobby Beekeepers Club November monthly meeting, checking the bees of Arnold Eslen, Convenor of the Wairarapa Club, for mites.

Dogs

While visiting their beehives, beekeepers see a lot of dogs. Generally they give us no trouble, for as far as they are concerned we are just part of the farming scene. Like humans they vary in their intelligence and temperament. There are good, bad, clever and stupid dogs. There is an easy way to tell the difference between a good dog and a bad dog. When he runs towards you, hold your hand out and if he licks it or sniffs it he is a good dog. If he bites it he is a bad dog. If he looks as if he might bite your hand get your assistant to hold his hand out. If your assistant is stupid enough to do so then he is too silly to be working for a beekeeper, might I suggest he has missed his calling and should be at Wellington in Parliament making laws to help drive beekeepers and other people crazy trying to comply with.

When I was young I did a lot of horse riding and had a fox-terrier called Jip. He used to love going horse riding with me and would run and jump on to my foot in the stirrup and then up to the saddle in front of me. He could stop in the saddle better than I could even when jumping over hurdles. Jip was a clever little dog. I also had a pig dog called Glen and his job was to hold on to the ear of a pig whilst another holder held the other ear. I thought Glen was a good dog but the pig, no doubt, would hold the opposite view.

Once when I drove my truck into a bush yard I was followed by a young barking dog, he hung about and kept barking after I started working the hives until he got stung under the tail, then he ran as fast as he could for home dragging his backside on the ground to try and get the sting out. I still laugh when I remember how ridiculous he looked with his low slung body and frantically reciprocating legs.

Dogs are like people, some of them have to learn the hard way.

Ron Mossop

Definitive Honey Cake

(16 Servings)
Nonstick cooking spray
3 1/2 cups all-purpose flour
1 tbsp baking powder
1 tsp baking soda
1/2 tsp salt
4 tsp cinnamon
1/2 tsp cloves
1/2 tsp allspice
1 cup vegetable oil
1 cup honey
1 1/2 cups granulated sugar
1/2 cup packed brown sugar
3 eggs
1 tsp vanilla extract
1 cup warm coffee
1/2 cup orange juice
1/2 cup shredded, peeled apples (optional)
1/2 cup sliced almonds

Preheat the oven to 350°F. Generously spray a nine or 10 inch bundt or angel food cake pan with nonstick cooking spray.

In a large bowl, whisk together the flour, baking powder, baking soda, salt, cinnamon, cloves and allspice. Make a well in the centre and stir in the oil, honey, both sugars, eggs, vanilla, coffee and orange juice.

Using a strong wire whisk or an electric mixer on slow speed, mix the ingredients until thoroughly combined, making certain that the dry ingredients are not stuck at the bottom of the bowl. The batter will be thick but pourable. Fold in the shredded apples, if using.

Spoon or pour the batter into the prepared pan. Sprinkle with the almonds. Place the cake on a baking sheet and bake until done, about 60 to 75 minutes. The cake is done when it springs back when gently pressed with your fingertips. Cool for 10 minutes, then invert the cake onto a serving plate.

Honey-Apple Baklava

(16 servings)
12 ounces walnuts
3 cups coarsely chopped, cored, unpeeled apples (about 3 medium)
1/2 cup sugar
1 tsp cinnamon
4 ounces (1 stick) unsalted butter, melted
16 ounce package frozen phyllo dough (20 sheets), thawed*
3/4 cup water
3/4 cup honey
3/4 cup sugar
1/2 tsp cinnamon

Preheat the oven to 350°F.

In a food processor, finely chop the walnuts (you will have about three cups); remove to a large bowl. Add the apples to the food processor (no need to clean the container first) and chop until the apple pieces are pea size. Add the apples to the walnuts and toss together with the sugar and cinnamon. Set aside.

Brush the bottom of a 10-inch tart pan (with sides at least two inches high) with some of the melted butter. Centre one sheet of phyllo dough in the pan and brush with some butter. Repeat this process, making layers of eight sheets, smoothing the phyllo across the bottom of the pan and pressing it into the sides. Allow the excess phyllo dough to extend beyond the edge of the pan.

Spread half of the apple-nut mixture over the phyllo layer. Repeat the process, buttering each of eight sheets of phyllo, stacking them and then adding the remaining half of the apple-nut mixture. Top the layers with four more sheets of phyllo dough, again buttering each layer. Brush the top layer with more butter. Roll the excess phyllo around the sides of the pan into a tight border around the tart.

Using a very sharp paring knife, cut the pastry into eight wedges. Then cut across the cake twice, making one cut above the centre cut and one cut below the centre cut to make smaller portions.

Bake the baklava in the preheated oven for about 30 minutes. Reduce the temperature to 325°F and continue to bake until the top is golden brown, about 30 more minutes.

Meanwhile, in a medium saucepan over medium heat, stir together the water, honey, sugar and cinnamon and simmer until the sugar is dissolved, about five minutes. Remove from the heat and cool. Pour the sauce over the baklava and refrigerate for two hours or as long as over night before serving.

* Note: Phyllo (or filo) dough, found in the frozen food section of many supermarkets, needs to thaw in the box at room temperature - it takes about four hours. Do not open the box until all other ingredients are assembled and you are ready to work. Carefully unroll the phyllo sheets onto a smooth dry surface. Immediately cover with plastic wrap and then a damp towel. Work with one sheet at a time, keeping the remaining sheets covered.

Bee Sting Honey Cakes

(8 servings)
2 cups all-purpose flour, plus additional for working the dough
3/8 tsp salt
1/3 cup sugar
2 tsp finely minced lemon zest
1 tsp finely minced orange zest
2 3/4 tsp active dry yeast
8 tbsp (4 ounces) unsalted
1 cup milk, warmed
1/2 tsp vanilla extract
1 egg
Nonstick cooking spray
1/3 cup honey
1/2 cup (about 2 ounces) sliced almonds
Confectioner's sugar or white chocolate for topping

In food processor, combine the flour, salt, sugar, lemon and orange zests and yeast. Cut four tablespoons of the butter into pieces and add to the processor. Pulse to form coarse crumbs.

To the ingredients in the food processor, add the warm milk, vanilla extract and egg; process until the mixture forms a thick, batter-like dough. Carefully remove the blade of the food processor and slide the bowl into a plastic bag. Set aside at room temperature to rise for two hours.

Generously grease eight four inch tart pans with nonstick cooking spray. Line the bottom of each pan with a circle of parchment paper.

Gently punch down the dough with a lightly floured fist and divide it into eight equal portions. The dough will be very sticky. On a lightly floured surface, flatten the balls and spread the dough into the prepared pans.

In a medium bowl, cream together the honey and the remaining four tablespoons butter. Place a small dollop of honey butter on top of each tart and sprinkle each tart with some of the almonds.

Preheat the oven to 400°F. Transfer the tart pans to a baking sheet; set aside to rise until the oven is thoroughly preheated, about 20 minutes.

Transfer the baking sheet to the oven, reduce the heat to 375°F and bake until golden brown, 22 to 25 minutes. Cool and dust with the confectioners' sugar or, if you want a beehive look, drizzle melted white chocolate over the top of the tart in concentric circles.

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