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Hivelights

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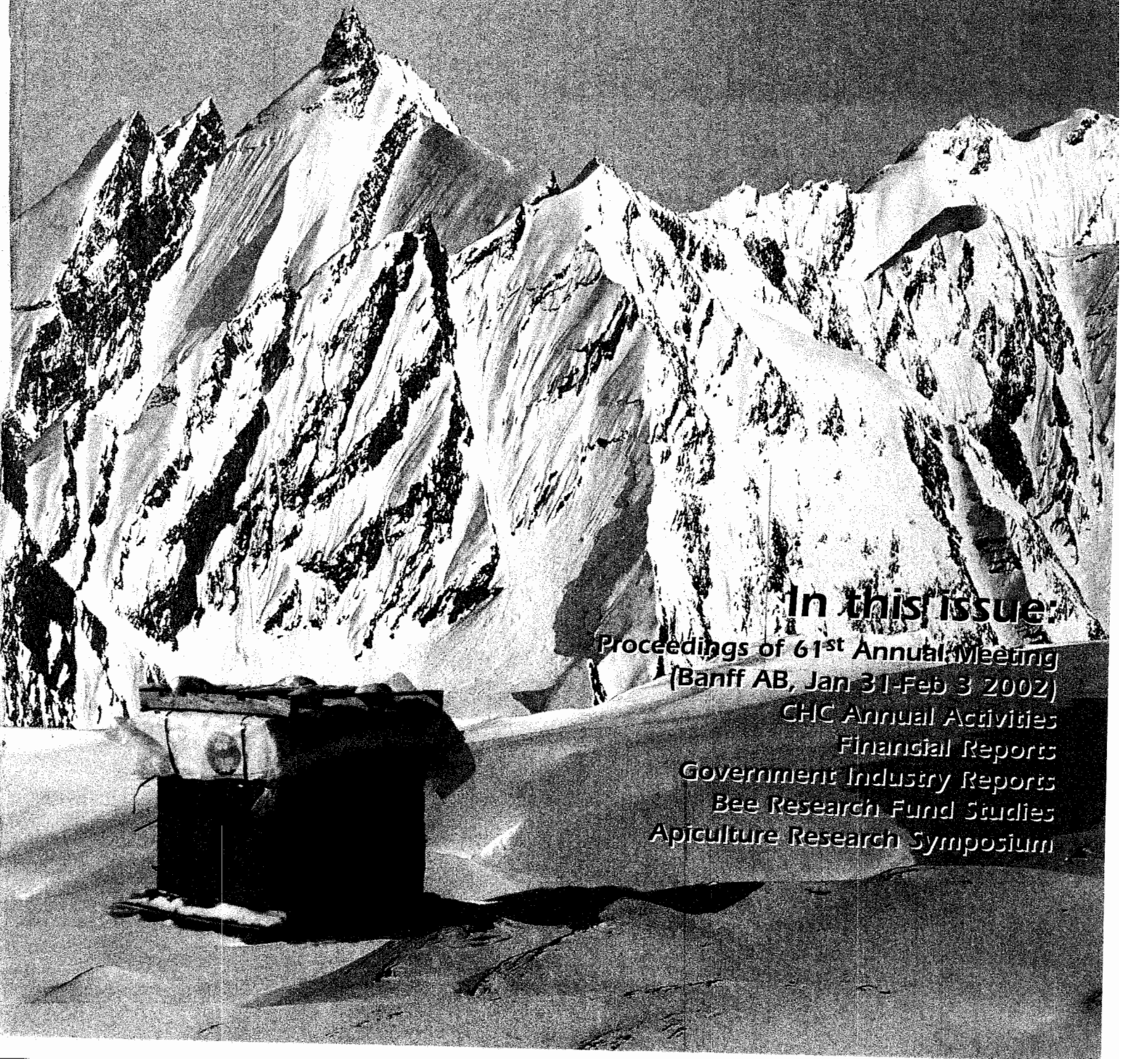
Canadian Honey Council



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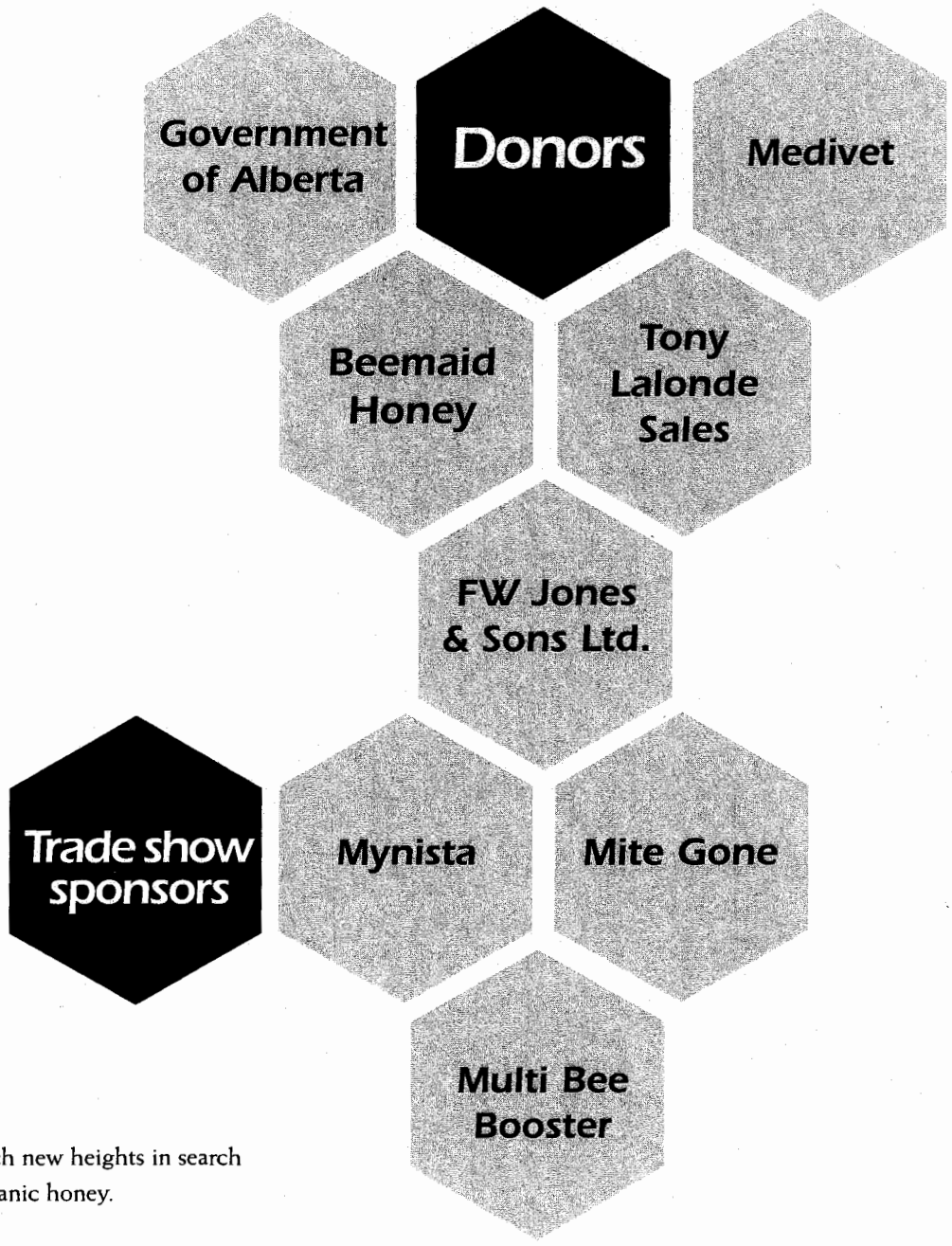

The cover

Beekeepers reach new heights in search for sites for organic honey.

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Officers of the Canadian Honey Council

Canadian Beekeepers Association 1940-1972

	President				Secretary		
1940-41	William R. Agar*	Brooklyn	ON	1940	W.T Patterson*	Winnipeg	MB
1942	Sam M. Deschenes*	Montreal	QC	1941-48	Roy M. Pugh*	Tisdale	SK
1943	J.W. Braithwaite*	Brandon	MB				
1944	P.C. Colquhoun*	Maple Creek	SK				
1945	Allan T. Brown	Peterborough	ON				
1946	W.E. Phillips*	Dauphin	MB				
1947-49	Frank Garland*	Winnipeg	MB				
1949-51	J.N. Dyment*	Smithville	ON	1949	W.G.LeMaistre*	Edmonton	AB
1952	Peter Kowalski*	Edmonton	AB	1950-59	Roy M.Pugh*	Tisdale	SK
1953-54	W.H.Turnbull*	Vernon	BC				
1955-56	H.C. Allen*	Toronto	ON				
1957-58	Sid J. Lye*	Oakville	MB				
1959-65	Victor Mesley	Kemptville	ON	1960-62	R.M.McKay	Ottawa	ON
1966-67	Earl J. Burnett*	Roland	MB	1962-69	John E. King*	Ottawa	ON
1968-69	Robert Asher	Brooks	AB				
1969-71	Lou Truscott	Creston	BC	1969-72	Hank R. Taylor	Ottawa	ON

Canadian Honey Council 1972-2002

	President				Secretary		
1971-72	Don F. Peer*	Nipawin	SK				
1972-74	Robert Bird*	New Westminster	BC	1972-75	Frank R. Garland*	Winnipeg	MB
1974-76	Jack M. Smith*	Beaverlodge	AB	1975-82	Fred Rathje*	Bassano	AB
1976-78	Gerry Paradis*	Falher	AB				
1978-80	Tom Taylor	Nipawin	SK				
1980-82	Howard Bryans	Alvinston	ON				
1982-84	Merv Abrahamson	Pelley	SK	1982-85	Bob Douglas	MacGregor	MB
1984-86	Jerry Awram	Hines Creek	AB	1985-98	Linda Gane	Nipawin	SK
1986-88	Dale Hansen	Farmington	BC				
1988-93	Roger Congdon	Cottam	ON				
1993-95	Barrie Termeer	Rollyview	AB		**National Coordinator**		
1995-99	Wink Howland	Yorkton	SK	1998-	Heather Clay	Calgary	AB
1999-01	Merv Malyon	Brandon	MB				
2001-02	Dave MacMillan	Thornloe	ON				

* Deceased

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Minutes of the 61st Annual Meeting of the Canadian Honey Council

31 January to 3 February 2002, Banff AB

The 61st annual meeting of the Canadian Honey Council opened at 6.30 PM, Thursday 31 January 2002 at the Banff Centre for Conferences, Banff, AB.

President David MacMillan welcomed members and guests and invited them to enjoy the program and the speakers. A report of the research symposium Friday 1 February is in Section 2 and 3 of the proceedings.

Business Meeting

Saturday 2 February 2002
Present: David Macmillan,
Vice President Wink Howland,
Phil Veldhuis, Stan Reist,
Jean Bergeron, John Pedersen,
Paul Vautour, and the National Coordinator Heather Clay.
Scott Plante represented Alain Moyen with the permission of the FAQ.

Minutes of the 2001 Meeting

Motion: Moved by Paul Vautour /Wink Howland to accept the minutes of the 2001 meeting as printed in the proceedings
CARRIED.

There was no business arising from minutes.

2001 Financial Statement

Wink Howland

The financial statement Appendix II was presented to the delegates. It was noted that Hivelights revenue is up $9,000 but the expenses exceed revenue by $10,000. There is a great need to increase membership subscriptions.

Motion: Moved by Wink Howland/ Stan Reist to accept the 2001 financial statement as presented.
CARRIED

Motion: Moved by Wink Howland/ John Pedersen that Jack MacKay be appointed auditor for the year 2002
CARRIED

President's Report

David MacMillan

The Ottawa trip in May of 2001 was the culmination of our lobbying efforts on several fronts. Because we were already into the bee season and in an attempt to keep costs down I decided to go without bringing in either of our executive members. Heather Clay, Doug McRory and I met with the Canadian Food Inspection Agency personnel and did the rounds of various departments responsible for bee issues in Ottawa. Regarding the honey house inspection draft proposal we recommended some minor changes in the record keeping and asked for standardized forms.

We also met with representatives of the Bureau of Veterinary Drugs to pursue the registrations of Tylosin and Lincomycin. Don Nelson, Beaverlodge Research Station joined us in this meeting. The important issue was to get the BVD to accept the American data on residues so that research would not have to be duplicated. The data has been submitted to the Federal Drug Administration and is in the process of approval. We have expressed our interest in getting these antibiotics registered for bees but progress is slow.

Discussions were held with the Pest Management Regulatory Agency regarding the emergency registration of Coumaphos and the concerns that beekeepers have about the systemic insecticide Imidacloprid. Coumaphos is an organophosphate and the PMRA is reluctant to give any label extensions for this chemical. Emergency registration can be achieved under certain conditions if there is a serious problem.

We now have confirmation of varroa resistance in several parts of Canada and so we have contacted the manufacturer, Bayer Chemical, to pursue registration. The beekeeping industry realizes that products such as Coumaphos and Apistan are not long term solutions for treatment of mites and there is an increasing willingness to incorporate other biological controls.

The concerns about Imidacloprid keep growing. We hoped to stop any new releases for use of this product but it has been registered for use on a number of new crops for this coming year. A widespread spray program that is being considered for aphid control could have serious consequences for us. Also the news from N. Dakota is very alarming. It appears that imidacloprid has been found in the wax of affected colonies. This is a migratory operation so it is hard to say where the contamination came from. It is however further justification for the stand that council has taken. We will continue our efforts regarding this product until the question of long term effects have been addressed.

The arrival of Varroa resistance to fluvalinate (Apistan), plus the outbreak

of resistant AFB in BC and Alberta has some beekeepers very worried about suffering crippling winter losses. This worry has in part brought about some policy changes on the border closure issue. BC and Manitoba have voted for access to mainland US queens and Alberta wants open trade in package bees. Further discussion will take place at these meetings.

The financial situation of council is cause for concern. We were over our budget for 2001 largely due to expenditures on Hivelights. This will have to be addressed. I think Hivelights is close to becoming a truly national magazine and close to becoming profitable but it needs a bigger subscriber base. We could use more involvement from CAPA members by way of articles submitted. Budgetary restraints have prevented attendance at the American meetings and have hindered our effectiveness in Ottawa. One issue that we have not dealt with is the increasing flood of Chinese and Argentine honey. While I can appreciate the importance of US countervailing duties, it is not without some cost to Canadians. Our home markets are slowly being filled up with blended products and our smaller packers and producer packers who sell only Canadian honey are finding it hard to compete.

The need for a strong CHC has never been greater. We need resources to do the job and we need your support to achieve this.

Motion: Moved by Wink Howland/ Paul Vautour to accept the President's report as presented. CARRIED

National Coordinator's report

Heather Clay

The CHC had a busy year dealing with a large number of issues. Our membership is up and the advertising from Hivelights has increased (Appendix I). The problem is that our income has not kept pace with rising costs. We hope that the success of this meeting and the improved circulation of Hivelights will bring in higher revenues in 2002.

Maximum Residue Level for Oxytetracycline and Tetracycline

Oxytetracycline (Oxytet) has been used for 40 years and in all that time no MRL has been set for honey. The CFIA when it was formed in 1997 asked the Dept of Health to set an MRL and they eventually responded with an Administrative tolerance of 0.1 PPM. The CFIA is not willing to accept that standard because it is not an official MRL and it would not stand up in court. As a result CFIA enforces a zero tolerance for oxytetracycline and tetracycline in honey. The CHC has requested the Dept of Health to set MRLs for all drugs used in the honey industry.

Nutrition labeling

Health Canada has proposed a new regulation for nutrition labels on processed food. The CHC is working with the Fair Labeling Practices group within the CFIA to produce a generic nutritional label which all honey packers will be able to use.

Tylosin Off Label Prescription

Alberta beekeepers with a resistant strain of American Foul Brood have won a temporary battle for the right to treat their colonies with the drug Tylan® (tylosin). Through the efforts of the Alberta provincial apiarist and researchers at Beaverlodge, the Alberta Veterinary Medical Association, has agreed to issue "off label" prescriptions for purchase of Tylan soluble (Tylosin) to treat rAFB in apiaries this fall.

The veterinarian will require a positive confirmation of the presence of rAFB and the product is only to be used during the fall period. This should help beekeepers deal with the situation while they work on improving their AFB management routine. The CHC is working with various authorities to have the drug registered and legally available to beekeepers who need an alternative to oxytetracycline.

Honey House Grading Regulations

The new Honey House Grading Regulations were presented at the annual meeting in Moncton. Generally the new proposal is based on the Hazards and Critical Control Point (HACCP) plan and will be applied to all levels of packers. It was introduced to the honey inspection program in summer 2001. The CHC is working with the CFIA to ensure that the rules are made more "beekeeper" friendly.

Imported honey

Figures from Agriculture and Agri-Food Canada show that overall imports were up sharply again in September after being down in August. Imports to the end of September 2001 were about one-third higher than all of last year. Argentina was the single largest source

of imports for the month, exceeding China for the first time. Argentine honey was priced cheaper than Chinese honey (possibly reflecting the large volume). The CHC is urging CFIA to monitor the imports of honey to prevent Canada becoming a back door to the USA.

CFIA Import Protocols

The issue of the Peace River areas of Alberta and BC demanding a special quarantine area to allow bees from the mainland USA was discussed with CFIA. The CFIA indicated that a quarantine could be put in place but it would require the agreement of Alberta Agriculture and BC Agriculture Departments. The enforcement of the quarantine zone would be a provincial matter. It is unlikely that an agreement would be reached for the next import season. The CHC reviews border protocols each year at the annual meeting.

Tylosin and Lincomycin

Only one chemical is registered (Oxytetracycline) to control American Foul Brood. Thousands of colonies in Alberta and BC are now affected by a strain of bacteria that is resistant to the drug. The CHC is pursuing the registration of two alternative drugs called tylosin and lincomycin. The regulators in the Bureau of Veterinary Drugs who are responsible for the registration of drugs want human safety data done in Canada. This could cost a lot of money. As well the fees to register a minor species may cost $16,000. The CHC has met with BVD staff and are negotiating a reduction in fees to have the drug registered.

Imidacloprid problems

Prince Edward Island beekeepers have reported serious losses of honeybees that they believe is linked to the residues from imidacloprid. Potatoes on the island have been treated with soil applications of Admire (imidacloprid) to prevent Colorado potato beetle since 1995. It is believed that the rotational clover and canola crops have sublethal residues of imidacloprid in the pollen and nectar that causes slow death of the colony. New Brunswick beekeepers reported large losses of 50-60% in 2001 that may also be attributable to the use of Admire. Similar figures are reported in potato areas of Ontario.

In Canada the Pest Management Regulatory Agency (PMRA) has registered Gaucho75 ST as a seed treatment for canola, mustard and rapeseed, and in Ontario for corn. The CHC has requested the withdrawal of this product until further independent research is completed. The minister of Health Allan Rock has not agreed to this although the PMRA has agreed to review the currently available research before making a final decision.

Imidacloprid in North Dakota

A beekeeper in North Dakota lost large numbers of his bee colonies (60%) in 2001 and has embarked on a campaign to find out the cause. Laboratory tests have been performed on his bees, and wax. The early testing has shown no residues from aerial sprayed pesticides but there were residues of imidacloprid (trade name Gaucho /Admire) in quantities high enough to kill bees. Follow up tests are being done and the case is being documented in preparation for potential legal action. The beekeeper believes that the accumulation of imidacloprid in his bees wax has been occurring for 3-5 years. When he uses fresh foundation the bee colony is productive but when he puts on contaminated comb the bees begin to die. He has also observed unusual behaviour problems with the bees and advises other beekeepers to be very careful about checking which chemicals have been used in the areas where bees forage.

Imidacloprid workshop

A group of scientists, extension workers and representatives from government and industry attended an imidacloprid workshop in Calgary on 29 January, 2002. A summary of the conclusions was presented at the research symposium on Friday, indicating that there is no effect of imidacloprid on honeybees when used according to label. Our position is that the long term sub lethal studies have not been done and we want to see more work done on the hives that experienced a problem in potato areas.

Centre of Excellence

Manitoba beekeepers have been pursuing the idea of establishing a centre of excellence for apiculture at the University of Manitoba. The CHC resolved to support the beekeepers in this endeavour.

Varroa Resistance

Alert beekeepers in New Brunswick noticed a higher than usual number of varroa mites in brood cells after treatment with Apistan® (fluvalinate). Subsequent testing has shown a rising trend in varroa resistance (see article in this issue of Hivelights). The CHC has been pursuing the registration of an alternative chemical treatment for Apistan. Coumaphos is currently used in the USA for fluvalinate tolerant mites and it may be possible to get an emergency registration for this product on a province by province basis. In the meantime, formic acid treatment is recommended as a good alter-

native for spring. John Gates has tested a thymol based product in BC and found good results. Other alternatives are genetic selection of bees for hygienic behaviour. A line of Russian bees is showing promise and funds from the Canadian Bee Research Fund has been used to import the genetics of this stock into Ontario for producing queens in Canada.

Stock improvement

The CHC resolved to support Medhat Nasr and Gard Otis in their attempts to import strains of honeybees that may be tolerant to varroa mites. Medhat Nasr received assistance from the Ontario Beekeepers Association and a $4000 grant from the Canadian Bee Research Fund to continue his project in making the genetics of Russian and Harbo lines available in Canada

Motion: Moved by Wink Howland /Jean Bergeron to accept the National Coordinator's report as presented.
CARRIED

Provincial Delegates' Reports

Maritime Beekeepers Association

Paul Vautour

Drought in all the provinces reduced the honey flow in 2001. In Nova Scotia an extensive survey of apiaries showed no tracheal mites. This is proof that areas can remain free of the mite if importation is controlled. No tracheal mites have been detected since the depopulation of the original find in 1995.

In New Brunswick, the auditor general commented on the level of inspections and the funding for enforcing the NB Apiary Inspection Act. Things may change and there may be increased funding for inspection.

A large number of beekeepers in NB experienced high losses in the spring of 2001. The average for NB was 21% loss but some commercial beekeepers lost up to 60% of their colonies. It is not clear what caused the losses.

Varroa mite resistance to fluvalinate occurred at the end of 2001. Some beekeepers noticed that colonies treated with Apistan for four weeks still had high loads of varroa mites. New Brunswick is preparing a request for emergency registration of coumaphos. Grand Manan an island off the Fundy coast is mite free and seeking to be a mite free zone.

A study was conducted in Prince Edward Island by Dr Jim Kemp and Dick Rogers to determine if the systemic insecticide used to kill colorado potato beetle in potatoes is linked to high losses of honeybees. Beekeepers are eagerly awaiting the results which will be presented at this meeting.

Fédération des Apiculteurs du Québec

Scott Plante

Quebec had a hot dry summer, and many operations suffered low production. The nectar flow was late and many hives were honey bound when it did come in.

There are 36,000 colonies operating in Quebec and tracheal mite affects 50% of the big beekeepers. Varroa mite is widespread through the province. Over 2,000 hives moved to NB for pollination of blueberries in 2001. There is a concern that the fluvalinate resistance in NB could be a problem in the future. More hives will be going to pollination in 2002. The current rental price for bees is $70-80 in Quebec and higher in NB.

Ontario Beekeepers Association

David MacMillan

Another season has been put to rest. Some beekeepers fared quite well while others suffered from drought or too much moisture. However no matter how many drums we have sitting in our warehouses we owe our American neighbours a great deal of thanks for their antidumping efforts. The positive effect this action has had on prices is a blessing in what has otherwise been a difficult year for many.

Honey sales in Ontario were on the slow side but supplies of golden honey appear to be cleaned up. Some of our producer-packers have been selling more of this grade in order to better compete with Canadian-Argentine blends. Despite drought conditions across much of Southern Ontario we had some very good crops of light coloured honey. The provincial average was around 100 lbs. It appears that Ontario is the recipient of large quantities of Chinese honey. This should be no surprise to many but it is still disappointing for Ontario producers.

Small hive beetle has not been detected in southern Ontario but some pockets of resistant varroa mites appeared in border areas. Ontario has applied for the emergency use of Coumaphos to give those beekeepers a chance to treat their colonies in spring. Ontario lost Medhat Nasr from running the tech transfer program. He has taken a posi-

tion with Rutgers University in New Jersey. The Russian bee project continued with the help of his assistant Geoff Wilson and we hope to have this improved stock available for producers in the near future. Work on SMR bees has been done by Alison Skinner and the hygienic bee breeding program continues. Together with the Buckfast bee program, Ontario leads the way in its work on bee breeding.

Manitoba Beekeepers Association

Phil Veldhuis

The Red River area of Manitoba had good honey production but everywhere else suffered from widespread drought. The eastern part of the province had only three weeks of prime weather for honey production. This severely limited the brood and production.

Beekeepers benefit from the two apiarists employed by the Ministry of Agriculture. Don Dixon and Rhéal Lafrenière do a great job. Manitoba is pushing to become a Centre of Excellence for apiculture. Research conducted at the University of Manitoba has been supported by the MBA. The association donated $10,000 to assist in a project on research of indoor treatments of honeybee colonies.

Manitoba has the beginnings of a problem with fluvalinate resistant mites. These may spread naturally but it is recognized that beekeepers throughout the province will soon experience the effect. A request has been made to get coumaphos for emergency treatment of varroa mites.

Saskatchewan Beekeepers Association

Wink Howland

Many western and central areas of Saskatchewan had little or no snow cover last winter, and neither spring or summer rains materialized. The result was drought and severely diminished crops of all kinds, honey included! Those areas which had a snow cover and that received some of the showers which passed through the province, managed to achieve an average crop. The Saskatchewan crop was down 25% from last year. The moderate increase in honey prices is unlikely to offset the decrease in production for most beekeepers.

The provincial government provided some much needed financial assistance to enable inspectors to examine a substantial number of colonies for American foulbrood. There have not been any inspectors for many years, and beekeepers have been left to look after their own problems. The inspectors found some foulbrood, but fortunately, the samples did not appear to show resistance to oxytetracycline antibiotic.

Aerial spraying did not have a large impact on beekeepers in 2001. A few beekeepers experienced some bee losses as a result of aerial sprays, but those losses were minimal and not likely to have much effect on the overall crop. However, the drought conditions have been ideal for grasshopper production, and unless we have a cold winter followed by a wet spring, grasshopper spraying could pose a problem in the coming year.

The majority of the SBA do not support the ABA position on border opening. In SK beekeepers have changed their management to suit the changing conditions. Packages from Australia and New Zealand amounted to around 2,000 imported in 2001. Most beekeepers make splits in spring and requeen themselves. Off shore queens were approximately 10% of total supply

Yard registration was a big issue in SK. If the border to the US is open there will be a potential for migratory beekeepers from the US to seek the high production of honey enjoyed by SK beekeepers. The issue will be debated at the next SBA meeting.

Alberta Beekeepers Association

Jean Bergeron

Alberta's Peace River Region is one of best honey producing areas in the world. Since the border was closed to package bees from the USA, production has been impacted by increased costs of overwintering and the high cost of imported bees. The cost of production for 2000 was $130 for the province but the Peace River region was $146 per colony.

Wintering losses in northern Alberta are the highest in the country. Winters in Peace River area are long and severe. High wintering losses, poor health of over-wintered bees, insufficient local supply, high cost of importing, exhausted safety net programs have reduced the number of beekeepers from 1700 to 700 since 1987. Colonies are down from 72,000 to 50,000 despite the fact that there is now 30% more acreage of canola.

We believe that the pest situation has been overestimated in California. Experts claim that Africanized Honeybee and small hive beetle will never be a problem in northern states. Alberta has mites and resistant disease so there is no longer reason to prevent the importation from the US on account of disease.

The promise of Canadian queens and packages has not happened. Alberta supplies 38,000 queens, and imports 42,000 but the demand for queens is currently 220,000. Replacement bees from the US are half the price of offshore. With a supply of

US queens there will be increased production and profitability by 30%.

Want to know what actions CHC will take on assisting AB commercial beekeepers to get the stock they need.

BC Honey Producers Association

Stan Reist

The BC Ministry of Agriculture and Food has changed its priorities. Since the election, major cuts to personnel were announced but so far apiculture staff have no losses. The decision was to retain the positions but their responsibilities were changed.

There was hot discussion in the BCHPA regarding a motion to allow queens from the U.S.A. to be imported to B.C. Second thoughts took place and there were complaints about not understanding the motion . The motion was re-presented and carried with approximately 20 - 14.

There are indications of resistance to Apistan (fluvalinate) in B.C. and tests are under way to confirm or discount this report. The BCHPA would like Coumaphos as a one extra tool to treat resistant mites and to save colonies.

The honey crop was generally down and in a lot of cases not enough to winter feed.

The B.C. package bee industry is growing and reports are that packages sent to the B.C. Peace River Area did well, despite the rain. There are still a fair number of packages available for the 2002 year.

The BCMAF estimates that the value of BC pollination is $160 million.

Motion to accept the delegate reports moved by Wink Howland/ John Pedersen
CARRIED

Fred Rathje Award

Wink Howland

Since the CHC is holding a second annual meeting at the end of 2002 in Niagara Falls, it was decided not to award the Rathje trophy at this meeting in Banff.

Motion to accept the Rathje report moved by Wink Howland/ John Pedersen
CARRIED

Moved by Jean Bergeron / Wink Howland

Resolutions 2002

1. WHEREAS there has been interest expressed across Alberta for the importation of packaged bees from the USA. BE IT RESOLVED that the CHC supports and work for the importation of package bees from the USA into the entire province.
   DEFEATED
   Moved by Stan Reist /Wink Howland
2. BE IT RESOLVED that the CHC supports the importation of queens from Continental US subject to any restrictions and/or quarantines the authorizing agencies deem necessary.
   Moved by Stan Reist / Jean Bergeron
   To amend the motion to read:
   BE IT RESOLVED that the CHC supports the importation of queens from Continental US subject to the conditions of import certificates as established by Canada.
   DEFEATED
   Moved by Phil Veldhuis
3. BE IT RESOLVED that the Canadian Honey Council:
   i. Investigates alliances with American queen producers to produce queens from genetically favorable Canadian stock;
   ii. Allow for the importation of queens from continental United States of America for spring 2002 with reasonable conditions applied to ensure disease cleanliness and to enhance possible cooperation between prairie queen breeders and queen production facilities;
   iii. Investigate all other aspects of potential future large-scale imports from the continental United States of America.
   Chair ruled that the motion was redundant. This ruling was challenged by the Alberta delegate.
   A vote was taken and the ruling was upheld.
   Moved by Dave MacMillan /Wink Howland
4. WHEREAS there are still many beekeeping operations in Canada that are free of one or both of the pests "varroa " and "acarine", and WHEREAS there still exist many problems with honey bees in the U.S. i.e. rAFB, rTM,

rCoumaphos, rApistan, hive beetles, Africanization;
BE IT RESOLVED that Canadian Honey Council supports continued border closure to continental U.S.A. for honey bees.

Withdrawn

Moved by Paul Vautour / David MacMillan

5. WHEREAS there has been an interest expressed in importing packages and queens from varroa infested areas of NZ, and
WHEREAS currently this is prohibited;
BE IT RESOLVED that:
i. the recommendation of CHC to CFIA is to allow importation from the known infested areas, subject to all other existing protocols;
ii. the recommendation of CHC to the package suppliers is to require fluvalinate treatment for all bees imported from the North Island, and to continue to work with provincial apiarists to avoid introduction of Varroa into non-infested areas.

CARRIED

Moved by Wink Howland / Stan Reist

6. WHEREAS the control of varroa mites requires treatment with Apistan, (fluvalinate) and
WHEREAS, continued use of Apistan is known to eventually produce fluvalinate resistant varroa mites, and
WHEREAS, it is urgent that an alternative treatment be available as soon as possible, and
WHEREAS, Fluvalinate resistant mites are now present in Manitoba, New Brunswick, Ontario and British Colombia;
BE IT RESOLVED that the CHC and CAPA actively pursue both the full and/or emergency registrations of alternative chemical(s) ie: coumaphos / thymol / oxalic acid, for the control of varroa mites and to further reduce the risk of developing resistance.

CARRIED

Moved by Wink Howland / Stan Reist

7. WHEREAS Beekeepers face constant predation by skunks on their bees, and
WHEREAS there are no effective ways of dealing with this problem of skunk predation other than trapping, and WHEREAS the beekeeping community has been responsible for keeping the skunk population at low levels, thereby reducing the incidence of rabies,
BE IT RESOLVED that the CHC and CAPA request the Federal government, to allow beekeepers a special permit for the use of strychnine for the control of skunks.

CARRIED

Moved by Jean Bergeron /Stan Reist

8. WHEREAS the need for an unstable antibiotic suitable for spring control of AFB would provide a more complete protection package for beekeepers
BE IT RESOLVED that CHC and CAPA investigate the development and registration of a quick breakdown antibiotic to be included in the antibiotic registration process.

CARRIED

Moved by Jean Bergeron / Paul Vautour,

9. WHEREAS Agriculture and Agri-Food Canada's sole researcher on bees will be retiring within the next few years
BE IT RESOLVED the Canadian Honey Council supports the ABA in having this position filled with a honeybee Pathologist whose sole program will be the management and control of honeybee disease.
Amendment moved by Jean Bergeron / Paul Vautour
BE IT RESOLVED the Canadian Honey Council supports the ABA in having this position filled with a honeybee Pathologist whose main responsibility will be the management and control of honeybee disease.

CARRIED

Moved by Jean Bergeron / Dave MacMillan

10. WHEREAS there is an ongoing problem with heavy honeybee losses from the inappropriate application of insecticides, and;
WHEREAS application 'precautions' seem to not have the force of law; BE IT RESOLVED that the Canadian Honey Council urges the Pest Management Regulatory Agency to give these precautions the force of law.

CARRIED

Moved by Dave MacMillan /Stan Reist

11. WHEREAS beekeepers have no source of compensation for hives lost due to pesticide spraying, and
WHEREAS determining blame in such cases has proven difficult, and
WHEREAS the Pest Management Regulatory Agency collects and hold backs 3% of the gross sales as a registration fee pesticide companies pay to have their products registered, BE IT RESOLVED that the Canadian Honey Council lobbies the Pest Management Regulatory Agency, the Minister of Agriculture and the

Minister of Health to establish a compensation fund for beekeepers with hive losses due to pesticides.

CARRIED

Moved by David MacMillan /Wink Howland

12. WHEREAS Russian bee stock imported and developed by the U.S. is showing great promise, and WHEREAS several new lines that have not been imported to Canada are to become available soon, BE IT RESOLVED that Canadian Honey Council support the importation of Russian eggs and semen of these new lines through the existing Russian Bee Project and the OBA Tech Transfer/Applied Research Program as they come available.

CARRIED

Moved by David MacMillan / Wink Howland

13. BE IT RESOLVED that Canadian Honey Council pursues with the necessary authorities the setting of workable national standards for organic honey.

CARRIED

Moved by Paul Vautour / Phil Veldhuis

14. BE IT RESOLVED that the Canadian Honey Council thank the Calgary Beekeepers Association for assisting in hosting the meeting in Banff.

CARRIED

Moved by Phil Veldhuis / Dave MacMillan

15. BE IT RESOLVED that the CHC holds its annual meeting with the Manitoba Beekeepers Association in conjunction with their centenary meeting in 2004

CARRIED

Elections

Elections were held and the positions were filled as follows;

President:

Dave MacMillan was elected by acclamation.

Vice President

Wink Howland was elected by acclamation.

Executive Member

Phil Veldhuis was elected by acclamation.

Adjournment

The meeting was adjourned at 5:00 PM Saturday 2 February, 2002;

Motion to adjourn the meeting by David MacMillan /Paul Vautour.

CARRIED

Federal Government Reports

Honey Testing Program

John McCool
Canadian Food Inspection Agency
Ottawa ON

The CFIA is in the currently in the process of making changes to the inspection program. There will be a re-write of the regulations, new establishment inspection program and a focus on residues in honey. Areas of particular concern are antibiotic residues in honey. There are no maximum residue levels in place for honey and the CFIA uses the default level of zero for any residues in honey. Honey producers should be careful about using registered products and following the directions carefully. Inspections may be increased over the next year to comply with international Codex requirements.

Honey consumer isssue

Fred Butterworth - CFIA Lab Services Division, Calgary

Product labels should be clear precise accurate and not misleading. The CFIA is involved in ensuring that the registered establishments pack consistent quality honey in standard container sizes. The issue of labels and standard sizes will be discussed with industry in order to establish regulations that are fair and do not set up trade barriers.

Honey Establishment Inspection

Sam Barlin, CFIA Winnipeg and
Howard Willems, CFIA Saskatoon

CFIA has drafted a new Multi Commodity Activities Program for honey establishments which is based on HACCP principles. Details of the new MCAP program were presented at the meeting and can be found on the CHC website www.honeycouncil.ca/mcap.html

Market & Industry Service Branch

Dave Pearen
Agriculture and Agri-Food Canada
Ottawa, ON

The 2001 honey statistics from Statistics Canada are presented in Appendix V and VI. Honey production

in Canada was stable at an estimated 70 million pounds in 2001. Average production per colony remained at 116 pounds/colony and the number of bee colonies in Canada was over 600 thousand.

Alberta Saskatchewan and Manitoba were the key producers of honey. While both Saskatchewan and Manitoba increased production in 2001, drought and poor pollination conditions resulted in a drop in Alberta production. While yields in Alberta were 111 pounds/colony in 2000 they were down to 71 pounds/colony in 2001.

Honey Testing

Jonathon Haché-CFIA Ottawa LSD

Honey can be authenticated in the lab using Isotope Ratio Mass Spectrometry (IRMS) and variations in the amount of Carbon 13. The differences in C3 and C4 sugars means that the lab can detect additions of High Fructose Corn syrup to as little as ~7% added sugars. The laboratory results of the honey testing program are presented in appendix IV.

Animal Health Division, Imports

Brian Jamieson
Canadian Food Inspection Agency,
Ottawa, ON

There were a number of animal health import issues in 2001.

- ▷ New Zealand Imports
- ▷ Imports from Mainland USA
- ▷ Importation of used Beekeeping Equipment

Imports from New Zealand

Varroa mite surveillance through June 2001showed that the South Island remained free of varroa but the North Island had a significant zone of infestation.

The option for importing in 2002 will be modified to allow imports from infested zone provided that treatment is done by commercial contract (the impact on transitting of NZ bees through Hawaii is unknown)

Import from Mainland USA

The US border issue has been discussed in consultation with CAPA and CHC. The major issues were queens and/or packaged bees, Canada's honeybee health status, the US ability to certify, timeframe for regulatory change, and the potential for an agreement on conditions of import. The current prohibition will continue in place through December 2004, subject to annual review.

Future Import Options from USA

The status quo - does not meet expressed needs of Alberta, BC and Manitoba. Some of the options to be considered are the possibility of importing into defined provinces only, the need for tracking and prevention of intra province movement. If industry requests then all import restrictions could be removed. However, if packaged bees are allowed entry, we cannot justify refusing bees on comb.

Canada's Honeybee Health Status

Varroa mites with fluvalinate resistance have been reported in New Brunswick, Ontario, Manitoba and BC. Alternative treatments using coumaphos have been sought on an emergency basis. American Foul Brood resistant to oxytetracycline has been reported from Alberta and BC.

There are no reports of Small Hive Beetle. Pesticides are available for Varroa mite

Timeframe for Policy Change

Amending the regulation to remove the "ban"on importation of honey bees can be done in a tight timeframe (Ministerial Regulation not G.O.C) and action could be immediate.

The regulation for import permits is already in place but there must be agreement on the import conditions.

Total Deregulation of Imports would require a Government Order in Council amendment. This would not be possible for the import season 2002.

Used Beekeeping Equipment

Importation of Packing Material, Beehives and Beeswax into Canada is prohibited.

57. No person shall import into Canada

(a) Used beehives or used beehive equipment; or

(b) Bee products for bee feeding unless

(i) they are accompanied by a certificate stating that they have been treated in a manner approved by the Minister to prevent the introduction or spread of any disease, or

(ii) they are transported under seal of an inspector direct from the point of importation to an establishment approved by the Minister for treatment. SOR/97-85, s. 46.

Any change to this act would require a GOC amendment and this could not be achieved in less than one year. Therefore under current regulations no used used beeswax can be imported for rendering in Canada.

CAPA Reports

CAPA Chemicals Committee

John Gruszka

Resistant American Foulbrood (rAFB)

Resistant American Foulbrood continues to be a significant problem for the industry. The Province of Alberta released the results of their province-wide survey (Alberta Bee News December 2001). RAFB has been found across Alberta and positively identified (by lab test) in 40 Alberta beekeeping operations (69,000 colonies of honeybees). Some of these had serious rAFB problems while in others, rAFB is only beginning to be found.

British Columbia reports that rAFB is geographically widespread, however, the levels that have been found are very low. To date, rAFB has not been found on Vancouver Island.

Saskatchewan performed a study (in 2001) of honey samples collected from the 2000 honey crop. A total of 139 honey samples were collected along with 32 comb samples and examined for American Foulbrood and for possible resistance to oxytetracycline. Eleven of the 139 honey samples were found to contain rAFB. However, the lab found difficulties with the microbiological protocol used and many of the samples were contaminated with other microbial species. Consequently, the results are not reliable. Honey samples that contained the suspected rAFB have been forwarded to Beaverlodge where they will be re-analyzed in a similar research project that is being initiated.

There have been no reports of rAFB found in other parts of Canada, to date.

Irradiation of Honey Bee Equipment Infected with rAFB

One option for the control of rAFB in infected equipment is to irradiate the equipment. Gamma irradiation facilities exist in Ontario and electron-beam irradiation facilities are available in Vancouver, British Columbia and Pinawa, Manitoba. There was a flurry of activity in February-March-April 2001 that involved the Import Committee, Chemicals Committee, and many individual CAPA members. The controversy was generated around the debate over whether electron-beam irradiation was as good as gamma irradiation in controlling rAFB and if not, if the western Canadian beekeeping industry would have access to a gamma irradiation facility in Sandy, Utah. This debate reopened the issue of opening the border to equipment from the United States.

The issue arose upon the initiative of one large commercial beekeeper in Alberta with a severe rAFB problem. In the end, the issue died when the aforementioned beekeeper decided to have his equipment treated with electron-beam irradiation in British Columbia. van Westendorp (personal communication) indicates that the facility in Vancouver has treated approximately 10,000 boxes of bee equipment during the past year. The majority of this was from one commercial beekeeper in Alberta but a significant number of boxes are being irradiated from B.C. and other Alberta sources.

The Alberta beekeeper has indicated (personal communication with Gruszka) that he is extremely pleased with the results of the electron beam-irradiation of his equipment. Both equipment with scale and equipment without scale were irradiated and offshore packages installed into the equipment. The beekeeper reports that he has never seen such uniform and complete brood patterns, that the irradiated scale was removed by the worker bees, and that he has not seen any re-infestation of foulbrood from these colonies.

Hopefully, this will indicate to the industry that the electron-beam irradiation is as good, or certainly adequate, as the gamma irradiation and that Western Canadian beekeepers (particularly B.C. and Alberta) will find that it is cheaper to use the facility in Vancouver than to truck equipment to Utah.

If the current debate over moving equipment for gamma irradiation has been temporarily resolved, it still leaves some long-term regulatory issues. The first major issue is that of movement of bees and equipment, particularly the large-scale movement that takes place between British Columbia and Alberta. Secondly, it needs to be determined whether the long-term efficacy in any particular operation with rAFB is maintained (whether irradiated equipment includes visible scale or whether the scale is first removed).

Registration of Tylosin

Tylosin has yet to receive registration for use in Canada or the United States. Work is being initiated at Beaverlodge to determine the most appropriate application methods to minimize residues. However, the ultimate decision to register Tylosin in Canada will be made by Health Canada and they will likely base this registration on residues in honey. It remains to be seen whether Health Canada will accept U.S. generated residue data or whether such data will have to be generated in Canada.

As of the fall of 2001, beekeepers who have resistant foulbrood in

Alberta have been able to access Tylosin. Through the efforts of the Provincial Apiarist, Kenn Tuckey, and the cooperation of the Alberta Veterinary Medical Association, a system has been established whereby beekeepers with a rAFB problem can contact a local veterinarian who will supply the beekeeper with an "off-label prescription." Application of Tylosin to honeybee colonies is restricted to the fall.

Emergency Registration of Coumaphos

Varroa mites resistant to Apistan have been discovered in British Columbia, New Brunswick, southern Manitoba and Ontario. Coumaphos-impregnated strips (Checkmite+) have been available to U.S. beekeepers with Apistan-resistant Varroa mites (on a Section 18 Emergency Registration) in various states in the U.S. Dr. Martha Farkas indicated that PMRA would consider an emergency registration application for use of coumaphos-impregnated strips to control Apistan-resistant Varroa mites.

Bayer, the manufacturer of the strips, has indicated that they would support an emergency registration and are assisting with application for emergency use permits. Dr. Farkas indicates that emergency registration will be made available to those jurisdictions who indicate that they have a resistant Varroa problem, and that each individual province will have to apply for its own emergency use permit. It should be noted that this is a temporary registration process. To quote from the Pest Management Regulatory Agency Regulatory Directive (DIR 2001-05) "Emergency registrations are not intended as a solution to an ongoing pest management problem. Occasionally, an emergency situation may exist in a subsequent year. In the absence of long-term interest by the registrant, and evidence that users and the sponsoring agencies are actively working towards satisfying the data and information requirements for a long-term solution (i.e. registration) emergency registration for a third year will not normally be considered."

Coumaphos will be a short-term solution. Whether long-term registration will be available will be impacted by the organophosphate review that PMRA is currently undertaking.

It should also be noted that some jurisdictions in the United States (Florida, Maine, California) are already indicating that Varroa has become resistant to coumaphos after three years of use in those states.

Import Committee Report for 2001

Doug McRory

The import committee had two issues to deal with this past season:

The only import of genetic material was for the "Russian" and "Harbo" Stocks from the USA. This went well and there are currently six lines established in Ontario. Ontario has asked for another importation for 2002. I propose the following motion:

Be it resolved that Canadian Association of Professional Apiculturists supports the Canadian Honey Council resolution to import Russian eggs and semen of the new Russian lines being released by USDA through the existing Russian Bee Project at the University of Guelph and the OBA Tech Transfer/Applied Research Program.

The other issue was the irradiation of comb in the USA. John Gruszka has reported on that situation in his Chemicals committee Report. Dave MacMillian, Heather Clay, Dr. Brian Jamison, Bruce Zagodny and myself put a great deal of effort into this area.

Canadian Bee Research Fund

Rob Currie

Mark Winston stepped down from his position on the CBRF board of directors in February 2001. His contribution to the success of the CBRF cannot be overstated. Mark was a founding director of the CBRF and through his vision and leadership he made the idea of a research fund become a reality. The beekeepers and research community thank him for his dedication.

The Canadian Bee Research Fund is now in its fifth year of operation, and by December 2001 almost $700,000 has been raised towards supporting bee research in Canada (Appendix III; audited financial reports). The performance of the CIBC managed fund over the past year has been less than expected. As a result, the end of year balance was disappointing. The directors of the CBRF decided not to remove the money from the CIBC fund at this time because the fixed income investments within it would be earning a much higher rate of interest than any that were currently available.

In February 2001 the CBRF directors reviewed applications and approved disbursement of $20,000 in funding for new projects. These projects received approval in February 2002 for funding to continue the projects for a second year.

The following projects were funded in 2001:

Dr Don Nelson,

Agriculture & Agri-Food Canada.
$10,000
"Management of oxytetracycline

resistant American Foulbrood disease in honey bees"

Dr. Rob Currie,
University of Manitoba,
$6,000
"Use of formic acid to control varroa and tracheal mites in indoor wintering facilities."

Dr Medhat Nasr,
OBA, Guelph,
$4,000
"Evaluation of Russian honeybee stocks for varroa resistance and economic traits in Canada."

Apimondia '99 Organizing Committee

Final Report

Don Dixon, Chair
Apimondia '99 Organizing Committee

After approximately 10 years the work of the Canadian Apimondia '99 Organizing Committee has come to an end.

During the past year the Committee was involved in a few final activities.

An Apimondia '99 historical event book was prepared and published by Don Nelson. Copies of the book were provided to Apimondia, the Canadian Honey Council, the Canadian Association of Professional Apiculturists and Apimondia '99 Organizing Committee members. Thanks to Don for taking on this task. In addition, Mark Winston has established an Apimondia '99 archives at Simon Fraser University.

Cynthia Scott-Dupree and Don Dixon attended the Apimondia 2001 Congress at Durban, South Africa during October, 2001 as representatives of the Apimondia '99 Organizing Committee. We fulfilled our responsibility to transfer the Congress President's Collar from Canada to South Africa and met with Apimondia officials regarding the final report from the Vancouver Congress.

At the end of this year the final balance of Apimondia '99 funds being held in trust by CAPA was $10,434.56. This final surplus of funds was divided into equal amounts of $5,217.28 and paid to the CHC and CAPA. This brings the total payments made to CHC and CAPA of surplus funds from the Apimondia '99 Congress to $448,634.56. The work of the Apimondia '99 Organizing Committee is now finished and the committee has been terminated.

On behalf of the Canadian Apimondia '99 Organizing Committee I would like to again thank the many volunteers, sponsors, speakers, participants and corporate partners for making Apimondia '99 such a successful and memorable event.

Section II - CBRF Reports

Varroa Resistance and Economic Traits of Russian Honey Bees in Canada

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Varroa mites are the most destructive parasite on honey bees. In North America, the primary control to Varroa is the use of conventional acaracides such as Apistan® and Check Mite+ (Coumaphos). Recently Varroa mites have become resistant to these pesticides (Milani 1999), so alternative methods for controlling varroa have to be developed. One possible solution is to use honey bees that are genetically resistant to Varroa mites. One stock of honey bees that has been identified as having resistance to varroa is the Russian bee. The history of the Russian honey bee, their resistance to varroa mites and their economic characteristics will be examined through this report.

Origin of the Russian Bee Stock

Varroa resistant Russian honey bee stocks, which were introduced to North America in the 1990s, originated in Primorsky Territory, Russia. This region is in the eastern most part of Russia lying between 43° and 48° latitude, with winter temperatures falling as low as -40°C. It is part of the Apis cerana natural range, however, in the

late 19th century, *A. mellifera* was introduced by Ukranian settlers. This was the first area where *A. mellifera* was exposed to varroa mites. The European honey bees of this area are dark, indicating that they are Carniolan ancestry (Danka et al. 1995). The first problems associated with mites in this area were reported in the 1960s to '70s.

Testing the Russian Stock by United States Department of Agriculture- Agriculture Research Services (USDA-ARS) (Danka et al. 1995, Rinderer et al. 1997, 1999, 2000, 2001a)

1. **Testing Russian honey bee stocks in Russia**
   Russian bees in Russia have low mite levels kills when miticides were applied. Colonies of resistant stock had slow build-up of mite populations. 15 months after treatment with a miticide, 7% worker brood became infested, while up to 39% drone brood became infested with Varroa mites. During this period of initial testing Russian stocks were found to have a high tendency to swarm.
2. **Testing North American honey bee stocks in the US**
   American bee stocks had higher mite levels when miticides were applied. North American stocks of honey bees had higher infestations of mites in the brood, 12 months after treating with miticides, 33% of worker brood and 76% of drone brood were infested with varroa mites. At 12 months, Parasitic Mite Syndrome symptoms had become evident, and colonies were treated with Apistan to keep them alive.
3. **Importation of Russian bees to North America**
   Russian queens were imported to North America July 1, 1997. They were visually checked for external parasites, and the nurse bees were killed and tested for viruses. The imported queens were released in quarantine apiary on Grand Terre Island, Louisiana.
4. **Evaluation of Russian and North American bee stocks in the USA.**
   In the US, Russian stocks were found to be more resistant to varroa mites than North American stocks of honey bees (Rinderer 1999, Rinderer 2001). Russian stocks of bees were found to have lower percentages of mites in the brood. Non-resistant, North American bee stocks had between 65 and 75% of the total mite population in the brood, while Russian stocks had 48.1% of the total mite population in the brood. In both cases the remaining percentages of mites were found on the adult honey bees.
5. **Selecting Russian honey bee stocks.**
   Russian stocks were monitored for mite population dynamics. The mite population at the end of the experiment was divided by the mite population at the beginning of the experiment for each colony, giving a mite index. Colonies with low mite indices were selected as parents for varroa resistant Russian stocks. Testing showed that these traits were inherited indicating that breeding could be accomplished to increase resistance. During this period colonies were also selected against susceptibility to chalk brood.

Mechanisms of Resistance of Russian Honey Bees to Varroa

Russian honey bee stocks showed resistance to mites (Rinderer et al. 1999, Rinderer et al. 2001a), however they were not mite proof. Russian bee stocks were infested by varroa mites, but both worker, and drone brood of these stocks have lower infestation levels than North American stocks of honey bees. These Russian stocks had also lower percentages of the infesting mites in the brood but the remaining mites were found on the adult honey bees. Thus, fewer mites could reproduce and kept the mite population low in bee colonies.

Economic Characteristics of the Russian honey bees.

Characteristics other than varroa resistance are also very important when a bee stock is used in commercial operations. Russian honey bees have bee proved to have many favourable characteristics for commercial use. In a field survey run with commercial beekeepers in the USA, Rinderer et al.(2001b) found that the Russian honey bees produced more honey than the stocks they had traditionally used in the USA. In another field study de Guzman et al. (2001b) also found that Russian bee stocks were more resistant to tracheal mites than were American stocks of honey bees.

Russian Honey Bee Stocks in Canada

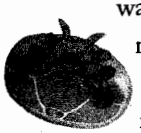
In 1999 Ontario Beekeepers' Association (OBA), Eastern Apiculture Society, and later joined by Saskatchewan Beekeepers' Association (SBA), and Canadian Honey Council in 2001, decided to import the Russian bee stock for initial evaluation as a source of Varroa resistance.

The main objectives are: 1) to import and establish the Russian bees to Canada, 2) to evaluate the Russian honey bees in Northern climates. Traits to be tested for Varroa resistance are varroa and honey bee population dynamics, hygienic behaviour, slow mite reproduction (SMR), and grooming behaviour. Traits to be tested for economic characteristics are defensive behaviour, winter ability, queen acceptance, queen supercedure and tracheal mite resistance, and 3) to test the Russian bees under field conditions and release Russian lines of honey bees for commercial use if they prove to be suitable for Northern climates.

Importing and Establishing the Russian Bee Stock in Canada

Permits were obtained to import Russian eggs and semen from the Canadian Food Inspection Agency (CFIA). In 2000 the first 3 lines of Russian queens released by the USDA-ARS were imported. Queens were reared under quarantine. To maintain purity of the stock, queens were instrumentally inseminated with the imported Russian semen. Some of the Russian queens were naturally mated to Ontario drones, to produce an F1 hybrid

In 2001, an isolated mating bee yard was established on an island in Georgian Bay, Ontario to produce naturally mated queens. This island has never had honey bees, thus ensuring that the island had only Russian drones. A second importation of eggs from the three lines of Russian bees, released by the USDA-ARS in 2001 was carried on according to permits approved by the CFIA. These queens were reared, and mated on the isolated mating bee yard with drones produced by queens from the 2000 first importation to establish pure Russian stocks. Queens were also reared from the Pure Russian queens imported and inseminated in 2000. These queens were also mated on the isolated mating island to maintain the 2000 imported lines.



Evaluation of Russian Bees for Varroa Resistance and Economic Traits In Northern Climates

An experiment was set up to determine varroa resistance and economic traits of Russian bees in Canada. This project is still in progress and will continue for the next field season. Not all traits have been investigated and all reported results are only preliminary.

In 2001, Russian and Ontario queens were reared. Half of these queens were open mated on the isolated mating yard, while the rest were open mated to Ontario drones in a beeyard near Guelph Ontario. This system produced pure Russian, pure Ontario, hybrid of Russian queens mated to Ontario drones, and hybrid of Ontario queens mated with Russian drones. 40 colonies were dismantled in 2 yards (20 colonies per yard). In each yard, all the bees were shaken into a mass box. The frames were removed from all of the colonies and randomized. Colonies were re-established with 1 kg of bees, 3 frames of brood, 1 frame of honey and pollen, and a queen from one of the four test lines. Measurement of resistance and economic traits started five weeks after the colonies were established.

Queen Acceptance. One week after the queens were introduced, queen acceptance was determined by confirming the presence of eggs and locating the introduced queen. Most of the queens were accepted. Colonies accepted 95% of Russian queens, and 80% of Ontario queens, with hybrids having acceptance between Russian and Ontario queens.

Early Queen Replacement. Colonies were monitored every two weeks for presence of the queen. The colony was considered to have early queen replacement when queen cells were found in the colony or the queen went missing. Within the first 2 months after queen acceptance, approximately 40% of the Russian queens and 0% of Ontario queens had early queen replacement. This characteristic will be further investigated.

Varroa Population Increase. The numbers of mites falling on a sticky board, placed in the hive for 24 hours, was counted every two weeks. Varroa increase was determined by dividing the number of mites found on the sticky board found 2 and 4 weeks after the initial by the number of mites found on the initial sticky board. Russian bees had among the lowest mite increase over the 2 and 4 week periods.

Hygienic Behaviour. The hygienic behaviour assay was performed as described by Nasr (1998). A frame of capped brood was taken from each colony. Pupae at the white eye stage were selected by pressing four, 1.3 inch diameter metal rings into each frame. Each ring was considered a replicate and was treated with 40 ml of liquid nitrogen. After 2-4 minutes each replicate was treated again with 40 ml liquid nitrogen. The pupae were allowed to thaw and the rings removed. The number of empty cells was counted. Then, the frame was placed back into

the middle of the brood chamber. After 24 hours, each frame was removed and inspected to count the number of uncapped pupæ cells and the number of removed pupae. A pupa was considered removed if there was evidence of damage found on that pupa. This assay was repeated two weeks later for each colony. The ratios of removed freeze killed pupae were calculated. Pure Russian and hybrid stocks exhibited more than 70%. The Ontario stocks displayed approximately 50% hygienic behaviour.

Tracheal Mite Resistance Bioassay. Frames from the Russian test colonies were included in the Ontario Beekeepers' Association (OBA) bioassay for tracheal mite resistance (described by Gary and Page 1987 and modified by Nasr et al 2001). Stocks provided by bee breeders in Ontario had the lowest mite abundance, with an average of approximately 2 mites per bee. Russian bee stocks had an average of slightly less than 3 mites per bee. The hybrid lines placed between these two stocks. This indicates that Russian bees are not as resistant to tracheal mites as the Ontario stocks, however, the Russians preformed very well.

Conclusions

Initial results indicated that the Russian bees had promising traits. They displayed high levels of hygienic behaviour and good resistance to tracheal mites. The Russian bees had good ability to survive winters. They also had some similar economic characteristics to North American stocks of honey bees. They represent a potential source for resistance to mites.

Some negative attributes have been found in the Russian stock. The traits needing improvement include high supercedure rates. Negative traits can be bred out of the population with a continuing selection program. Our evaluation will be continued through next season to better understand the mechanisms of resistance to mites, to quantify the resistance to Varroa mites and continue determining the economic characteristics of the Russian lines.

Acknowledgments

This project was financed by Ontario Beekeepers' Association, Eastern Apiculture Society, Saskatchewan Beekeepers' Association, Canadian Honey Council, Ontario Ministry of Agriculture, Food and Rural Affairs Food System 2002. We thank all participating and contributing beekeepers. We thank Heather Clay and Ontario Metropolitan Zoo for their help in getting permits from CFIA for importing the Russian bees.

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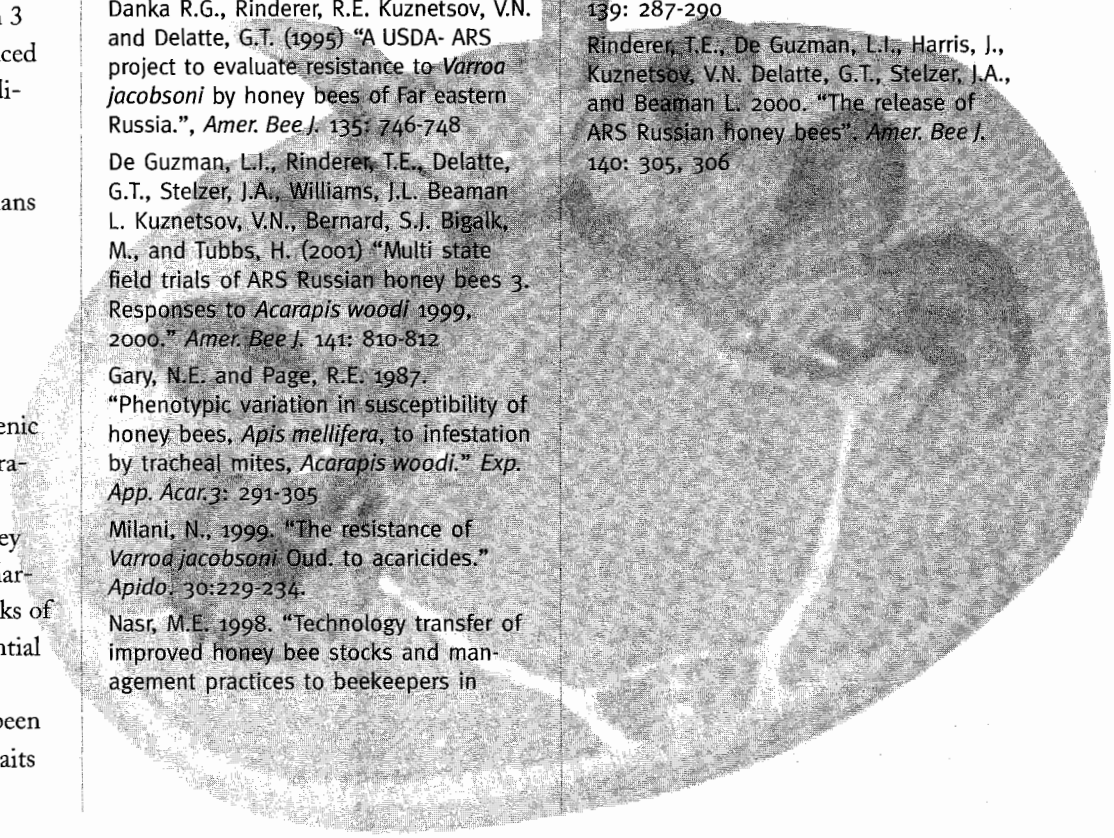

Developing new tools to manage American foulbrood in an era of mite resistance

Don Nelson, and
Adony Melathopoulos

Agriculture and Agri-Food Canada
Beaverlodge, AB ToH oCo

Introduction

Strains of American foulbrood (AFB) resistant to the antibiotic oxytetracycline (OTC) have spread throughout the US and are now becoming established in Western Canada. Since OTC is the only registered antibiotic for use against AFB in Canada, the current option for managing OTC-resistant AFB is to destroy infected colonies and either burn or irradiate the equipment. Although colony destruction reduces the level of infectious material, healthy colonies are still susceptible to infection by bees drifting in from neighbouring colonies or beekeeping operations, some of which may not even express AFB symptoms. To prevent high colony losses, Canadian beekeepers urgently need safe, effective and less-drastic methods of managing OTC resistance. The Canadian Bee Research Fund is supporting a research project at the Beaverlodge Research Farm to investigate a new multifaceted approach to managing AFB. The following is a summary of the first year's work on this project.

The current approach to managing diseases is to employ a multifaceted or integrated pest management (IPM) approach, which tailors treatment intensity to disease levels. An IPM approach to AFB would advocate withholding antibiotic treatments from colonies until the risk of an AFB outbreak becomes high enough to warrant treatment. Antibiotic use, after all, leads to the development of antibiotic resistance and the increased risk of contaminating honey with residues. One might ask why more beekeepers don't practice IPM for AFB if antibiotic use can be hazardous? Many Canadian beekeepers argue that without a reliable method to assess the risk of an AFB outbreak they are better off medicating all their colonies as a routine preventative measure instead of practicing IPM. Clearly there is a need for a quick and easy-to-use tool to determine AFB risk. Our research evaluated a method of measuring AFB spores in honey as a rapid and accurate tool to predict AFB risk within beekeeping operations.

Sampling Honey for AFB Spores

Spores collect in honey when colonies are infected with AFB. The number of spores in honey can be detected in the laboratory using sensitive microbiological techniques that even the lightest AFB infections, in which beekeepers do not see signs of diseased larvae, are easily found. Unfortunately no guidelines exist for how to sample honey from a large number of colonies to predict the overall risk of AFB outbreak within an operation. Our experiments investigated the relationship between spore levels and AFB risks by measuring the level of spores from the honey produced by 16 Western Canadian beekeepers with varying levels of AFB. The beekeepers in the study were all commercial-sized, with an average of 1900 colonies per operation. Beekeepers cooperating in the study collected their honey samples while filling drums of honey and returned the samples at the end of the season to Beaverlodge for analysis. Over 650 honey samples were analyzed for AFB spores. What was immediately striking from the results was that beekeepers with the highest levels of AFB over the past 3 seasons (based on a questionnaire to each cooperator) tended to have more honey samples with AFB (Figure 1). The result suggests the risk of having AFB can be predicted from honey samples. Our project also takes the analysis of honey samples another

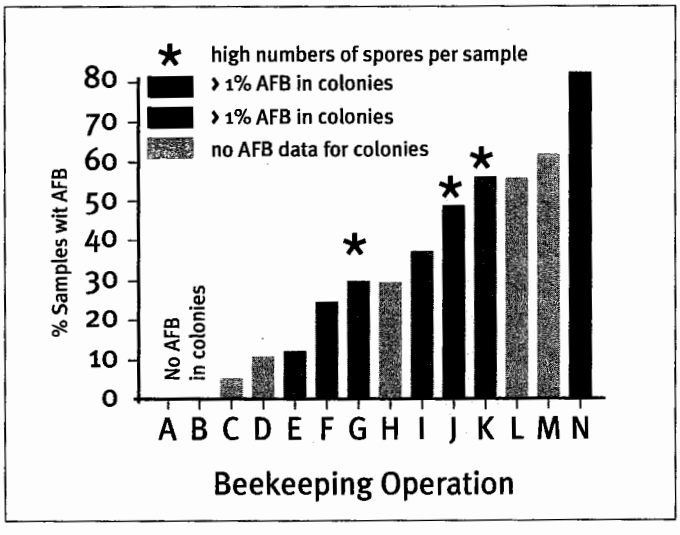

Figure 1. The percentage of 650 honey samples submitted by a total of 14 beekeepers (coded A through N) with AFB detected. The colour codes on the bars indicate the past levels of AFB within each operation over the past 3 years and asterisks mark samples with higher than average levels of spores in their samples (greater than 1000 spores / gram of honey).

step by determining how much of the detected AFB is OTC resistant. An unexpected and interesting finding from our OTC-sensitivity survey is that beekeeping operations can be infected by a mixture of OTC-resistant and OTC-susceptible strains. Although it is unclear how beekeepers can best manage mixtures of OTC susceptibilities, we anticipate continued studies into the patterns of OTC susceptibility within beekeeping operations will provide beekeepers with useful insight into the future role of OTC in managing AFB.

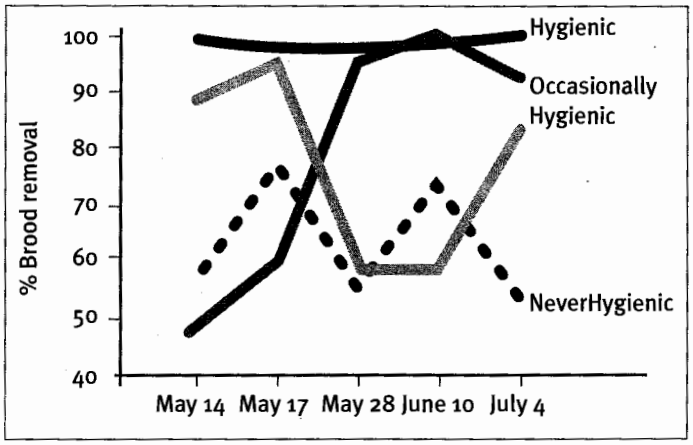

Figure 2. The percentage of dead brood removal in 48 hours among 4 different breeding colonies and 5 successive test dates. Colonies were not considered hygienic unless 85% of the brood was removed in 48 hours. Only 1 out of 4 colonies tested positive for hygienic behavior across all 5 test periods.

Evaluating Alternatives to OTC

A number of beekeeping operations within the study had consistent levels of spores in their honey samples and without antibiotics, AFB levels would likely escalate. Antibiotic alternatives for OTC-resistant AFB do exist, but are not registered for use with honey bees, are more persistent in honey than OTC and increase the risk of residues. Our research focussed on evaluating antibiotics formulated in protein supplements to minimize antibiotic residues and redirect the antibiotic to the growing, AFB-susceptible larvae. Preliminary results suggest protein-formulated antibiotic are effective at suppressing AFB, however results from hive residue studies will not be available until the spring of 2002.

Hygienic Behaviour

Clearly, antibiotics must not be relied upon if beekeepers are to avoid resistance and residue problems, but what alternatives are there? To help manage colonies with reduced antibiotic use, we are investigating methods to select for genetic resistance to AFB using Western Canadian bee stock. Our study focuses on hygienic behaviour, a heritable characteristic that confers resistance to AFB. Colonies carrying the hygienic behaviour trait detect early AFB infections, uncap the cells and then remove the larvae before the disease has had an opportunity to produce spores. Hygienic behaviour stops AFB in the same way that plowing a field stops weeds; it stops the AFB before it can form seeds, or in this case, spores.

Our spring 2000 survey of 8 Alberta queen breeders indicated that 30% of their breeding stock carried the hygienic behaviour trait at a level high enough to breed from, but too low to provide reliable AFB control. The preliminary results indicate the trait was only moderately inherited by progeny, suggesting a need for better methods of selecting breeders and mating daughters. The results of repeatedly testing breeders for hygienic behaviour indicates that the frequency of retesting (Figure 2) and number of dead pupae introduced to colonies may be important factors in selecting breeders that are better able to pass on the trait to offspring.

Conclusion

The goal of AFB research at Beaverlodge is to provide beekeepers with a new approach to managing AFB with lower reliance on antibiotics. Our success to date includes being able to predict AFB levels from honey samples and new information on how to better select breeders to increase the level of AFB resistance among colonies. Although results are still pending on research into protein-based methods to deliver antibiotics, all avenues of the research we have initiated appear to hold promise in tackling AFB in the future.

Acknowledgements:

We thank the Canadian Bee Research Fund, Matching Investment Initiative (Agriculture and Agri-Food Canada), Medivet Pharmaceuticals Ltd., the Alberta Beekeepers' Association, the Alberta Honey Producers' Cooperative and all cooperating beekeepers for supporting the research.

Indoor winter fumigation of *Apis mellifera L. (Hymenoptera: Apidae)* colonies infested with *Varroa destructor Anderson* and *Trueman (Acari: Varroidae)* is a practical control alternative in northern climates

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Formic acid treatment for the control of the ectoparasitic mite, *Varroa destructor* Anderson and Trueman infesting honey bee, *Apis mellifera L.*, colonies is usually an in-hive spring treatment. This study examined the use of formic acid in a practical experiment on wintered colonies kept indoors in darkness at 50° C from 24 November 1999 to 24 March 2000. Colonies were placed in small rooms that were fumigated for 48 hours on 22-24 January 2000. Queen and worker bee and parasitic mite mortality were monitored throughout the winter. This study revealed that formic acid fumigation of indoor-wintered honey bees is feasible and effective. The highest dose caused the highest mite mortality without increasing bee mortality (figure 1). Nosema levels were significantly lower in the high dose treatment then in the control after the experiment. Tracheal mite levels did not change significantly,

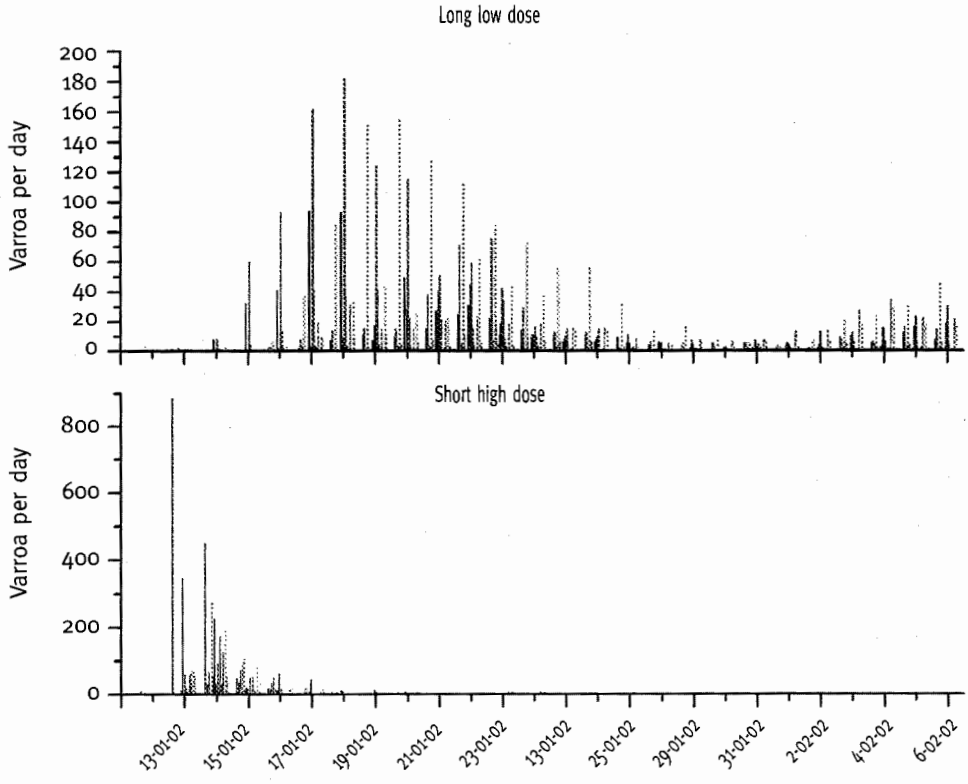

Figure 1. Varroa mite drop as counted each day from non-sticky white boards placed on the bottom board beneath the honey bee cluster in each hive (21 hives per treatment). The long-low dose formic acid treatment lasted 27 days (January 12-February 7).

The short-high dose formic acid treatment lasted only 9 days (January 12-January 20), but the white boards were emptied every day until February 7. These numbers are actual counts and some data are missing, so the results should be considered preliminary.

although a treatment effect may have been obscured by methodology. Queen loss was seen at unacceptable levels. Repeated fumigation periods may increase the efficacy of this treatment method and should be tested in future studies. The cause and prevention of queen loss must be revealed for this method to be generally accepted.

Section III - Apiculture Symposium

New applications for honey bee monitoring technology

Rudy Gelderblom

Dr. Jerry Bromenshenk delivered the keynote address at the 61st CHC annual meeting. Dr. Bromenshenk is Director of the Montana Organization for Research in Energy (MORE), Director MT DOE/EPSCoR (Experimental Program to Stimulate Competitive Research), and a research professor with the Division of Biological Sciences, University of Montana.

His topic was new applications of technology developed to quantify and document beekeeper's losses due to poisoning.

The presentation outlined the development of the technology through the advent of the industrial revolution to the current state of the art. Specifically, equipment now exists to monitor and measure;

- flight activity, the number of bees in and out of the hive. Stressors like pollutants have an immediate effect on the flight activity of bees,
- Hive core temperature, an indicator of the health and reproductive status of a colony,
- Pollen constitution (particulates – metal, radionuclides),
- Hive air quality (volatile organics), and sampling of bees themselves, (microbiologicals).
- Surface waters.

Combined with current communications technology. Data can be reviewed in real time and remotely. The lessons learned from the current research are that:

- Honey bees are capable of detecting by smell a wider array of chemicals at far lower concentrations than previously suspected,
- Colony forager activity patterns and physiological processes such as thermoregulation can be measured in real-time,
- Behavioral and physiological responses provide measurable and interpretable indices of colony condition,
- Unaided human observation can not accurately quantify these responses,
- Bees can be trained to locate substances.

Applications that suggest themselves are the detection of chemicals in the atmosphere, whether relevant or not to bee health. The slight electrostatic charge on bees and their mobility makes them ideal collectors of even minute concentrations of airborne particles. Bees could be used to map heavy metals, radioactive materials or explosives across a landscape or monitor their levels. Not only can bees pick up minute traces of chemicals in the air, they can be trained to find a chemical in the first place!

Imidacloprid and honey bees

Summary Research Review Meeting

JANUARY 29, 2002

Don Dixon
Manitoba Agriculture and Food
Winnipeg MB R3T 5S6

Background:

Following a request by the Canadian Honey Council to review concerns related to the possible negative effects of the insecticide Imidacloprid on bees, the Canadian Association of Professional Apiculturists organized and hosted a meeting on this subject at Calgary Alberta on January 29, 2002.

Purpose of the Meeting:

1. To conduct a comprehensive review of past and current research to determine:
   - if any firm conclusions can be reached regarding the impact (negative or otherwise) of Imidacloprid on honey bees.
   - identify any research gaps that should be addressed, who should do this research and how it should be funded.
2. Develop a long term plan with strategic partners, government and pesticide manufacturers to ensure that beekeeping industry concerns are addressed during the development stages of new pesti-

cides before they are introduced for widespread use.

Agenda:

Following is the agenda that was followed during the meeting.

1. Introduction Don Dixon
2. Literature Review Mark Winston
3. CHC Review of Concerns Heather Clay
4. Imidacloprid Residue Studies in PEI Dick Rogers and Jim Kemp
5. Impact of Imidacloprid and other Novel Pesticides on Non-Apis Pollinators. Lora Morandin
6. Report from Bayer Inc. Richard Schmuck
7. PMRA Review of Imidacloprid. Hemendra Mulye
8. Canola Council of Canada. JoAnne Buth
9. Discussion
10. Conclusions and Recommendations

Results of the Meeting:

The meeting was attended by approximately 30 participants including the presenters and representatives from the Canadian Honey Council, provincial ministries of agriculture, Canadian Association of Professional Apiculturists, the Pest Management Regulatory Agency (Heath Canada), the Canola Council of Canada and Bayer Inc.

Following the meeting a smaller working group of participants was charged with drafting a summary.

Conclusions and Recommendations.

These were presented to the Canadian Honey Council at their Annual Meeting on Feb. 1, 2002.

Following are the four Conclusions and Recommendations that were presented to the Canadian Honey Council. A more expanded summary of the meeting, including the list of participants, is available upon request from the recording secretary of the meeting, Rhéal Lafrèniere, Manitoba Agriculture and Food, 204-545 University Cres. Winnipeg, MB R3T 5S6, Tel; 204-945-4825.

Conclusions and Recommendations.

1. Based on a substantial body of research to date there is no consistent evidence that Imidacloprid poses a serious threat to honey bees and bumble bees, when used as a systemic insecticide following label directions.
2. Beekeepers in Canada are experiencing an increasing incidence of unexplained and substantial colony mortality. There is a need to conduct multi-year studies to investigate the potential factors responsible for colony losses including pesticides, diseases, pests, climate, nutrition, genetics, management and the interactions between these and other factors. Research should focus on regions that are experiencing high colony mortality and should include, but not be limited to, studies of low level chronic exposure to contaminants.
3. It is recommended that the Pest Management Regulatory Agency (Health Canada) consider the effect of all new insecticide registrations, particularly systemic insecticides and relevant genetically modified crops, on pollinators.
4. It is recommended that the Canadian beekeeping industry propose to meet with pesticide manufacturers (Crop Life Canada) to establish an ongoing dialogue leading to appropriate testing of pesticides that could have negative impacts on pollinators. Particular emphasis should be directed to pesticides with new modes of action.

The effects of Imidacloprid and other novel pesticides on bumble bees

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A. Bumble bee colony health: Summer 2001

Treatments:

1. Control—pollen and 30% sugar water mixture
2. Imidacloprid—control plus technical imidacloprid from Bayer AG (Leverkusen, Germany) at 7 ppb.
3. Chitinase—control plus chitinase from Sigma-Aldrich (Oakville, Ontario) at 0.6 µg/g pollen.
4. Bt–control plus Cry 1Ac from Monsanto (St. Louis, Missouri) at 11ng/g pollen.

The isolated proteins and insecticide were added to non-GM pollen at levels

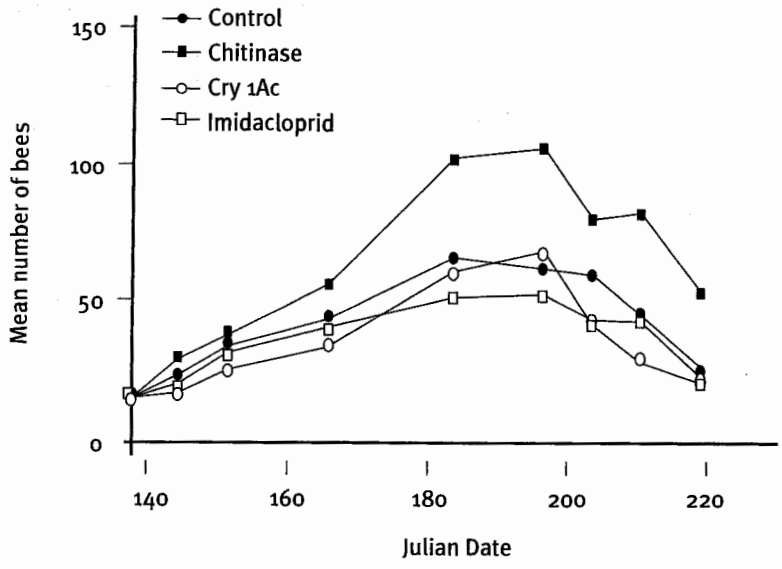

Fig. 2 Colony growth

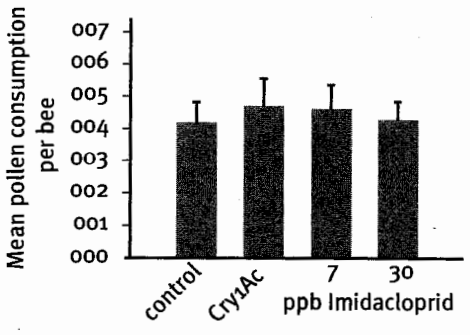

Fig. 1 Pollen consumption

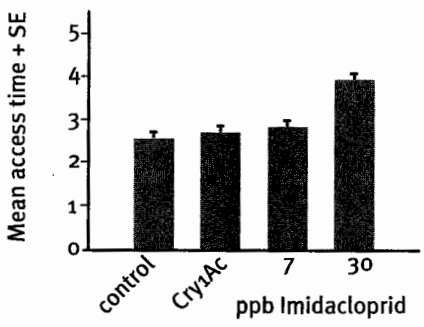

Fig. 4 Experienced forager access time

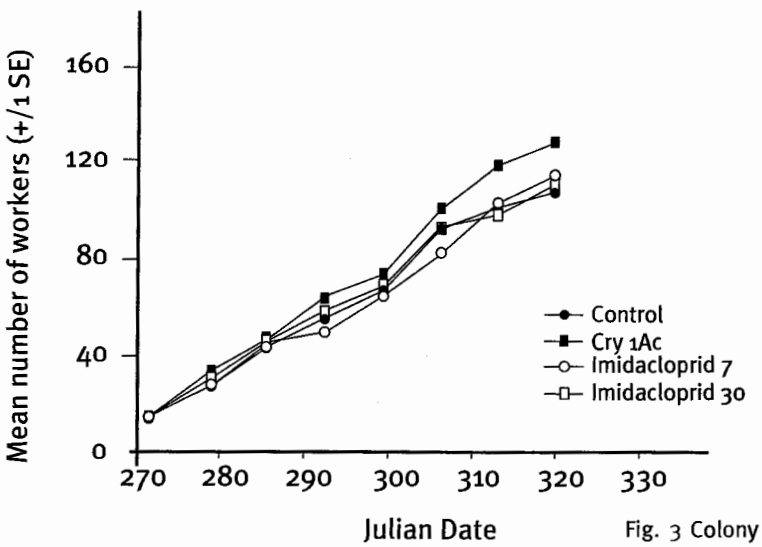

Fig. 3 Colony growth

that realistically could be found in transgenic pollen or imidacloprid-treated plants.

Methods

Twenty-four *Bombus occidentalis* colonies with a queen and five to ten workers ("first brood" stage) were fed pollen from one of the treatment groups twice weekly, ad libitum. At each feeding time, old pollen was removed, weighed, and recorded. The amount of brood, weights of newly emerged workers, and numbers of workers, queens, males, and dead bees were censused weekly.

Results

- No difference in pollen consumption among treatments (Fig. 1)
- No difference in the amount of brood over the duration of the experiment
- Mean weights of newly emerged workers in the control, cry1Ac, chitinase and imidacloprid treatments were not different among treatments
- Number of reproductives (males and queens) produced was not different among groups
- Colony growth was the same among treatments (Fig. 2)

These findings suggest that imidacloprid, Cry1Ac, and chitinase, at the doses tested, will not harm bumble bee colony health.

B. Bumble bee foraging ability: Fall 2001

Twenty-four *B. impatiens* colonies were assessed in four treatment groups similar to the summer experiment: 1. Control, 2. Cry1Ac at 11ng/g, 3. Imidacloprid at ~7 ppb, and 4. Imidacloprid at ~30 ppb. Colonies

were fed the appropriate treatment in their pollen from first brood stage and throughout the experiment, and number of workers and amount of brood were monitored.

Emphasis in this experiment was on assessing individual learning and motor ability based on treatment. Colonies were connected to a screened indoor enclosure by a gated mesh tunnel, and bees trained to visit centrifuge tube feeders containing 30% sucrose solution located on a Styrofoam base inside the enclosure. Individual bees from each of the four groups were tested on their ability to access a reward from an artificial complex flower.

Results

- Colony growth was the same in all treatments (Fig. 3)
- Access time for experienced foragers on artificial complex flowers was greater in the imidacloprid 30 ppb treatment than in the other groups (Fig. 4)

Conclusions

- Cry1Ac, chitinase, and imidacloprid at 7 and 30 ppb did not affect bumble bee colony health
- Imidacloprid at 30 ppb resulted in slower foraging rates on artificial complex flowers, possibly resulting in poorer foraging ability

Acknowledgements

We thank the British Columbia Honey Producers Association, Bayer, and Monsanto for providing financial support, and Monsanto and Bayer for their contribution of Cry protein and imidacloprid respectively. The bumble bee colonies were donated by Biobest Canada.

Imidacloprid (Admire®) Residue Levels Following In-furrow Application in Potato Fields in Prince Edward Island and New Brunswick - Final Report

Principal Investigators:

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University of Prince Edward Island
Charlottetown, Prince Edward Island

Mr. Richard E. L. Rogers
Wildwood Labs
Kentville, Nova Scotia

Imidacloprid (ADMIRE® 240F), is a synthetic systemic chloronicotinyl insecticide, produced for the control of Colorado potato beetles, aphids, flea beetles, and leafhoppers on potato crops (Elbert et al., 1991; Schmuck, 1999). Imidacloprid is an agonist at nicotinic acetylcholine receptors that demonstrates selective toxicity for insects over vertebrates, and has the fastest growing sales of any insecticide worldwide. In April 1999, imidacloprid was approved for use in potatoes across Canada and as a broad spectrum pesticide, it is presently registered in 100 countries for use on over 65 crops. Due to its long term action, this chloronicotinoid is highly effective and has been used extensively as an in-furrow treatment for Colorado potato beetle. In potato fields the recommended in-furrow rate of application is 850 ml to 1.3 L / ha. Due to its residual activity, imidacloprid has become the most popular control agent for Colorado potato beetle.

Despite worldwide recognition, the use of Admire® has been in question following reports by French bee keepers of "disoriented" honey bees that had been foraging in imidacloprid (Gaucho®) treated sunflower fields. The bee keepers in France also reported that the honey bees had high rates of mortality, and low honey production due to a decrease in colony strength. In Canada, the PMRA's initial review of imidacloprid concluded that although pollinators (honey bees) could be at risk due to its high toxicity, the risk could be mitigated by a label statement contraindicating application of the product to blooming crops when bees are visiting the treatment area. Since that time, the question of whether systemic residues of imidacloprid may occur in nectar and pollen of flowering crops at concentrations harmful to honey bees has been the focus of an extensive research program. In an investigation on the foraging behavior and orientation ability of honey bees by Kirchner changes in behavior were found for imidacloprid concentrations of 20 ppb (parts per billion) to 100

Year Designation	Admire Application	Crop Planted
Year 1 field	Admire applied in Spring 2001	Potato Field
Year 2 field	Admire applied in Spring 2000	Grain Field
Year 3 field	Admire applied in Spring 1999	Clover Field

figure 1 - Field Year was based upon when field had been treated with Admire.

ppb, although no effect was observed at 10 ppb. Although the effects on the behavior of bees were observed to start at imidacloprid concentrations of 20 ppb, no damage to the test populations was observed for the range of concentrations tested up to 100 ppb.

With the release of information from France, some bee keepers in Prince Edward Island and New Brunswick, complained of similar problems following placement of colonies near clover fields that had been previously treated with ADMIRE®, and requested a moratorium on the use of Admire® on Prince Edward Island. With this concern expressed, it was important to determine whether imidacloprid residue levels following use in potato fields was negatively affecting honey bee health on Prince Edward Island.

The objectives of this study were to determine if residue levels (ppb) of imidacloprid applied in-furrow, plus two metabolites, (hydroxy-imidacloprid and olefin-imidacloprid), were present one and two years following application of Admire in:

1) soil, clover leaves, and clover flowers, and wild flowers
2) pollen, and nectar collected from honey bees foraging in previously treated clover fields
3) uncapped honey collected from the hives placed in previously treated clover fields

The collections were conducted at eighteen sites between Charlottetown and Summerside on Prince Edward Island, and at five sites between Woodstock and Florenceville, New Brunswick. Three classifications of fields were used in this study: 1) Potato fields (Year 1), 2) Underseeded grain fields (Year 2 field), 3) First and Second flowering clover fields (Year 3 field. Runoff areas of some year 1 and year 2 fields were subcategories for soil and wildflower sampling. (see figure 1)

The fields used in this study had been planted in potatoes and treated with an in-furrow application of Admire (Bayer Corporation, active ingredient – imidacloprid) at the rate of 850 ml per hectare at the time of planting, except for the following fields: 1) fields 15 and 37 (Control fields, no treatment), 2) field 03 (the field treated at the rate of 850 ml/hectare, and the field treated at the rate of 1300 ml/hectare), 3) field 110 (foliar application of imidacloprid). Underseeded grain fields were planted in either oats or barley and underseeded with a mixture of red clover (*Trifolium pretense*), alsike clover (*Trifolium hybridum*), and timothy. First flowering clover fields (first cut hay), and second flowering clover fields (second cut hay) contained a mixture of red clover (*Trifolium pretense*), alsike clover (*Trifolium hybridum*), and timothy.

Residue analysis was performed by Enviro-Test Laboratories, Edmonton, Alberta.

The objectives of this part of the study were: 1) To determine LOD/LOQ (Limit of Detection /Limit of Quantification) and validate the modified analytical methods. Samples that had been stored in a freezer at -20 ± 5°C at the University of Prince Edward Island, were shipped to Enviro-Test Laboratories in coolers containing dry ice

Honey Bees

Honey bee colonies were placed on site to supply the foraging bees from which the pollen and nectar were collected. The hives and colonies of honey bees were supplied by the Prince Edward Island division of Jasper Wyman & Son. They also supplied additional supers when needed for colony management

Soil

A composite sample of one hundred and sixty soil cores (18cm x 13mm diameter) per field were collected from eleven fields. A five acre plot was measured and staked out on each field, and divided into twenty collection points (fig. 2). Eight soil cores at one foot intervals were collected at each point to ensure that a treated furrow would be sampled.

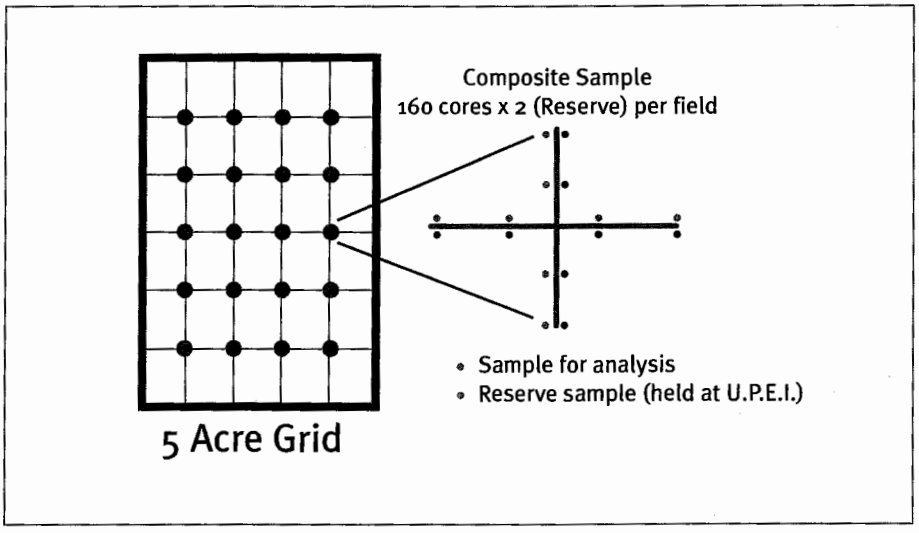

Fig. 2 Sampling design of 5 acre plot.

A composite sample of 80+ clover flowers per field were collected from eight fields in Prince Edward Island. In New Brunswick, five acre plots were measured and staked out on each field, and divided into twenty collection points, similar to those on Prince Edward Island. The same five acre plot, and twenty collection points used to collect soil in Prince Edward Island were used to collect the clover flowers. In both locations a minimum of four flowers (freshly opened inflorescences) were collected per field point. (fig 2a)

Sample	P.E.I.	N.B.
Soil Cores	3,800	
Clover Leaves	6,400	1,600
Clover Flowers	1,280 +	800 +
Wildflowers (grams)	480 +	
Honey Bees	6,000 +	

fig. 2a Total Number of Samples Collected for Residue Analysis

A composite sample of four hundred clover leaves per field were collected from eight fields in Prince Edward Island. In New Brunswick, a composite sample of one hundred and sixty clover leaves per field were collected from five fields. The same five acre plot, and twenty collection points used to collect soil in Prince Edward Island were used to collect the leaves.

Wildflowers

A composite sample of forty grams per species of Goldenrod (*Solidago canadensis*) inflorescences, Fireweed (*Epilobium angustifolium*) flowers, and Aster (*Aster novi-belgii*) flowers were collected if present from seven runoff fields. The twenty collection points used to collect runoff soil was used to collect the wildflowers. Once the flowers were removed from the plant they were immediately stored in a bag, and placed in a cooler containing dry ice.

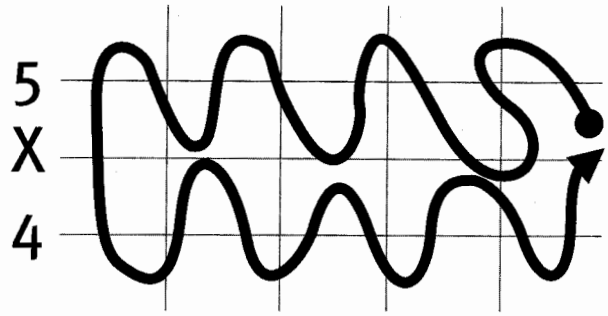

Fig. 3 Serpentine honeybee collection pattern

Honey Bees

Using a portable bug vac and a serpentine collecting pattern, (fig 3) pollen and nectar collecting honey bees were collected from each second bloom treated, and second bloom control, fields during the period late July to early September. The collected bees were immediately placed on dry ice and at the end of each day transported to the lab at UPEI for long-term storage in a freezer at −20°C ± 5°C.

Nectar and Pollen Extraction

Honey bees were sorted into pollen and nectar carrying bees in a cold-room, and then extracted the pollen and nectar loads in the lab, under a microscope at room temperature. After extraction, samples were refrozen and on October 30 were transported back to UPEI on dry ice

Honey Collection

Unripe honey was collected from the hives on August 22 and September 14, 2002. The equivalent of 1-2 frames of uncapped honey was collected, either on drawn comb, or comb freshly drawn in an empty frame space.

Summary

Residue levels of imidacloprid were detected in soil in all treated fields. (fig. 5) The edges of sloped fields in first year rotation (i.e. potato fields) exhibited only one case of residue in soil. Metabolites were not included in the soil analysis because honey bees are not exposed to them in the soil. Three fields had residue levels of imidacloprid in clover leaves at just above detectable levels. Otherwise, all clover flowers, wildflowers, pollen, nectar, and uncapped honey did not have detectable levels of imidacloprid or its hydroxy and olefin metabolites. (fig. 4) Data collected on bee colonies placed in clover fields that were previously treated with Admire®, did not indicate adverse effects during the time frame of this study.

	Imidacloprid	Metabolites
Soil	Yes: Field 10 of 10 Runoff 1 of 6	Not analyzed
Clover Leaves	very low: 3 of 11	No
Clover flowers	No	No
Widlflowers	No	No
Pollen	No	No
Nectar	No	No
Honey	No	No

fig. 4 Summary of Imidacloprid and imidacloprid metabolites residue levels in Prince Edward Island and New Brunswick. (Olefin and Hydroxy)

Acknowledgements

We wish to thank the many individuals that have made this research project possible. First to our field team of UPEI students: Karen Johnson, Jennifer Feeley, Roxanne Hall, and Angus MacDonald, without your attention to detail and hard work the success of this project would not have

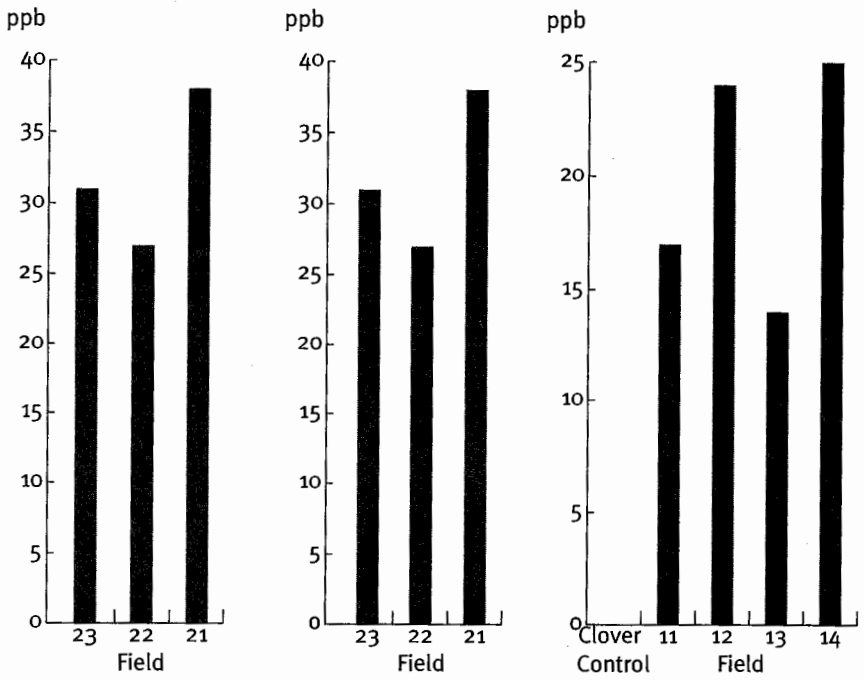

fig. 5 Field soil residue results for imidacloprid

been possible. We also wish to thank Chris Prouse for initiation of this project, and Paul MacPhail for his invaluable assistance in locating fields, and supplying information for this project. We also would like to thank the many N.B. Provincial Government representatives: Julie Baker, IPM Research Assistant (N.B. Agriculture), Peter Scott, Crop Development Officer, (N.B. Agriculture), Kevin McCully (N.B. Agriculture (Director). In addition we are very grateful for the cooperation and information provided by Dr. Robert Coffin (Cavendish Farms). The colonies of honey bees were donated by Wymans Ltd., we appreciate your support and generosity, and look forward to your future involvement in other areas of research. We would also like to extend our sincere appreciation to the PEI and NB Potato Growers that allowed us to use their fields in this study, without your help, this project would not have occurred.

And finally, thank you to the Government of Prince Edward Island, Government of New Brunswick and the Bayer Corporation for providing funding for this research. In particular we wish to thank Dr. Veldon Sorensen (Bayer Canada) who has demonstrated the ideal relationship that can be formed between industry and independent research.

The authors (Dr. Jim Kemp, Mr. Richard Rogers) would be pleased to answer any further questions with regard to this study.

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Parasitic flies and bumble bees

Robin E. Owen

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Phorid (*Diptera, Phoridae*) and conopid (*Diptera, Conopidae*) parasitize bumble bee species in southern Alberta. Parasitism of four species was investigated. Males experienced a significantly higher incidence of parasitism by the phorid, *Apocephalus borealis,* and a significantly lower incidence of parasitism by the conopid, *Physocephala texana*, than workers. Parasitism rates varied between bumble-bee sexes and species in patterns that did not reflect differences in relative host abundance. Bumble-bee workers and males parasitized by *A. borealis* had significantly shorter lifespans relative to unparasitized bees. Based on previous estimates of bumble-bee mortality, A. borealis parasitism may reduce worker lifespans by up to 70%. In contrast, the mortality rate of bees parasitized by *P. texana* was not significantly different from unparasitized bees. These results contrast with previous work highlighting the importance of conopid parasitism to bumble-bee populations in Europe, and suggest that phorid parasitism may impose greater costs to bumble bees than conopid parasitism in local populations.

2001 CHC Board of Directors

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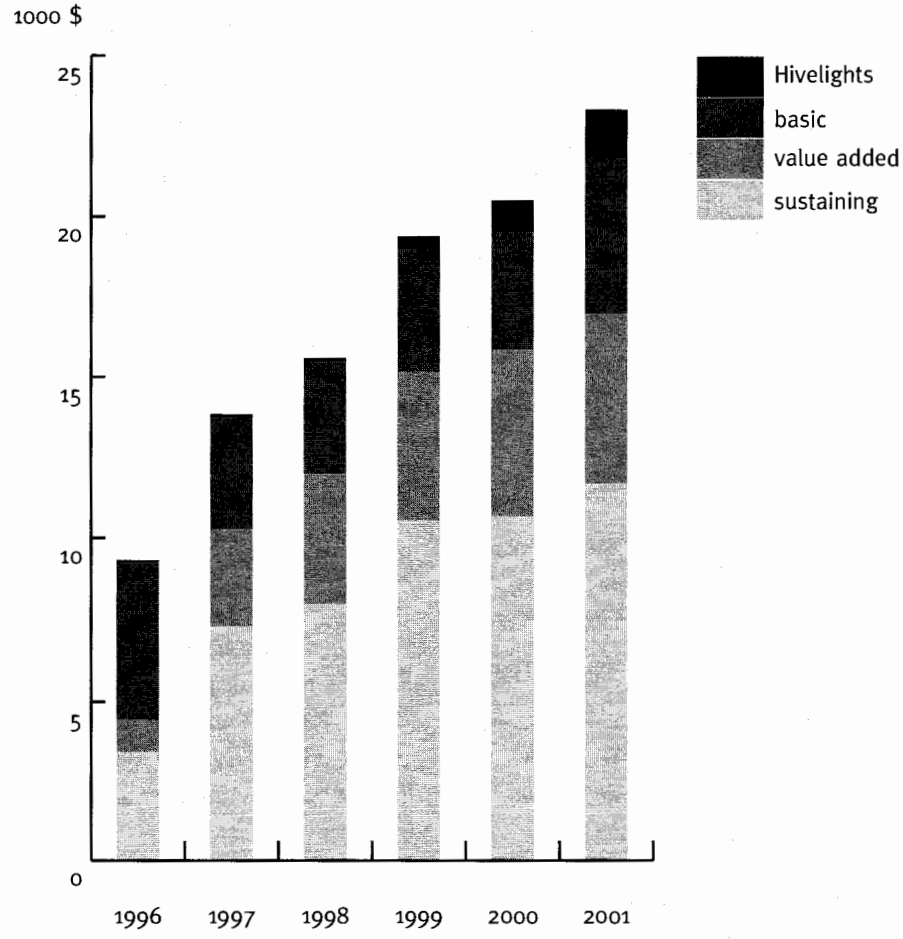
Appendix I: CHC Revenue 1996 - 2001

CHC Revenue 1996 - 2001

Membership and subscriptions



Graph 1. General revenue for CHC. Sustaining, value added, and basic individual memberships does not include provincial delegate fees

Appendix II: Consolidated Balance Sheet and Statement of Income

Canadian Honey Council
2001 Financial Statement
Consolidated Balance Sheet as at October 31, 2001
(Unaudited)

	2001	2000
Assets		
Current Assets		
Cash	**2,157**	3,660
Short-term investments	**58,006**	61,329
Inventory	**350**	560
Accrued interest receivable	**2,532**	1,985
	63,045	67,534
Fixed Assets net book value		
Equipment	**2,696**	2,456
	$65,741	$69,990
Liabilities		
Current Liabilities		
Accounts payable	**2,284**	2,238
Deferred income	**5,068**	5,540
	7,352	7,778
Members' Equity		
Reserves for Future Expenditures		
Capital reserve	**5,440**	5,440
Unapropriated Retained Earnings	**52,949**	56,772
	58,389	62,212
	$65,741	$69,990

Canadian Honey Council
Consolidated Statement of Income
For the year ended October 31, 2001
(Unaudited)

	2001	2000
Revenue		
Membership fees	**49,840**	47,695
Annual meeting	**4,626**	2,585
Apimondia profit share		50,000
Apimondia sales		277
Donations - CBRF	**92,646**	1,588
Hive lights	**18,406**	9,418
Interest	**3,393**	2,421
Promotional materials	**360**	139
Other		205
	169,271	114,328
Operating Expenses		
Advertising & promotion	**210**	
Annual meeting	**3,783**	813
Apimondia committee		3,120
Awards and donations	**188**	349
Bank charges	**78**	87
CBRF - Admin.		132
CBRF - Donations	**92,646**	1,588
Credit card charges	**81**	44
Hive lights	**23,387**	13,565
Memberships and Subscriptions		1,177
Office	**2,129**	2,037
President's honorarium	**2,000**	2,000
Professional fees	**1,243**	1,243
Rent- building	**1,200**	1,200
Telephone	**1,661**	1,609
Travel	**5,138**	3,527
Wages and benefits	**38,522**	38,470
	172,266	70,961
Net Income Before Amortization	**(2,995)**	43,367
Amortization	**829**	483
Net Income for the Year	**$(3,824)**	$42,884

Appendix II: General Fund Balance and Statement of Income

Canadian Honey Council
2001 Financial Statement
General Fund Balance Sheet as at October 31, 2001
(Unaudited)

Assets	**2001**	2000
Current Assets		
Cash	**2,049**	3,790
Cash Short-term investments		5,000
Inventory	**350**	560
Accrued Interest receivable		165
	2,399	9,515
Fixed Assets net book value		
Equipment	**2,695**	2,455
	$5,094	$11,970
Liabilities		
Current Liabilities		
Accounts payable	**2,282**	2,236
Deferred income	**5,068**	5,540
	7,350	7,776
Members' Equity		
Unappropriated Retained Earnings	**(2,256)**	4,194
	$5,094	$11,970

Canadian Honey Council
General Fund Statement of Income
For the year ended October 31, 2001
(Unaudited)

	2001	2000
Revenue		
Membership fees	**49,840**	47,695
Annual meeting	**4,626**	2,585
Apimondia sales		277
Donations - CBRF	**92,646**	1,588
Hive lights	**18,406**	9,418
Interest	**579**	537
Promotional materials	**360**	139
Other		205
	166,457	62,444
Operating Expenses		
Advertising & promotion	**210**	
Annual meeting	**3,783**	813
Apimondia committee		3,120
Awards and donations		175
Bank charges	**78**	87
CBRF - Admin.		132
CBRF - Donations	**92,646**	1,588
Credit card charges	**81**	44
Hive lights	**23,387**	13,565
Memberships and subscriptions		1,177
Office	**2,129**	2,037
President's honorarium	**2,000**	2,000
Professional fees	**1,243**	1,243
Rent- building	**1,200**	1,200
Telephone	**1,661**	1,609
Travel	**5,138**	3,527
Wages and benefits	**38,522**	38,470
	172,078	70,787
Net Income Before Amortization	(5,621)	(8,343)
Amortization	**829**	483
Net Income for the Year	(6,450)	(8,826)
Unappropriated Retained Earnings beginning	**4,194**	15,020
Prior year's adjustment	**0**	(2,000)
Unappropriated Retained Earning, end of year	**$(2,256)**	$ 4,194

Appendix III: Canadian Bee Research Fund Financial Statement

Canadian Bee Research Fund
2001 Financial Statement
Consolidated Balance Sheet as at December 31, 2001
(Unaudited)

	2001	2000
Assets		
Current Assets		
Cash	**228**	1,105
Short-term investments	**502,860**	419,791
Accrued Interest receivable	**24**	260
	$503,112	$421,156
Liabilities		
Current Liabilities		
Accounts payable	**424**	20,396
Equity		
General Fund Balance	**39,131**	30,913
Endowment Fund Balance	**463,557**	369,847
	502,688	400,760
	$503,112	$421,156

Canadian Bee Research Fund
General Fund Statement of Operations and
Changes in Fund Balances
For the year ended December 31, 2001
(Unaudited)

	2001	2000
Revenue		
Donations	**95,173**	312,190
Investment Income	**3,066**	
Other	**240**	5,065
	98,479	317,255
Less transfers to Endowment Fund	**89,743**	284,185
	$ 8,736	$ 33,070
Operating Expenses		
Bank charges	**16**	32
Office	**50**	411
Professional fees	**452**	420
Research grants		20,000
	518	20,863
Net Income for the Year	**8,218**	12,207
Fund Balance beginning of year	20,913	8,976
Prior years adjustment	10,000	9,730
Balance, end of year	$39,131	$30,913

Appendix IV: Honey Inspection Program, Canadian Food Inspection Agency

Compliance Summary For Honey Commodities
5-Year Progression of Chemical Residues

		FY 2000/2001		FY 1999/2000		FY 1998/99		FY 1997/98		FY 1996/97	
		n	% ok	n	% ok	n	% ok	n	% ok	n	% ok
Domestic	Antibiotics [1]	94.0	69.05	87.0[2]	83.78	50.0	100.00	88.0	100.00	146.0[2]	100.00
	Metals	0.0	-	-	-	0.0	-	0.0	-	42.0[3]	97.61
	Phenol	41.0	100.00	65.0[2]	98.39	50.0	98.0	83.0	98.80	53.0	94.33
	Pesticides	70.0[5]	100.00	104.0[5]	100.00	47.0	100.00	102.0[4]	100.00	75.0	100.00
	Sulfonamides	58.0	95.12	73.0[6]	100.00	50.0	98.00	87.0	100.00	50.0	96.00
	Total	**263.0[7]**		**329.0[7]**		**197.0**		**360.0**		**366.0**	
Imported	Antibiotics [1]	21.0	95.24	89.0	100.00	25.0	100.00	60.0	98.33	74.0[1]	100.00
	Pesticides	22.0	100.00	52.0	100.00	32.0	100.00	84.0[4]	100.00	68.0	100.00
	Phenol	26.0	96.15	85.0	87.06	28.0	88.46	47.0	91.49	95.0	92.63
	Sulfonamides	15.0	80.00	109.0[2]	86.96	25.0	96.00	47.0	95.74	92.0	96.74
	Total	**84.0**		**335.0**		**110.0**		**238.0**		**329.0**	
Total honey product		**347.0**		**664.0**		**307.0**		**598.0**		**695.0**	

[1] Only tetracyclines
[2] Sum included both random and suspect samples, compliance rate is for random portion only
[3] Exceeds a guideline only, there are no official maximum residue limits for metals est. in Canada
[4] Includes amitraz
[5] Includes amitraz metabolite testing and both random and suspect samples
[6] Includes both random and suspect samples
[7] This includes suspect samples

Monitoring of Domestic Honey Products
For The Period April 1, 2000 - March 31, 2001
Chemical residues in domestic honey

	Program	Number	Residue found	No. Found	Mean ppm	Minimum ppm	Maximum ppm	Violations
Monitoring	**Drugs**							
	Antibiotic	42	No Residue	29				
			Oxytetracycline	4	0.010	0.010	0.010	4
			Tetracycline	9	0.247	0.010	1.460	9
	Sulfonamides	41	No Residue	39				
			Sulfathiazole	2	0.530	0.360	0.700	2
	Chemicals							
	Amitraz	36	No Residue	36				
	Pesticides	34	No Residue	32				
			Captan	2	0.030	0.030	0.030	
	Phenol	40	No Residue	38				
			Phenol	2	0.035	0.020	0.050	
Suspect	**Drugs**							
	Antibiotic Pretest	52	No Residue	1				
			Tetracycline	52	0.417	0.030	2.300	51
	Sulfa Pretest	17	No Residue	1				
			Sulfathiazole	16	0.376	0.130	0.680	16
	Chemicals							
	Phenol Pretest	1	No Residue	1				

Veterinary Drugs Monitoring Imported Honey

Program	Origin	Number	Residue Found	No. Found	Mean ppm	Minimum ppm	Maximum ppm	Violations
Antibiotics	Bulgaria	1	Tetracycline	1	0.030	0.030	0.030	1
	China	4	No Residue	4				
	Cyprus	2	No Residue	2				
	Greece	3	No Residue	3				
	Hungary	2	No Residue	2				
	Italy	1	No Residue	1				
	Poland	2	No Residue	2				
	Romania	2	No Residue	2				
	US	4	No Residue	4				
Sulfonamides	China	5	No Residue	5				
	Greece	1	No Residue	1				
	Hungary	1	No Residue	1				
	Italy	1	No Residue	1				
	Poland	2	Sulfamethazine	2	0.040	0.033	0.046	2
			Sulfathiazole	1	0.023	0.023	0.023	2
	Romania	2	No Residue	2				
	United States	3	No Residue	3				

Agricultural Chemicals Monitoring Imported Honey

Program	Origin	Number	Residue Found	No. Found	Mean ppm	Minimum ppm	Maximum ppm	Violations
Amitraz	New Zealand	1	No Residue	1				
	Poland	2	No Residue	2				
Pesticides (MRA)	China	4	No Residue	4				
	Cyprus	2	No Residue	2				
	Greece	3	No Residue	3				
	Hungary	2	No Residue	2				
	Italy	1	No Residue	1				
	New Zealand	1	No Residue	1				
	Poland	2	No Residue	2				
	Romania	2	No Residue	2				
	United States	2	No Residue	2				
Phenol	Bulgaria	1	No Residue	1				
	China	4	No Residue	3				
			Phenol	1	0.040	0.040	0.040	
	Cyprus	2	No Residue	2				
	Greece	4	No Residue	4				
	Hungary	2	No Residue	1				
			Phenol	1	0.100	0.100	0.100	
	Italy	2	No Residue	2				
	Poland	2	No Residue	2				
	Romania	2	No Residue	2				
	United States	7	No Residue	6				
			Phenol	1	2.310	2.310	2.310	1

Appendix V: Canadian Honey Production, Statistics Canada

Estimates of the Number of Beekeepers, Colonies of Bees, Production of Honey and Value in Canada[1] by province[2] , 2000 and 2001 with Five-year averages, 1995 – 1999

Province and Year	Beekeepers number	Colonies number	Honey '000 lbs.	Production Total tonnes	Value '$'000
Prince Edward Island					
Average 1995 - 1999	56	1,019	94	42	133
2000	35	1,775	80	36	188
2001 P	40	2,200	198	90	
Nova Scotia					
Average 1995 - 1999	456	14,700	865	392	1,374
2000	450	19,500	800	363	1,240
2001 P	400	20,500	629	285	
New Brunswick					
Average 1995 - 1999	398	6,012	341	155	473
2000	275	7,585	265	120	594
2001 P	295	4,300	331	150	
Québec					
Average 1995 - 1999	533	29,661	3,489	1,582	5,441
2000	243 r	31,035 r	2,555 r	1,159 r	3,546
2001 P	240	30,000	3,638	1,650	
Ontario					
Average 1995 - 1999	4,020	80,800	8,406	3,813	8,838
2000	3,000	80,000	7,163	3,249	8,929
2001 P	3,000	80,000	8,379	3,801	
Manitoba					
Average 1995 - 1999	839	84,200	14,938	6,776	14,090
2000	860	95,000	13,300	6,033	12,917
2001 P	800	91,000	15,470	7,017	
Saskatchewan					
Average 1995 - 1999	1,390	89,900	18,045	8,185	16,408
2000	1,350	100,000	18,000	8,165	14,040
2001 P	1,350	100,000	21,500	9,752	
Alberta					
Average 1995 - 1999	736	187,000	25,657	11,638	24,656
2000	747 r	217,000 r	24,087 r	10,926 r	19,741
2001 P	747	227,000	16,117	7,311	
British Columbia					
Average 1995 - 1999	2,223	44,978	3,386	1,536	5,396
2000	2,293	47,968	3,981	1,806	8,089
2001 P	2,350	48,000	3,696	1,676	
Canada					
Average 1995 - 1999	10,650	538,270	75,220	34,119	76,810
2000	9,253 r	599,863 r	70,232 r	31,857 r	69,284
2001 P	9,222	603,000	69,958	31,733	

1 Figures compiled by Statistics Canada from provincial data with the exception of NB and PEI where data are collected through a Statistics Canada mail survey.

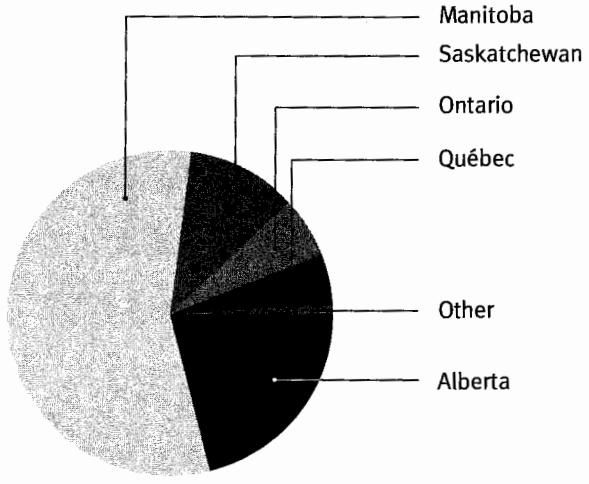
2 Does not include Newfoundland

Note: 1 pound = 0.453 kilogram; 2,204 pounds = 1 metric tonne.

P Preliminary

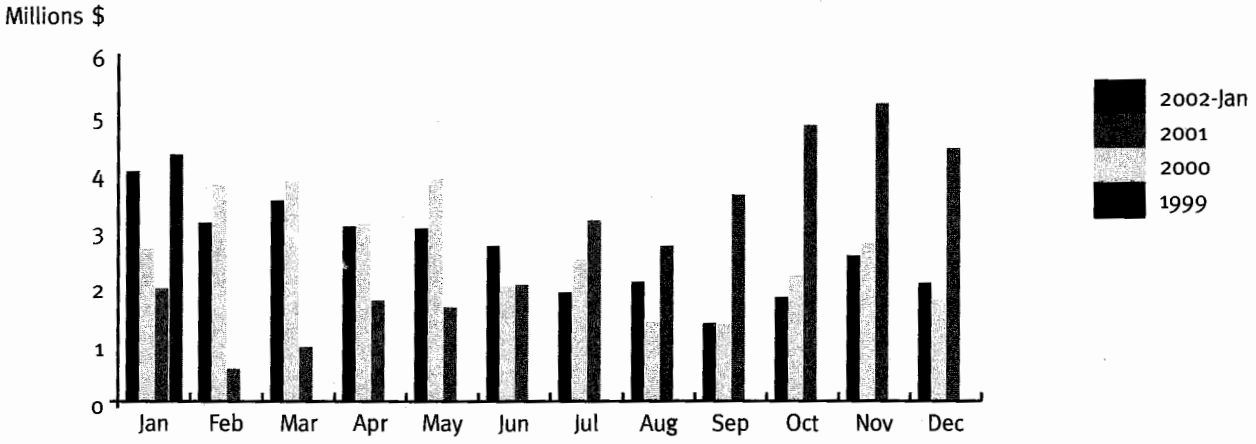
r Revised

Appendix VI: Canadian Honey Exports

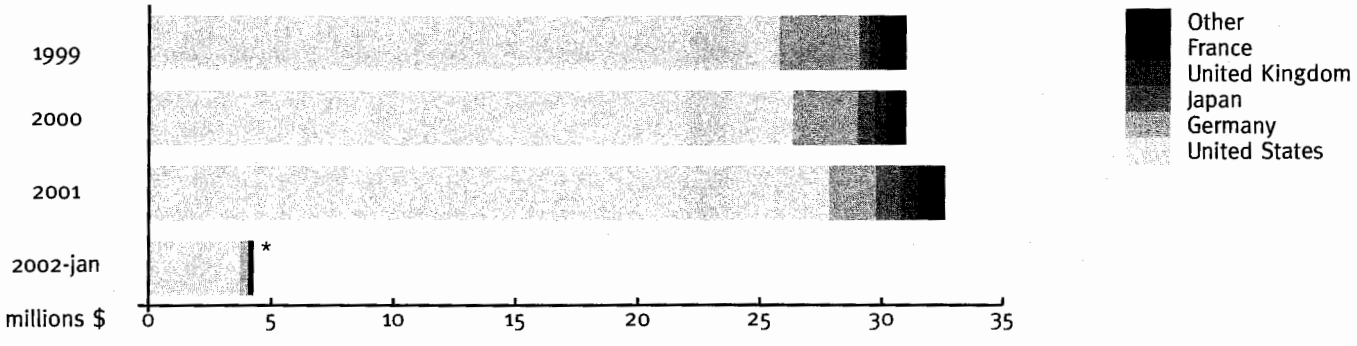


Graph 1. Percentage of honey exports by province for the past 4 years.

Graph 2. Value of monthly Canadian honey exports for 1999, 2000, 2001, and Jan. 2002.



Graph 3. Value of exports of Canadian honey by major importing country for 1998, 1999, 2000, and January to March 2001.



* no data for Japan and UK

Honorary Members

Awarded	Honorary Members			
1950	Hon. J.G. Gardiner		Ottawa	ON
1950	William R. Agar		Brooklyn	ON
1950	Harry Jones	F.W. Jones & Son		
1951	J.W. Braithwaite		Brandon	MB
1950	G.H Pearcey		Kelowna	BC
1950	C.B. Gooderham		Ottawa	ON
1950	Tom H. Shield*	Manager, Ontario Honey Producers Co-op	Toronto	ON
1951	P.C. Colquhoun		Maple Creek	SK
1951	C.G. Bishop		Sherbrooke	QC
1955	Harriet Grace	Director American Honey Institute	Madison	WI
1955	J.N. Dyment		Smithville	ON
1956	F.R. Armstrong	Dominion Honey Specialist	Ottawa	ON
1956	W.H. Turnbull		Vernon	BC
1964	J.Percy Hodgson	Hodgson Bee Supplies	New Westminster	BC
1964	H. C. Allen		Toronto	ON
1963	C.F. Pearcey		Kelowna	BC
1965	Roy M.Pugh		Tisdale	SK
1965	Frank Garland*		Winnipeg	MB
1973	F.L. Rathje*		Bassano	AB
2002	Kenn Tuckey		Edmonton	AB

* Deceased

Fred Rathje Award

2001	Don Nelson	Alberta
2000	John Gruszka	Saskatchewan
1999	Doug McCutcheon	British Columbia
1998	Jean Pierre Chapleau	Quebec
1997	Merv Malyon	Manitoba
1996	Lorna and Jack Robinson	Ontario
1995	Gordon Kern	British Columbia
1994	Kerry Clark	British Columbia
1993	Linda Gane	Saskatchewan
1992	Babe and Charlie Warren	British Columbia
1991	Gerry Paradis	Alberta
1990	Cam Jay	Manitoba
1988	Don Dixon	Manitoba
1987	John Corner	British Columbia
1986	Gerry Smeltzer	Nova Scotia
1985	Paul Pawlowski - First year of the award	Alberta

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Minister, Alberta Agriculture Food & Rural Development
provided funding to publish these proceedings

62nd Annual Meeting of the Canadian Honey Council is to be held in

Niagara Falls

(December, 2002)
in co-operation with CAPA and the Ontario Beekeepers Association and in association with AAPA, ATA and ESHPA.

63rd Annual Meeting of the Canadian Honey Council is to be held in

Winnipeg Manitoba

(February, 2004)
in co-operation with the Manitoba Beekeepers Association.