HiveIights

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Fluvalinate resistant varroa mites in Ontario

Travels in the Genetically Modified Zone

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CHC is the national organization of the beekeeping industry. It is the vital link between beekeeper associations, governments and provincial apiculturists.

Beekeepers in business can claim CHC membership and travel to the annual meeting as eligible business expenses for tax purposes.

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HiveLights

August 2002 Vol 15 #3

EPEC (purple) induces the formation of pedestals on the host cell surface (orange)

Regulars

Articles

Reviews

News releases

Photography & illustrations:
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Next Issue:

Mead - VQA seal of approval

B Qual - Aussie quality assurance

On Farm Food Safety

and more

CHC Activities

Heather Clay National Coordinator CHC

In April 2002 David MacMillan and I traveled to Ottawa to meet with government officials regarding a number of issues concerning beekeepers.

Maximum Residue Level for Oxytetracycline and Tylosin

Oxytetracycline hydrochloride (OTC) has been in use as an antibiotic for more than 40 years. When it was first registered for use there was no requirement to set a maximum residue limit in honey. The food inspectors operated on an unofficial "administrative tolerance" of 0.1ppm (100 ppb). In the past this has not been a concern because residues below 0.1 ppm were not detectable. However advances in technology now mean that the scientific equipment for checking residues can detect levels as low as 0.006 ppm (6 ppb). Without an official MRL the Canadian Food Inspection Agency enforces a zero tolerance for oxytetracycline in honey. Recently tylosin was introduced to the Alberta beekeeping industry to control resistant AFB but there is no MRL for tylosin either. It is a big concern to the beekeepers that this bureaucratic bungling may cost them their crop of honey. We are working hard on the issue of establishment of MRLs for OTC and Tylosin.

Nutrition labeling

Nutrition labeling is coming soon. Smaller producers (less than $1million production) will have two years to switch to the new nutrition label that is expected to be introduces later this year. The CHC has requested the use of a generic nutritional label which all honey packers will be able to use. As we get more information from Health Canada, it will be available on our website www.honeycouncil.ca.

Coumaphos Emergency Registration

The finds of varroa mite that are resistant to fluvalinate treatment prompted various provinces to request the emergency use of coumaphos. New Brunswick, Ontario, and Manitoba received permission for the conditional sale and use of coumaphos in the problem areas. British Columbia and Alberta are in the process of getting permission for coumaphos treatment. The availability of coumaphos should help beekeepers deal with the situation while they work on improving their varroa mite management. The CHC is working with various authorities to have the drug registered and legally available to beekeepers who need an alternative to fluvalinate.

Honey House Grading Regulations

The new Honey House Grading Regulations were discussed with CFIA personnel. Some producer packers have been part of a pilot programme to test the workability of the new inspection system. There are a few problem areas but generally most were happy with new inspection practices. It requires more paperwork than most are used to and the CHC is working with the CFIA to ensure that the rules are kept "beekeeper friendly".

Chloramphenicol in Chinese honey

A mini crisis erupted in April and May when chloramphenicol was detected in imported Chinese honey. The CFIA responded to a directive from Health Canada to recall all products that contained the offending Chinese honey. A list of recall products appeared on the CFIA website and the media chewed on the story for some time. It is surprising how many products contained blended honey. The unfortunate part is that blended honey can be labeled Canada No 1 and there is often no indication that it has been blended. Honey sales will likely be affected by the recalls. On the good side, the price of Canadian honey has increased and most of the stocks of local honey have been sold.

Imidacloprid problems

The summary of the imidacloprid workshop in Calgary, January 2002 reported that imidacloprid when used correctly is not a threat to honeybees. A number of beekeepers disagree claiming that the reviewers only looked at short term studies and that the study in 2001 on PEI did not check the colonies that had experience problems of decline. As a result, researchers Dr.Jim Kemp and Dick Rogers have sought funding to conduct a more detailed study on PEI during the summer of 2002. Results will be know in June 2003. The CHC is very supportive of this initiative as it should investigate the many factors that contributed to the decline of colonies.

Organic honey

The Canadian General Standards Board is currently reviewing the standards for the production of organic honey. Our association has not been included in the process and we found out during our meetings in Ottawa that there was a chance of getting involved before the end of the review process. We sent a representative, Terry Mcevoy to the organic working group meetings in Ottawa. He was able to present our position on the problem of buffer zones and organic certification. Beekeepers can control what goes into the hive and what crops they place the bees on but they cannot control the land use in a zone of 3.5 km radius — 3850 ha or 9500 acres. We want to see the Canadian standards made realistic and brought into line with international requirements. It is a bizarre situation that Canada is one of the least urbanized countries in the world but we have such unrealistic standards that it is almost impossible to qualify for organic honey certification.

Board of Directors

Report from the president

David MacMillan, President CHC, Ontario

Dave MacMillan
Ontario

The situation over Chinese honey and chloramphenicol residues has brought to light a number of concerns that need looking into!

First of all how much of this antibiotic has been entering our food chain and for how long? Our food inspection agency only began testing for the residue after the European Union rejected Chinese honey in February 2002. The CFIA will tell you that they can't check for every banned substance but why are importers not required to prove the product meets our standards? Why can products like Chinese honey be imported without any background checking. Importers should be legislated into proving these products meet our safety standards. What is the point of regulating our own producers to such an extent that we can hardly stay in business and at the same time allow unregulated imports to flood our markets?

Secondly, lots look at what has happened to the price of honey since the Chinese honey has been taken out of the picture. The effect of the recalls on Chinese honey together with the antidumping duty levied by the US on Chinese honey has pushed the price of honey from $90 per lb to $1.52 per lb. The domestic price of honey has been severely influenced by the imports and we have a clear case of injury due to dumping! So when the Chinese remove chloramphenicol from their honey and once again flood the market with cheap honey, what are we going to do? We have been far too complacent in the past and unwilling or unable to act as an industry in a unified fashion. Please consider the above situation, discuss it at your meetings, bring it to the attention of your fellow beekeepers and make plans to act. This season we have an opportunity to promote quality Canadian honey and get the price it deserves.

Remember that the CFIA is enforcing a zero tolerance on all antibiotic residues so be careful with chemicals used in the beeyard. Have a good summer

Cross Canada reports

Maritimes

While the bees were still packed away for winter, Nova Scotia beekeepers, as well as beekeepers from New Brunswick and Prince Edward Island, attended a Formic Acid Workshop for Maritime beekeepers. Partial funding for the workshop was provided by Agriculture and Agri-Food Canada through Agri-Futures, Nova Scotia's Adaptation Council. The workshop was filled to capacity, well reviewed and provided beekeepers with a good base for the proper use of formic acid for Varroa mite control. This spring is the first season that Nova Scotia commercial beekeepers have used formic acid as their main control for Varroa mites.

Paul Vautour
New Brunswick

The results from bees sampled in the fall of 2001 for tracheal mites show that all samples were clear of tracheal mites. Nova Scotia will continue to sample colonies to monitor the clear status within the province.

With just a few exceptions, Nova Scotia over-wintering was very good with an estimated winter loss of just 10 percent. Many beekeepers remarked that the bees looked better than they have in years. The spring of 2002 has not been kind to beekeepers or bees with prolonged cold wet periods just when the bees need good weather to help with spring buildup. With that said the bees in Nova Scotia are looking good going into blueberry pollination. It is estimated that 16,500 colonies will be used for blueberry pollination this year. It was also reported that a relatively severe case of American Foul Brood infestation was found in at least one large beekeeping operation in Nova Scotia.

Nova Scotia will be hosting the Maritime Bee Tour this year to be held July 26/27. Florida State Apiarist, Lawrence Cutts will be the Tour's guest speaker.

Prince Edward Island bee-keepers are participating in a further study to determine if there are residues of imidacloprid to be found inside bee hives (wax, pollen, honey). Dr. Jim Kemp of UPEI and Dick Rogers, Wildwood Labs, will carry out the tests in PEI and New Brunswick. Funding was made available from the Canadian Adaptation and Rural Development (CARD) fund. Jim and Dick are also conducting another major study with the bulk of funding coming from the Bayer Company with matching Canadian Federal Government funds. This study will target commercial beekeepers in PEI and NB with selected hives being monitored over several years. The study will encompass the entire environment – both inside the hive and the surrounding community in an attempt to discover the reason(s) for such high bee mortality in recent years.

In New Brunswick beekeepers are reporting widely varying over-wintering results – some with 10 percent losses while others report 75 percent losses. Cold, wet weather also slowed down the buildup and some colonies went into decline. Testing was done for Varroa resistance to fluvalinate and some samples were positive for resistance. The province obtained an emergency registration for coumaphos from the PMRA for the current year.

The NBBA obtained a $70,000 grant from the NB Agricultural Council, which administers the CARD fund. This will be used to conduct training and a thorough inspection of apiaries in September for all diseases and, in particular, for colonies that show Varroa resistance to fluvalinate. Those apiaries will be treated with coumaphos by the inspectors according to label directions. The following spring the inspectors will again test and inspect the colonies for disease and apply formic acid as required. It is planned that a province-wide effort will be made to implement an IPM schedule for the future.

There is a shortage of bees for wild blueberry pollination and it is reported that some beekeepers from Quebec who had committed to provide bees cancelled because of the fluvalinate resistant Varroa.

Québec

In general we can say that the winter was mild, actually for a while we thought spring started back in February. Having had a nice winter, the results of overwintering were better than the previous year.

The start of the 2002 season was slow. March and April seemed warmer than usual but May and June were generally

wet and cold. The rain should be good for the nectar flow. I was once told that the secret to making honey is having lots of rain in the spring followed by lots of heat for July and August. So we will cross our fingers for summer sun!

Alain Moyen
Quebec

Apple pollination was 10 days later than 2001 but with much better results. The apple blossoms had an average of 3 to 4 good days of pollination which according to apple producers shoud produce a good crop.

Well despite the not so good start up, one thing positive is the honey prices. It is selling for anywhere from $1.20 to $1.50/lb so that is good news for the time being.

The Québec Federation of beekeepers has a lot of issues to deal with but one that is going to be hot is the registration of bee hives. The problem is we are not sure if it should be the beekeepers, the hives or the yard sites that should be registered and no-one agrees on who is to pay. Everyone agrees there is a need for registration but the process is under discussion.

So in the meantime, I wish everyone a good season.

Manitoba

It was a very frustrating spring in Manitoba. Most hives came through winter in good condition, causing great anticipation in beekeepers. Then late April and all of May were terribly cold so that bees could not get the pollen needed for good brood-rearing. As spring seeding was also delayed, there still exists an opportunity for good crops. Of course, the talk about higher honey prices is pretty exciting.

Phil Veldhuis
Manitoba

The MBA is funding two research projects this year, one on overwintering and one on queen production. We are contributing to Dr. Currie's research into indoor fumigation. Early this spring, several beekeepers gathered to help move the hives out of the University of Manitoba wintering building. Each hive was weighed and then examined for other symptoms of good or poor wintering. This kind of data collection is laborious but fundamental for good research. Most of these hives were loaned to the University by beekeepers as "in-kind" support in return for a charitable tax receipts from the University. We are also supporting a Queen development project. In conjunction with a nascent Queen Breeder's Association, we plan to identify good bees as the baseline for stock improvement.

A survey is being conducted to determine the opinion of Manitoba beekeepers on bee imports from mainland U.S. I will report the results of the poll in the next edition of Hivelights.

Saskatchewan

Spring missed Saskatchewan this year. The mild and dry winter ushered in a drier and colder season than our province has experienced for many years and most areas are about three weeks behind schedule. The cold nights of April and May, where temperatures often dropped to minus 10 or below, decimated nucleus colonies, where their populations weren't sufficient to withstand the cold. Many nucs perished because the bees were torn between a need to cluster, and a need to try and protect the new brood and as a result, saving neither themselves or their brood.

Winter colony survival varied substantially. Although the winter was mild, the lack of snow cover also meant a reduced insulation value and yards that weren't well protected from the wind lost substantial numbers. Some beekeepers suspected corn syrup in their colony losses, but definitive proof of a problem is difficult to establish. In speaking with a number of beekeepers, I would estimate our winter mortality at close to 20%.

Wink Howland
Saskatchewan

The drought that affected large parts of Alberta last year, and to a lesser degree, parts of Saskatchewan, appears to be continuing. All parts of the province have had below average rainfall this Spring, and in many areas, there has been no rain and no spring run-off. Cattle were bale fed through May as there was not enough pasture to support them. Even the dandelions, bane of the avid lawn keeper but blessing to the beekeeper, are in short supply. The delayed Spring certainly will delay our honey flow, and unless moisture is received soon, that flow will be very limited. What may save our industry this year, is the high price being paid for honey. In actual fact, it may turn out to be a combination of below average crops and above average prices that create an average year for us.

Saskatchewan producers are concerned that the Federal government has yet to establish Maximum Residue Levels for the chemicals used in our industry. CFIA has been particularly diligent during the past year, in looking for any oxytetracycline residues. Since no MRL has been established for oxytet, detection of any amount of the drug in our honey, could lead to its detention. It is ironic that this situation can exist, when oxytetracycline residues can exist in other consumer products. The problem is bureaucratic and dealing with that bureaucracy is difficult, but for the bee-keeper whose crop is seized, the situation is no longer difficult, but catastrophic. Saskatchewan urges Council to continue to press this issue with Ottawa, and has indicated a willingness to enter into a letter writing campaign, should that be deemed to be helpful. In the meantime, all our beekeepers have been warned to be particularly careful with their drugs, to insure that the CFIA inspections find nothing. There is no better protection than that!

Varroa and tracheal mites continue to spread. A new varroa find in the previously mite fee Preeceville area will affect a number of beekeepers. Where the varroa came from is unknown, as the Preeceville area is a considerable distance from known varroa areas. To date, there has been no evidence of varroa resistance to Apistan.

It's a busy season now with an abundance of sunshine and nightly thundershowers. Perhaps by fall we all be

bragging about the size of our crop. Good luck all!

British Columbia

The spring season, this year, has in most parts been slow. In talking to various beekeepers, the bees just didn't come out of winter. Hence, small colonies, late packages & nucs & a fair amount of lost colonies.

Stan Reist
British Columbia

For being behind & late, the bloom for the most part has not been far off schedule. The pollination season has caught up with most crops.

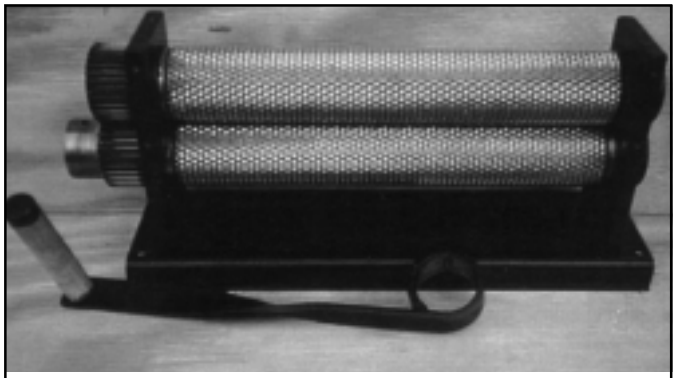
BC Queen Breeders can supply queens if asked in January but they are not able to gear up the day before you need them. BC Alberta and Manitoba support bringing in queens from the USA. The sad thing is the time & money spent on the border issue. Just think of where our industry could have been had that effort & dollars gone toward a stock & breeding program. It looks & sounds like Ontario is light years ahead of the West, in this process. Maybe it's a lesson in co-operation, willingness & a need to grow & prosper.

Resistant Foul Brood and reistant varroa mites have cropped up in B.C.'s Fraser Valley. When it comes to border issues maybe we are looking at the wrong border. Is our R rated AFB & resistant mites from the US via Washington or is it from somewhere in California via Alberta or other provinces? According to those with illegal bees from the USA there have been no problems with smuggled stock. They have been doing it for years with no ill effects. I wonder what the Beekeepers in the Fraser Valley would say!

BeeMaid

There have been ongoing reports of antibiotics being found in Chinese honey, mainly chloramphenicol, but also some streptomycin. This has heightened the awareness of consumers to the problem of residues we hope that it will not impact sales of honey of Canadian origin.

Jerry Bromenshenk, of the University of Montana, is proposing the establishment of a North American center to study bee poisonings. He is looking for support from various levels of industry including some of the multi national companies that are end users of honey. With corporate sponsorship, university participation and experts from across the continent, a cooperative venture of this type may become a reality.



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John Pedersen
Beemaid

BeeMaid has agreed to maintain an active role in assisting the CHC with developing a national On Farm Food Safety program. Ed Belhumeur sat in on the most recent telephone conference where it was decided that CHC would proceed with Phase 2 of the COFFS program.

Researchers blame bees for green rain

Agence France-Presse 14 Jun 2002
Calcutta

Green and yellow pre-monsson rains lashing an eastern Indian town have sparked panic among superstitious villagers but scientists say the phenomenon was nothing but bee droppings.

The oddly coloured rain which left plants stained, has sent droves of villagers to Hindu temples to pray for divine mercy on Sangrampur, some 50 km east of Calcutta in the state of West Bengal.

"They think they have incurred the wrath of the Hindu gods and goddesses. They are flocking to the temples to pray," said Sutanu Prasad Kar, a local administrative official.

But researchers concluded that the rain's colour was no more than excretion from bees that had consumed a cocktail of pollen from mangoes, coconuts, parthenium and grass.

"The green droplets were probably washed off by the rain from the tree leaves," said Deepak Chakraborty, the chief scientist of the West Bengal Pollution Control Board. He is also head of the School of Environmental Studies at Jadavpur University in Calcutta.

He said the separate tests by his board and by a research center in Calcutta had come to the same conclusion.

"Villagers will be told of the scientists findings and urged not to panic," said Dr. Chakraborty adding that a similar phenomenon was once reported in Cambodia.

Fluvalinate resistant varroa mites in Ontario

A. Skinner et J. Tam
Programme de transfert technologique de l'Association des apiculteurs de l'Ontario, Guelph, Ontario
D. McRory
Chef de la division d'apiculture provinciale, Guelph, Ontario
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F. Bryers, J. Anderson and B. Halsall
Ontario Bee Inspectors

Summary

Honey bee colonies in eastern Ontario were monitored for the presence of varroa mites resistant to fluvalinate using the protocol established by Pettis et al. (1998). On November 1 the efficacies of the 2.5% and 10% Apistan® strips were 25.21±17.28% and 76.48±20%. On November 21 the efficacies of the 2.5% and 10% Apistan® strips were 0.67±1.24% and 16.81±11.44%, respectively. These results indicate a varroa population which is resistant to fluvalinate.

Introduction

In 2001 beekeepers in the Cornwall area of eastern Ontario experienced severe winter mortality in their bee operations. Commercial beekeepers lost between 40 to 70% of their colonies. For some, this was the second year with high losses. In the spring, bee inspectors sampled colonies to determine the level of tracheal mites in the area. Though low infestation levels were present, it was determined that acarosis was not the cause of the mortality. Across the border in New York, fluvalinate resistance was established in the varroa population. The bee yards near Cornwall, on average 6.3 km from the US border, were suspected to contain fluvalinate resistant varroa.

Materials and Methods

On November 1, eight colonies in the Cornwall area of Ontario were sampled to test for fluvalinate resistant varroa mites. Testing was done according to the following protocol by Pettis et al. (1998).

The snap top lids from 500 ml, wide-mouth mason jars were replaced with #8 wire mesh, and one sugar cube was glued to the bottom of each jar. Apistan® strips (10%) and Apistan® Package Bee strips (2.5%) were cut into pieces 3/8" wide and each piece was stapled to the middle of an index card (3x5"). The index cards were placed in the jars with the strip facing inward. For each colony, both concentrations of Apistan® were tested. A quarter cup of bees from the varroa infested colony being tested was placed in each jar. The jars were kept for 24 hours at 25 C.

When testing the above methodology the following modification was utilized (Nasr, unpublished). During the 24 hour waiting period, jars were inverted and were placed over the bottom half of a 100 x 15 mm petri dish which had holes melted into the sides for ventilation. In the bottom of the petri dish, a quarter inch below the jar, a circle of paper coated with Tangle-Trap® was used to trap the fallen varroa.

The wash method was used to determine the number of varroa that were not affected by the fluvalinate and did not drop from the bees in the jar. The bees were covered with 70% ethanol and the sample jars were placed on the shaker for 20 minutes. The bees were then poured onto a screen and washed. Varroa that were rinsed from the sample were counted and recorded for each jar.

On November 21, six of the colonies were re-tested using the same protocol. Two of the previously tested colonies were dead. For each colony tested, on both dates, there were four replicates of each of the concentrations of Apistan®.

Results

On November 1, the average number of varroa in each quarter cup sample of bees was 25.43±16.33. The efficacy of the 2.5% fluvalinate strip was 25.21±17.28% and the efficacy of the 10% fluvalinate strip was 76.48±20.15%. On November 21, the average number of varroa in each quarter cup sample of bees was 16.94±15.17. The efficacy of the 2.5% fluvalinate strip was 0.67±1.24% and the efficacy of the 10% fluvalinate strip was 16.81±11.44%. Colonies which had less than an average of 15 mites in the quarter cup samples of bees were considered to have an insufficient number of varroa to determine Apistan® efficacy and were not included in the efficacy calculations.

Honey bee colonies in eastern Ontario were monitored for the presence of varroa mites resistant to fluvalinate using the protocol established by Pettis et al. (1998). On November 1 the efficacies of the 2.5% and 10% Apistan® strips were 25.21±17.28% and 76.48±20%. On November 21 the efficacies of the 2.5% and 10% Apistan® strips were 0.67±1.24% and 16.81±11.44%, respectively. These results indicate a varroa population which is resistant to fluvalinate.

Discussion

According to Pettis et al. (1998) a population of varroa is considered resistant to fluvalinate if the efficacy of the 2.5% strip is less than 30% and the efficacy of the 10% strip is less than 50%.

On November 1, the 2.5% strip was 25% effective and the 10% strip was 76% effective. This indicates that there is evidence of a fluvalinate resistance problem.

continued on page 11

Varroas résistants au fluvalinate, Ontario, Canada

Sommaire

Des colonies d'abeilles dans l'est de l'Ontario ont été échantillonnées pour détecter la présence de varroas résistants au fluvalinate administré en utilisant le protocole établi par Pettis et al. (1998). Le 1er novembre, l'efficacité des bandes d'Apistan® à 2,5% et à 10% était de 25.21±17.28% et de 76.48±20%. Le 21 novembre, l'efficacité des bandes d'Apistan® à 2,5% et à 10% était de 0.67±1.24% et 16.81±11.44%, respectivement. Ces résultats indiquent qu'il existe une population de varroas résistante au fluvalinate.

Introduction

Durant l'hiver 2001, les apiculteurs de la région de Cornwall dans la partie est de l'Ontario ont subi de lourds dommages. Les apiculteurs commerciaux ont perdu de 40 à 70% de leurs colonies. Pour certains d'entre eux, il s'agissait de la deuxième année de pertes élevées. Le printemps venu, les inspecteurs ont échantillonné plusieurs colonies pour déterminer le niveau d'acariose dans la région. Bien que l'infestation est été présente à un faible degré, on a constaté que l'acariose n'était pas la cause de la mortalité des abeilles. Près de la frontière de l'État de New York, on a mesuré la résistance au fluvalinate dans la population de varroas. On soupçonnait que les ruchers des environs de Cornwall, situés en moyenne à 6,3 kilomètres de la frontière américaine, abritaient des varroas résistants au fluvalinate.

Matériaux et méthodes

Le 1er novembre, huit colonies de la région de Cornwall, Ontario, ont été échantillonnées pour mesurer les varroas résistants au fluvalinate. L'essai a été fait selon le protocole établi par Pettis et al. (1998).

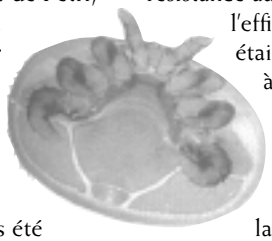
Les couvercles de pots Mason de 500 ml à grande ouverture ont été remplacés par du treillis métallique #8, et un cube en sucre a été collé au fond de chaque pot. Des bandes d'Apistan® (10%) et des languettes d'Apistan® pour paquets d'abeilles (2,5%) ont été coupées en sections de 3/8" de largeur et chaque section a été agrafée au milieu d'une fiche de carton de 3x5". Les fiches ont été placées dans les pots avec les sections d'Apistan tournées vers l'intérieur. Pour chacune des colonies, on a utilisé les deux concentrations d'Apistan®. Un quart de tasse d'abeilles provenant d'une colonie infestée ont été placées dans chacun des pots. Les pots ont été conservés 24 heures à 25 C.

On a apporté la modification suivante à la

Suite a la page 10

suite de la page 9

méthodologie décrite plus haut. (Nasr, non publié). Pendant la période de 24 heures, les pots ont été renversé sur une assiette de Pétri de 100 x 15 millimètres, laquelle avait eu des ouvertures pratiquées dans les côtés pour permettre la ventilation. Au fond de l'assiette de Pétri, à un quart de pouce sous le pot, on a installé un cercle de papier enduit de Tangle-Trap® pour engluer les varroas qui tombaient.



On a déterminé par lavage le nombre de varroas qui n'ont pas été affectés par le fluvalinate et ne sont pas tombés des abeilles dans le pot. Les abeilles ont été recouvertes d'éthanol à 70% et les pots Mason ont été placés sur un plateau vibrant pour une durée de 20 minutes. Les abeilles ont été ensuite versées sur un grillage et lavées et on a fait le décompte des varroas recueillis dans chaque échantillon.

Le 21 novembre, six des colonies ont été testées de nouveau en suivant le même protocole. Deux des colonies précédemment examinées étaient mortes. Pour chaque colonie examinée, à chaque occasion, on a procédé à quatre échantillons avec chacune des concentrations d'Apistan®.

Résultats

Le 1er novembre, le nombre moyen de varroas dans chaque échantillon d'un quart de tasse d'abeilles était de 25.43±16.33. L'efficacité des bandes de fluvalinate à 2,5% a été de 25.21±17.28% et l'efficacité des bandes de fluvalinate à 10% a été de 76.48±20.15%. Le 21 novembre , le nombre moyen de varroas dans chaque échantillon d'un quart de tasse d'abeilles était de 16.94±15.17. L'efficacité de la bande de fluvalinate à 2,5% était de 0.67±1.24% et l'efficacité de la bande de fluvalinate à 10% était de 16.81±11.44%. Les colonies qui avaient moins d'une moyenne de 15 varroas par échantillon d'un quart de tasse d'abeilles étaient considérées comme ayant un nombre insuffisant de varroas pour déterminer l'efficacité de l'Apistan® et n'ont pas été incluses dans les calculs.

Discussion

Selon Pettis et al. (1998), une population de varroas sera considérée comme résistante au fluvalinate si l'efficacité des bandes à 2,5% est inférieure à 30%, et si l'efficacité des bandes à 10% est inférieure à 50%. Le 1er novembre, la bande à 2,5% était efficace à 25%, et la bande à 10% était efficace à 76%. Ces données indiquent un problème de résistance au fluvalinate. Le 21 novembre, l'efficacité de la bande à 2,5% était inférieure à 1%, et la bande à 10% était efficace à 17%. Selon la méthode de Pettis et al (1998), ces résultats démontrent clairement la résistance au fluvalinate dans la population de varroas.

En plus des résultats des tests, on retrouvait également d'autres indices de résistance. On comptait plus de varroas dans les colonies échantillonnées qu'on pourrait s'y attendre dans des colonies dont la population d'acariens est sensible au fluvalinate. Le 1er novembre, après plus de 45 jours de traitement à l'Apistan®, il y avait en moyenne 25 varroas par échantillon d'un quart de tasse d'abeilles (de 3 à 65 acariens). Le 21 novembre, après plus de 60 jours de traitement à l'Apistan®, il y avait en moyenne 17 varroas par échantillon d'un quart de tasse d'abeilles (de 1 à 66 acariens). En comparaison, une population de varroas résistante au fluvalinate échantillonnée en utilisant la méthode à l'éther aux Etats-Unis en 1997 a permis de compter de 30 à 50 acariens sur 300 abeilles (environ une demi-tasse d'abeilles) (Baxter et al., 1998).

On assiste présentement au développement d'une population de varroas résistante au fluvalinate dans le sud de l'Ontario. Il semble que la résistance ne provient pas de l'usage excessif de l'Apistan® mais plutôt des acariens transportés lors de la dissémination naturelle des abeilles. Les varroas résistants au Fluvalinate étaient déjà présents de l'autre côté de la frontière américaine à quelques kilomètres à peine des ruchers canadiens. Les ruchers affectés de la région de Cornwall sont concentrés au sud, mais le problème se répand rapidement vers le nord.

Références

Pettis, J. S., H. Shimanuki et M. F. Feldlaufer. 1998. Detecting fluvalinate resistant varroa mites. American Bee J. 138(7): 535-537.

Baxter, J., F. Eischen, J. Pettis, W. T. Wilson et H. Shimanuki. 1998. Detection of fluvalinate resistant varroa mites in U.S. honey bees. American Bee J. 138(4): 291.

Saisie de reines-abeilles à la frontière

Canada Customs and Revenue, Carway, le 27 mai 2002

L'Agence des douanes et du revenu du Canada (ADRC) a annoncé aujourd'hui que des agents des douanes du poste frontalier de Carway avaient saisi 250 reines-abeilles apportées illégalement au Canada.

Vers 19 h 50 le jeudi 23 mai, un homme du sud de l'Alberta se présente au poste frontalier de Carway, en provenance des États-Unis. À son arrivée, il déclare qu'il a en sa possession plusieurs rayons de miel. En procédant à un examen plus poussé, les agents des douanes découvrent 250 reines-abeilles. Durant l'interrogatoire qui suit, l'individu avoue qu'il savait qu'il était illégal d'apporter ces abeilles au Canada, mais qu'il a tout de même choisi de le faire.

L'ADRC s'emploie à faire respecter les lois à la frontière au nom d'un grand nombre d'organismes gouvernementaux. Dans cette affaire, les abeilles, dont la valeur est estimée à 3 753 $, ont été saisies et remises à l'Agence canadienne d'inspection des aliments.

Il s'agit de la deuxième saisie de reines-abeilles effectuée au cours des deux dernières semaines. Le 15 mai, des agents des douanes du poste frontalier de Del Bonita en avaient saisi 16, boîtes.

Ces saisies témoignent de l'excellent travail effectué par les agents des douanes en vue de mettre à exécution les lois qui aident à protéger le Canada contre la maladie.

continued from page 8

On November 21, the 2.5% strip was <1% effective and the 10% strip was 17% effective. According to the Pettis et al. (1998) test, this clearly shows fluvalinate resistance in the varroa population.

Apart from the bioassay results, there were other indications of a resistant varroa population. There were more varroa mites in the sampled colonies than would be expected in colonies with a mite population that was susceptible to fluvalinate. On November 1, after more than 45 days of Apistan® treatment, there was an average of 25 mites in the quarter cup samples of bees (range 3-65 mites). On November 21, after more than 60 days of Apistan® treatment, there was an average of 17 mites in the quarter cup samples of bees (range 1 - 66 mites). By comparison, a fluvalinate resistant population of varroa mites sampled using the ether roll method in the US in 1997 had 30 to 50 mites on 300 bees (approximately half a cup of bees) (Baxter et al., 1998).

There is a developing population of varroa mites in the area of south eastern Ontario which are resistant to fluvalinate. It is expected that the resistance is not from overuse of Apistan® but from introduced mites from the natural dispersion of bees. Fluvalinate resistant varroa mites had already been established across the US border just kilometers from the Canadian bee yards.

Affected yards in the Cornwall area are concentrated in the south and rapidly spreading northward.

References

Pettis, J. S., H. Shimanuki and M. F. Feldlaufer. 1998. Detecting fluvalinate resistant varroa mites. American Bee J. 138(7): 535-537.
Baxter, J., F. Eischen, J. Pettis, W. T. Wilson and H. Shimanuki. 1998. Detection of fluvalinate resistant varroa mites in U.S. honey bees. American Bee J. 138(4): 291.

Travels in the Genetically Modified Zone

Room for more Respectful Conversation

Simon Fraser University Media & Public Relations, June 5 2002.

"We need an independent assessment of the risk factors associated with genetically modified crops." That is one message that rings out in SFU Biology professor Mark Winston's new book, Travels in the Genetically Modified Zone.

After two years of travel throughout Canada, the U.S. and Britain, Winston has written a book that seeks to illuminate the divergent opinions of those who are for and against this new agricultural technology. Overall, he says, the book seeks to demonstrate that there is a middle ground for respectful conversation on this contentious issue.

An internationally-recognized expert in bee biology, Winston is also a passionate and engaging writer. He takes the reader along with him on his travels. From a counter-culture conference at the Vogue Theatre in Vancouver to quintessential Canadian and American farmhouses, from the ancient parliamentary halls of Westminster in London to high tech research labs in corporate America, Winston introduces us to scientists, farmers, executives, regulators and special interest groups, all of whom have differing opinions about genetically modified crops.

"I started out open-minded about genetically modified crops," he says. "I came away more confident about the promise of biology and more aware of the continued and growing need for us as a society to have a full sense of the risks and benefits."

CONTACT: Mark Winston, 604-291-4459
Simon Fraser University, Media and Public Relations Phone 604-291-3210
Fax 604-291-3039, Web address: http://www.sfu.ca/mediapr/

Queen bees seized at the border

Canada Customs and Revenue, Carway, May 27, 2002

The Canada Customs and Revenue Agency (CCRA) announced today that customs officers at the Carway border crossing have seized 250 queen bees that were being illegally brought into Canada.

At approximately 7:50 p.m. on Thursday, May 23rd an individual from southern Alberta entered Canada at the Carway border crossing. Upon arrival he declared that he had a number of honey combs. An in-depth secondary examination was conducted, during which customs officers found 250 queen bees. During questioning the individual admitted that he knew it was illegal to bring them into the country but chose to do so anyway.

The CCRA enforces legislation at the border for many government agencies. In this case, the bees, valued at $3,753, were seized and will be turned over to the Canadian Food Inspection Agency.

This is the second seizure of queen bees in the past two weeks. On May 15th, customs officers at the Del Bonita border crossing seized 16 boxes of queen bees.

These seizures demonstrate the excellent work that customs officers are doing, in enforcing legislation that helps to keep Canada free of disease.

Pollination with mason bees

Mason bees, native to North America, are an effective natural pollinating force and, following the advice presented in this title, may present a bountiful surprise to gardeners who nurture them.

The author, aware that orchard pollination has been severely affected by a decrease in the population of honey bees, promotes mason bees as logical substitute. In this concise manual, their life cycle is discussed and simple methods are presented to attract the various species that are part of the genus.

A proactive guide, this title also serves as an intriguing introduction to the world of bee-based pollination."

O. May Ang, Bloomsbury Review, a Book Magazine. Vol. 22 (2) Mar-Ap 2002, Page 12

Pollination With Mason Bees by bee pollination expert Margriet Dogterom is a straightforward, 'reader friendly', step-by-step guide for gardeners, naturalists, and biologists who seek to use or learn more about Mason Bees.

With a strong emphasis on practical applications, Pollination with Mason Bees focuses on choosing nest types, caring for bees and evaluating their behaviour. An amazing reference, packed with a mind-boggling amount of information for its slim page count, *Pollination with Mason Bees* is also highly recommended for bee lovers who want to learn more about this amazing family of insects, as well as personal and community library gardening and horticultural reference collections.

James A Cox, Editor in Chief, The Midwest Book Review. BookWatch, March 2002, Page 9.

Margriets book is available from McCutcheons Books (see ad inside back cover) or order online at www.beediverse.com

National Honey Board and Cornell University to present research on antimicrobial activity of honey against food pathogens

6/17/2002
LONGMONT, Colo., Jun 17, 2002 /PRNewswire via COMTEX/

The National Honey Board (NHB) today announced that in partnership with a scientific team at Cornell University, Department of Food Science and Technology, a significant study was concluded involving research into the antimicrobial activity of honey against food pathogens and food spoilage microorganisms. A poster session was held at the Institute of Food Technologists (IFT) 2002 Annual Meeting in Anaheim, California, Monday June 17th, 2002, from 2 p.m. to 5:30 p.m. at the Anaheim Convention Center. Ms. Melissa Mundo presented.

The research study, led by Olga Padilla-Zakour, Ph.D., determined that the growth of many microorganisms is either partially or completely inhibited in the presence of diluted honey.

The potential of this study is the incorporation of honey into foods could enhance their safety and shelf life without the use of chemical preservatives.

"This study expands on previous work which demonstrated the antimicrobial activity of honey against specific bacteria," said Marcia Cardetti, NHB's director of scientific affairs. "The new research now shows us the efficacy of honey against a range of food spoilage bacteria and food pathogens."

Based in Longmont, Colorado, the National Honey Board is a research and product commodity board whose mission is to advance the use and application of honey and honey products throughout the world.

French bees dying painful deaths

Adam Sage
Times of London
Agence France-Presse 14 Jun 2002

The bees are dying, the hives are empty and the lawyers are buzzing across France amid a crisis in the country's apiculture.

French keepers say millions of bees have died this spring after being poisoned by pesticides sprayed on to farmland. Up to 4000 hives have been destroyed in southwest France, and hundreds more in Britannv.

The Keepers say they are losing thousands of dollars worth of honey, and witnessing their bees suffering painful deaths.

Jose Nadan a beekeeper in Faouet, Britanny, described the death of one of his bees. "It was contorting its abdomen, sticking out its tongue and showing all the signs of an intoxication [poisoning]".

With 20000 plant species in France dependent upon bees for their survival beekeepers say there are likely to be environmental costs. There have been a series of lawsuits and, in southwest France, a wide-ranging criminal inquiry led by a magistrate who has been asked to find and punish the killers.

Judge Jean Gaury, who is based in Saint Gaudens in the Pyrenees, has charged the managers of two local firms on suspicion of importing black-market Spanish pesticides, French judicial sources say that the products were manufactured in workshops in Spain, and then brought into France, where they would sell for 25 per cent of the normal price.

Jean-Claude Cauquil, a beekeeper near Toulouse, southwest France, said: "We are 150 kilometres from the border here and everyone knows that while most farmers play by-the rules, some go into Spain and smuggle back cheap pesticides."

The Canadian beekeeper pest management survey

By Adony Melathopoulos and
William G. Farney
Agriculture and Agri-Food Canada,
Beaverlodge AB.

Pest issues were considered the biggest challenge of Canadian beekeepers in a national survey taken in 2001. The survey, which consisted of 110 beekeepers from every province, with the exception of Newfoundland and Prince Edward Island, focused on questions surrounding the management of Varroa and American foulbrood (AFB). The most notable finding of the survey is that Canadian beekeepers rely on synthetic miticides and antibiotics to manage their pest problems but they also acknowledge that their reliance has associated problems.

According to Canadian beekeepers, pest issues are the most overwhelming challenge they face, registering as the top challenge with 45% of those surveyed. Pest issues overshadowed all other challenges including the low price of honey, the poor performance of queens and the lack of trained affordable labour. Of all pests, Varroa was considered the most challenging (Figure 1).

Varroa mites and AFB, the two pests that were the focus of the survey, are managed almost exclusively with pesticides. Over 85% of the beekeepers indicated they preventatively medicate colonies for AFB with the antibiotic oxytetracycline. Similarly, more than two thirds of the beekeepers indicated they exclusively use Apistan, a miticide containing the ingredient fluvalinate, to combat Varroa (Figure 2). Although a significant number of beekeepers surveyed used formic acid for Varroa control, few used formic acid without later rotating to Apistan. Widespread adoption of formic acid has been reported in Ontario but this may not have been reflected in the national survey because of the low number of respondents from that province. A small number of beekeepers indicated they monitored Varroa levels and treated only when they rose above an economic threshold, although the type of treatment they used was not specified.

Survey results from Delaware, Pennsylvania, Georgia and Florida suggest Canadian beekeepers rely on pesticides to the same extent as beekeepers from the US. Pesticide use in Canada, however, may be higher than in some regions of Europe. A recent national survey of Danish beekeepers indicated that 85% of beekeepers use tactics that do not involve synthetic pesticides, relying instead on organic acids such as formic and oxalic acid for Varroa control and no antibiotic use for AFB.

Canadian beekeepers are unanimous in recognising that there are significant problems associated with pesticides. The largest perceived problem with pesticides is the rapid development of treatment resistant mites and diseases (48% of responses that see pesticides as having problems), followed by the hazard of

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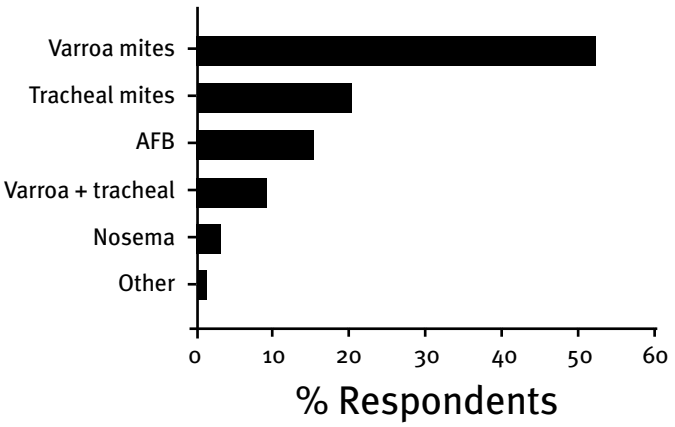

Figure 1. The proportion of survey respondents indicating the pest issue they consider their single biggest challenge (91 beekeepers total). The category 'Varroa + Tracheal' represents those respondents considering the combination of both mites as the biggest challenge.

Don't drink and fly!

Death of Honey Bee Colonies due to E-coli

Recent events in Walkerton Ontario showed how fecal coliform bacteria from cows can seep into drinking water and pollute the system, leading to illness and sometimes death. I learned the hard way that polluted water can also make bees sick.

Andrew Sperlich
RR#2 St Williams ON

Andrew Sperlich lost 400 colonies after feeding them sugar syrup that he prepared using water contaminated with e coli.

My mishap started from using well water that was contaminated with bacteria *escherichia coli* and coliform bacteria. Apparently surface water had run into it causing the contamination. I knew we were having a problem with the water but never did I think that the bees would be affected.

The spring weather was rainy and the hives were light so I used the well water to mix a syrup for feeding the bees. In total I mixed over two thousand litres of the syrup for my spring feeding with water that had a count over 80 part per hundred of E-coli and coliform bacteria.

Bacteria such as e coli can change the pH of the water turning the solution into an acid solution and in my case, the pH range was 5-5.5. The E-coli can ferment glucose producing various acids and continue to lower the pH which in turn causes further inversion. Ethyl alcohol is a by-product of this type of fermentation process. When fed to bees it induces dysentery, vomiting and death.

I lost four hundred hives during twenty-five days in spring. When the boxes were opened, the bees showed all the symptoms of being poisoned and there was a strong smell of rotting bees and alcohol. the deaths corresponded with the times that I returned to the beeyard to feed the bees. With all this being said it will still be a long shot to prove in court that the e-coli is connected to the bee death and the income loss.

Losing 400 colonies was a huge setback and it will take a while to recover. I am suing the previous land owner because the well was not inspected by the health unit, as we had been led to believe. In the meantime I have installed a water purifier and make sure that the water is tested regularly. I can highly recommend that beekeepers have their water tested before mixing feed. All animals need clean water, bees included.

LightHives

Rudy Gelderblom
Calgary beekeeper

The promise of reduced winter management for he beekeeper, and reduced emperature fluctuation for the

Above: The pristine hive just assembled
below: The hive after a season in the field.

bees, has made some people interested in polystyrene hives. They have been on the market in Europe for some time and in the last few years they have also become available in North America.

The material used to construct the hives is an extremely dense polystyrene, much more dense than any rigid foam you might use for insulation. I purchased a complete unit — bottom board, two deep boxes and a lid — in the fall of 2000. The hive arrived too late for me to test over the 2000-2001 winter so I waited for the next season before pressing it into service. This gave me time to recover from the effects of paying for the hive in American dollars.

When the time came I fitted the boxes with plastic frames — might as well be consistent, I thought — and installed a new queen with a split from another colony. It was not a strong colony that first year, which you would expect, but I took off about 40 lbs of honey in the fall and I was happy with that. I fed the colony syrup along with the other colonies in the fall, but when it came time to wrap the hives for winter I left it alone. I wrapped my other hives in building paper, rigid foam and a tarp to keep the weather off. The polystyrene

continued on page 20

écolte miel due ILE

mon miel depuis
c Super Cracker. »

Barry Davies

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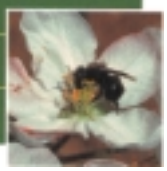
How to Manage the Blue Orchard Bee



I. Barton Smith, Jr.
Entomologist
Maryland Department of Agriculture Annapolis, MD 21401

With the native honey bee population gravely affected by parasitic mites and other honey bee pests — jeopardizing pollination of many crops — fruit and nut growers are seeking an alternative. "How to Manage the Blue Orchard Bee as an Orchard Pollinator" tells you all you need to know about how to rear this North American native as a successful orchard pollinator.USDA-ARS scientists adapted years of research on managing and rearing the blue orchard bee (BOB), Osmia lignaria, into this new, highly readable, how-to handbook. The 96-page manual was published by USDA's Sustainable Agriculture Network (SAN).

With a strong preference for fruit and nut trees, BOBs are highly efficient pollinators; in fact, just 250-300 females will pollinate an entire acre of apples or almonds. BOBs, which are easy to manage and rarely sting, pollinate under cloudy skies and at lower temperatures than most other bees. The guide synthesizes information on the biology

continued on page 24

What's up with all these E. colis?
Most strains of E. coli are benign. Many are actually good for you, and are normal residents of your digestive tract. There are a few bad strains of E. coli. like O157:H7 that caused the recent outbreak of diarrhea in Walkerton. The bad strains produce toxins that sicken people.

How does E. coli get in the water?
E. coli comes from human, domestic and wildlife fæces. During precipitation, E. coli may be washed into creeks, rivers, streams, lakes, or groundwater. When these are used as sources of drinking water — and the water is not treated or inadequately treated — E. coli may end up in drinking water.

What are the health effects of E. coli O157:H7?
E. coli O157:H7 is one of hundreds of strains of the bacterium E. coli. Although most strains are harmless and live in the intestines of healthy humans and animals, this strain produces a powerful toxin and can cause severe illness.

People have been ill from E.coli 0157:H7 sourced from undercooked meat and poultry, unpasteurized milk, non-chlorinated water and raw apple juice

Infection often causes severe bloody diarrhea and abdominal cramps; sometimes the infection causes non-bloody diarrhea. Frequently, no fever is present.

Farm Management and E.coli
Anyone who mismanages manure can contaminate a water source. Proper manure storage, handling and application methods minimize the risk to water supplies, while maximizing the benefits of applying manure to our crops. Nutrient Management Plans ensure
that the manure produced is

imidacloprid continued from pg. 16

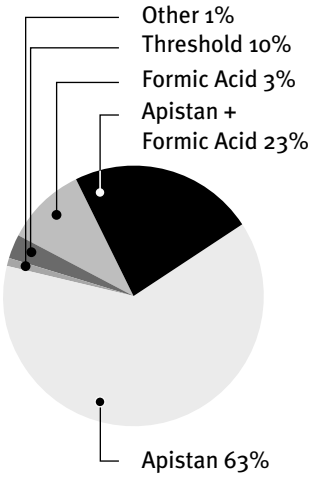
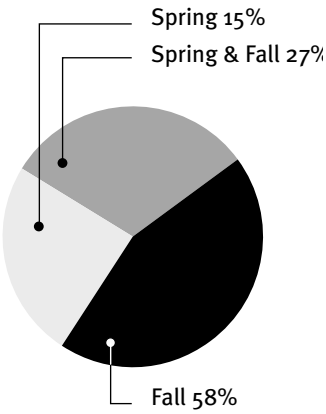


figure 2



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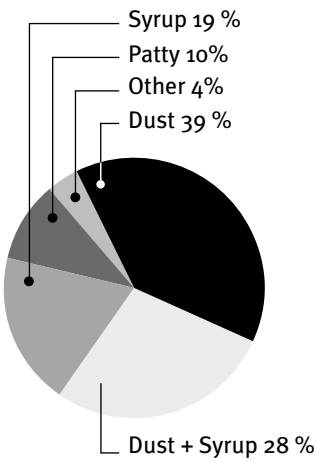

figure 4

contaminating honey and wax with pesticide (28%). The expense of pesticides, their safety to the applicator and difficulty in using them were considered minor problems (<25% combined).

Varroa mites

Canadian beekeepers show a strong preference of applying Apistan once per year in the fall (Figure 3). Only a small number of beekeepers indicated using Apistan twice per year. Many beekeepers indicate monitoring for Varroa population levels regularly (72%) or occasionally (24%). Very few beekeepers (3%) felt that monitoring was "a lot of work for information that is not very useful" and most felt monitoring was beneficial (97%). The most important benefits of monitoring were evenly distributed among "determining if my treatments worked", determining "which apiaries have mites and which do not" and monitoring "can save an unnecessary treatment". Sticky boards were the most popular option of monitoring for Varroa and were used by 73% of beekeepers. Few beekeepers monitored using sticky boards without a miticide such as Apistan or formic acid. Only 15% of beekeepers detected Varroa using methods that dislodge the mite from adult bees with ether, alcohol or icing sugar.

AFB

Although most Canadian beekeepers preventatively treat colonies with oxytetracycline, approximately 90% also look for and destroy frames with AFB infected brood. Oxytetracycline is most commonly applied as a dust of antibiotic mixed with icing sugar (Figure 4). Beekeepers felt that oxytetracycline was either very effective (55%) or effective (42%) at managing AFB. The result is surprising in light of the discovery of AFB resistant to oxytetracycline in British Columbia and Alberta a few years prior to the survey. It is possible that many respondents in British Columbia and Alberta had no problem with resistance or were unaware if they had a problem. Three beekeepers indicated that oxytetracycline was "not effective", however all were located in Eastern Canada, where resistance is not known to exist.

Beekeepers can inspect for AFB by either inspecting frames of brood in live colonies or by inspecting frames from colonies that have recently died. Furthermore, beekeepers can either inspect all or some of the brood frames in live colonies and inspect the comb once or twice per year. The majority of beekeepers in the survey inspected the frames of colonies only once per year and inspected only a portion of the brood frames (Table 1).

Canadian beekeepers clearly perceive pest issues as a priority, but overwhelmingly feel there are dangers associated with relying too heavily on miticides and antibiotics. The survey demonstrated that beekeepers depend on Apistan (fluvalinate) and oxytetracycline and it illustrated a clear need to better integrate exiting alternatives and to develop new management tactics. Better integration of natural pesticides or non-chemical tactics will reduce synthetic pesticide use. Increased use of formic acid, particularly in rotation with Apistan, would undoubtedly help beekeepers delay the development of fluvalinate (Apistan) resistance. Ontario and Danish beekeepers have successfully adopted formic acid and have demonstrated the feasibility of using this tactic to reduce their reliance on synthetic miticides.

Figure Captions

Figure 2. The proportion of beekeepers that manage Varroa by exclusive use of Apistan (APISTAN), rotating Apistan with formic acid (APISTAN + FORMIC ACID), treating only when mite levels are high enough to cause damage (THRESHOLD), or by exclusive use of formic acid (FORMIC ACID) (83 beekeepers total).

Figure 3. The proportion of beekeepers that apply Apistan either in the spring, the fall or both spring and fall. Only beekeepers that use Apistan exclusively were considered for the graph (52 beekeepers total).

Figure 4. The proportion of beekeepers that applied oxytetracycline exclusively as a dusting powder (DUSTING), as a combination of dusting powder and syrup feed (DUSTING + SYRUP), exclusively as a syrup feed (SYRUP) or in extender patties, either exclusively or in combination with other application methods (PATTY) (98 beekeepers total).

Table 1. The number of beekeepers who look for AFB symptoms: 1) in dead colonies (deadouts), 2) in live colonies once or twice per year or 3) in some or all frames containing brood in live colonies (from a total of 105 beekeepers).

Dead Colonies		Live Colonies			
Inspect	Do not inspect	inspect 1x per year	inspect 2X per year	inspect all frames	inspect some frames
41	64	58	47	46	59

continued on page 24

used in an environmentally sensitive manner.. This includes responding appropriately to any mishaps or weather related issues while applying manure.

How to protect yourself from contaminated water?
Avoid unpasteurized drinks. Drink water treated with chlorine or other effective disinfectants.

Direct surface drainage away from well casing. Surface water should not collect near the well. Check well pumps and distributions systems regularly. Investigate any changes in water quality.

Test your own water source periodically. Twice a year is recommended: in early spring - just after the thaw, and late summer , when water levels are low.

For testing kits or information, contact your regional health authority. Look in the blue pages of the phone book for a location near you

Sources: Health Canada and Agriculture and Agri Food Canada

Honey Bees and E.Coli
Researchers Yang Xiaolong, Diana Cox Foster and Scott Camazine at Pennsylvania State University injected bees with E. coli to investigate the survivorship of immune challenged bees. Three types of bees: normal bees without varroa mites, bees with varroa mites and normal wings, and bees with mites and deformed wings were compared. After challenge with E. coli, bees infested with mites but with normal wings lived a significantly shorter time than normal bees. The bees with deformed wings lived the shortest. This indicates that Varroa mites suppress the immune response of honey bees. The normal bees survived the longest. Bees with mites and normal wings survived significantly shorter than the normal bees. Bees with both mites and deformed wings die rapidly even without bacterial challenge.

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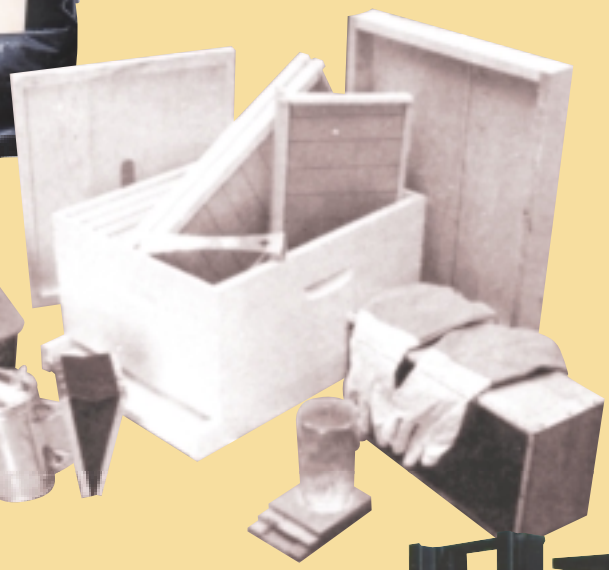
Staplers
Super carts



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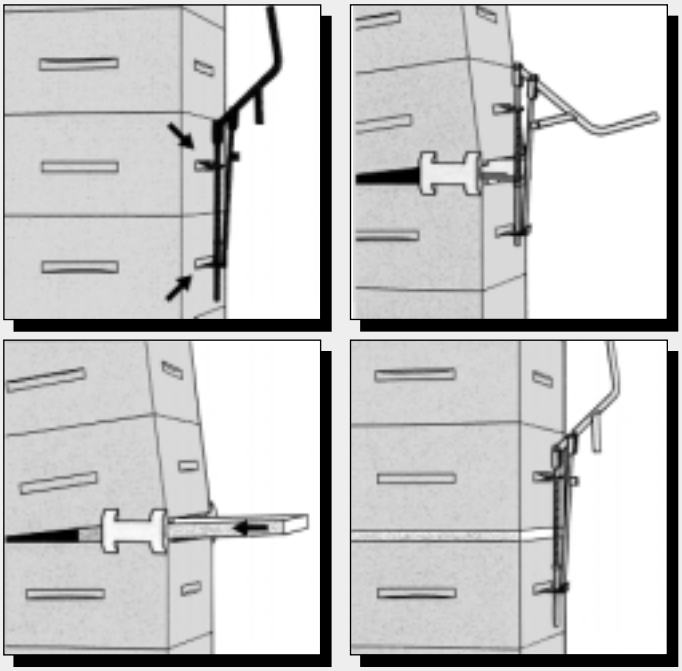
Réjean Lambert 819-828-2549
Scott Plante 418-834-5616

SuperCracker continued from pg. 15

boxing tape. Bee escapes work best when there is no brood in the honey supers. One person should be able to average less than a minute per colony to completely bee escape a bee yard.

For more information contact Davies Apiaries; RR#1 Seeley's Bay
Ontario K0H 2N0, Tel & Fax 613-387-3171 or Davapi@kos.net



efficaces lorsqu'il n'y plus de couvain dans les hausses à miel. Une personne seule devrait pouvoir installer les chasse-abeilles sur tout un rucher en en moins d'une minute par colonie.

Davies Apiaries
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The bottom plate of the Super Cracker is inserted in the handle below the super you wish to remove and the adjustable upper plate goes into the handle of the super above.
The spring loaded lever is pulled down, locked and the spacers inserted. Super Cracker is removed leaving spacers in place and the bee escape placed into the spacers. The stack of honey supers can easily be tipped forward allowing the bee escape to be pushed all the way in.

La base du Super Cracker est insérée dans la poignée sous la hausse que vous désirez enlever et la plaque supérieure ajustable est insérée dans la poignée de la hausse supérieure. Le levier à ressort est abaissé, bloqué et les espaceurs sont mis en place. On retire le Super Cracker en laissant les espaceurs en place et le chasse-abeilles est inséré. La pile de hausses à miel peut facilement être inclinée, permettant de rentrer le chasse-abeilles jusqu' au fond. Remettez le Super Cracker en place et enlevez les espaceurs.

Honeybee sequencing: one honey of an idea

The little buzzers are a magic well for discoveries in biology

By Myrna E. Watanabe
Reprinted fromThe Scientist, 16(13):22-23

In late May, the National Human Genome Research Institute (NHGRI) released its priority list of organisms under consideration for entry into the sequencing pipeline: One was the honeybee.

It was a move that has numerous supporters. "We feel that sequencing [the bee] will provide important tools and unique models for a variety of different areas of biology, including social behavior," says Gene E. Robinson, professor of entomology and director of the neuroscience program at University of Illinois at Urbana-Champaign, and lead author of the proposal that the NHGRI reviewed.

Robinson ticks off numerous reasons why the honeybee fits the institute's sequencing requirements: Bees are models for learning and memory; for studies of allergic disease; for gerontology research, as the long-lived, egg-producing queen is genetically identical to the much shorter-lived female workers; for studies of venom toxicology; and for studies of infectious diseases in dense societies. "The basic thrust that underlies everything about the [honeybee] genome is the notion [that], although phylogenetically distant from the human, honeybees live in societies that rival our own in complexity and in success in dealing with the many challenges posed by social life," says Robinson. "They are literally a magic well for discoveries in biology in a huge range of biological disciplines," explains Francis Ratnieks, director of the Laboratory of Apiculture and Social Insects, University of Sheffield, UK. "If you study it, you could be studying practically any topic in biology."

Nicholas Calderone, assistant professor of entomology at Cornell University, points out a practical reason for studying bees: they add $14.5 billion annually to the value of US agriculture. "They're indispensable to modern agriculture and the production of various fruit and vegetable crops," he says.

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hive, I figured, should be ready to go just like it was.

I was concerned about ventilation and moisture buildup as there are no openings other than the entrance and the screened bottom board. I cut an old super down to about 3 inches high and placed that on top of the two brood boxes with the lid and a weight on top. I figured the imperfect fit would provide enough draft to prevent moisture problems. The hive had absolutely no additional protection other than a coat of paint as suggested by the manufacturer to combat degradation of the material by UV.

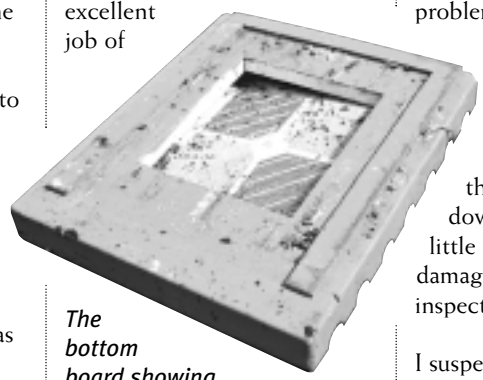
This spring I was delighted to find that the colony lived through the winter and appeared to be doing well, better in fact than most of my other colonies! Evidently the insulation is sufficient for the colony to survive the winter. There was no significant moisture buildup in the hive. It is unclear whether this was due to my intervention or whether there would not have been a problem regardless.

I am happy the bees lived, of course, but I am critical of the design on some counts. First, the bottom board seems woefully inadequate. A rectangular portion is cut from the centre of the board and a plastic screen is fastened to the bottom of the board with a few staples. Staples in polystyrene just don't have a lot of grip. The screen came loose almost immediately and, semi-detached, it provides easy access for rodents.

Also, the bottom board is quite a bit bigger than the boxes on top of it. This enlarges the footprint of the hive and makes it all but impossible to pick it up with a hand cart. There is also no opening in the skirt on the bottom board to insert a hand cart. If you did manage to get a hand cart under,

you would not be able to tip the hive without risking the bottom box separating from the bottom board as you tip it, or breaking the bottom board as you cannot lift where the weight is.

Contrary to assurances from the manufacturer that the boxes would be easy to separate from one another without damage from the hivetool, they are not. The bees did an excellent job of cementing the boxes together, and the material will get damaged by the hivetool in the process of separation. The boxes were so difficult to separate, in fact, that I had to lay the hive on its side and apply considerable force to the hive tool! Needless to say, this does damage the boxes and with that kind of damage the boxes would not last for more than a few seasons. (the bees were not too happy either!) Of course, the polystyrene itself has a half life of, what, 20,000 years? Which begs the question: "What to do with discarded polystyrene boxes?"



The bottom board showing the partly detached plastic screen in the top left corner.

I was concerned about being able to separate the polystyrene components from the start and to combat this problem I placed a piece of (unpainted) canvas on top of the hive before putting the lid on. This seems fairly effective in preventing the bees from glueing down the lid and I have little difficulty and no damage removing the lid for inspections.

I suspect the boxes could easily be punctured by an errand forklift. Where a wooden box would just be knocked over, which, filled with bees, would not be a happy thing either, the polystyrene box would be both skewered and knocked over. I leave this for someone else to test more thoroughly.

At some point I dropped a piece of 2x6 against the assembled hive (while still in storage). It was not a particularly forceful blow, but it broke the dovetails off one of the sides. (Evident in the bottom left corner of the picture.)

Another potential problem might be cleaning up after an infestation of AFB. Where it might be possible to scorch the inside of a wooden box to kill spores and put the box back into service, putting a torch to a polystyrene hive might present a problem.

I still think polystyrene boxes are a good idea. That the bees lived through the winter without any additional protection is great. No wrapping, no unwrapping. A bit of maintenance I am glad do to without. A design where the bottom and top are flush with the side of the box so I can pack them together on a pallet and lift them with a handcart if I need to, seems more sensible than the present design. The screened bottom board is a good idea, but stapled plastic is just not the way to go. To those wishing to experiment, I would recommend just buying the boxes and building the lid and bottom board yourself.

Infant botulism project 2001

Dr John Austin, Health Canada, Ottawa ON

An infant botulism study was carried out in 2001. Out of 80 samples from across Canada, we did not detect any spores of proteolytic strains of *Clostridium botulinum*. Only proteolytic strains of C. botulinum cause infant botulism. A single sample from Quebec contained approximately 6 spores of non-proteolytic *C. botulinum* type E per kg of honey. This is a very low contamination rate. Non-proteolytic strains do not cause infant botulism. *C. botulinum* type E is very commonly found in the environment.

There would be no compliance action taken on any honey — even if it was found to contain proteolytic *C. botulinum* strains (ie. the type that cause infant botulism). We realize that there is no current technology that can kill *C. botulinum* in honey without rendering the honey inedible. We also do not know how honey becomes contaminated with C. botulinum. Our recommendation to not feed honey to children less than 1 year of age is how HC manages the possible risk to infants caused by *C. botulinum* in honey.

The results of last year's survey are not an "inherently negative message" but are "good news" for the Canadian honey producers. I see no reason whey we would not obtain the same

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Foreign Invaders

Orley "Chip" Taylor, Jr., a professor in the ecology and evolutionary biology department, University of Kansas, Lawrence, says he is noticing more research in the field, and he believes that the African bee's arrival in the Americas is the cause. This bee is aggressive toward humans and, if able, will take over a European honeybee hive. (The European bees have been here for centuries: early colonists brought them to the Americas.)

African bees are present in a swath that stretches from Texas up into the San Joaquin Valley of California, says research leader Gloria DeGrandi-Hoffman, Agricultural Research Service's Carl Haydon Bee Research Center in Tucson, Ariz. DeGrandi-Hoffman and Stanley Schneider, University of North Carolina, Charlotte, are studying how African bees take over a European hive. "An African colony will send out small swarms of bees, [which] can get into European colonies," says DeGrandi-Hoffman. "Sometimes, those small swarms will have queens in them." If an African queen encounters and kills her European counterpart, then the African bees assume control of the colony, she says. As honeybee colonies are matrilineal, DeGrandi-Hoffman and Schneider are looking at the mitochondrial DNA and nuclear DNA markers to determine what happens genetically when African bees take over. This research can aid the US beekeeping industry, as beekeepers must maintain their hives' genetic integrity in areas where African bees are present.

beehives are like a supermarket, with forager bees queued at checkout lines to drop off their nectar.

Although Calderone's group at Cornell is studying the standard areas in agronomy (breeding strains for better honey production and more effective plant pollination), they also are looking at hive organization by examining the homeostatic mechanisms regulating honeybee colonies. "They store about a kilogram of pollen in the hive," explains Calderone. "When they reach that level, they slack off on collecting pollen. When they get very far below that, they increase collecting pollen."

How do foragers know how much pollen is in the hive? Researchers report that forager honeybees accomplish this by observing the pollen-containing cells in the hive.

No Society is Without Conflict

Insect societies are not immune to conflicts, which, says Sheffield's Ratnieks, are always about reproduction. Although the queen is the chief egg-layer, worker bees, which are females, have ovaries and can lay male-producing haploid eggs. "On the one hand, the individual worker would like to lay eggs," says Ratnieks. But, "the society as a whole doesn't want [them to]." He states that an average *Apis mellifera* colony raises 100 males daily during spring and summer. But, if the colony had its maximum of 60,000 workers, and each was allowed to lay eggs, then more than 100,000 eggs would be produced daily. Such reproduction must be suppressed, and to do this, worker bees police the hive and eat these eggs. Relatedness and shared genes explain this situation, in that worker bees are more related to the queen's sons than to the sons of other workers.

Ratnieks, too, questions how bees organize themselves. He likens the beehive to a supermarket, with forager bees queued at checkout lines to drop off their nectar. They must "keep a balance on the number of bees working at receiving and the number of bees collecting nectar," he says. If their wait to unload is short, indicating there are few foragers, the forager bee can do a waggle dance to recruit more bees for the quest.

A beehive, says Ratnieks, does not have a manager "who knows what's going on, issuing instructions. Each worker makes her own perceptions." Yet, a hive is highly structured. "You can't de-organize them. If you put 300 to 400 bees in a hive, they start to build a colony," Cornell's Calderone says. "There are a lot of interesting things built into their genetics that … enable them to do this." His group is working to figure out how bees coordinate their activities and survive.

Bee studies cover more than just social behavior; Brian Smith and colleagues at Ohio State University, Columbus, are studying how bees perceive odors. These odor-decoding mechanisms are analogous in honeybees and in vertebrates, he says. "There are a limited number of ways-perhaps only one or two-that a brain can encode odors and odor memories." He explains that in the vertebrate's brain, the cells in the olfactory bulbs look very similar to cells found within the antennal lobe of the honeybee brain. Smith's work, which is supported by the National Institutes of Health, has basic biomedical applications in understanding olfaction, and in understanding how the honeybee functions in its environment.

Myrna Watanabe is a freelance writer in Patterson, NY.

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results next year. The reasons for extending the survey are two-fold:

1. A two year survey will double the number of samples and double the length of time of the survey. This will make the "negative" results (ie. low incidence of *C. botulinum*) more statistically significant and give even greater relevance to any claim of Canadian honey producers that Canadian honey has an extremely low incidence of *C. botulinum* spores. This data may eventually be compared to honey imported from China, Argentina, U.S., etc.

2. If a sample is found positive for proteolytic *C. botulinum*, it will allow us to go on to the next step in our project. We can look at the practices of the beekeeper at the particular hive (ie. queen excluder, dead larvae, etc) to see if there might be a correlation between a particular practice and contamination with *C. botulinum*. We can also sample the immediate environment of the positive hive to look for a possible source of spores. If we are able to find a reason for contamination of honey with *C. botulinum*, we may be able to use this information to further prevent contamination of Canadian honey.

We would like to extend the survey an additional year, and reassure the apiarists participating in the survey is a useful endeavour that may lead to increased knowledge on how *C. botulinum* spores appear in honey — if we find a positive sample!.

Honey alert: chloramphenicol in Chinese honey

Canadian food Inspection Agency, Ottawa

The CFIA has evidence to suggest that all honey from China may contain chloramphenicol, but at uniformly low levels. Health Canada and the CFIA are therefore advising consumers not to eat any honey from China or Canadian honey which has been blended with honey of Chinese origin. The CFIA originally warned consumers not to eat products manufactured with honey from China based on the link between Chloramphenicol and aplastic anaemia. Since that time, and with additional information, Health Canada revised its health risk assessment. Since the levels of the drug are extremely low in food products made with honey from China, such as baked goods, consumers may continue to eat these products.

Is Chloramphenicol banned in Canada?

This drug is banned for use in food-producing animals in Canada as well as in a number of other countries. However, it is approved for human use in Canada as a last resort drug in the treatment of life-threatening, severe bacterial infections where no other treatment is available.

What are the effects of Chloramphenicol?

The drug is associated with random cases (one in 30,000 to one in 50,000 persons) of aplastic anaemia, a serious blood disorder for which there is no cure, and which is usually fatal. It is not known why some people contract this condition and others do not. It is not dose-related. In addition, there are concerns related to potential carcinogenicity and genotoxicity of the drug as well as the potential to cause antimicrobial resistance.

What were the results of the CFIA's testing

The CFIA has now completed testing of over 100 samples of the liquid honey and has found uniformly small amounts of contamination with chloramphenicol residues (0.3 to 34.0 parts per billion). Based on new information from other countries and new testing data from the CFIA, there is now added assurance that the residues of the honey in question are uniformly low and pose a low risk.

Why would this honey be risky?

It is not known what a safe dose of Chloramphenicol would be in humans. In addition, the use of the contaminated honey over a long period would increase the risk. In comparison, 2 Tsp of contaminated honey would contain less than one ten-millionth of a daily dose used to treat typhoid fever in adults. There is sometimes a delay in the onset of aplastic anaemia.

For a complete list of products that have been recalled visit the CFIA website: http://www.inspection.gc.ca/english/corpaffr/recarapp/2002/honprode.shtml

ontinued from pg. 21

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Resources:

The NHGRI Web site for information on white paper proposals:

www.nhgri.nih.gov/About_NHGRI/Der/org_request/seq_target_genome.html

The BARC's Beenome Web site:
www.barc.usda.gov/psi/brl/beenome.html

Oxytetracycline — Let's not lose it

Heather Clay
National Coordinator, CHC

Oxytetracycline hydrochloride (OTC), is an antibiotic used to treat American Foul Brood (AFB)(*Paenibacillus larvae*)and

European Foul Brood (EFB)(*Melissococcus pluton*), and a useful alternative to the old "sulpha" drugs that were found to leave residues in honey. It has been available to beekeepers since 1952 when Pfizer first registered Terramycin™ in the USA. Until recently Pfizer Animal Health Group held the monopoly on OTC sales with its Trademark product Terramycin™. Two years ago they pulled out of the Canadian market and in October 2000 they sold their feed additives in the US to Philbro, a wholly owned subsidiary of Phillip Brothers Chemicals Inc. Recently Phillips Brothers decided not to renew the registration of Terramycin‰ and supplies in the US are quickly disappearing.

The opportunity for supplying the Canadian market with a generic brand of OTC was met by Medivet, Alberta. Their products Oxytet25 and Foul Brood Mix have become staples of the Canadian bee industry for the treatment of American and European Foul Brood. Medivet purchases the raw ingredients from a certified company in China that produces the antibiotic under controlled conditions. The active ingredient is blended in Canada to rigorous standards with every batch tested for stability and effectiveness. When used according to directions OTC is a valuable tool for beekeepers who need to treat AFB and EFB.

The literature shows that OTC takes 6-9 weeks to decompose in honey in the hive (at 37 degrees C). Dr Peter Sporns, University of Alberta (1) has shown that OTC is present for longer in honey when stored at a cooler temperature which is a concern for producers who extract honey and store it at room temperature.

Some areas in Alberta and parts of British Columbia have experienced a problem with strains of AFB that are resistant to the drug OTC. This has not caused a large increase in the incidence of the disease as Alberta reported less than 2% infection with AFB in 2001. Tests have shown that not all the spores are resistant and the resistant variety is no more aggressive than other strains of AFB. With good management practices it is possible to survive the rise of OTC resistant AFB.

Oxytetracycline Half Life (1)

	Temp° C	Half Life hours
Honey:water 1:1	60	4.1
Honey:water 1:1	30	68
Honey	60	6.5
Honey	30	330

Alberta has gained access to Tylosin (Tylan™) to treat their OTC resistant AFB. This antibiotic has been around for some time in the animal feed industry. Health Canada is aware that tylosin which is used as an animal growth promoter, has been banned in the EU because it is similar to antimicrobial drugs used in human medication. Tylosin is effective in killing the vegetative stage of AFB. Alippi et al (3)found that tylosin suppresses AFB for 16-25% longer than oxytetracycline in spring and 50-58% longer in spring. However tylosin is detectable at levels of 2 ppm in honey after 60 days. Residue levels this high would cause the honey shipment to be rejected by the Canadian Food Inspection Agency.

The biggest concern with OTC is misuse of the product. It is likely that resistance to OTC was caused by long term exposure to improper dosage levels. Dr. Bill Wilson (4) developed and refined the extender pattie method of treating colonies with OTC. He claims that extender patties did not cause OTC resistance.

Oxytetracycline Half Life (2)
Honey ..... 7.6 days
Sugar ..... 6.3 days
Tylosin
Honey.....186 days
Sugar .....75 days

"It first showed up in Argentina in the early 1990s, and they were not using extender patties (H. Shimanuki, personal comm. 1999). Terramycin resistance also appeared in Canada in the late 1990s, and they do not have a history of using Terramycin extender patties. Long-term exposure to Terramycin or improper

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Grease patties

Allen Dick, Swalwell AB
Commercial Beekeeper

Extender patties (grease patties) are used by some commercial beekeepers in Alberta for controlling American Foulbrood, and for suppressing tracheal mites.

The grease/sugar format is deliberately designed not to be attractive to the bees, and is therefore removed slowly, extending oxytetracycline treatment over weeks. The grease keeps the powder dry; since OTC degrades quickly once wet, this application method ensures that the OTC maintains its activity until the bees encounter it.

An important consideration in administering these patties is that they must be inside the cluster or they will be ignored. Therefore, patties go on the top bars immediately above the brood in singles or on the top of the lower box — if the bees are fully occupying doubles and raising brood below.

The patties are typically made as follows:

Bill Wilson's Original Formula: This formula for extender patties requires two tablespoons (18g) of Oxytet25 per one pound (454g) of mix (1/3 lb.(151g) vegetable shortening and 2/3 lb (303g). granulated sugar) to make two half pound patties that should last about 6 weeks.

The above 1/2 pound (227g) patties each would each contain about 844 mg active ingredient. Over 6 weeks this releases about 140

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and management of the BOB in a highly readable format, with many photos and diagrams.

"How to Manage the Blue Orchard Bee as an Orchard Pollinator" was written by Jordi Bosch and William P. Kemp, researchers at the USDA-ARS Bee Biology and Systematic Laboratory in Logan, Utah, and was published by USDA's Sustainable Agriculture Network (SAN), www.sare.org. To order the $9.95 book, go to: http://www.sare.org/htdocs/bobflyer.htm

grease patties continued from page 23

grams of the drug per week. Therefore a 132 lb patty batch (40kg sugar and 20kg vegetable shortening) requires about 4000 ml (17 cups) which is about 3.6 kilograms or 8 pounds of Oxytet25.

For spring use, 1/3 pound or 1/4 pound patties are preferred by some commercial beekeepers for various reasons. For smaller patties, the amount of OTC used should be increased proportionately: ie: For 1/4 pound patties double the OTC or for 1/3 pound patties, increase the OTC by 1/2 while maintaining the other ingredients constant. About 800 mg of active ingredient per patty is the goal. Mann Lake sells pre-made 6 ounce patties that have *1000 mg* of active ingredient each.

Large colonies will remove the patties more quickly, while small colonies may take longer to consume the patties, so the dosage is somewhat self-adjusting. Some beekeepers just take a pail of the mix to the yard and trowel some onto each hive, judging dosage by the colony strength. This method makes the patty material harder to move the patty later if it is not consumed by the time supers must go on, but may save on material and time at application time. All remaining traces of patties must be removed by the bees or the beekeeper before supers are applied for honey production, to ensure that contamination of honey for human use does not occur.

Interestingly, we have found that hives of similar size may remove the patties at vastly differing rates. Some hardly seem to touch them. Regardless of whether the hives consume them or not, we have found that our rate of AFB has dropped to zero in the four years that we have used the patties. We no longer find any AFB in an outfit of 2,500 hives, and we look carefully. We now just use them in the spring and scrape off any excess at time of supering, but initially we used them both spring and fall.

Mixing:

The mix is made either by hand using a bowl and a spoon, or in quantity using converted 3.5 cubic foot cement mixers. Lately we have found a commercial dough mixer to be the most efficeient for commercial-sized batches. Complete and thorough mixing is very important to ensure even application of the drug. For this reason, the drug should be thoroughly mixed with the sugar before adding the grease.

To convert a cement mixer for patty making, the paddles are removed and sometimes a stationary scraper bar is added. The mixture is a soft slurry at room temperature, and can be squashed to fit under a hive lid, but sets a bit over time and in colder environments.

The actual patties are made up using a trowel or spatula on 'scale paper', a 8 by 11 inch wax paper that comes pre-cut in boxes of 2,000 from paper or butcher supply houses. The paper can be doubled over the patty, making the patty easier to handle. The whole patty, paper and all goes on the top bars.

oxytet continued from page 23

dosage levels apparently created the bacterial resistance. However, patties did provide the means by which the antibiotic could be kept in the hive for many weeks or longer. It has been reported that some beekeepers kept patties inside their colonies for several months to a year. Leaving treatment materials in a hive longer than the label recommends is not a good idea since it represents a violation of the label and can contribute to the development of bacterial resistance to Terramycin. Applying Terramycin in a powdered sugar mix has always been a convenient method of administering the antibiotic. However, when the treatment schedule is erratic and the bees consume all of the antibiotic before the brood nest has been properly cleaned, the amount of AFB cycles up and down, but the disease is never well-controlled. This type of imprecise treatment along with low doses or outdated Terramycin probably contributed to the development of resistance in P. larvae."

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