



Beekeeping in Malta

Report on visit 20-25 August 1995

REFERENCE
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ABBREVIATIONS

AFB	American foulbrood
<i>B. larvae</i>	The bacterium that causes American foulbrood.
EFB	European foulbrood
EDPR	Exotic Disease and Pest Response
GATT	General Agreement on Tariffs and Trade
MAF	Ministry of Agriculture
NZ	New Zealand
NZMAF	New Zealand Ministry of Agriculture
<i>M. pluton</i>	<i>Melissococcus pluton</i> - the bacterium that causes European foulbrood.
MFAF	Ministry of Food Agriculture & Fisheries (Malta)
SPS	Sanitary and Phytosanitary Agreement
WTO	World Trade Organisation

ACKNOWLEDGEMENTS

I wish to thank the staff of the Ministry of Food, Agriculture and Fisheries for hosting my visit and introducing me to the heritage of Malta and its beekeeping industry.

In particular I would like to thank the Minister Mr Galea for taking time from a busy schedule to attend a beekeepers meeting, to the Director Mr Inglott for meeting with me, and to Jo Borg for co-ordinating my visit and arranging my itinerary and the public meetings.

A special thanks must also go to Arnold Grech Principal Beekeeping Officer and to John Camilleri who took me everywhere, and were such great hosts. And lastly, I wish to pay tribute to the skills of our drivers.

The visit to Malta was made possible by my own Ministry of Agriculture and their assistance is acknowledged.

G Murray Reid

10 October 1995

1.0 SUMMARY OF RECOMMENDATIONS

A brief study was made of Malta's beekeeping industry from 20-25 August 1995. The following recommendations are made.

1.1 Importance of Beekeeping

Beekeeping is important to the economy of Malta either directly or indirectly (through pollination) and should be supported by government extension and regulatory services.

1.2 Honey Imports

The existing import requirements for honey, honey bees and used beekeeping equipment, should be reviewed with an objective of restricting imports of honey in particular. As part of this review it would be necessary to carry out a risk assessment of importing bees, bee products and used equipment. It is also recommended that a survey be conducted to determine the bee health status in Malta, and a bee disease surveillance program that gives trading partners an ongoing assurance as to bee health in Malta, be initiated. To maintain the existing bee health status a good border security system with trained Agriculture Quarantine staff should be put in place. The existing legislation should be reviewed and any changes needed to effect border controls or a bee disease survey should be drafted.

1.3 Endemic Bee Disease Control

The beekeeping legislation should be reviewed to see if the powers of inspectors or penalties need to be enhanced. The urgency of this could depend on what is found during the survey. MFAF inspectors should have the powers to destroy hives infected with American foulbrood disease, to register all apiaries and control

the movement of infected hives, bees or bee products. Increased extension may be needed in disease recognition, and control methods especially for American foulbrood and Varroa disease.

1.4 Extension

The bee extension officer in Gozo (a multi skilled position) would benefit from more beekeeping experience especially bee disease recognition and control. A replacement officer should be found for the principal bee officer and trained to diploma level in another country with advanced beekeeping, extension and regulatory systems.

An organised program of extension activities should be carried out especially in colonies management, bee diseases, queen bee rearing and introduction, and honey processing and marketing. Extension programs should be designed for both new beekeepers and existing beekeepers.

1.5 Marketing

There is a need to develop niche markets for Maltese honey and other bee products in Malta and even for export. This activity really lies with the beekeepers themselves or with traders, but MFAF could co-ordinate such activities.

1.6 Bee Stock Improvement

Discussions should be held with industry groups to develop a breeding plan and policy on Italian versus black bees. It is possible to maintain both lines which should be surveyed and tested for resistance to Varroa disease. In the meantime MFAF should continue to produce selected queens and/or queen cells for release to farmers.

Extension workshops on queen bee selection, queen production and introduction should be carried out.

2.0 INTRODUCTION

Five days is not long enough to study and absorb all the technical and political factors involved in the beekeeping industry in Malta. My observations and recommendations are made with some trepidation as I am no "instant expert" on beekeeping in Malta.

My recommendations are made in the light of my experiences in New Zealand and other countries with similar beekeeping practices. Whether they are right for Malta, would work in a Maltese environment, or could be afforded will require more examination and discussion with affected parties.

Few of the recommendations could be adopted in isolation as they are mostly interlinked. For example there is no point in investing a lot of time and money in encouraging the beekeeping industry to expand if there is nowhere to place the beehives or sell the excess honey. Similarly, governments can't place restrictions on honey imports for disease control purposes without determining the health status of their own bees first.

2.1 Importance of beekeeping

In New Zealand a study of the importance of honey bees to horticulture and agriculture showed that farming activities dependent on bee pollination were worth over 60 times more than the value of honey, bee products and pollination fees earned by beekeepers.

In Malta honey bees play an important role as a source of income for many

farmers but will also contribute to agriculture and horticulture. If honey bees are deemed to be an essential industry then it should be supported by government services. Whether these services are free to farmers or on a full or partial cost recovery basis should be examined further according to government policy.

3.0 RESTRICTIONS ON IMPORTING HONEY AND BEE PRODUCTS

Many Maltese beekeepers mentioned to me that they couldn't get high prices for their honey because of foreign imports and there was also no incentive to expand hive numbers because they claimed they couldn't sell the excess honey.

3.1 Sanitary and Phytosanitary Agreements

A restriction, or ban, on imported honey is a possibility worth examining, on the given information that Malta is free of European foulbrood and Chalkbrood disease. Under the General Agreement on Tariffs and Trade (GATT) and the World Trade Organisation (WTO) it is not permitted to erect non-tariff trade barriers that can't be scientifically justified. However, the Sanitary and Phytosanitary Agreement (SPS), adopted by the WTO in 1994, does establish principles by which countries can protect the health of their plant, animal and human populations.

It would be quite reasonable for Malta to restrict imports of honey and other high risk bee products to prevent the introduction of the bacterium, *Melissococcus pluton*, which causes the bee disease called European foulbrood and the fungus *Ascosphaera apis*, which causes Chalkbrood. This assumes European foulbrood and Chalkbrood are not established in Malta already.

European foulbrood bacteria are very resistant and can exist in honey, used bee

equipment, bees or bee products for many years. It occurs in most countries in the world where it is usually treated by feeding the antibiotic oxytetracycline. Similarly, Chalkbrood is also very resistant and can be introduced most easily through importing infected honey or bees. There is no easy control for Chalkbrood and it is usually controlled by management. Malta has experienced the problems caused by the introduction of the exotic Varroa mite (*Varroa jacobsoni*) and the likelihood of introducing *Melissococcus pluton* and/or *Ascospheara apis* must be considered high.

3.2 New Zealand's Situation

New Zealand has a restriction on imports of honey and bee products to reduce the likelihood of *M. pluton* causing an epidemic. Bee products are allowed entry (usually under permit) provided they are heat sterilised during manufacture, packaged in a low risk format (eg capsules or pills) not attractive to bees (eg cosmetics) or not for use in the beekeeping industry.

Imports of honey are currently not permitted from countries with European foulbrood disease. Chalkbrood disease is endemic in New Zealand.

3.3 Risk Assessment for European foulbrood

A Risk Assessment for European foulbrood disease, carried out by the NZMAF Regulatory Authority in 1994 determined that honey, and many products containing honey, were high risk commodities. These products do have the potential to be made safe by heat sterilisation and/or gamma radiation. However, before imports of risk items could be allowed into New Zealand the MAF Regulatory Authority required further research work into:

- The infective dose of *M. pluton* needed to start an epidemic of European foulbrood.

- The sensitivity of the culture test for *M. pluton* and
- The thermal death point of *M. pluton* for a range of honeys as well as other bee products.

When this data is available imports may be allowed under permit and subject to heat sterilisation and laboratory testing. The risk assessment for importing honey into New Zealand is likely to be applicable to Malta. The risk assessment for European foulbrood also applies to Chalkbrood except that research done in NZ has provided answers to the questions above. Based on this work NZ honey is allowed into Australia after heat sterilisation and laboratory testing for Chalkbrood spores.

Bee Disease Survey

One of the key Sanitary Phytosanitary Principals is that of "Necessity". This says in essence that a country can't raise import barriers using an animal or bee disease as an excuse if that disease is already present within the importing country.

It also follows that a comprehensive bee disease survey and on-going surveillance program would be needed before any restrictions on imports could be justified on imports. The survey would need to be carried out by credible personnel and be based on a statistically sound sampling basis. *M. pluton* can be isolated under high powered microscopes or cultured from honey, bee products and bees. However, as the sensitivity of the existing techniques is not known a negative culture doesn't necessarily mean *M. pluton* or European foulbrood is not present. *Ascospheara apis* can be detected by laboratory culture. Both these procedures could be done in Malta after suitable staff were trained in the techniques or the tests could be carried out overseas.

Protocols to send specimens out of Malta to another country for analysis would

need to be developed. Training programs for field inspectors and laboratory personnel would also need to be developed.

4.0 SURVEILLANCE

Assuming Malta is determined to be free of European foulbrood and Chalkbrood an ongoing surveillance program should be put in place to inspect hives and sample bees, larvae and honey for laboratory analysis. This will give government and trading partners a current picture of the bee health status in Malta. European foulbrood, like American foulbrood, which is present in Malta, can exist in bee colonies as inapparent infections. That is, the bacteria can be present but the clinical or field symptoms may not be obvious. This also applies to Chalkbrood.

The surveillance program needs to be designed to give statistical significance and this assumes there is an adequate apiary data base available. The surveillance program as used in New Zealand could be used as a model.

5.0 BORDER QUARANTINE

If restrictions were placed on imports of bees and bee products then protocols and training would be needed for Quarantine/Customs Offices at the borders.

Import protocols for Malta could be modeled on New Zealand's Standards, "Clearance of Animals and Animal Products" and the training program for Quarantine staff could follow our self paced learning program for MAF Quarantine Service Officers called "Safeguarding New Zealand's Beekeeping Industry".



RELEVANT LEGISLATION AND PROTOCOLS

Changes may be needed to Malta's legislation to restrict imports. Import protocols, permits and procedures would need to be developed and presented to importers, and training would be required for the officer(s) charged with issuing import permits for bees, bee products or used beekeeping equipment.

CONTROLLING ENDEMIC DISEASES

Controlling any honey bee disease involves education, legislation and supervision or auditing beekeepers activities.

American foulbrood (*Bacillus larvae*) AFB

This spore forming bacterium is extremely resistant and can survive boiling in water and is known to be viable after 30 years in honey. It can be spread by beekeepers exchanging equipment or bees, through bees robbing diseased honey from weakened hives and by importing contaminated honey or bee products or used equipment. Eradication is achieved by destroying (burning) all infected bees, honey and hive parts. In some countries the antibiotic oxytetracycline is fed to suppress the disease but the drug must be fed on a regular basis. American foulbrood or AFB doesn't appear to be common in Malta but legislation to allow diseased hives to be burnt by government officers may be required. In New Zealand, legislation gives warranted officers the powers to enter land (but not buildings), to inspect hives, to burn any infected with AFB, with or without giving the beekeeper prior notice, and the power to order the beekeeper to burn infected hives. Currently no drugs are allowed to be fed for AFB in New Zealand.

In addition beekeepers must register each apiary, inspect their hives for AFB and notify NZMAF immediately they find AFB and take steps to burn infected hives as soon as possible. Government inspectors examine 4% of apiaries each year to audit beekeeper inspections or stamp out disease outbreaks, while selected beekeepers acting under NZMAF Warrants inspect 5-6% of all apiaries. The NZ beekeeping industry is developing a disease control program which will involve screening honey and bees for the presence of *Bacillus larvae* spores. This type of screening is very cost effective and allows field inspections to be targeted more effectively. New Zealand Apicultural Scientists have developed a very sensitive culture technique for *Bacillus larvae* and this research could be made available.

I understand in Malta that beekeepers are required to destroy AFB hives but MFAF officers cannot destroy diseased hives without the beekeepers permission. MFAF officers need to have these powers if AFB is to be eradicated. Government officers should also be able to restrict the movement of beehives if disease has been found in an apiary.

7.2 Varroa

Varroa mites devastated beekeeping in Malta and beekeepers are only now recovering hive numbers killed by this pest. It would appear that beekeepers were slow to adopt methods taught by MFAF officers (ie using Bayvarol miticide strips in their hives) and even now are not practising correct control measures.

The recommended method is to determine the infestation level using strips and sticky paper (to trap the mites dislodged by the miticide) and then apply the correct number of strips. Beekeepers seem to be putting in 4 strips regardless of the infestation level or the strength of the hive.

I did not determine in my short visit whether this incorrect practice was due to lack of appropriate extension information or its adoption by beekeepers. This

issue should be examined further as inappropriate use of these miticides can;

- Cause contamination of honey and wax which may create consumer resistance or jeopardise exports.
- Cause resistance in Varroa populations.
- Cost the beekeeper unnecessary expense for the Bayvarol strips.

8.0 EXTENSION

8.1 How effective the bee extension service on Malta and Gozo is was very difficult to judge. No doubt personalities and industry or beekeeper politics all exert an influence. Two things were apparent:

- The bee extension/regulatory officer on Gozo, John Camilleri, is not expert in apiculture and has reluctantly assumed beekeeping duties. His first priorities are to the horticulture industry.
- Arnold Grech, the principal beekeeping officer for Malta, is not in the best of health and is not far off retiring. A replacement will be needed for Arnold, and identification and training for the replacement officer should be afforded priority.

There would appear to be a need for extension activities in the following areas.

- Endemic bee disease recognition and control.

- Wax moth control.
- Correct use of miticides for Varroa control.
- Breeder queen selection, queen bee production, and introduction and transport of queen bees, queen cells and bee hives.
- Honey processing and packaging.
- Honey marketing.

How this information can best be disseminated to Malta's beekeepers will require further analysis. As in New Zealand a combination of methods would no doubt be appropriate depending on the topic and chosen audience. Methods used in NZ include;

newsletters (fax or mail), ¹discussion groups, field days, individual visits, articles in beekeeping journals, newspapers, magazines, television and radio reports, and bee courses at Universities and Polytechnics or Community Colleges.

A beekeeping course is, or was, being taught at the University. This should be continued as the more people who can be exposed to the benefits of beekeeping and bee pollination the better. Similarly, beekeeping demonstrations at the Presidential Garden open days are a valuable way to show the public that bees are beneficial insects.

8.2 New Extension/Regulatory Officer

A young school boy, Andrew, is being trained as a possible successor to Mr

¹ Meeting of small groups, usually about 10-12, to discuss or demonstrate given topics in depth.

Arnold Grech. I was impressed with his enthusiasm but if he is to replace Arnold as the Bee Officer he will need overseas experience in order to have any hope of succeeding with Malta's rural farmers, at least in his early years as an extension and regulatory officer.

New Zealand has a one year Beekeeping Diploma course taught at a Telford Rural Polytechnic. This is a very practical course with the emphasis on developing practical skills not only in beekeeping but in other areas such as small engine maintenance, forestry, fencing, welding etc. The diploma course plus allocated time with NZMAF Apiculture Officers would provide a good background for a young bee extension officer in Malta. A full year should be allowed to complete the Diploma, work with NZMAF and with a queen bee breeder.

8.3 NZ Ministry of Agriculture Training

Training with NZMAF Apicultural Advisory Officers could be offered on a consultancy basis in the following broad areas:

- Inspecting for endemic bee diseases.
- Legislation, regulations and warrants.
- Managing an apiary database.
- Managing a bee disease control program.
- Surveying and sampling for exotic bee diseases.
- Developing and practising response procedures in case an exotic bee disease is detected.
- Certifying export product for export.
- Controlling imports of bees, bee products and used beekeeping equipment.
- Training Agriculture Quarantine staff.
- Marketing of honey and bee products.

- Certifying products for export.
- Pollination programs and auditing hives for performance.
- Developing an extension strategy for existing and new beekeepers and practising extension skills.
- Genetic improvement through queen bee selection and breeding (Telford teaches queen bee production methods but a secondment to a queen bee breeder may be useful).

9.0 MARKETING

I saw little evidence of beekeepers adding value to their honey, by niche marketing or developing other products such as polishes, candles, royal jelly, propolis etc. Most appeared content to sell honey to family, or friends or local contacts. I would expect there to be a potential market in tourist outlets such as hotels, the airport shops and even local stores.

I asked one beekeeper why he didn't sell honey in the hotel in Gozo. He said he used to but another beekeeper saw what he was doing and under cut his price. Others said they can't compete with cheap imports. Surveys and experiences in New Zealand and elsewhere have shown that honey is not price sensitive if presented and promoted in an attractive and appropriate manner.

Whether a dynamic retail and tourist market could be developed in Malta for Maltese honey remains to be seen. It will probably take an entrepreneur or business person to do it. Farmers, or others who are only part time beekeepers may not have enough incentive.

10.0 GENETIC IMPROVEMENT

There were two types of honey bee being farmed by beekeepers, the black and sometimes aggressive Western European bee *Apis mellifera mellifera* and the more gentle yellow Italian bee *Apis mellifera ligustica*.

Many of these Italian strains have been imported from New Zealand. The success of these introductions have been somewhat mixed but the cause for queen and package bee loss is not obvious. Some of the fault no doubt lies with the beekeepers introduction methods while the stress of shipping bees such a long way may also contribute. However, New Zealand bees shipped to Canada and Korea don't seem to experience the sort of losses some Maltese beekeepers had. Good extension and demonstration of introduction and feeding techniques should assist here.

A bigger problem to resolve may be a potential conflict of importation versus maintenance of the "endemic" ie black stock. The black strain may be more resistant to Varroa but strains of Italian bee could also have this ability. Such strains should be identified and tested and if appropriate multiplied for release to beekeepers. The Italian strains may be more desirable where bees are kept close to houses or where a beekeeper wishes to increase the number of hives necessary to make a living from beekeeping. Some New Zealand bee stocks were reported to abscond (leave the hive) when Bayvarol miticide strips were used whereas this behaviour is not observed with black bees. This phenomenon should be investigated further especially if imports of New Zealand bees are continued.

It should be possible to maintain the black stock in the presence of Italian strains, with or without, the use of artificial insemination. The MFAF currently operates the major, if not the only, queen bee production and breeding unit in Malta. It is appropriate that MFAF continues in this role until such time as commercial interest expands and can supply the demand for queen bees. At that point the role

of MFAF's bee unit in producing commercial queen bees should be reviewed.

11.0 BUMBLE BEES

Worker bumble bees are being imported from Europe for glasshouse pollination at great cost. I was quoted figures of Malta £30 (about NZ\$120) for 60 worker bees with no queen bee. New Zealand produces bumble bee units for tomato pollination and also exports thousands of queen bumble bees to Europe each year. It may be possible for Malta to import queen right units from NZ at cheaper prices. A queen right unit will last longer and provide a better pollination service.

